

THE RESEARCH PAGE

Much vigorous laboratory activity is currently being centered on social learning in children. The review which follows discusses imitation, one basic form of social learning. In this paper, Dr. Bandura describes a series of studies emanating from his own laboratory that confirm the significance of imitation in personality development of the child and point to some of the factors that bring about imitative responses in preschool-aged children. At the same time, the research reviewed here suggests rather extensive modification of traditional psychoanalytic-based theories of identification.

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Research Editor

THE ROLE OF IMITATION IN PERSONALITY DEVELOPMENT *

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I remember reading a story reported by Professor Mowrer about a lonesome farmer who decided to get a parrot for company. After acquiring the bird, the farmer spent many long evenings teaching the parrot the phrase, "Say Uncle." Despite the devoted tutorial attention, the parrot proved totally unresponsive and finally, the frustrated farmer got a stick and struck the parrot on the head after each refusal to produce the desired phrase.

But the visceral method proved no more effective than the cerebral one, so the farmer grabbed his feathered friend and tossed him in the chicken house. A short time later the farmer heard a

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loud commotion in the chicken house and, upon investigation, found that the parrot was pommeling the startled chickens on the head with a stick and shouting, "Say Uncle!" "Say Uncle!"

While this story is not intended as an introduction to a treatise on parrot-training practices, it provides a graphic illustration of the process of social learning that I shall discuss in this paper.

One can distinguish two kinds of processes by which children acquire attitudes, values, and patterns of social behavior. First, the learning that occurs on the basis of direct tuition or instrumental training. In this form of learning, parents and other socializing agents are relatively explicit about what they wish the child to learn, and attempt to shape his behavior through rewarding and punishing consequences.

Although a certain amount of socialization of a child takes place through such direct training, personality pat-

* The experiments reported in this paper were supported in part by research Grants M-1734, M-4398, and M-5316 from the National Institute of Health, Public Health Service, and the Lewis S. Haas Child Development Research Fund, Stanford University.

The author wishes to express his appreciation to the many students who assisted in various phases of this research. I am also grateful to Edith Dowley, Director, Marilyn Haley and Patricia Rowe, Head Teachers, Stanford University Nursery Schools, for their aid in arranging the research facilities.

terns are primarily acquired through the child's active imitation of parental attitudes and behavior, most of which the parents have never directly attempted to teach. Indeed, parental modeling behavior may often counteract the effects of their direct training. When a parent punishes his child physically for having aggressed toward peers, for example, the intended outcome of this training is that the child should refrain from hitting others. The child, however, is also learning from parental demonstration how to aggress physically, and this imitative learning may provide the direction for the child's behavior when he is similarly frustrated in subsequent social interactions.

Research on imitation demonstrates that, unlike the relatively slow process of instrumental training, when a model is provided, patterns of behavior are rapidly acquired in large segments or in their entirety (Bandura, 1962). The pervasiveness of this form of learning is also clearly evident in naturalistic observations of children's play in which they frequently reproduce the entire parental role-behavior including the appropriate mannerisms, voice inflections and attitudes, much to the parents' surprise and embarrassment. Although the process whereby a person reproduces the behavior exhibited by real-life or symbolized models is generally labelled "identification" in theories of personality, I shall employ the term imitation because it encompasses the same behavioral phenomenon, and avoids the elusiveness and surplus meanings that have come to be associated with the former concept.

Let us now consider a series of experiments that both illustrates the process of learning through imitation, and identifies some of the factors which serve to enhance or to reduce the occurrence of imitative behavior.

Transmission of Aggression

One set of experiments was designed primarily to determine the extent to which aggression can be transmitted to children through exposure to aggressive adult models (Bandura, Ross and Ross, 1962). One group of children observed an aggressive model who exhibited relatively novel forms of physical and

verbal aggression toward a large inflated plastic doll; a second group viewed the same model behave in a very subdued and inhibited manner, while children in a control group had no exposure to any models. Half the children in each of the experimental conditions observed models of the same sex as themselves, and the remaining children in each group witnessed opposite sex models.

This investigation was later extended (Bandura, Ross and Ross, 1963a) in order to compare the effects of real-life and film-mediated or televised aggressive models on children's behavior. Children in the human film-aggression group viewed a movie showing the same adults, who had served as models in the earlier experiment, portraying the novel aggressive acts toward the inflated doll. For children in the cartoon-aggression groups, a film in which the female model costumed as a cartoon cat exhibiting the aggressive behavior toward the plastic doll was projected on a glass lenscreen in a television console.

After exposure to their respective models all children, including those in the control group, were mildly frustrated and tested for the amount of imitative and non-imitative aggression.

The results of these experiments leave little doubt that exposure to aggressive models heightens children's aggressive responses to subsequent frustration. As shown in Figure 1, children who observed the aggressive models exhibited approximately twice as much aggression than did subjects in the non-aggressive model group or the control group. In addition, children who witnessed the subdued nonaggressive model displayed the inhibited behavior characteristic of their model and expressed significantly less aggression than the control children.

Some evidence that the influence of models is partly determined by the sex appropriateness of their behavior is provided by the finding that the aggressive male model was a more powerful stimulus for aggression than the aggressive female model. Some of the children, particularly the boys, commented spontaneously on the fact that the female model's behavior was out of character (e.g., "That's no way for a lady to be-

have. Ladies are supposed to act like ladies. . .")

In contrast, aggression by the male model was generally viewed as appropriate and approved by both the boys ("Al's a good sucker, he beat up Bobo. I want to sock like Al.") and the girls ("That man is a strong fighter. He punched and punched, and he could hit Bobo right down to the floor and if Bobo got up he said, 'Punch your nose'. He's a good fighter like Daddy.")

what less inclined to imitate precisely the cartoon character than the real-life aggressive model, all three experimental conditions—real-life, film-mediated, and cartoon aggressive models—produced equivalent increases in overall aggressive behavior based on a variety of measures of both imitative and non-imitative aggression.

The finding that film-mediated models are as effective as real-life models in eliciting and transmitting aggressive

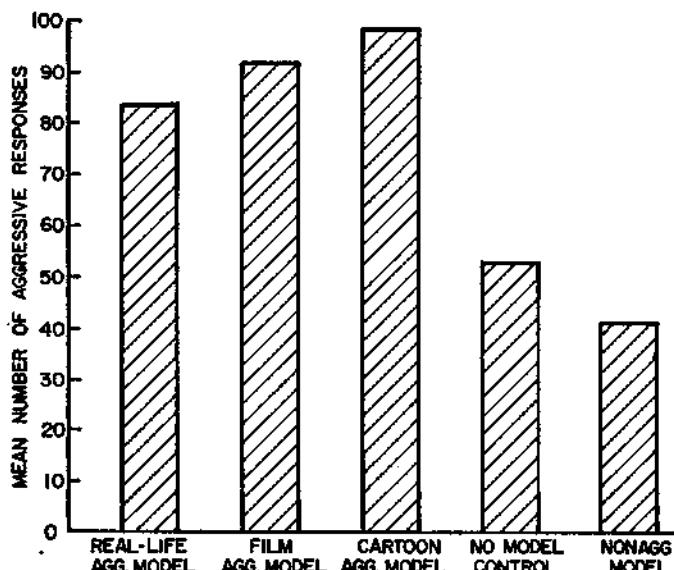


Figure 1. Mean number of aggressive responses performed by children in each of five groups.

The data furthermore reveal that aggressive models are highly influential not only in reducing children's inhibitions over aggression, but also in shaping the form of their behavior. Children who observed the aggressive models displayed a great number of precisely imitative aggressive acts, whereas, such responses rarely occurred in either the non-aggressive model group or the control group. Illustrations of the way many of the children became virtually carbon copies of their models are presented in Figure 2. The top frames show the female model performing four novel aggressive responses; the lower frames depict a boy and a girl reproducing the behavior of the female model whom they had observed in the film presentation.

Although the children were some-

responses indicates that televised models may serve as important sources of behavior and can no longer be ignored in conceptualizations of personality development. Indeed, most youngsters probably have more exposure to prestigious televised male models than to their own fathers. With further advances in mass media and audiovisual technology, pictorially presented models, mainly through television, are likely to play an increasingly influential role in shaping personality patterns, and in modifying attitudes and social norms.

It has been widely assumed on the basis of psychoanalytic theory and other hydraulic energy models of personality, that children's vicarious participation in film-mediated aggression or the direct expression of aggressive behavior will serve to discharge "pent-

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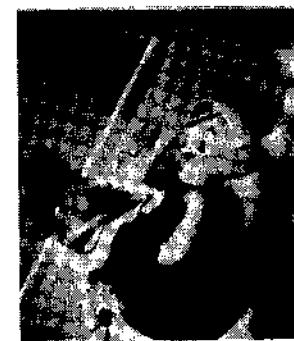
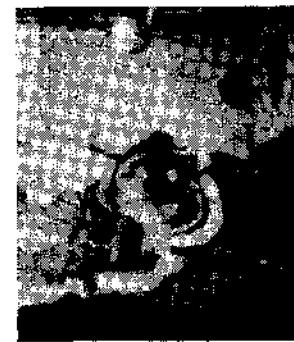
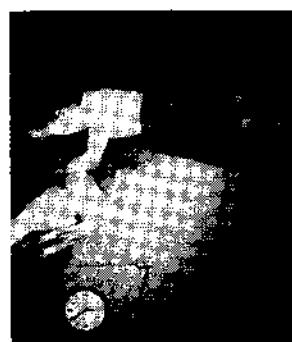
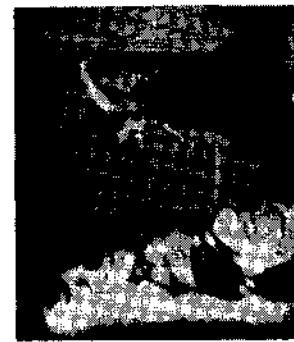
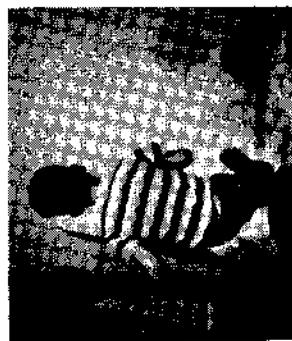
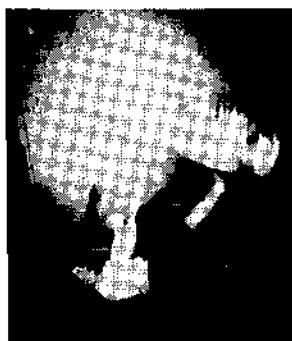


Figure 2. Photographs of two children exhibiting precise imitation of the female model whom they had previously observed on film.

up energies" and affects. Guided by this catharsis hypothesis, many parents, educators and mental health workers encourage hyperaggressive children to participate in aggressive recreational activities, to view highly aggressive televised programs, and to aggress in psychotherapeutic playrooms and other permissive settings.

In contrast to this "drainage" view, social learning theory (Bandura & Walters, in press) would predict that the provision of aggressive models and the inadvertant positive reinforcement of aggression, which inevitably occurs during the encouragement of cathartic expressions, are exceedingly effective procedures for enhancing aggressive response tendencies. It is not surprising, therefore, that studies in which children or adolescents have been exposed to film-mediated aggressive models (Bandura, Ross and Ross, 1961, 1963a, b; Lovaas, 1961; Mussen and Rutherford, 1961; Siegel, 1959; Walters, Llewellyn Thomas and Acker, 1962) have uniformly demonstrated that vicarious participation in aggressive activity increases, rather than decreases, aggressive behavior.

On the other hand, providing aggressive children with examples of alternative constructive ways of coping with interpersonal frustration has been found to be highly successful in modifying aggressive-domineering personality patterns (Chittenden, 1942). Additional comparisons of social theory and the traditional approaches to personality development will be presented later.

It is apparent that children do not reproduce the personality characteristics of every model with whom they come into contact, nor do they imitate every element of behavior exhibited even by models whom they may have selected as their primary sources of social behavior. The experiments that I shall discuss in the remaining sections of this paper are mainly concerned with some of the psychological variables determining the selection of models, and the degree to which their behavior will be imitated.

Response Consequences to the Model and Imitation

The manner in which rewarding or

punishing consequences to the model's behavior influences imitation is demonstrated in an experiment in which nursery school children observed either an aggressive model rewarded, an aggressive model punished, or had no exposure to the models (Bandura, Ross and Ross, 1963b). The models were two adults presented to the children on film projected into a television console.

In the aggression-rewarded condition, Rocky, the aggressive model appropriates all of Johnny's attractive play possessions and tasty food stuffs through aggressive-domineering means. The film shown to the children in the aggression-punished condition was identical with that shown to the aggression-rewarded group except for a slight rearrangement of the film sequence so the aggression exhibited by Rocky resulted in his being severly punished by Johnny. Following exposure to the models the children were tested for the incidence of post-exposure aggressive behavior.

Children who observed Rocky's aggressive behavior rewarded readily imitated his physical and verbal aggression, whereas, children who saw him punished exhibited relatively little imitative behavior and did not differ from a group of control children who had no exposure to the models.

At the conclusion of the experiment each child was asked to evaluate the behavior of Rocky and Johnny, and to select the character he preferred to emulate. These data yielded some interesting and surprising findings. As might be expected, children who observed Rocky's aggressive behavior punished both failed to reproduce his behavior and rejected him as a model for emulation.

On the other hand, when Rocky's aggression was highly successful in amassing rewarding resources, he was chosen by most of the children as the preferred model for imitation. The surprising finding, however, is that without exception these children were highly critical of his behavior (e.g., "Rocky is harsh" . . . "Rough and bossy" . . . "Mean" . . . "Wicked" . . . "He whack people" . . .)

It was evident from the children's comments that the successful payoff of aggression rather than its intrinsic de-

sirability served as the primary basis for emulation (e.g., "Rocky beat Johnny and chase him and get all the good toys" . . . "He came and snatched Johnny's toys. Get a lot of toys . . .") The children resolved the conflict by derogating the unfortunate victim, apparently as justification for Rocky's exploitative-assaultive behavior. They criticized Johnny for his inability to control Rocky ("He's a cry baby. Didn't know how to make Rocky mind."), for his miserliness ("If he'd shared right in the beginning, Rocky might have played nice."), and generally described him as, "Sulky", "Mean", and "Sort of dumb."

This study clearly demonstrates the way rewarding consequences to the model's behavior may outweigh the value systems of the observers—children readily adopted successful modeling behavior even though they had labeled it objectionable, morally reprehensible, and publicly criticized the model for engaging in such behavior.

In many televised and other mass media presentations antisocial models amass considerable rewarding resources through devious means but are punished following the last commercial on the assumption that the punishment ending will erase or counteract the learning of the model's antisocial behavior.

The findings from a recently completed experiment (Bandura, 1963) reveal that, although punishment administered to a model tends to inhibit children's performance of the modeled behavior, it has virtually no influence on the occurrence of imitative learning. In this experiment children observed a film-mediated aggressive model who was severely punished in one condition of the experiment, generously rewarded in a second condition, while the third condition presented no response-consequences to the model.

Consistent with the findings cited earlier, a post-exposure test of imitative behavior showed that children who observed the punished model performed significantly fewer imitative responses than children in the model-rewarded and the no-consequence groups. Children in all three groups were then offered attractive incentives contingent on their reproducing the model's behavior. The introduction of the rewards completely wiped out the previously

observed performance differences, revealing an equivalent amount of learning among the children in the model-rewarded, model-punished and the no-consequences groups. Similarly, girls exhibited approximately as much imitative aggression as did the boys.

It might be concluded from these findings that exposure of children to punished antisocial or other types of models is likely to result in little overt imitative behavior. Nevertheless, the observed behavior is learned and may be exhibited on future occasions given the appropriate instigations, the instruments necessary for performing the imitative acts, and the prospect of sufficiently attractive positive rewards contingent on the successful execution of the behavior.

Nurturance and Imitation

The role of nurturance in facilitating imitative learning has been emphasized in most theories of identification. Through the repeated association of the parent's behavior and attributes with warm, rewarding, and affectionately demonstrative caretaking activities, it is assumed that the parent's behavioral characteristics gradually take on positive value for the child. Consequently, the child is motivated to reproduce these positively valenced attributes in his own behavior.

Some empirical support for the nurturance hypothesis is provided in an experiment in which the quality of the rewarding interaction between a female model and nursery school children was systematically varied (Bandura and Huston, 1961). With one group of children the model behaved in a warm and rewarding manner, while a second group of children experienced a distant and non-nurturant relationship with the model. Following the experimental social interactions the model and the children played a game in which the model exhibited a relatively novel pattern of verbal and motor behavior, and the number of imitative responses performed by the children was recorded.

Children who had experienced the rewarding interaction with the model displayed substantially more imitative behavior than did children with whom the same adult had interacted in a non-

rewarding way. Exposure to a model possessing rewarding qualities not only elicited precisely imitative verbal responses but also increased the level of non-imitative verbalization. These results are essentially in agreement with those of Milner (1951), who found that children receiving high reading readiness scores had more verbal and affectionately demonstrative maternal models than children in the low reading ability group.

The importance of attaching positive valence to the activities and behavior which the parent or teacher wishes the child to reproduce is dramatically illustrated in a case report by Mowrer (1960). A two year old girl, who suffered from an auditory defect, was seriously retarded in language development, a condition that resulted primarily from her refusal to wear a hearing aid. In analyzing the mother-child verbal interaction, it became readily apparent that the girl was hearing only language responses of high amplitude which the mother uttered in a raised voice during disciplinary interventions. Considering the repeated association of the mother's verbal behavior with negative emotional experiences, it was not surprising that the child refused to wear a hearing aid, and exhibited little interest in, or desire for, vocalization.

The mother was instructed to follow a remedial program in which she deliberately and frequently associated her vocalizations with highly positive experiences, and refrained from using language punitively. Within a brief period of time the child began to show an active interest in the mother's verbalizations, was quite willing to wear the hearing aid, and made rapid progress in her language development.

In discussions of the process of education and socialization, considerable emphasis is generally placed on direct training procedures. As the above case illustrates, however, the attachment of positive valence to modeling behavior may be an important precondition for the occurrence of social learning. Indeed, once the behavior in question has acquired positive properties, the child is likely to perform it in the absence of socializing agents and externally administered rewards.

Social Power and Imitation

In the studies to which reference has been made, children were exposed to only a single model. During the course of social development, however, children have extensive contact with multiple models, particularly family members, who may differ widely in their behavior and in their relative influence. Therefore, a further study, designed to test several different theories of identificatory learning, utilized three-person groups representing prototypes of the nuclear family (Bandura, Ross and Ross, 1963c).

In one condition of the experiment an adult assumed the role of controller of highly rewarding resources including attractive play material, appetizing foods and high status objects. Another adult was the recipient of these resources, while the child, a participant observer in the triad, was essentially ignored. In a second condition, one adult controlled the resources; the child, however, was the recipient of the positive resources, while the other adult was assigned a subordinate and powerless role.

An adult male and female served as models in each of the triads. For half the boys and girls in each condition the male model controlled and dispensed the rewarding resources, simulating the husband-dominant home; for the remaining children, the female model mediated the positive resources as in the wife-dominant home. Following the experimental social interactions the adult models exhibited divergent patterns of behavior in the presence of the child, and measures were obtained of the degree to which the child patterned his behavior after that of the models.

According to the status envy theory of identification proposed by Whiting (1959, 1960), where a child competes unsuccessfully with an adult for affection, attention, food and care, the child will envy the consumer adult and consequently identify with him. This theory represents an extension of the psychoanalytic defensive identification hypothesis that identification is the outcome of rivalrous interaction between the child and the parent who occupies an envied consumer status. In contrast to the status envy hypothesis, the social

power theory of identification (Macoby, 1959; Mussen and Distler, 1960), predicts that children will reproduce more of the behavior of the adult who controls positive resources than that of the powerless adult model.

The results of this experiment reveal that children tend to identify with the source of rewarding power rather than with the competitor for the rewards. In both experimental triads, regardless of whether the rival adult or the children themselves were the recipients of the rewarding resources, the model who possessed rewarding power was imitated to a considerably greater extent than was the competitor or the ignored model. Moreover, power inversions on the part of the male and female models produced cross-sex imitation, particularly in girls. These findings suggest that the distribution of rewarding power within the family may play an important role in the development of both appropriate and deviant sex-role behavior.

Although the children adopted many of the characteristics of the model who possessed rewarding power, they also reproduced some of the response patterns exhibited by the model who occupied a subordinate role. The children's behavior represented a synthesis of behavioral elements selected from both models, and since the specific admixture of elements varied from child to child, they displayed quite different patterns of imitative behavior. Thus, within the one family even same-sex siblings may exhibit different personality characteristics, owing to their having selected for imitation different elements of their parents' attitudes and behavior. Paradoxical as it may seem, it is possible to achieve considerable innovation through selective imitation.

Social Learning, Psychoanalytic, and Stage Theories of Personality

It was pointed out in preceding sections of this paper, that laboratory data have failed to support predictions derived from several widely accepted psychoanalytic principles of personality development. Research generated by modern social learning theory also raises some questions about the validity of stage theories that typically de-

pict the developmental process as involving a relatively spontaneous emergence of age-specific modes of behavior as the child passes from one stage to another. According to Piaget's theory of moral development (1948), for example, one can distinguish two clear-cut stages of moral orientations demarcated from each other at approximately seven years of age.

In the first stage, defined as objective morality, children judge the gravity of a deviant act in terms of the amount of material damages, and disregard the intentionality of the action. By contrast, during the second or subjective morality stage, children judge conduct in terms of its intent rather than its material consequences. The sequence and timing of these stages are presumably predetermined and, consequently, young children are incapable of adopting a subjective orientation while objective moral judgments are rarely encountered in older children.

However, in an experiment designed to study the influence of models in transmitting and modifying children's moral judgments (Bandura and McDonald, 1963), objective and subjective moral judgments were found to exist together rather than as successive developmental stages. The vast majority of young children were capable of exercising subjective judgments and most of the older children displayed varying degrees of objective morality.

Children who exhibited predominantly objective and subjective moral orientations were then selected and exposed to adult models who consistently expressed moral judgments that ran counter to the children's orientations. The provision of models was highly effective in altering the children's moral judgments. Objective children modified their moral orientations toward subjectivity and, similarly, subjective children became considerably more objective in their judgmental behavior. Furthermore, the children maintained their altered orientations in a new test situation in the absence of the models. It is highly probable that other personality characteristics generally viewed as predetermined age-specific phenomena can also be readily altered through the application of appropriate social

learning principles.

Despite the voluminous clinical and theoretical literature pertaining to child development, the available body of empirically verified knowledge is comparatively meagre. The recent years, however, have witnessed a new direction in theorizing about the developmental process, which has generated considerable laboratory research within the framework of social learning theory. These studies are beginning to yield rel-

atively unambiguous statements about the influence of particular antecedent events on the behavior and attitudes of children. This approach evidently holds promise of providing both more reliable guidelines for educational practice, and the type of evidence necessary for discarding procedures that prove to be ineffective in, or even a hindrance to, the successful realization of desired developmental, educational and psychotherapeutic objectives.

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Analysis of Self-Efficacy Theory of Behavioral Change¹

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This article reports the findings of two experimental tests of self-efficacy theory of behavioral change. The first study investigated the hypothesis that systematic desensitization effects changes in avoidance behavior by creating and strengthening expectations of personal efficacy. Thorough extinction of anxiety arousal to visualized threats by desensitization treatment produced differential increases in self-efficacy. In accord with prediction, microanalysis of congruence between self-efficacy and performance showed self-efficacy to be a highly accurate predictor of degree of behavioral change following complete desensitization. The findings also lend support to the view that perceived self-efficacy mediates anxiety arousal. The second experiment investigated the process of efficacy and behavioral change during the course of treatment by participant modeling. Self-efficacy proved to be a superior predictor of amount of behavioral improvement phobics gained from partial mastery of threats at different phases of treatment.

According to social learning theory (Bandura, 1977a), changes in defensive behavior produced by different methods of treatment derive from a common cognitive mechanism. It is postulated that psychological procedures, whatever their format, serve as ways of creating and strengthening expectations of personal effectiveness. Perceived self-efficacy affects people's

¹This research was supported by Public Health Research Grant M-5162 from the National Institute of Mental Health. The authors are indebted to Laura Macht for her able assistance in administering the assessment procedures, and to Earl Neilson for his contributions to the preliminary work in this project. We are grateful to Paul McReynolds, Robert Peterson, and Duane Varble for arranging the research facilities at the University of Nevada, Reno.

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choice of activities and behavioral settings, how much effort they expend, and how long they will persist in the face of obstacles and aversive experiences. The stronger the perceived self-efficacy, the more active the coping efforts. Those who persist in subjectively threatening activities will eventually eliminate their inhibitions through corrective experience, whereas those who avoid what they fear, or who cease their coping efforts prematurely, will retain their self-debilitating expectations and defensive behavior.

In this social learning analysis, expectations of personal efficacy stem from four main sources of information. Performance accomplishments provide the most influential efficacy information because it is based on personal mastery experiences. The other sources of efficacy information include the vicarious experiences of observing others succeed through their efforts, verbal persuasion that one possesses the capabilities to cope successfully, and states of physiological arousal from which people judge their level of anxiety and vulnerability to stress.

Empirical tests of this theory (Bandura, Adams, & Beyer, 1977), confirm that different treatment approaches alter expectations of personal efficacy, and the more dependable the source of efficacy information, the greater are the changes in self-efficacy. Thus, treatments based on performance accomplishments through the aid of participant modeling produce higher, stronger, and more generalized expectations of personal efficacy than do vicarious experiences alone. Results of a microanalysis of the congruence between self-efficacy and performance reveal that behavioral changes correspond closely to level of self-efficacy whether instated enactively or vicariously.

As a further test of the generality of this theory, an experiment was conducted of efficacy expectations instated by systematic desensitization, which is aimed at eliminating emotional arousal. Social learning theory and the dual-process theory of anxiety, on which the desensitization approach is based, posit different explanatory mechanisms for the changes produced by this mode of treatment.

The standard desensitization approach is based on the assumption that anxiety activates defensive behavior (Wolpe, 1974). According to this view, association of neutral events with aversive stimulation creates an anxiety drive that motivates defensive behavior. The defensive behavior, in turn, is reinforced by reducing the anxiety aroused by conditioned aversive stimuli. Hence, to eliminate defensive responding it is considered necessary to eradicate its underlying anxiety. Treatment strategies are therefore keyed to reduction of emotional arousal. Aversive stimuli are presented at graduated levels in conjunction with relaxation until anxiety reactions to the threats are eliminated.

Although desensitization produces behavioral changes, the principal assumption that defensive behavior is controlled by anxiety arousal is disputed by several lines of evidence (Bandura, 1977b; Bolles, 1972; Herrnstein, 1969; Rescorla & Solomon, 1967). Autonomic arousal, which constitutes the principal index of anxiety, is not necessary for defensive learning. Maintenance of avoidance behavior is even less dependent upon autonomic feedback. Social learning theory regards anxiety and defensive behavior as coeffects rather than as causally linked (Bandura, 1977b). Aversive experiences, of either a personal or a vicarious sort, create expectations of injurious consequences that can activate both fear and defensive behavior. Being coeffects, there is no fixed relationship between autonomic arousal and actions.

Dual-process theory predicts that thorough extinction of anxiety should eliminate avoidance behavior. In the desensitization treatment, however, anxiety reactions are typically eliminated to visualized representations of feared situations. One would expect some transfer loss of extinction effects from symbolic to real-life threats, as is indeed the case (Agras, 1967; Barlow, Leitenberg, Agras, & Wincze, 1969). It is not uncommon for people to perform less than they have been desensitized to in imagery. Therefore, extinction of anxiety to visualized threats might be expected to produce substantial, though less than complete, reductions in avoidance behavior. However, since anxiety arousal to visualized threats is completely eliminated in all subjects, dual-process theory provides no basis for predicting the substantial variability in behavior commonly displayed by subjects who have all been equally desensitized.

Stressful situations generally elicit emotional arousal that, depending on the circumstances, might have informative value concerning personal competency. Therefore, emotional arousal is a constituent source of information that can affect perceived self-efficacy in coping with stressful situations (Bandura, 1977a). Because high levels of arousal usually debilitate performance, individuals are more likely to expect to function effectively when they are not beset by aversive arousal than if they are tense and viscerally agitated. Treatment approaches that focus on physiological arousal as the major factor requiring modification further reinforce the expectation that anxiety arousal governs behavioral functioning. Clients are taught how to manage their physiological arousal, they learn to discriminate small variations in their level of arousal, and most of the treatment strategies are designed to eradicate physiological arousal to subjective threats. By the structuring explanations and therapeutic practices, arousal is thus given considerable salience.

From the perspective of social learning theory, reducing physiological arousal improves performance by raising efficacy expectations rather than

by eliminating a drive that instigates the defensive behavior. This cognitive mediating mechanism of change places greater emphasis on the informative than on the automatic energizing function of physiological arousal. Most arousal is activated by thought, and cognitive appraisal of arousal states to a large extent determines the level and direction of motivational inducements to action (Bandura, 1977b; Weiner, 1972). Because arousal is only one of several sources of efficacy information, and not necessarily the most dependable one, extinguishing anxiety arousal is rarely a sufficient condition for eliminating avoidance behavior.

To test the theory that desensitization changes behavior through its intervening effects on efficacy expectations, severe phobics were administered the standard desensitization treatment until their anxiety reactions were completely extinguished to imaginal representations of the most aversive scenes. Their approach behavior and efficacy expectations were measured before and after completion of desensitization treatment. The perceived self-efficacy of phobics reflects the direct and mediated experiences they have had with what they fear, as well as appraisals of their physiological arousal to the threats. Because subjects have met with different types and amounts of efficacy-generating experiences, it was hypothesized that eliminating emotional arousal alone would enhance self-efficacy but the levels attained would vary. It was further predicted that the higher and stronger the efficacy expectations instated by the desensitization treatment, the greater would be the reductions in avoidance behavior.

METHOD

Subjects

Subjects whose social, recreational, and vocational activities were adversely affected by chronic snake phobias were recruited through advertisements placed in a newspaper serving a metropolitan area and its suburban communities. All but one of the subjects who participated in the desensitization study were females. They ranged in age from 19 to 57 years with a mean age of 31 years.

Pretreatment Measures

A multifaceted assessment procedure was used to provide the data required for a microanalysis of changes in expectations of personal effectiveness and avoidance behavior.

Behavioral Avoidance. The test of avoidance behavior consisted of a series of 29 performance tasks requiring increasingly more threatening interactions with a red-tailed boa constrictor. The hierarchical set of tasks required subjects to approach a glass cage containing the snake, to look down at it, to touch and hold the snake with gloved and bare hands, to let it loose in the room and return it to the cage, to hold it within 12 cm of their faces, and finally to tolerate the snake crawling in their laps while they held their hands passively at their sides.

A female tester administered all the assessment procedures. Prior to measuring phobic behavior, subjects were given factual information about the characteristics and habits of snakes to eliminate moderately fearful subjects who might be emboldened by factual information alone. Those who could not enter the room containing the snake received a score of zero; subjects who did enter were asked to perform the various tasks in the graded series. To control for any possible influence of expressive cues from the tester, she stood behind the subject and read aloud the tasks to be performed.

The avoidance score was the number of snake-interaction tasks the subject performed successfully. Those who could lift the snake inside the cage with a gloved hand were considered insufficiently fearful and were not included in the experiment. To maximize the generality of the findings, all people who were sufficiently phobic on the behavior test were selected for study.

Fear Arousal Accompanying Approach Responses. In addition to the measurement of performance capabilities, the degree of fear aroused by each approach response was assessed. During the behavioral test, subjects rated orally, on a 10-interval scale, the intensity of fear they experienced when each snake approach task was described to them, and again while they were performing the corresponding behavior. These fear ratings for all the approach tasks actually completed were averaged to provide the index of fear arousal.

Efficacy Expectations. In the pretest phase efficacy expectations were measured after the test of behavioral avoidance so that subjects would have some understanding of what types of performances were required. Separate measures were obtained of the magnitude, strength, and generality of expectations.

Subjects were provided with the list of performance tasks included in the behavioral test and instructed to designate those they expected to perform as of then. For each task so designated, they rated the strength of their expectations on a 100-point probability scale, ranging in 10-unit intervals, from high uncertainty through intermediate values of certainty to complete certitude. The *level* of self-efficacy was the number of performance tasks

subjects designated they expected to perform with a probability value above 10, which was the lowest point on the scale signifying virtual impossibility. *Strength of self-efficacy* was computed by summing the magnitude of expectancy scores across tasks and dividing the sum by the total number of performance tasks. To provide an index of the *generality* of self-efficacy, subjects rated the level and strength of their expectations in coping successfully with an unfamiliar snake as well as with a boa constrictor similar to the one used in treatment.

Efficacy expectations were measured after the behavioral pretest, prior to the posttest that was administered within a week after treatment was concluded, and after completing the behavioral posttest. These expectations were recorded privately and remained so during the behavior tests to minimize any motivational inducements to improve performance that could arise had the expectations been communicated publicly to the examiner.

Situational Generalization of Fear and Self-Efficacy. Situational generalization of the effects of desensitization was assessed in terms of subjects' anticipatory fear of snake encounters under different natural conditions and their self-efficacy in coping with them.

Fear of snake encounters in natural situations was measured on six scales portraying diverse encounters with snakes, including visiting a reptile exhibit, watching a film on the habits of snakes, suddenly confronting snakes on hikes or in a garage, visiting a household containing pet snakes, and handling them. Subjects were instructed to rate each item on a 7-interval scale of fearfulness. The mean of the six ratings constituted the level of anticipatory fear arousal over encounters with snakes.

Subjects also rated the situations described above in terms of how effectively they could cope with snakes were they to encounter them in their everyday life. The ratings were averaged to provide a score of perceived self-efficacy in dealing with snakes. In addition, they rated their self-efficacy in coping with other animals they feared and with difficult social situations. Animal and social threats were selected to provide additional measures of generalization of perceived self-efficacy along a dimension of similarity to the threat that was the focus of treatment.

Systematic Desensitization

A female therapist administered to subjects individually the systematic desensitization treatment. As in the standard procedure, deep muscular relaxation was successively paired with imaginal representations of snake scenes arranged in order of increasing aversiveness. During the first session subjects received training in muscular relaxation. In addition, they were provided with audio cassettes and relaxation tapes for use at home to

improve their facility at inducing deep relaxation. They continued the home practice in relaxation twice a day over 4 consecutive days.

In subsequent treatment sessions, after being deeply relaxed, subjects were instructed by the therapist to visualize the least threatening item in the hierarchy of anxiety-provoking scenes. The anxiety hierarchy contained a total of 51 scenes ranging from relatively innocuous activities such as visualizing themselves looking at pictures and toy replicas of snakes to handling live snakes in ways that would be highly fear-provoking. Whenever subjects signaled anxiety to visualization of a threatening scene it was withdrawn, relaxation was reinstated, and the same item was repeatedly presented until it ceased to evoke anxiety. If relaxation remained unimpaired in the imagined presence of the threat, subjects' anxiety reactions to the next item in the hierarchy were extinguished. This procedure was continued throughout the graduated series of aversive scenes until subjects' anxiety reactions to the most threatening events were completely eliminated. The average duration of the desensitization treatment, not counting the relaxation training, was 4 hours, 27 minutes.

Posttreatment Measures

The assessment procedures used in the pretreatment phase of the study were readministered within a week after the completion of treatment. Efficacy expectations were measured prior to, and after, the behavioral posttest to examine the reciprocal influence between expectations and performance accomplishments.

To gauge the generality of changes in self-efficacy and performance, subjects' approach behavior was measured initially toward the dissimilar corn snake and then with the red-tailed boa used in the pretest. Subjects were tested with the dissimilar snake first to minimize possible transfer effects from performance improvements during the posttest, which would be more likely to occur in dealing with a familiar threat a second time than in coping with a new one.

The same female tester who conducted the pretest administered the posttreatment measures. To control for any possible bias, she was not informed of the conditions to which subjects had been assigned.

Supplementary Treatment

Subjects who failed to achieve terminal performances in the posttest after completing the desensitization treatment were administered participant modeling until they performed all the therapeutic tasks successfully.

The therapist first modeled the relevant activities and then guided the subject with response induction aids through the graded hierarchy of tasks until they were fully mastered. The subjects were then readministered the standard assessment procedures.

RESULTS

Level of Self-Efficacy

Phobics whose anxiety arousal to visualized threats was thoroughly extinguished emerge from the desensitization treatment with widely differing expectations of personal efficacy. The mean level of efficacy expectations and approach responses displayed by subjects at different phases of the experiment are presented graphically in Figure 1. Table I shows the significance of the changes achieved by subjects, as evaluated by the *t* test for correlated means.

Comparison of efficacy expectations prior to treatment and following treatment, but before the posttest, confirms that extinction of anxiety arousal through symbolic desensitization significantly enhances self-efficacy toward similar and dissimilar threats alike (Table I). Analysis of

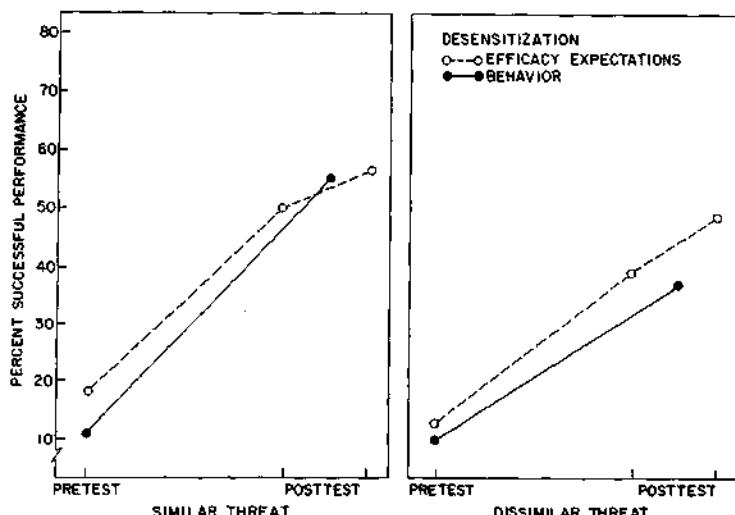


Fig. 1. Level of efficacy expectations and approach behavior displayed by subjects toward different threats after fear arousal to symbolic representations of threatening activities was eliminated through systematic desensitization.

Table 1. Significance of Intragroup Changes for Each Measure

Measure	Desensitization	Participant modeling
	Pretest vs. posttest (N = 10)	Posttest vs. supplemental test (N = 8)
Level of efficacy expectations		
Total	4.06 ^a	4.83 ^b
Similar threat	4.04 ^a	5.64 ^b
Dissimilar threat	3.83 ^a	3.79 ^a
Strength of efficacy expectations		
Total	3.99 ^a	3.61 ^a
Similar threat	4.06 ^a	3.94 ^a
Dissimilar threat	3.89 ^a	2.47 ^c
Approach behavior		
Total	6.00 ^b	8.15 ^b
Similar threat	5.51 ^b	5.19 ^b
Dissimilar threat	4.17 ^a	5.84 ^b
Fear arousal		
Initial approach		
Total	5.16 ^b	3.31 ^a
Similar threat	5.44 ^b	2.80 ^c
Dissimilar threat	5.07 ^b	2.38 ^c
Total approach		
Total	3.52 ^a	4.30 ^a
Similar threat	3.05 ^c	5.23 ^b
Dissimilar threat	3.08 ^c	3.20 ^a
Anticipatory fear arousal		
Total	4.78 ^b	2.85 ^c
Similar threat	5.33 ^b	2.90 ^c
Dissimilar threat	4.17 ^a	2.41 ^c
Generalized self-efficacy		
Snakes	5.64 ^b	3.44 ^a
Other animals	2.54 ^c	1.83
Social	1.46	.36
Generalized fear reduction	6.55 ^b	3.75 ^a

^a $p < .01$.^b $p < .001$.^c $p < .05$.

mean approach responses yielded a similar pattern of significant increases in approach behavior toward both threats.

Although subjects expressed significantly higher self-efficacy ($t_{(9)} = 2.53$, $p < .05$) and performed more approach responses ($t_{(9)} = 2.58$, $p < .05$) toward the similar than toward the dissimilar threat, the degree of correlation between efficacy and performance was similar regardless of the nature of the threat. The higher the level of perceived self-efficacy at the

completion of treatment, the higher was the level of approach behavior ($r = .75$, $p < .01$).

Microanalysis of Congruence Between Self-Efficacy and Performance

Correlations based upon aggregate measures do not fully reveal the degree of correspondence between self-efficacy and performance on the specific tasks from which the aggregate measures are obtained. A subject can display an equivalent number of efficacy expectations and successful performances but they might not correspond entirely to the same tasks. The most precise index of the relationship is provided by a microanalysis of the congruence between self-efficacy and performance at the level of individual tasks.

The microanalytic measure of congruence is obtained by recording whether or not subjects considered themselves capable of performing each of the various tasks at the end of treatment and computing the percent of accurate correspondence between efficacy judgment and actual performance. Self-efficacy was a highly accurate predictor of approach behavior exhibited on tasks varying in difficulty toward both threats by subjects who had been thoroughly desensitized (84% congruence). The efficacy-behavior congruence for the similar threat (85%) was comparable to that for the dissimilar threat (82%).

The preceding indices of congruity are based on all of the assessment tasks, some of which subjects performed in the pretest. When the microanalysis is conducted only on the subset of tasks that subjects had never performed in the pretest assessment, the degree of congruence between perceived self-efficacy and subsequent behavior is equally high toward similar (83%) and dissimilar (81%) threats. It should be noted in passing that the relationship between efficacy judgments and performance reported in an earlier article (Bandura, 1977a) differs slightly from the correlational and congruence indices given above because additional subjects were added to the sample since the earlier report.

Strength of Self-Efficacy

In the preceding analysis, a weak sense of self-efficacy received the same weight as one reflecting complete certitude. However, one would expect intensity and persistence of effort, and hence level of performance, to vary as a function of strength of perceived self-efficacy. The results reveal that desensitization enhances strength, as well as level, of efficacy expectations.

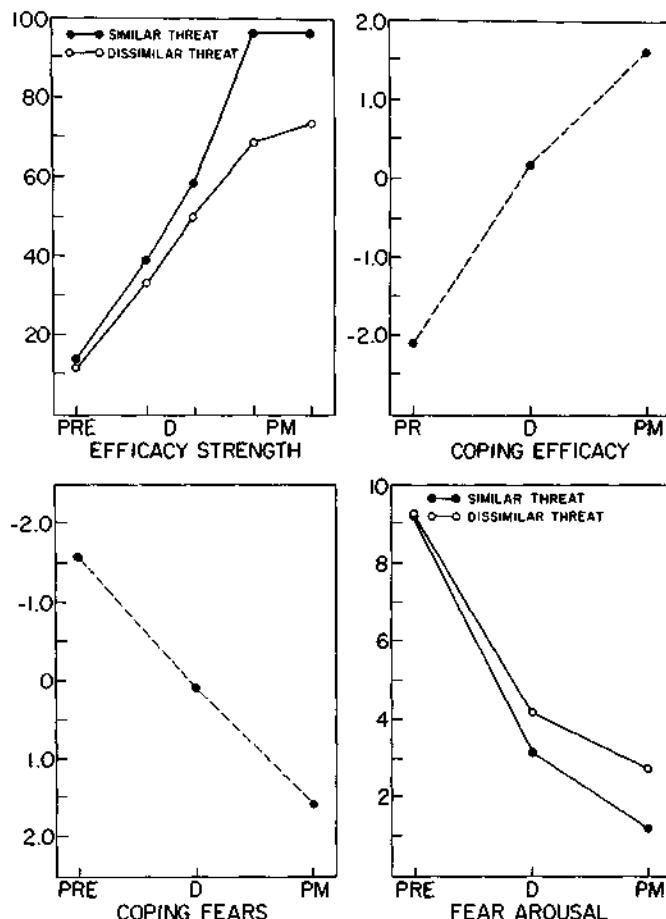


Fig. 2. Changes in strength of efficacy expectations (upper left panel), self-efficacy in coping with snake encounters in natural settings (upper right panel), fear of snake encounters in natural settings (lower left panel), and fear arousal accompanying interaction responses toward the test snakes (lower right panel) displayed by subjects after receiving desensitization (D) and participant modeling (PM) treatments.

Prior to treatment, subjects expressed relatively weak performance expectations. The desensitization treatment, however, increased the strength of subjects' perceived self-efficacy (Figure 2). As summarized in Table I, these differences are highly significant for both threats and for the pooled data. The stronger the performance expectations at the completion of treatment, the higher the level of approach behavior ($r = .72, p < .01$).

Because of the high congruence between self-efficacy and performance, subjects did not alter their efficacy expectations much after

completing the behavioral posttest. They raised the strength ($t_{(9)} = 3.79$, $p < .05$), but not the level, of their efficacy expectations on the basis of their achievements in the posttest.

Fear Arousal Accompanying Approach Responses

Reduction in fear arousal accompanying approach responses was evaluated by comparing the average level of fear elicited by responses that subjects performed before treatment with the fear levels reported in the posttest for the same subset of approach responses, and for the total number of approach responses they completed successfully. Results of the statistical analysis are shown in Table I. In accord with evidence of previous studies (Bandura, Blanchard, & Ritter, 1969), symbolic desensitization produced substantial reductions in fear arousal accompanying the initial and total approach responses toward both threats, with the familiar threat eliciting the weaker fearful reactions ($t_{(9)} = 2.29$, $p < .05$).

Decreases in the level of anticipatory fear evoked in the posttest by the approach task that subjects could not perform in pretest provides an index of fear extinction that is unaffected by having previously performed that particular behavior. This measure also reveals a significant decrement in fear arousal in relation to both threats (Table I).

The activation of anxiety has traditionally been depicted as a process in which anxiety arousal is elicited directly either by the conditioned aversive properties of stimuli or by their symbolized representations of unconscious forces. Neither the conditioning nor the psychodynamics theories require much in the way of conscious involvement of the person in the activation process. In the social learning theory of anxiety, it is mainly the perceived lack of efficacy to manage potentially aversive aspects of the environment that makes them fearsome. People fear potential aversive events that they construe as exceeding their coping capabilities, but do not find them fearsome if they believe they can manage them.

The correlational analysis lends some support to the view that perceived self-efficacy mediates anxiety arousal. The higher the subjects' level of self-efficacy following treatment, the less was their anticipatory arousal at the prospect of performing threatening tasks they previously avoided ($r = -.71$, $p < .025$), and the weaker was the accompanying arousal when they subsequently performed the various interaction tasks ($r = -.65$, $p < .025$). A similar pattern of relationships was obtained between strength of self-efficacy and degree of arousal. A strong sense of self-efficacy was associated with low anticipatory arousal ($r = -.54$, $p < .10$) and weak anxiety arousal while performing threatening tasks ($r = -.60$, $p < .05$).

Situational Generalization

The findings on the situational generalization of treatment effects are consistent with those obtained through direct assessment with the two different threats (Table I). Extinguishing arousal to symbolic representations of threats reduced anticipatory fear and enhanced self-efficacy in coping with snakes and with other animals in natural situations.

Supplementary Treatment

It will be recalled that subjects who achieved only partial improvement were administered participant modeling after the formal experiment was completed. Only one of the subjects achieved terminal performance through symbolic desensitization alone. This is not surprising because most of the subjects in the sample (80%) were exceedingly phobic, refusing in the pretest assessment to enter the test room or even to view the snake at a safe distance. Of the remaining nine subjects, eight were available and received the supplemental treatment using participant modeling.

Compared to the scores obtained following desensitization treatment, participant modeling instated marked changes on all measures (Table I). It boosted substantially the level, strength, and generality of self-efficacy; it enabled all but one subject to achieve terminal performances; it completely extinguished anticipatory and performance fear arousal; and it enhanced self-efficacy in coping with reptiles and other animals under varying natural conditions.

In the microanalysis of efficacy-performance congruence, which is the evidence of primary theoretical interest, efficacy expectations were highly reliable predictors of subsequent approach behavior toward similar (97%) and dissimilar (76%) threats on all tasks. The corresponding congruence between self-efficacy and behavior toward similar (94%) and dissimilar (62%) threats was also high even for the restricted number of highly threatening tasks that subjects were unable to perform either in pretest or following completion of desensitization treatment.

MICROANALYSIS OF SELF-EFFICACY AND PERFORMANCE CHANGES DURING THE COURSE OF PARTICIPANT MODELING

The series of experiments completed to date examined the value of efficacy expectations in predicting behavioral changes at the completion of enactive, vicarious, and emotive modes of treatment. The present study in-

vestigated the process of efficacy and behavioral change during the course of treatment itself. A microanalysis of the process of change as treatment progresses provides an especially rigorous test of the explanatory and predictive power of self-efficacy theory. Participant modeling was selected for this purpose because the amount of treatment can be well regulated and it promotes rapid change.

In the design of this experiment, performance tasks were segmented into blocks of activities that were progressively more difficult and threatening. Phobic subjects received participant modeling treatment only for the block of items at which they failed in the hierarchy of tasks. Treatment was continued until they could perform the activities in the failed block, whereupon they were tested for their efficacy expectations and approach responses on all succeeding blocks. This sequence of treatment on the failed block followed by tests on succeeding blocks was repeated until subjects achieved terminal performances. Based on the central thesis that perceived self-efficacy is the mechanism through which treatments reduce avoidance behavior, it was hypothesized that changes in efficacy expectations instated by partial mastery experiences would accurately predict the level of subsequent behavioral change.

METHOD

Subjects

Six severe snake phobics recruited from the same population through a newspaper advertisement served as subjects in this experiment.

Sequential Microanalytic Procedure

The various treatment activities were divided into 11 natural blocks of tasks of increasing difficulty and threat value. Items in the initial block included looking at a caged boa constrictor from progressively closer distances until subjects could stand along side the cage. Succeeding blocks included placing gloved and bare hands against the glass side adjacent to the snake's body and head area, looking down at the snake with the cover drawn partially and then fully open, placing gloved and bare hands inside the cage; touching and then lifting the snake inside the cage with gloved and bare hands for increasing intervals. The higher level blocks required subjects to hold the snake outside the cage with gloved and bare hands for progressively longer periods; to let the snake loose in the room, retrieve it, and

return it to the cage; to hold the snake in front of their faces; and finally to tolerate the snake crawling in their laps for an extended period while they held their hands passively by their sides.

Behavioral Pretest. At the beginning of the experiment, a female tester administered the behavioral avoidance test. As previously described, the test consists of a series of 29 tasks requiring increasingly more threatening interactions with the boa constrictor.

Sequential Treatment and Assessment. A different female experimenter administered individually the treatment procedure. She first modeled the full range of activities while subjects observed from a distance in the room. Subjects then received the participant modeling treatment for the block of items they failed in the hierarchy of pretest assessment tasks. In implementing the procedure, the therapist enlisted whatever response induction aids were required to enable subjects to perform the tasks within the failed block and then faded out the supplementary aids so that subjects eventually performed the activities unassisted. This treatment approach, including the standard set of response induction aids, is described at length elsewhere (Bandura, Jeffery, & Wright, 1974).

After subjects successfully performed the previously failed block of tasks, the experimenter departed and the subjects proceeded to a designated section of the room where the self-efficacy recording forms were enclosed in a folder. Subjects recorded privately which of the 29 performance tasks they judged themselves capable of completing as of then, and rated the strength of their efficacy expectations using the format described earlier. When subjects finished recording their level and strength of self-efficacy, the tester administered the behavioral avoidance test. Subjects who attained terminal performances received no further treatment. For those who achieved only partial improvement, the sequence of treatment on the failed block followed by assessments of self-efficacy and approach behavior on succeeding blocks was repeated until they achieved terminal performances.

RESULTS

Figure 3 presents the level of self-efficacy and performance instated by each fractional treatment for each of the subjects. The numbers appearing immediately below the bar graphs refer to the block of activities on which the subjects received treatment. As can be seen from the figure, almost all the subjects required treatment on the intermediate block of activities. At this block 6 level, subjects were aided through participant modeling to touch the snake in the cage. Interestingly, although all subjects successfully performed these same activities, they varied considerably in

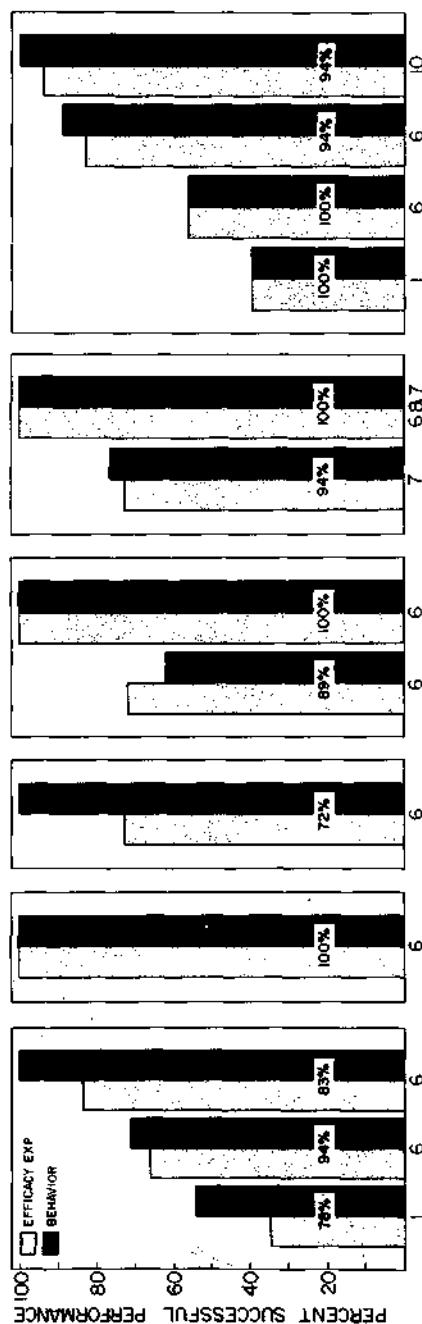


Fig. 3. Degree of congruence between self-efficacy and behavior shown by each of six subjects during the course of participant modeling treatment. The numbers appearing below the bar graphs refer to the blocks of activities on which each subject received treatment; the percentages reported on the bar graphs show the degree of congruence between efficacy judgments and subsequent performance after subjects mastered subsets of activities they previously failed.

their subsequent performance attainments on the behavioral avoidance test. Some failed similar tasks during assessment and required a repeat treatment on the same level of activities; others moved slightly beyond the treated level; and still others achieved terminal performances after being aided to touch the snake.

It is of further interest to note that of the subjects who failed to perform the intermediate level activities, which they had previously mastered in treatment, virtually all achieved terminal performances after they were again treated on the identical intermediate task. Thus, it is evident from the widely variable performances that follow the same partial mastery in treatment that past performance is of limited value in predicting what subjects would be able to do when tested on more threatening tasks.

Efficacy-Performance Congruence

Although previous behavior is a weak predictor of subsequent performance, inspection of Figure 3 shows perceived self-efficacy to be an excellent predictor. This is revealed most precisely in the microanalytic measure of the degree of congruence between self-efficacy and behavior on each task. These congruence indices are reported separately on the bar graphs for tests conducted after the completion of each partial treatment.

To provide an aggregate index of fit, the congruencies between efficacy judgments and performance were summed across tasks, fractional treatments, and subjects. Self-efficacy predicted subsequent performance as measured at different points in treatment in 92% of the total assessment tasks. This relationship holds even when the measure of congruence is based only on the subset of activities that subjects could not perform in treatment because they extended beyond the failed block of activities. Efficacy expectations formed through partial mastery experiences during the course of treatment predicted at an 84% level of accuracy performance on highly threatening tasks that subjects had never done before.

DISCUSSION

Results of the present series of experiments, combined with previous findings (Bandura et al., 1977), lend substantial validity to the theory that psychological influences alter defensive behavior by enhancing the level and strength of perceived self-efficacy. First, it provides a common theoretical framework for explaining and predicting behavioral changes accompanying diverse modes of treatment. Thus, efficacy expectations predict with considerable accuracy the level of performance regardless of whether self-efficacy

cacy is changed through enactive mastery, vicarious experience, or extinction of anxiety arousal by systematic desensitization.

Prediction of differential changes in behavior by people receiving the same mode of treatment provides an even more stringent test of the explanatory mechanism. Although anxiety reactions to visualized threats were thoroughly eliminated by desensitization in all subjects, nevertheless, their performance attainments varied from 10% to 100% of the tasks, a rather large dispersion. Knowing that they achieved equivalent extinction of anxiety arousal is of little aid in predicting how much they would change behaviorally. However, percepts of self-efficacy instated by the desensitization treatment account well for the variability in performance.

The findings of the microanalysis of the process of change during the course of participant modeling not only lend further support for the social learning theory but provide a basis for comparing the predictive value of behavior and perceived efficacy. Knowing that all subjects successfully performed intermediate level activities was of little value in predicting their performance attainments on subsequent tasks because the same mastery achievements produced varied changes in behavior. The same level of enactive mastery also produced differential levels of self-efficacy, which were excellent predictors of performance.

Evidence that comparable behavioral enactment and arousal extinction create differing efficacy expectations underscores other aspects of self-efficacy theory that require investigation. One important constituent function concerns the cognitive processing of efficacy information. The efficacy information conveyed by enactive, vicarious, and emotive experiences must be distinguished from the information as processed, transformed, and integrated by the individual. For example, the efficacy judgments formed from behavioral enactments will depend on how people appraise the difficulty of the tasks, the amount of time and effort they had to expend, and the number of situational aids they needed to achieve the requisite performances. To the extent that people differ in how they judge the many factors bearing on their performance, their percepts of self-efficacy will vary to some degree.

The effects on self-efficacy of information conveyed by visceral arousal will similarly depend on how it is cognitively appraised. A number of factors, including appraisal of the sources of arousal, the situational circumstances under which arousal is elicited, and past experiences on how level of arousal affects one's performances figure in the cognitive processing of emotional reactivity. To cite a familiar example, seasoned dramatic actors, who become anxious before a performance but lose their apprehensiveness once the play gets under way, are likely to ascribe their arousal to common situational factors rather than to personal deficiencies. For people who find moderate levels of arousal facilitatory rather than debili-

tating, arousal will have different informative value than those for whom arousal usually portends inadequate performances.

A second aspect of the theory relates to the multiple determination of self-efficacy. The impact of any single source of efficacy information will partly depend on the total configuration of efficacy experiences in which it occurs. Because people have met with different types and amounts of efficacy-relevant experiences, there is little reason to assume that providing one new source of efficacy information will affect everyone uniformly. Extinguishing fear arousal to threats will raise efficacy expectations, but more so in persons who have had occasional performance successes than in those who have consistently failed in their coping attempts.

Another issue that warrants some discussion concerns the measurement of self-efficacy. Proponents of radical behaviorism are quick to find fault with measures based on verbal indices. They usually relegate such measures to the subordinate status of mere "verbal reports," which supposedly have an ill-defined relationship to the cognitive events they represent. Among the behaviorally oriented theorists, those who are willing to embrace cognitive factors in their conceptual schemes generally favor physical indicants of cognitive activities in the form of autonomic or motor reactions.

Review of the research literature suggests that ascriptions of limitations to verbal judgments often arise more for reasons of conceptual orthodoxy than for lack of predictive or explanatory power. Consider the results of several different lines of research. In studies in which verbal, autonomic, and motor responses to weak stimulation are measured concurrently, verbal indices generally prove to be comparable or superior discriminators of sensory stimuli (Eriksen, 1960). In both operant and classical conditioning, verbalized hypotheses about environmental contingencies are by far the best predictors of performance changes during the course of conditioning (Bandura, 1969; Dulany, 1968; Spielberger & De Nike, 1966; Dawson & Furedy, 1976). In the series of experiments under discussion, efficacy judgments are better predictors than is past behavior of changes in performance resulting from enactive treatments, and the only effective predictors of behavior instated by vicarious and emotive modes of treatment, none of which involve motor responding during the induction phase (Bandura et al., 1977). And finally, to take a common example from everyday life, vast numbers of people are outfitted by ophthalmologists with suitable corrective eyeglasses on the basis of verbalized discriminations of printed stimuli. In brief, there exists little empirical justification for revering autonomic reactions or muscular contractions more highly than cognitive judgments arrived at by processing, weighing, and integrating vast amounts of relevant information concerning one's capabilities.

Among the reservations routinely expressed about verbal indices is that they can be used to misrepresent cognitive events. This is undoubtedly true. Individuals can be easily outfitted with defective eyeglasses by reporting that the blurred stimuli are the clearer ones. However, this would hardly constitute justification for renouncing the optometric enterprise. It should also be noted here that the potentiality for falsification of psychological changes applies equally to behavioral indices. People usually learn more than they represent in action due to deficiencies in motor reproduction or to insufficient positive incentives. Indeed, when certain behaviors are nonrewarded or punished, verbal accounts provide better measures of what people have acquired than do their spontaneous performances (Bandura, 1965). Should they choose to do so, people can easily manipulate their operant rates and learning performances to misrepresent what they have learned or believe. They can easily feign learning deficits. They can produce high stable performances under fixed-interval schedules of reinforcement and low episodic responding under variable ratio schedules. And they can respond in the presence of stimuli signifying nonreward (S^A) and withhold responses in the presence of stimuli that are discriminative for reinforcement (S^D). Thus, under disadvantageous conditions, "behavioral reports" can be just as misleading as so-called verbal reports. Given reason to do so, people can deceive by their actions as they can by their words.

The moral is that the functional role of thought in the regulation of behavior should be studied under conditions in which people are motivated to express judgments that reflect what they are thinking. To conduct such experiments under circumstances in which people have incentive to misrepresent their thoughts exemplifies a deficiency in selection of research strategy rather than in judgmental indices. It would likewise be pointless to study the determinants of learning and performance changes under conditions in which participants are intent on leading researchers astray by deceptive actions.

The preceding remarks should not be misinterpreted as advocacy for substituting verbal indices for measures of behavior, as so commonly happens in psychotherapy outcome studies. The best measure of behavior is behavior, not reports about it. But, as shown by research cited above, under appropriate conditions verbal indices provide a measure of thought for examining the explanatory and predictive power of cognitive factors in psychological change.

The basic mechanisms of behavioral change have been explored in this research with severe snake phobias. There are several reasons for the choice of this psychological condition. First, although a phobic dread of snakes appears at first glance to be a circumscribed problem, in fact, it has generalized debilitating effects on vocational and recreational activities, and provides a chronic source of distressing ruminations (Bandura et al., 1974,

1977; Bandura, Jeffery, & Gajdos, 1975). Second, the phobic behavior is relatively refractory to change, especially if measured in terms of the stringent criterion of elimination, rather than simply reduction, of phobic behavior. Third, the level and generality of behavioral change can be assessed precisely. Unless one measures with some precision how people behave, one lacks the essential requirement for a meaningful microanalysis of efficacy determinants of behavior.

The fourth, and particularly important, benefit derives from the fact that reptiles are rather retiring creatures that tend to keep to themselves and their intimates in unpopulated locales. Consequently, treatment effects are rarely confounded by extratherapeutic encounters with the threats during the course of treatment. In most other psychological conditions, the effects of treatment are almost invariably confounded by experiences arising from periodic contact with the feared events between sessions. Consider a few examples. People receiving treatment for assertiveness are repeatedly confronted with situations requiring assertive action; acrophobics are faced with elevated locales all around them that they are required to enter from time to time; and those who are developing social and cognitive skills can hardly avoid drawing on them in their everyday life. Any successes achieved in these extratherapeutic encounters make treatment look good, whereas intervening failures detract from its apparent effectiveness. The longer the interval over which the procedures are applied, the greater the likelihood of confounding from extraneous sources of influences.

For these various reasons, severe snake phobias provide a reliable, standardized procedure with high experimental control, for measuring the relative power of alternative modes of influences for producing efficacy and behavioral changes (Bandura, 1978). In extending self-efficacy theory to other forms of behavior, investigators will have to give greater consideration to precise assessment of gradations in behavior, to confounding extra-treatment influences, and to the time elapsing between measurement of self-efficacy and behavior.

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REVIEWER A

The present manuscript reports two experiments that establish the predictive validity of self-efficacy ratings for performance improvement among snake phobics. The experiments were conducted with care and sound methodology. The report is very well written. The main demonstration, very convincingly shown, is that subject predictions of posttest behavior correlate very highly with posttest performance, subsequent to extensive desensitization (Experiment I) or during participant modeling (Experiment II). The role of cognitive self-efficacy in mediating fear reduction is strongly supported.

I would like to raise some issues of interpretation for the authors' consideration, however.

The authors argue that complete desensitization of a 51-item hierarchy guarantees that the anxiety reactions of all subjects are equally and completely extinguished. Without independent confirmation of this argument, it is not wholly warranted. Although the authors thoughtfully comment on the use and abuse of physiological measures in the discussion sec-

tion, physiological evidence in support of their argument seems to be required to make that argument convincing. At any rate, as the design and results stand now, the authors can only conclude that subjects no longer subjectively experienced anxiety during symbolic presentation. Laboratory and clinical research suggest that signaling of anxiety during desensitization is a complex function of a variety of internal responses and external stimuli, and that such determinants vary among individuals. That physiological reactions and self-reports of fear are not always congruent and that incongruence (i.e., physiological reaction in the absence of reported fear in response to hierarchy images) is related to lack of outcome improvement have been reported by several investigators. Thus, I question whether the operational definition of "arousal extinction" (i.e., desensitization until no further anxiety *signals*) is unambiguously valid. If it is not, the major premise for the independence of subsequent self-efficacy variability is undermined.

Experiment II, of course, does not relate to desensitization theory. Experiment I does, but the design does not allow absolute statements regarding desensitization mechanisms. The experiment does demonstrate a *contribution* of cognitive self-efficacy to desensitization outcome but does not separate extinction processes due to repeated imaginal exposures from self-efficacy by-products. Even assuming complete elimination of anxiety arousal (a doubtful assumption as argued above), the outcome data still at best reflect the additive effects of hypothetical extinction processes and hypothetical cognitive processes. As such, the design does not rule out an extinction contribution. A complete design to address these issues would involve 3 groups: (a) desensitization without efficacy effects, (b) efficacy change without repeated imaginal exposure, and (a) and (b) together as in the present study. I'm sure the authors would argue that desensitization cannot be separated from efficacy change, since they feel that efficacy changes are inherent to desensitization process. However, there may be methods to establish this condition and it would be well worth the effort in terms of powerful, unequivocal conclusions. For example, a condition involving desensitization conducted under nontherapeutic instructions without demand to show posttest improvement could be employed. (Several studies, incidentally, have found improvement under such conditions. Unfortunately, efficacy has never been assessed in that context. If no efficacy effects are found, improved performance would be due to some other desensitization mechanism, e.g., extinction.) The second condition might be adequately represented by simply offering a money incentive to show improved posttest performance. I'm certain such an incentive would result in both increased efficacy and increased performance. Such a condition would provide a separate assessment of efficacy change independent of desensitization process.

Although efficacy ratings were obtained "privately" before the posttest, I'm sure the subjects realized the ratings would ultimately be viewed by research staff, so they are not wholly free of demand influences; and once the predictions are made under such conditions, there is demand to match the predicted performance at posttest.

While clearly severe phobics were employed (much to the author's credit), and while several good reasons are offered in the discussion for use of such a problem, the degree of generality is indeed markedly limited and thus overgeneralized conclusions about desensitization process are all the more unwarranted.

REVIEWER B

This article sets out "To test the theory that desensitization changes behavior through its intervening effects on efficacy expectations . . ." (p. 290). I don't think the studies reported here actually achieve this goal. In some sense, I think the data are oversold. I'm certainly not arguing against cognitive mediation—just the present operationalism. I view the correlational findings as very interesting but providing a weak test of the experimental question.

I hope we have not reached the point where we are surprised that an immediately preceding and adequately conducted self-report is better than a behavioral test carried out before the intervention. Self-report here has the advantage in that subjects can judge their current skill level after the additional input of the treatment procedure (whether it be a skill training or instructional format). Additionally, even though the author has reduced the social pressure on conforming to prediction, the subject may still self-impose this pressure. It would be most interesting to manipulate self-efficacy in cases where motor skill development was required to gauge the actual instrumental nature of the self-efficacy concept. If designed appropriately this might also allow for confirmation of the assumption that self-efficacy is related to persistence of effort.

Needless to say, I find the paper, even with its flaws, enticing. That is also true of the self-efficacy theory. Both should prompt a good deal of thought and work on cognitive contributions to behavior change. The paper is also well presented and the emphases on adequate assessment of generalization and operationalized self-report are sorely needed.

Cognitive Processes Mediating Behavioral Change

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The present experiment was designed to test the theory that psychological procedures achieve changes in behavior by altering the level and strength of self-efficacy. In this formulation, perceived self-efficacy influences level of performance by enhancing intensity and persistence of effort. Adult phobics were administered treatments based upon either performance mastery experiences, vicarious experiences, or they received no treatment. Their efficacy expectations and approach behavior toward threats differing on a similarity dimension were measured before and after treatment. In accord with our prediction, the mastery-based treatment produced higher, stronger, and more generalized expectations of personal efficacy than did the treatment relying solely upon vicarious experiences. Results of a microanalysis further confirm the hypothesized relationship between self-efficacy and behavioral change. Self-efficacy was a uniformly accurate predictor of performance on tasks of varying difficulty with different threats regardless of whether the changes in self-efficacy were produced through enactive mastery or by vicarious experience alone.

Current developments in the field of behavioral change reveal two major divergent trends. This difference is especially evident in the treatment of anxiety and defensive behavior. On the one hand, explanations of

behavioral change are relying more heavily upon cognitive mechanisms. On the other hand, it is performance treatments that operate through mastery experiences that are proving most powerful in producing affective, attitudinal, and behavioral changes. Regardless of the methods involved, treatments implemented through actual performance achieve results consistently superior to those based upon symbolic forms of the same approaches (Bandura, 1977a).

This research was supported by Public Health Research Grant MH-5162 from the National Institute of Mental Health.

We are indebted to Hilary Wickersham for her generous and able assistance in administering the assessment procedures.

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According to social learning theory, behavioral changes produced by different meth-

ods are mediated by a common cognitive mechanism (Bandura, 1977a). Psychological procedures, whatever their format, serve as ways of creating and strengthening expectations of personal efficacy. In this formulation, efficacy expectations are distinguished from response-outcome expectancies. An outcome expectancy is defined as the estimate that a given behavior will lead to certain outcomes. An efficacy expectation is the conviction that one can successfully execute the behavior required to produce the outcomes. Efficacy and outcome expectations are differentiated because individuals can come to believe that a particular course of action will result in certain outcomes, but question whether they can perform those actions. The strength of convictions in one's own effectiveness determines whether coping behavior will be attempted in the first place. People fear and avoid threatening situations they believe exceed their coping abilities, whereas they behave assuredly when they judge themselves capable of managing situations that would otherwise intimidate them.

Perceived self-efficacy not only influences choice of activities but, through expectations of eventual success, it can affect persistence of coping efforts once an activity is initiated. Efficacy expectations are likely to determine how much effort people will expend and how long they will persist in the face of obstacles and aversive experiences. The stronger the efficacy or mastery expectations, the more active the efforts. Those who persevere in activities that are subjectively threatening will gain corrective experiences that further reinforce their sense of efficacy and thereby eventually eliminate their fears. Those who cease their coping efforts prematurely will retain their self-debilitating expectations and fears for a long time.

In the social learning analysis, expectations of personal efficacy stem from four main sources of information. *Performance accomplishments* provide the most influential source of efficacy information because it is based on experiences of personal mastery (Bandura, Jeffery, & Gajdos, 1975). Successes raise mastery expectations; repeated failures lower them, especially if mishaps occur early in the course of events. However, the impact

of enactive attainments on perceived self-efficacy will depend upon cognitive appraisal of a number of informative factors, including the difficulty of the task, the amount of effort expended, the number of situational supports, and the pattern and rate of successes.

Many expectations are derived from *vicarious experience*. Seeing others cope with threats and eventually succeed can create expectations in observers that they too should be able to achieve some improvements in performance if they intensify and persist in their efforts. A number of modeling variables likely to affect mastery expectations have been shown to enhance the disinhibiting influence of modeling procedures (Bandura & Menlove, 1968; Kazdin, 1974a, 1974b; Meichenbaum, 1971). Vicarious experience, relying as it does on inferences from social comparison, is a less dependable source of information about one's own capabilities than is direct evidence of personal accomplishments. Consequently, the efficacy expectations induced by modeling alone are likely to be weaker and more vulnerable to change.

In attempts to influence human behavior, *verbal persuasion* is widely used because of its ease and ready availability. People are led, through persuasive suggestion, into believing they can cope successfully with what has overwhelmed them in the past. Efficacy expectations induced in this manner, lacking an authentic experiential base, are also likely to be weaker than those arising from one's own accomplishments. In the face of distressing threats and a long history of failure in coping with them, whatever mastery expectations are created by suggestion can be readily extinguished by disconfirming experience.

Emotional arousal can also influence efficacy expectations in threatening situations. People rely partly upon their state of physiological arousal in judging their anxiety and vulnerability to stress. Because high arousal usually debilitates performance, individuals are apt to consider themselves more able when they are not beset by aversive arousal than when they are tense and viscerally agitated. The experience of anxiety generates further

anxiety through the process of anticipatory self-arousal (Bandura, 1977b; Sarason, 1975). Although based on different theoretical rationales, many of the methods used to eliminate defensive behavior are principally aimed at diminishing emotional arousal.

By postulating a common mechanism of operation, this conceptual framework is designed to account for behavioral changes achieved by enactive, vicarious, exhortative, and emotive means. The present investigation tested predictions derived from social learning theory by use of enactive and vicarious treatments to produce differential levels of self-efficacy. These diverse procedures were chosen for study to determine the predictive value of self-efficacy created by quite different modes of treatment.

Empirical tests of the relationship between expectancy and performance of threatening activities have generally yielded weak, inconsistent results (Bandura, 1969; Davison & Wilson, 1973; Lick & Bootzin, 1975). Such findings are not surprising considering that in most studies the measures of expectations are mainly concerned with people's hopes of favorable outcomes rather than with their sense of mastery. Moreover, the outcome expectations are usually assessed at a single point in a change process in global terms as though they were a static, unidimensional factor. Participants simply judge how much they expect to benefit from undergoing a given procedure. Such global measures reflect a mixture of, among other things, hope, wishful thinking, belief in the potency of the procedures, and faith in the therapist.

Efficacy expectations vary on several dimensions that can have important performance implications. They differ in magnitude. Thus, when tasks are ordered according to level of difficulty, the efficacy expectations of different individuals may be limited to the simpler tasks, extend to moderately difficult ones, or include even the most taxing performances. Efficacy expectations also differ in generality. Some types of experiences create only limited mastery expectations, while others instill a more generalized sense of personal efficacy that extends well beyond the specific treatment situations. In addition, expectancies vary in strength. Weak expecta-

tions are readily modified by disconfirming experiences, whereas individuals who possess strong expectations of mastery will persevere in their coping efforts despite dissuading experiences.

This experiment was designed to gauge the differential power of direct and vicarious experience in creating efficacy expectations and to test the hypothesized relationship between self-efficacy and behavioral change. Severe snake phobics received either a participant modeling treatment operating through direct mastery experiences, modeling alone, or they received no treatment. The level, strength, and generality of efficacy expectations as well as approach behavior and fear arousal were measured prior to and after treatment. It was predicted that the treatment based upon enactive mastery would produce higher, stronger, and more generalized expectations than would the treatment relying solely upon vicarious experience. It was hypothesized further that level of self-efficacy would order variations in performance obtained between treatments, within the same treatment conditions and at the level of specific tasks.

Method

Subjects

Subjects whose lives were adversely affected by chronic snake phobias were recruited through advertisements placed in community newspapers. Their lives were restricted by anxious avoidance of social, recreational, and vocational activities in which a snake might conceivably appear, however remote the possibility. Virtually all were plagued by intrusive thoughts and nightmares over which they could exercise little control. The distressing anticipatory ruminations were especially troublesome during the summer months. Of the 33 subjects who participated in the study, 7 were males and 26 were females. They ranged in age from 18 to 50 years with a mean age of 33 years.

Pretreatment Measures

A multifaceted assessment procedure was used to provide the data required for a microanalysis of changes in self-efficacy and avoidance behavior.

Behavioral avoidance. The test of avoidance behavior consisted of a series of 29 performance tasks requiring increasingly more threatening interactions with a red-tailed boa constrictor. Subjects were in-

structed to approach a glass cage containing the snake, to look down at it, to touch and hold the snake with gloved and then bare hands, to let it loose in the room and then return it to the cage, to hold it within 12 cm of their faces, and finally to tolerate the snake crawling in their laps while they held their hands passively at their sides.

A female tester administered all the assessment procedures. Prior to measuring phobic behavior, subjects were given factual information about the characteristics and habits of snakes to eliminate moderately fearful subjects who might be emboldened by factual information alone. Those who could not enter the room containing the snake received a score of 0; subjects who did enter were asked to perform the various tasks in the graded series. To control for any possible influence of expressive cues from the tester, she stood behind the subject and read aloud the tasks to be performed.

The avoidance score was the number of snake-interaction tasks the subject performed successfully. Those who could lift the snake inside the cage with a gloved hand were considered insufficiently fearful and were not included in the experiment. Based on this criterion, 27% of the respondents were excluded. To maximize the generality of the findings, all people who were sufficiently phobic on the behavior test were included in the study.

Fear arousal accompanying approach responses. In addition to the measurement of performance capabilities, the degree of fear aroused by each approach response was assessed. During the behavioral test, subjects rated orally, on a 10-interval scale, the intensity of fear they experienced when each snake approach task was described to them and again while they were performing the corresponding behavior. These fear ratings for all the approach tasks actually completed were averaged to provide the index of fear arousal.

Efficacy expectations. Efficacy expectations were measured after the behavioral avoidance pretest so that subjects would have some understanding of what types of performances were required. Separate measures were obtained of the magnitude, strength, and generality of expectations.

Subjects were provided with the list of performances included in the behavioral test and instructed to designate those they expected to perform before treatment. For each task so designated, they rated the strength of their expectations on a 100-point probability scale, ranging in 10-point intervals, from high uncertainty, through intermediate values of certainty, to complete certitude. To provide an index of the generality of self-efficacy, subjects rated the level and strength of their expectations in coping successfully with an unfamiliar snake as well as a boa constrictor similar to the one used in treatment.

Efficacy expectations were measured after the behavioral pretest, prior to the posttest which was administered within a week after treatment was concluded, and after completing the behavioral posttest. These expectations were recorded privately and remained so during the behavior tests to minimize any

motivational inducements to improve performance that could arise had the expectations been communicated publicly to the examiner.

Situational generalization of fear and self-efficacy. The use of test snakes of varying degrees of dissimilarity from the one employed in treatment provided a measure of the generalized effects of treatment across different threats. Situational generalization was assessed in terms of subjects' anticipatory fear of snake encounters under different natural conditions and their self-efficacy in coping with them.

Fear of snake encounters in natural settings was measured on six scales portraying diverse encounters with snakes, including visiting a reptile exhibit, watching a film on the habits of snakes, suddenly confronting snakes on hikes or in a garage, visiting a household containing pet snakes, and handling snakes. Subjects were instructed to rate each item on a 7-point scale of fearfulness. The mean of the six ratings constituted the level of anticipatory fear arousal over confrontations with snakes.

Subjects also rated the situations described above in terms of how effectively they could cope with snakes were they to encounter them in their everyday life. The ratings were averaged to provide a score of perceived self-efficacy in dealing with snakes. In addition, they rated their self-efficacy in coping with other animals they feared and difficult social situations. Animals and social threats were selected to provide additional measures of generalization of perceived self-efficacy along a dimension of similarity to the threat that was the focus of treatment.

Treatment Conditions

Subjects were individually matched in triads according to pretreatment avoidance behavior and randomly assigned to one of three conditions. To ensure that the effects produced by the different treatments were due to the procedures rather than to the personal characteristics of a particular therapist, two female therapists administered each of the methods to different groups of triads. Both therapists proved to be equally effective in the changes they achieved with the different methods.

Participant modeling. In this treatment, which is described at length elsewhere (Bandura, Jeffrey, & Wright, 1974), defensive behavior is rapidly eliminated by enlisting a standard series of performance induction aids. The treatment was conducted with a rosy boa constrictor which was distinguishably different from the one used in the behavioral assessments.

To weaken subjects' inhibitions, the therapist initially modeled the threatening activities before subjects attempted to perform them. However, the modeling aid was used only briefly in this performance-based treatment, so as to minimize overlap of the modeling element in these two modes of treatment. The therapist then introduced performance aids sequentially from a preestablished hierarchy to en-

able subjects to perform the feared activities successfully. Intimidating performances were broken down into easily mastered steps of increasing difficulty ranging from looking at, touching, and holding the snake; placing open hands in front of its head as it moved about; holding the snake in front of their faces; allowing the snake to crawl freely in their laps; to letting the snake loose in the room and retrieving it. Joint performance with the therapist was used to facilitate performances that subjects could not execute on their own. Another method for overcoming inhibitions was to have subjects enact the feared behavior for increasingly longer periods. Protective conditions that reduce the likelihood of feared consequences (e.g., use of protective gloves, coats, and visors, and control of the snake by the therapist to ensure safety) were arranged as a further means of weakening dysfunctional restraints that retard change. If these various procedures proved insufficient, subjects performed the feared activities using the induction aids with a baby boa, which was much less threatening, and then with the larger boa.

As treatment progressed, the supplementary aids were withdrawn. After subjects completed all the activities, they engaged in self-directed performance for 5 min., during which they executed the various tasks entirely on their own. The inclusion of challenging tasks and progressive self-directed mastery was designed to ensure that subjects would ascribe their successes to enhanced personal efficacy rather than to external factors. The duration of treatment varied from 40 min. to 7 hours with the median time being 90 min.

Modeling. Subjects assigned to the modeling condition merely observed the therapist perform the same graduated set of activities. Because subjects in the modeling condition did not engage in any behavior themselves, they had no performance sources of information for their efficacy expectations. Modeling was administered for the same length of time as the matched counterparts in participant modeling engaged in their performance mode of treatment. Thus, for example, if a given subject required 1 hour of participant modeling to master all the therapeutic tasks, the matched subject in the modeling condition would observe 1 hour of comparable modeling.

Control condition. Subjects in the control condition were administered the assessment procedures after an equivalent period of time had elapsed according to their matched triad assignment without any intervening treatment.

Posttreatment Measures

The assessment procedures used in the pretreatment phase of the study were readministered within a week after the completion of treatment. Efficacy expectations were measured prior to and after the behavioral posttest to examine the reciprocal influence between expectations and performance accomplishments.

To gauge the generality of expectancy and performance changes, subjects in each condition were

tested initially with a dissimilar 90-cm corn snake and then with the red-tailed boa used in the pretest. The two snakes were previously shown to be of equivalent threat value as measured by subjects' avoidance behavior and fear arousal (Bandura et al., 1974). Subjects were tested with the dissimilar snake first to minimize possible transfer effects from performance improvements during the posttest, which would be more likely to occur in dealing with a familiar threat a second time than in coping with a new one.

The same female tester who conducted the pretest administered the posttreatment measures. To control for any possible bias, she was not informed of the subjects' conditions.

Supplementary Treatment

Following the posttest, the controls and those in the modeling condition who failed to achieve terminal performances (all of the controls and 73% of the modeling subjects) received participant modeling until they performed all the therapeutic tasks successfully. They were then readministered the standard assessment procedures.

Follow-Up Assessment

In order to evaluate the durability of changes and the degree of congruence between efficacy expectations and behavior long after treatment, subjects returned for an additional assessment 1 month following completion of their final treatment. Except for four subjects, who could no longer be located, all participated in the follow-up assessment.

Results

Analysis of pretest scores revealed no significant initial differences between conditions except on the measure of fear arousal accompanying approach responses. The controls experienced less fear than did subjects assigned to the participant modeling, $F(1, 53) = 9.03, p < .01$, and the modeling, $F(1, 53) = 7.85, p < .01$, treatments. Separate analyses of variance were computed for each dependent measure, except for the changes in fear arousal which were evaluated by analysis of covariance with the pretest measure serving as the covariate. Table 1 shows the significance levels of the treatment effects, the differences between the various conditions, and the changes achieved by subjects within each condition.

Level of Self-Efficacy

The efficacy expectations and approach responses displayed by subjects at different

Table 1: Significance of Treatment Effects, Intergroup Differences, and Within-Group Changes for Each Measure

Response	Treatment effects (F test)	Treatment × Phase (F test)	Intergroup comparisons (F test)				Within-group comparisons (t test)			
			Participant modeling vs. control		Modeling vs. control		Participant modeling		Modeling	
			Participant modeling	vs. control	Modeling	vs. control	Participant modeling	vs. control	Control	Modeling
Level of efficacy expectations										
Total	7.56***	12.96***	5.19**	29.10****	9.71***	6.61****	4.28****	.73	11.44****	
Similar threat	7.63***	13.22***	5.52**	32.24****	11.08***	6.42****	4.05****	1.25	12.17****	
Dissimilar threat	7.63***	13.22***	4.31**	22.78****	7.27***	5.97****	4.24****	.19	3.02****	
Strength of efficacy expectations										
Total	8.06***	20.50***	8.04***	31.68****	7.80***	9.76****	3.98***	.23	2.25**	
Similar threat	8.40***	20.90***	12.68***	43.05****	9.00***	9.14***	3.57***	.28	1.07	
Dissimilar threat	8.40***	20.90***	3.41*	17.85****	5.65**	7.05***	4.07***	.03	1.91**	
Approach behavior										
Total	6.02***	26.44****	14.95****	36.48****	4.72**	11.71***	3.94***	.94**	7.16****	
Similar threat	6.02***	26.44****	8.44***	34.59****	8.86***	10.90***	4.33***	3.74***	8.60****	
Dissimilar threat	6.02***	26.44****	19.30****	30.45****	1.27	9.69***	2.08*	1.49	5.37****	
Fear arousal										
Initial approach										
Total	.63	23.56****	3.55*	20.45****	6.96**	11.70****	6.98****	2.78*	6.01****	
Similar threat	3.10*	13.22***	1.37	15.30****	7.52***	10.92***	8.35***	2.98*	4.30****	
Dissimilar threat	3.10	13.22***	5.19**	19.72****	4.67**	12.51***	4.70***	1.92*	5.36****	
Total approach										
Total	.54	27.39****	3.67*	17.68****	5.24**	13.97****	6.72***	.80	3.94***	
Similar threat	2.37	17.88****	7.07***	20.76****	3.60*	13.32***	6.76***	.97	3.11***	
Dissimilar threat	2.37	17.88****	1.23	12.44****	5.84**	13.16***	5.86***	.43	2.82**	
Generalized self-efficacy										
Snakes	7.20***	4.46**	4.62**	22.46****	6.70**	5.38***	3.23***	1.40	5.69****	
Other animals	.28	.28				4.25***	2.79**	2.18*	1.83*	
Social	.86	2.96*	.69	2.11	5.22**	2.28*	2.80**	.00	1.79	
Generalized fear reduction	4.87**	5.41***	2.77	18.92****	7.21***	6.10***	2.23**	.03	5.93****	

* $p < .10$.
** $p < .05$.
*** $p < .01$.
**** $p < .001$.

phases of the experiment are presented graphically in Figure 1. Analysis of variance of the self-efficacy scores reveals that the main effects of treatment and the Treatment \times Phase interaction are all significant for the threats considered separately and for the pooled scores (see Table 1). Regardless of treatment condition, subjects expressed higher self-efficacy in relation to the similar threat than toward the dissimilar threat, $F(1, 30) = 21.78, p < .001$.

All three measures based on the two threats and the combined data yield the same pattern of results: Control subjects did not alter their efficacy expectations and modeling produced moderate increases in self-efficacy, whereas participant modeling markedly enhanced efficacy expectations. Statistical comparisons of the posttest means of these conditions corroborate the differential power of the treatments. Participant modeling instated higher self-efficacy than did modeling which, in turn, surpassed the control condition.

Analysis of changes in self-efficacy as a result of performing the behavioral posttest disclosed only one significant difference. Subjects in the control condition showed a significant increase, $t(10) = 2.60, p < .05$, in self-efficacy in coping with the similar threat immediately after the posttest.

Approach Behavior

Results of the analysis of variance performed on the approach scores are reported in Table 1. With a few minor exceptions, the changes exhibited in approach behavior, including the threat difference, $F(1, 30) = 12.57, p < .01$, are similar to those achieved for level of self-efficacy. Participant modeling and modeling produced significant increases in approach behavior toward both threats. Compared to their pretest performance, the controls improved slightly in coping with the familiar threat the second time, but not toward to the dissimilar threat.

In intergroup comparisons of level of approach behavior during the posttest phase, subjects who received participant modeling surpassed those in the modeling and control conditions on all of the behavioral measures. Those receiving the modeling treatment also

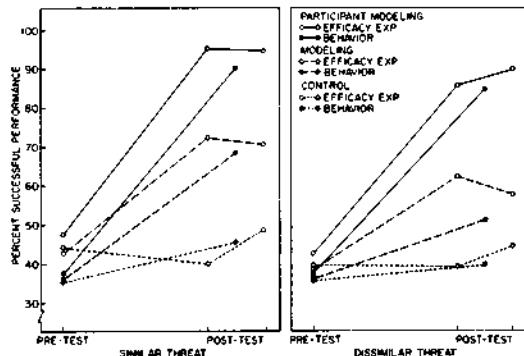


Figure 1. Level of self-efficacy and approach behavior displayed by subjects toward different threats after receiving vicarious or performance-based treatments or no treatment. (In the posttest phase, level of self-efficacy was measured prior to and after the behavioral avoidance tests with the two snakes.)

out-performed the controls on total approach and approach toward the similar threat but they did not differ with regard to the dissimilar threat. The latter finding was due largely to one subject in the modeling condition who executed fearlessly all the post-treatment behavioral tasks with the similar threat but performed well below her baseline level with the corn snake because of its unusually threatening behavior. For reasons known only to the reptile, it suddenly began weaving menacingly in an upright position, hissing, and rattling its tail, a dramatic performance that was never repeated with any other subject. Except for this case, subjects who received the modeling treatment surpassed the controls on the dissimilar threat as well, $t(9) = 2.28, p < .025$.

Microanalysis of Congruence Between Self-Efficacy and Performance

The relationships revealed by the aggregate measures are corroborated more precisely by a microanalysis of the congruence between self-efficacy and performance at the level of individual tasks. This measure was obtained by recording whether subjects judged themselves capable of performing each of the various tasks and computing the percentage of accurate correspondence between efficacy judgment and actual performance. Self-efficacy was a uniformly accurate predictor of individual task performance regardless of

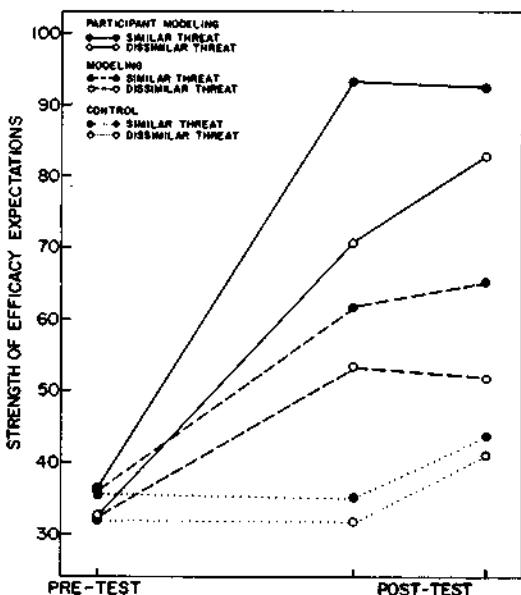


Figure 2. Changes in strength of self-efficacy displayed by subjects toward different threats after receiving vicarious or performance-based treatments or no treatment. (In the posttest phase, strength of self-efficacy was measured prior to and after behavioral avoidance tests with the two snakes.)

whether the changes in self-efficacy were produced through performance accomplishments (89%) or by vicarious experience alone (86%). The degree of congruence between perceived self-efficacy and subsequent behavior is equally high for enactive (82%) and vicarious (79%) treatments when the micro-analysis is conducted only on the subset of tasks that subjects had never performed in the pretest assessment period. Nontreated controls exhibited a similarly high level of congruence (90%). Although self-efficacy was an excellent predictor of performance under all conditions, the congruence was slightly higher, $F(1, 30) = 7.27, p < .025$, for the similar threat (92%) than for the dissimilar threat (85%).

After the controls received participant modeling, they displayed essentially the same marked changes on the various dependent measures (see Table 1) as did their counterparts who were originally assigned to this treatment condition. The high congruence between self-efficacy and behavior (86%) exhibited by the treated controls is consistent

with the results obtained from the other conditions.

Strength of Self-Efficacy

In the preceding analyses, efficacy expectations were considered without regard to their strength. A weak sense of self-efficacy thus received the same weight as one reflecting complete certitude. However, the intensity and persistence of effort, and hence level of performance, should be higher with strong than with weak self-efficacy.

To test the predicted differential effects of the treatments on strength of self-efficacy, the magnitude expectancy scores were summed across tasks and divided by the total number of performance tasks. The obtained changes in strength of the self-efficacy are depicted graphically in Figure 2 and evaluated statistically in Table 1. In addition to the significant treatment and Treatment \times Phase interaction effects, subjects in all conditions manifested slightly stronger efficacy expectations in coping with the similar threat than with the dissimilar one, $F(1, 30) = 32.90, p < .001$.

As shown in Table 1, participant modeling created a strong sense of self-efficacy irrespective of threat or performance tasks that exceeded the other conditions. Modeling strengthened self-efficacy moderately and also differed significantly from the control condition. The controls, in turn, began with a weak sense of self-efficacy and did not change in this respect.

Detailed analysis of the likelihood that any given task will be performed depending on the strength of the corresponding efficacy expectation provides an even more stringent test of the relationship between self-efficacy and performance. The probability of successful performance of any given task as a function of strength of efficacy expectation is plotted in Figure 3. Because the control subjects performed few responses and had correspondingly restricted efficacy expectations, their data were plotted after they had received the participant modeling treatment. Regardless of whether self-efficacy was instated enactively or vicariously, the stronger the self-efficacy, the higher the likelihood that a particular task would be completed successfully. More-

over, the positive relationship between strength of self-efficacy and probability of successful performance is virtually identical for the two threats.

Differential Prediction from Behavior and Self-Efficacy in Participant Modeling

Subjects who received participant modeling, either as the primary or as the supplementary treatment, successfully performed all of the behaviors in treatment that were later assessed in the posttest. Although all had previously achieved maximal performances, not all expressed maximal efficacy expectations that they would be able to perform all the tasks under test conditions. The lingering self-doubts involved mainly the highly threatening tasks of holding a snake near their face and allowing it to move freely over their body. One can therefore compare the error rates of predictions of perfect test performance made from maximal past performance and from maximal efficacy expectations. It would be predicted from the proposed theory that, among the successful past performers, those who acquire maximal efficacy expectations should attain terminal performances, whereas those holding lower expectations should not.

If one predicts that subjects who performed maximally in treatment will likewise achieve terminal performances when assessed with similar tasks, the error rate is relatively low for the similar threat (28%) but high for the dissimilar threat (52%). If, on the other hand, one predicts that those who express maximal expectations will perform maximally, the error rate is comparably low for both the similar (21%) and dissimilar (24%) threats. The predictive superiority of efficacy expectations over past performance is significant for total approach behavior ($p < .04$) and for approach toward the dissimilar threat ($p < .04$), as evaluated by the sign test.

Differential Effects of Variations in Modeling on Self-Efficacy and Behavior

In order to equate for duration of treatment, subjects in the modeling condition were yoked to matched counterparts in participant modeling, who received treatment until they

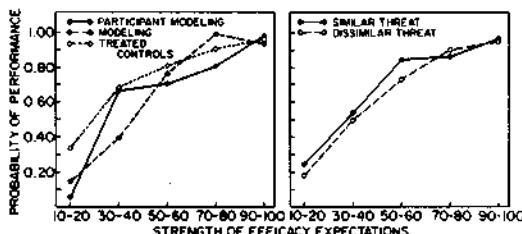


Figure 3. Probability of successful performance of any given task as a function of strength of self-efficacy. (The left panel shows the relationship for vicarious and performance-based treatments; the right panel shows the relationship between strength of self-efficacy and successful approach responses toward similar and dissimilar threats combined across treatments.)

performed all the therapeutic tasks. Because subjects who received participant modeling varied in the time they required to complete the treatment, some of the subjects in the modeling condition had only brief exposure to successful performances, whereas others had the benefit of observing feared activities modeled repeatedly without any untoward consequences. These variations in length of exposure provided an opportunity to test the prediction that repeated observation of successful modeling increases efficacy expectations.

Approximately half (5) of the subjects in this condition received less than 90 min. of modeling, while the remainder had longer exposure to the modeled performances. Figure 4 summarizes the magnitude of change in efficacy expectations and behavior for those two levels of modeling. Compared to limited modeling, the more extended modeling produced a greater increase in self-efficacy toward the similar threat, $t(9) = 3.26$, $p < .001$, the dissimilar threat, $t(9) = 7.02$, $p < .001$, and on the combined measure, $t(9) = 4.72$, $p < .01$. Longer exposure also increased the strength of efficacy expectations on all three measures beyond the .001 significance level.

In general, the increases in approach behavior as a function of duration of modeling parallel the changes in self-efficacy. Repeated observation of successful performance, in contrast to brief modeling, resulting in significantly larger increments in overall approach behavior, $t(9) = 2.23$, $p < .05$, toward the similar threat, $t(9) = 2.32$, $p < .025$, but not

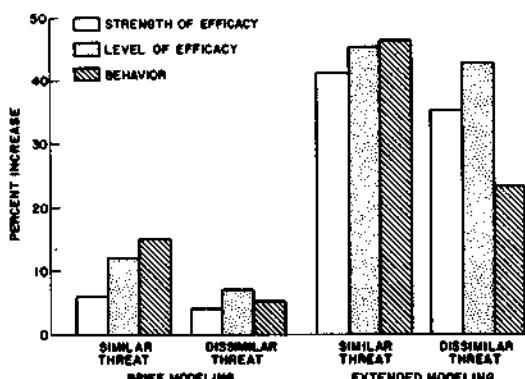


Figure 4. Magnitude of change in self-efficacy and behavior achieved by subjects who received either brief or extended modeling.

toward the dissimilar threat. The latter discrepancy is due almost entirely to the single case cited earlier in which the dissimilar snake behaved in an unusually menacing way. Except for this subject, those who had the benefit of extended modeling clearly out-performed the subjects who observed the same modeling for a shorter period, $t(9) = 2.61$, $p < .025$.

Fear Arousal Accompanying Approach Responses

Extinction of fear arousal accompanying approach responses was measured in several ways. The average level of fear elicited by responses that subjects performed before treatment was compared with the fear levels reported in the posttest for the same subset of approach responses and for the total number of approach responses they completed successfully. Results of the statistical analyses are shown in Table 1.

Subjects who received participant modeling and the modeling treatments displayed substantial reductions in fear arousal for the initial and total approach responses toward both threats. The controls experienced less fear the second time they performed the initial approach responses with the familiar boa, but their fear remained undiminished toward the dissimilar threat.

Although both treatments surpassed the controls, they did not differ much from each other. There are several reasons for the latter

finding. Both treatments achieved virtually complete extinction of fear arousal for the initial subset of approach responses, thus, reducing the possibility of obtaining a difference. In the case of the total approach responses, because subjects who received participant modeling performed more threatening tasks than did their counterparts in the modeling condition, the mean fear levels are based on differential performances. Decreases in the level of anticipatory fear evoked in the posttest by the approach task that subjects could not perform in pretest provides an index of fear extinction that is comparable across conditions and is unaffected by having enacted that particular behavior. On this measure, participant modeling produced greater reduction in fear arousal than did the modeling treatment in relation to both the similar, $F(1, 64) = 11.57$, $p < .01$, and the dissimilar threat, $F(1, 64) = 13.01$, $p < .001$.

Situational Generalization

Inspection of Table 1 shows that the findings on the situational generalization of treatment effects are consistent with those obtained through direct assessment with the two different threats. Both participant modeling and modeling significantly reduced anticipatory fear and enhanced self-efficacy in coping with snakes in natural situations, whereas the controls showed no change on either measure. In accord with the previous results, participant modeling was more effective in instilling self-efficacy than was modeling alone. Both modes of treatment significantly enhanced self-efficacy in coping with other animal fears and stressful social situations but analysis of the intergroup differences failed to yield significance.

Correlational Analysis

Product-moment correlations were computed between self-efficacy at the completion of treatment and the other main posttest measures. The correlations were of comparable magnitude for the two threats and the two modes of treatment. Consequently, the scores were pooled across threats and the correlations computed separately on data from the two treatments were then averaged across

treatments by means of an r -to- z transformation.

The correlational analysis reveals that the higher the level of self-efficacy at the completion of treatment, the higher the level of approach behavior ($r = .84$, $p < .001$), the lower the anticipatory fear ($r = -.42$, $p < .05$), and the greater the sense of personal efficacy ($r = .72$, $p < .001$) in coping with snakes in natural situations.

Similar relationships were obtained between strength of self-efficacy at the completion of treatment and level of approach behavior ($r = .86$, $p < .001$), anticipatory fearfulness ($r = -.33$, $p < .10$), and personal efficacy ($r = .65$, $p < .001$) in managing designated snake encounters under naturally occurring conditions.

Because self-efficacy was measured prior to and after the behavioral posttest, it is of interest to compare the magnitude of the relationship between these factors separately for the two treatments at these two phases. Level of self-efficacy prior to the posttest and degree of behavioral change correlated .83 for the enactive treatment and .84 for the vicarious one. Having put themselves to the behavioral test, subjects altered slightly their expectations of personal efficacy to produce an even closer correspondence ($r = .94$ and $r = .97$ for enactive and vicarious treatments, respectively). However, the correlations before and after the posttest did not differ significantly from each other.

Follow-Up Assessment

As noted earlier, the control subjects and those in the modeling condition who achieved only partial improvement were administered the participant modeling treatment after the formal experiment was completed. The follow-up data therefore reflect the enduring effects of enactive mastery. Comparisons of measures obtained after treatment and 1 month later show that subjects not only maintained their gains in self-efficacy and approach behavior, but achieved some further improvements on measures of generalization. They exhibited greater approach behavior, $t(28) = 2.96$, $p < .01$, and lower fear arousal, $t(28) = 2.73$; $p < .02$, toward the dissimilar

threat, additional reductions in fear in coping with snakes in natural situations, $t(28) = 1.71$, $p < .10$, and increased social self-efficacy, $t(28) = 1.73$, $p < .10$. The congruence between self-efficacy and behavior was as high 1 month after treatment (95%) as it was in the immediate posttreatment period.

After 6 months had elapsed, subjects were sent questionnaires measuring the extent to which they were able to participate in vocational, recreational, and social activities they previously avoided because of their snake phobia, as well as modifications in the incidence of nightmares and other frightening thoughts of reptiles. Changes in these areas of functioning were rated on 5-point scales ranging from a worsening of debilities, through no improvement, to marked improvement. Subjects were requested to supplement their ratings with concrete examples of the changes they had undergone. In addition, they indicated how often, if ever, they used the treatment strategies to eliminate their fears in other areas of functioning. Of the subjects, 70% were available for the extended follow-up assessment.

The data on the transfer effects of treatment further corroborate results of the standardized assessments. Subjects reported either marked (61%) or moderate (39%) relief from aversive thoughts and recurrent nightmares about reptiles. They were no longer preoccupied with frightening ruminations concerning snakes ("Everytime I went outside I was on guard. During my waking hours a lot of 'what ifs' entered my mind. Now I am not 'what ifing' as much . . . I just don't worry about 'the possibility' of encountering a snake now. If it happens I can deal with it."). Evidence that mastery experiences fostered through performance accomplishments can eliminate distressing nightmares of long-standing is especially noteworthy ("I had nightmares about twice a month. I used to be afraid every time I walked into a dark room or got into a car alone at night, thinking that maybe there was a snake on the floor. I haven't had a nightmare since the treatment program. I also used to feel revulsion whenever I even heard the word 'snake.' My body tensed up, and I would

often get a chill and feel sick to my stomach. That never happens anymore.").

Following treatment, all subjects reported that they had begun to participate in one or more activities (e.g., camping, hiking, picnicking, gardening, swimming, field trips) they formerly avoided because of their dread of snakes. Of the subjects, 23% indicated moderate improvement and 77% reported marked improvement in this respect. For some, elimination of a phobia that had plagued them for years was a particularly liberating experience ("For the first time I am able to go on walks around our neighborhood which has a lot of wooded areas.").

In describing the benefits they derived from treatment, subjects often commented on their enhanced sense of self-efficacy ("As a result of feeling more confident and in charge of myself I can manage other fears . . . I have a greater self-confidence. When something comes up that is new or unknown to me I feel, 'Well, I can handle that.'"). It is evident from the questionnaire data that self-efficacy concerning other threats does not derive solely from past accomplishments. In the course of treatment, subjects learned a generalizable skill for dealing successfully with stressful situations. Indeed, 41% of the subjects reported using a participant modeling procedure to overcome a variety of dysfunctional fears and inhibitions. Having a generalizable skill at one's disposal for managing aversive aspects of an environment not only contributes to one's sense of personal efficacy, but affects how the environment is perceived. Potentially stressful situations that one can control are likely to be viewed as less threatening.

Discussion

The theoretical formulation of the cognitive mechanism mediating behavior change systematizes the diverse findings obtained in this study. In accord with prediction, participant modeling produced higher, more generalized, and stronger expectations of personal efficacy than did modeling alone. Self-efficacy, in turn, proved to be a consistently accurate predictor of performance on tasks varying in difficulty, with dissimilar threats,

and for diverse modes of treatment. This is most evident in the microanalysis of the high congruence between self-efficacy and performance on the various individual tasks.

It can be recalled that, in the social learning analysis, cumulative accomplishments are considered to be among the most influential sources of efficacy information. The pattern of results yielded by participant modeling indicates that the experiences associated with this mode of treatment altered subjects' sense of personal competence rather than merely provided behavioral cues for judgments of self-efficacy. Although all subjects who received participant modeling observed themselves perform maximally, not all developed maximal efficacy expectations. Their subsequent approach behavior toward a dissimilar threat was better predicted from their expectations of personal efficacy than from their past performance.

The conceptualization receives additional support for the variations in self-efficacy and behavior change produced by modeling alone. In this condition, subjects observed the therapist behave fearlessly, but because they themselves performed no responses, they had no behavioral sources for their self-efficacy. Nevertheless, the efficacy expectations produced vicariously were just as highly predictive of subsequent approach behavior as were those instilled enactively.

As a further test of the generality of the theory under discussion, a recently completed study (Bandura & Adams, Note 1) included a microanalysis of efficacy expectations instated by systematic desensitization, which is aimed at reducing emotional arousal. This approach, originally founded on the theory that anxiety activates defensive behavior, assumes that defensive behavior is diminished because anxiety is eliminated by associative reconditioning of threatening stimuli to relaxation (Wolpe, 1974). Evidence from several lines of research shows that anxiety and defensive behavior are coeffects rather than causally related (Bandura, 1977b; Bolles, 1972; Herrnstein, 1969; Rescorla & Solomon, 1967). Moreover, subjects who have been thoroughly desensitized to threats vary substantially in their behavioral improvement. The effects of

this treatment must therefore result from some other mechanism of operation.

In the social learning analysis, treatments aimed at reducing physiological arousal improve performance because they raise expectations of personal efficacy rather than by eliminating a drive that supposedly instigates defensive behavior. The social learning perspective thus places greater emphasis on the informative function of physiological arousal than on its automatic energizing property. Phobics whose anxiety reactions to visualized threats have been thoroughly extinguished do, indeed, emerge from the desensitization treatment with differing efficacy expectations (Bandura & Adams, Note 1). The higher the efficacy expectations created by desensitization, the higher the subsequent performance.

The proposed cognitive mechanism provides a basis for predicting the variable responses that characteristically accompany social persuasion and attributional approaches to behavioral change. Additional tests of the generality of this formulation need to be extended to efficacy expectations arising from these other modes of conveying efficacy information. Analyses are also needed of the factors influencing the cognitive appraisal of efficacy information conveyed by each of the major sources of self-efficacy.

It is possible to generate alternative explanations for particular subsets of data, but the mechanism set forth in the present theory appears to account for the different sets of findings. It might be reasoned that self-efficacy was a reliable predictor of behavioral change in the treatment involving enactive mastery because subjects were simply judging their future performance from their past behavior. However, this type of interpretation has no explanatory value for the vicarious and emotive treatments, in which perceived self-efficacy is an equally accurate predictor of performance although subjects engaged in no overt coping behavior. Even in the enactive treatment, self-efficacy proved to be a better predictor of behavior toward unfamiliar threats than did past performance. Moreover, when changes are measured during the course of participant modeling treatment itself, self-efficacy derived from partial enactive mastery

accurately predicts subsequent performance on stressful tasks that subjects had never done before (Bandura & Adams, Note 1).

One might invoke a superordinate mediator that controls both efficacy expectations and behavior. However, it would have to be an exceedingly complex one to account for the diverse sets of relationships. To cite but a few examples, it would have to affect differentially efficacy expectations and behavior resulting from maximal enactive mastery; somehow it would have to produce different levels of self-efficacy from equivalent reductions in emotional arousal; and it would have to generate some variation in efficacy expectations from similar partial mastery experiences. The theory presented here posits a central processor of efficacy information. That is, people process, weigh, and integrate diverse sources of information concerning their capabilities. They then regulate their choice behavior and effort expenditure on the basis of their perceived self-efficacy.

Evidence that subjects develop somewhat different efficacy expectations from similar enactive mastery and fear extinction deserves comment. One possible explanation for the variance is in terms of cognitive processing of efficacy information. The information conveyed by events must be distinguished from the information as processed and transformed by the individual. To the extent that subjects differ in how they cognitively appraise their attainments, their percepts of self-efficacy will vary to some degree. A second possibility concerns the multiple determination of self-efficacy. Because people have met with different types and amounts of efficacy-generating experiences, providing one new source of efficacy information would not be expected to affect everyone uniformly. Thus, for example, extinguishing fear arousal to threats will enhance self-efficacy, but more so in subjects whose past coping attempts have occasionally succeeded than in those who consistently failed.

In testing the relative power of diverse modes of treatment, alternative experimental designs are available. Matched subjects can be randomly assigned to different methods that are administered until some terminal cri-

terion is attained. Such a design, however, creates problems of implementation and analysis. In the case of modeling, in which subjects observe but perform no responses, there are no explicit criteria for when the demonstrations of coping behavior should be concluded. Furthermore, when length of treatment is free to vary across conditions, the mode effects become confounded by variation in duration of application. An alternative design, and the one adopted in the present study, equalizes length of treatment by yoking matched subjects to a treatment of established superiority. This design also presents certain difficulties, although of lesser magnitude. Because the enactive subjects determined the length of treatment for their matched counterparts, some of the modeling subjects may have received more treatment than they needed, while others may not have received enough. Had the modeling treatment been tailored to their own individual requirements, it might well have proven somewhat more effective. Nevertheless, results of other experiments, in which length of treatment is not delimited, show that enactive mastery produces substantially greater behavioral changes than does modeling, and in a shorter time (Bandura, 1977a).

Within the social learning framework, self-efficacy is not the sole determinant of behavior. Expectation alone will not produce desired performances if the requisite competences are lacking. Moreover, there are many things that people can do with certitude of success that they fail to perform because they have no incentives to do so. Given sufficient capabilities and incentives, however, efficacy expectations are likely to be a major determinant of people's choice of activities, how hard they strive, and how long they will persist in their attempts. These were the conditions that obtained in the present study. All subjects had at their disposal the responses necessary for the interaction tasks and they all were motivated to overcome their phobic behavior. Under conditions in which people differ significantly in capabilities and motivation, skill and incentive factors will contribute to variance in performance.

Efficacy expectations do not operate independently of contextual factors. Some tasks

require greater skill and more arduous performances and carry higher risk of feared consequences than do others. Expectations will vary accordingly. For example, the level and strength of perceived self-efficacy in public speaking will differ depending upon the subject matter, the format of the presentation, and the types of audiences that will be addressed. Hence, the present theory is based on discriminative operation of percepts of self-efficacy rather than on global personality traits or motives of effectance. To elucidate how perceived self-efficacy affects behavior therefore requires a microanalysis of both factors.

Discrepancies between efficacy expectations and performance are most likely to arise when performance requirements and situational circumstances are ill-defined. In the present study, the generalization test threat was labeled simply as an "unfamiliar snake," which does not convey much information about its intimidating potential. However, there would be little reason for subjects to assume that it was any more dangerous than the species with which they had been pretested and treated. Although perceived self-efficacy was an accurate predictor of approach behavior toward both the familiar and unfamiliar threats, the discrepancy between expectation and performance was slightly higher in the more ambiguous test situation.

The operative process involved in the relationship between efficacy expectations and action requires further investigation. Efficacy expectations are presumed to influence level of performance by enhancing intensity and persistence of effort. In this experiment, the behavioral tasks were ordered in level of threat and subjects either persisted in their attempts until they completed all of them or they quit at varying points along the way. The number of tasks successfully completed reflects degree of perseverance. As a further step toward elucidating the intervening process, it would be of interest to measure the intensity and duration of effort subjects exert in attempts to master arduous or insoluble tasks as a function of level and strength of their efficacy expectations.

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Received August 27, 1976 ■

The Self System in Reciprocal Determinism

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Reprinted from AMERICAN PSYCHOLOGIST, Vol. 33, No. 4, April 1978
Printed in U. S. A.

The Self System in Reciprocal Determinism

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ABSTRACT: Explanations of human behavior have generally favored unidirectional causal models emphasizing either environmental or internal determinants of behavior. In social learning theory, causal processes are conceptualized in terms of reciprocal determinism. Viewed from this perspective, psychological functioning involves a continuous reciprocal interaction between behavioral, cognitive, and environmental influences. The major controversies between unidirectional and reciprocal models of human behavior center on the issue of self influences. A self system within the framework of social learning theory comprises cognitive structures and subfunctions for perceiving, evaluating, and regulating behavior, not a psychic agent that controls action. The influential role of the self system in reciprocal determinism is documented through a reciprocal analysis of self-regulatory processes. Reciprocal determinism is proposed as a basic analytic principle for analyzing psychosocial phenomena at the level of intrapersonal development, interpersonal transactions, and interactive functioning of organizational and social systems.

Recent years have witnessed a heightened interest in the basic conceptions of human nature underlying different psychological theories. This interest stems in part from growing recognition of how such conceptions delimit research to selected processes and are in turn shaped by findings of paradigms embodying the particular view. As psychological knowledge is converted to behavioral technologies, the models of human behavior on which research is premised have important social as well as theoretical implications (Bandura, 1974).

Explanations of human behavior have generally been couched in terms of a limited set of determinants, usually portrayed as operating in a unidirectional manner. Exponents of environmental determinism study and theorize about how behavior is controlled by situational influences. Those favoring personal determinism seek the causes of human behavior in dispositional sources in the form of instincts, drives, traits, and other motivational forces within the individual. Interactionists attempt to accommodate both situational

and dispositional factors, but within an essentially unidirectional view of behavioral processes. The present article analyzes the various causal models and the role of self influences in behavior from the perspective of reciprocal determinism.

Unidirectional environmental determinism is carried to its extreme in the more radical forms of behaviorism. It is not that the interdependence of personal and environmental influences is never acknowledged by advocates of this point of view. Indeed, Skinner (1971) has often commented on the capacity for countercontrol. However, the notion of countercontrol portrays the environment as the instigating force to which individuals can counteract. As will be shown later, people create and activate environments as well as rebut them. A further conceptual problem is that having been acknowledged, the reality of reciprocal interdependence is negated and the preeminent control of behavior by the environment is repeatedly asserted (e.g., "A person does not act upon the world, the world acts upon him," Skinner, 1971, p. 211). The environment thus becomes an autonomous force that automatically shapes, orchestrates, and controls behavior. Whatever allusions are made to two-way processes, environmental rule clearly emerges as the reigning metaphor in the operant view of reality.

There exists no shortage of advocates of alternative theories emphasizing the personal determination of environments. Humanists and existentialists, who stress the human capacity for conscious judgment and intentional action, contend that individuals determine what they become by their own free choices. Most psychologists find conceptions of human behavior in terms of unidirectional personal determinism as unsatisfying as those espousing unidirectional environmental determinism.

Preparation of this article was facilitated by Public Health Research Grant M-5162 from the National Institute of Mental Health and by the James McKeen Cattell Award.

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To contend that mind creates reality fails to acknowledge that environmental influences partly determine what people attend to, perceive, and think. To contend further that the methods of natural science are incapable of dealing with personal determinants of behavior does not enlist many supporters from the ranks of those who are moved more by empirical evidence than by philosophic discourse.

Social learning theory (Bandura, 1974, 1977b) analyzes behavior in terms of reciprocal determinism. The term *determinism* is used here to signify the production of effects by events, rather than in the doctrinal sense that actions are completely determined by a prior sequence of causes independent of the individual. Because of the complexity of interacting factors, events produce effects probabilistically rather than inevitably. In their transactions with the environment, people are not simply reactors to external stimulation. Most external influences affect behavior through intermediary cognitive processes. Cognitive factors partly determine which external events will be observed, how they will be perceived, whether they have any lasting effects, what valence and efficacy they have, and how the information they convey will be organized for future use. The extraordinary capacity of humans to use symbols enables them to engage in reflective thought, to create, and to plan foresighted courses of action in thought rather than having to perform possible options and suffer the consequences of thoughtless action. By altering their immediate environment, by creating cognitive self-inducements, and by arranging conditional incentives for themselves, people can exercise some influence over their own behavior. An act therefore includes among its determinants self-produced influences.

It is true that behavior is influenced by the environment, but the environment is partly of a person's own making. By their actions, people play a role in creating the social milieu and other circumstances that arise in their daily transactions. Thus, from the social learning perspective, psychological functioning involves a continuous reciprocal interaction between behavioral, cognitive, and environmental influences.

Reciprocal Determinism and Interactionism

Over the years the locus of the causes of behavior has been debated in personality and social psychology in terms of dispositional and situational

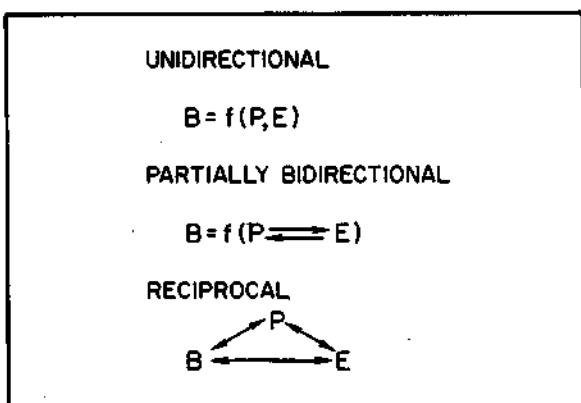


Figure 1. Schematic representation of three alternative conceptions of interaction. *B* signifies behavior, *P* the cognitive and other internal events that can affect perceptions and actions, and *E* the external environment.

determinants of conduct. Most of the participants in the controversy eventually adopted the position that behavior results from the interaction of persons and situations rather than from either factor alone (Bowers, 1973; Endler & Magnusson, 1975). However, these views of interactionism and the accompanying methodologies essentially retain a unidirectional orientation toward behavior.

Interaction processes have been conceptualized in three fundamentally different ways. These alternative formulations are summarized schematically in Figure 1. In the unidirectional notion of interaction, persons and situations are treated as independent entities that combine to produce behavior. This commonly held view can be called into question on both conceptual and empirical grounds. Personal and environmental factors do not function as independent determinants; rather, they determine each other. Nor can "persons" be considered causes independent of their behavior. It is largely through their actions that people produce the environmental conditions that affect their behavior in a reciprocal fashion. The experiences generated by behavior also partly determine what individuals think, expect, and can do, which in turn, affect their subsequent behavior.

A second conception of interaction acknowledges that personal and environmental influences are bidirectional, but it retains a unidirectional view of behavior. In this analysis, persons and situations are considered to be interdependent causes of behavior, but behavior is treated as though it were only a by-product that does not figure at all in the causal process. As previously noted, be-

havior is an interacting determinant, not simply an outcome of a "person-situation interaction."

The methodology used to evaluate the preceding conceptualizations relies heavily on factorial designs in which responses of different individuals are measured under varying situational conditions. The data are then analyzed to determine how much of the variation in behavior is due to personal characteristics, how much to situational conditions, and how much to their joint effects. The attention of researchers working within this framework centers mainly on the dispute over which of the components—persons, situations, or Person \times Situation—accounts most for variation in behavior. However, the basic weakness in the conceptual scheme (i.e., treating behavior as a dependent rather than as an interdependent factor) goes largely unnoticed.

In the social learning view of interaction, which is analyzed as a process of reciprocal determinism (Bandura, 1977b), behavior, internal personal factors, and environmental influences all operate as interlocking determinants of each other. As shown in Figure 1, the process involves a triadic reciprocal interaction rather than a dyadic conjoint or a dyadic bidirectional one. We have already noted that behavior and environmental conditions function as reciprocally interacting determinants. Internal personal factors (e.g., conceptions, beliefs, self-perceptions) and behavior also operate as reciprocal determinants of each other. For example, people's efficacy and outcome expectations influence how they behave, and the environmental effects created by their actions in turn alter their expectations. People activate different environmental reactions, apart from their behavior, by their physical characteristics (e.g., size, physiognomy, race, sex, attractiveness) and socially conferred attributes, roles, and status. The differential social treatment affects recipients' self-conceptions and actions in ways that either maintain or alter the environmental biases.

The relative influence exerted by these three sets of interlocking factors will vary in different individuals and under different circumstances. In some cases, environmental conditions exercise such powerful constraints on behavior that they emerge as the overriding determinants. If, for example, people are dropped in deep water they will all promptly engage in swimming activities, however uniquely varied they might be in their cognitive and behavioral repertoires. There are times when behavior is the central factor in the interlocking

system. One example of this is persons who play familiar piano selections for themselves that create a pleasing sensory environment. The behavior is self-regulated over a long period by the sensory effects it produces, whereas cognitive activities and contextual environmental events are not much involved in the process.

In other instances, cognitive factors serve as the predominant influence in the regulatory system. The activation and maintenance of defensive behavior is a good case in point. False beliefs activate avoidance responses that keep individuals out of touch with prevailing environmental conditions, thus creating a strong reciprocal interaction between beliefs and action that is protected from corrective environmental influence. In extreme cases, behavior is so powerfully controlled by bizarre internal contingencies that neither the beliefs nor the accompanying actions are much affected even by extremely punishing environmental consequences (Bateson, 1961).

In still other instances, the development and activation of the three interlocking factors are all highly interdependent. Television-viewing behavior provides an everyday example. Personal preferences influence when and which programs, from among the available alternatives, individuals choose to watch on television. Although the potential televised environment is identical for all viewers, the actual televised environment that impinges on given individuals depends on what they select to watch. Through their viewing behavior, they partly shape the nature of the future televised environment. Because production costs and commercial requirements also determine what people are shown, the options provided in the televised environment partly shape the viewers' preferences. Here, all three factors—viewer preferences, viewing behavior, and televised offerings—reciprocally affect each other.

The methodology for elucidating psychological processes requires analysis of sequential interactions between the triadic, interdependent factors within the interlocking system. Investigations of reciprocal processes have thus far rarely, if ever, examined more than two of the interacting factors simultaneously. Some studies analyze how cognitions and behavior affect each other in a reciprocal fashion (Bandura, 1977a; Bandura & Adams, 1977). More often, however, the sequential analysis centers on how social behavior and environment determine each other. In these studies of dyadic exchanges, behavior creates certain condi-

tions and is, in turn, altered by the very conditions it creates (Bandura, Lipsher, & Miller, 1960; Patterson, 1975; Raush, Barry, Hertel, & Swain, 1974; Thomas & Martin, 1976).

From the perspective of reciprocal determinism, the common practice of searching for the ultimate environmental cause of behavior is an idle exercise because, in an interactional process, one and the same event can be a stimulus, a response, or an environmental reinforcer, depending on where in the sequence the analysis arbitrarily begins. Figure 2, which represents a sequence of reactions of two persons (A and B), shows how the same events change their status from stimuli, to responses, to environmental reinforcers, at different entry points in the flow of the two-way interaction. For example, event A_2 is an environmental stimulus in the third point of entry, a response in the second analysis, and an environmental reinforcer in the first analysis. One cannot speak of "behavior" and its "controlling environmental conditions" as though these two factors were fundamentally different events.

The preceding analysis focused only on the dependencies among acts, and how they change from responses to environmental events in the flow of interaction. However, regulatory processes are not governed solely by the reciprocal influence of antecedent and consequent acts. While behaving, people are also cognitively appraising the progression of events. Their thoughts about the probable effects of prospective actions partly determine how acts are affected by their immediate environmental consequences. Consider, for example, investigations of reciprocal coercive behavior in an ongoing dyadic interaction. In discordant families, coercive behavior by one member tends to elicit coercive counteractions from recipients in a mutual escalation of aggression (Patterson, 1975). However, coercion often does not produce coercive counteractions. To increase the predictive power of a theory of behavior, it is necessary to broaden the analysis to include cognitive factors that operate in the interlocking system. Counterresponses to antecedent acts are influenced not only by their immediate effects but also by judgments of later consequences for a given course of action. Thus, aggressive children will continue, or even escalate, coercive behavior in the face of immediate punishment when they expect persistence eventually to gain them what they seek. But the same momentary punishment will serve as an inhibitor rather than as an enhancer of coercion when they expect

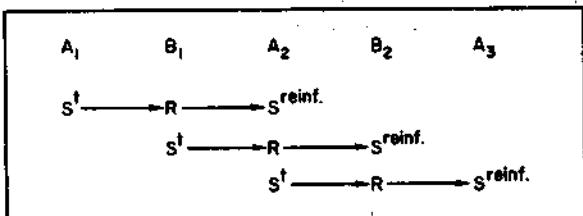


Figure 2. Illustration of how the same behavioral event can be an antecedent stimulus, a response, or a reinforcing consequent depending on where one arbitrarily begins the analysis in the flow of a social interaction. The A's are successive responses by one person, and the B's are successive responses by the second person in the dyadic interaction. S^t represents stimulus; R represents response; and S^{reinf.} represents reinforcer.

continuance of the aversive conduct to be ineffective.

The predictive value of momentary reciprocal consequences derives partly from people's expectations of how their actions are likely to change future consequences over the course of sequential interchanges. Findings from several lines of research document how cognitive factors alter the functional relationship between actions and outcomes. The degree to which behavior is influenced by its momentary effects depends on people's beliefs about action-outcome contingencies (Baron, Kaufman, & Stauber, 1969; Estes, 1972; Kaufman, Baron, & Kopp, 1966; Spielberger & DeNike, 1966), the meaning they attribute to the outcomes (Dulany, 1968), and their expectations that persistence in a given course of behavior will eventually alter people's reinforcement practices (Bandura & Barab, 1971).

In the above studies, cognitive influences serve as controlling rather than controllable factors. But cognitions do not arise in a vacuum, nor do they function as autonomous determinants of behavior. In the social learning analysis of cognitive development, conceptions about oneself and the nature of the environment are developed and verified through four different processes (Bandura, 1977b). People derive much of their knowledge from direct experience of the effects produced by their actions. Indeed, most theories of cognitive development, whether they favor behavioristic, information-processing, or Piagetian orientations, focus almost exclusively on cognitive change through feedback from direct experimentation. However, results of one's own actions are not the sole source of knowledge. Information about the

nature of things is frequently extracted from vicarious experience. In this mode of verification, observation of the effects produced by somebody else's actions serves as the source and authentication of thoughts.

There are many things we cannot come to know by direct or vicarious experience because of limited accessibility or because the matters involve metaphysical ideas that are not subject to objective confirmation. When experiential verification is either difficult or impossible, people develop and evaluate their conceptions of things in terms of the judgments voiced by others. In addition to enactive, vicarious, and social sources of thought verification, all of which rely on external influences, logical verification also enters into the process, especially in later phases of development. After people acquire some rules of inference, they can evaluate the soundness of their reasoning and derive from what they already know new knowledge about things that extend beyond their experiences.

External influences play a role not only in the development of cognitions but in their activation as well. Different sights, smells, and sounds will elicit quite different trains of thought. Thus, while it is true that conceptions govern behavior, the conceptions themselves are partly fashioned from direct or mediated transactions with the environment. A complete analysis of reciprocal determinism therefore requires investigation of how all three sets of factors—cognitive, behavioral, and environmental—interact reciprocally among themselves. Contrary to common misconception, social learning theory does not disregard personal determinants of behavior. Within this perspective, such determinants are treated as integral, dynamic factors in causal processes rather than as static trait dimensions.

Self-Regulatory Functions of the Self System

The differences between unidirectional and reciprocal analyses of behavior have been drawn most sharply in the area of self-regulatory phenomena. Exponents of radical behaviorism have always disavowed any construct of self for fear that it would usher in psychic agents and divert attention from physical to experiential reality. While this approach encompasses a large set of environmental factors, it assumes that self-generated influences either do not exist or, if they do, that they have

no effect upon behavior. Internal events are treated simply as an intermediate link in a causal chain. Since environmental conditions presumably create the intermediate link, one can explain behavior in terms of external factors without recourse to any internal determinants. Through a conceptual bypass, cognitive determinants are thus excised from the analysis of causal processes.

In contrast to the latter view, internal determinants of behavior are gaining increasing attention in contemporary theorizing and research. Indeed, self-referent processes occupy a central position in social learning theory (Bandura, 1977b). As will be shown later, self-generated events cannot be relegated to a redundant explanatory link. In the triadic reciprocal system, they not only operate as reciprocal determinants of behavior but they play a role in the perception and formation of the environmental influences themselves.

Self influences have traditionally been conceptualized in terms of the self-concept (Rogers, 1959; Wylie, 1974). In these approaches, self-conceptions are measured by having people rate in one way or another evaluative statements that they consider apply to themselves. The principal thesis that self-conceptions determine psychological functioning is then tested by correlating self-concepts or disparities between actual-ideal selves with various indexes of adjustment, attitudes, and behavior.

One can point to several features of self theories of this type that detract from their explanatory and predictive power. For the most part, they are concerned with global self-images. A global view of what people think of themselves cannot possibly account for the wide variations they typically show in their self-reactions under different situational circumstances, on different activities, and at different times. A postulated internal determinant cannot be less complex than its effects. Another limitation of self theories is that they fail to specify in sufficient detail how self-concepts regulate specific actions.

In social learning theory, a self system is not a psychic agent that controls behavior. Rather, it refers to cognitive structures that provide reference mechanisms and to a set of subfunctions for the perception, evaluation, and regulation of behavior. Before proceeding to a reciprocal analysis of self influences, the processes by which people exercise some control over their own behavior will be reviewed briefly.

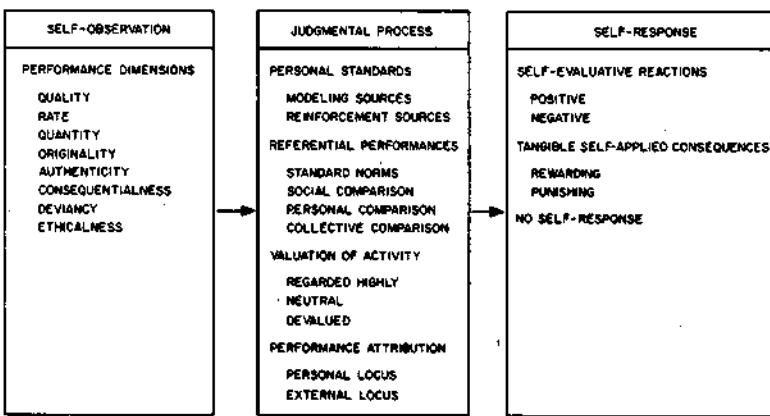


Figure 3. Component processes in the self-regulation of behavior by self-prescribed contingencies.

COMPONENT PROCESSES IN SELF-REGULATION

Figure 3 summarizes the different component processes in the self-regulation of behavior through self-prescribed contingencies. Behavior typically varies on a number of dimensions, some of which are listed in the self-observation component. Depending on value orientations and the functional significance of given activities, people attend selectively to certain aspects of their behavior and ignore variations on nonrelevant dimensions.

Simply observing variations in one's performances yields some relevant information, but such data, in themselves, do not provide any basis for personal reactions. Behavior produces self-reactions through a judgmental function that includes several subsidiary processes. Whether a given performance will be regarded as commendable or dissatisfying depends upon the personal standards against which it is evaluated. Actions that measure up to internal standards are appraised favorably; those that fall short are judged unsatisfactory.

For most activities, there are no absolute measures of adequacy. The time in which a given distance is run, the number of points obtained on an achievement test, or the size of charitable contributions often do not convey sufficient information for self-appraisal even when compared with an internal standard. When adequacy is defined relationally, performances are evaluated by comparing them with those of others. The referential comparisons may involve standard norms, the performances of particular individuals, or the accomplishments of reference groups.

One's previous behavior is continuously used as the reference against which ongoing performance is judged. In this referential process, it is self-com-

parison that supplies the measure of adequacy. Past attainments influence performance appraisals mainly through their effects on standard setting. After a given level of performance is attained, it is no longer challenging, and new self-satisfactions are often sought through progressive improvement.

Another important factor in the judgmental component of self-regulation concerns the evaluation of the activities. People do not much care how they perform on tasks that have little or no significance for them. And little effort is expended on devalued activities. It is mainly in areas affecting one's welfare and self-esteem that favorable performance appraisals activate personal consequences (Simon, Note 2).

Self-reactions also vary depending on how people perceive the determinants of their behavior. They take pride in their accomplishments when they ascribe their successes to their own abilities and efforts. They do not derive much self-satisfaction, however, when they view their performances as heavily dependent on external factors. The same is true for judgments of failure and blameworthy conduct. People respond self-critically to inadequate performances for which they hold themselves responsible but not to those which they perceive are due to unusual circumstances or to insufficient capabilities. Performance appraisals set the occasion for self-produced consequences. Favorable judgments give rise to rewarding self-reactions, whereas unfavorable appraisals activate negative self-reactions. Performances that are judged to have no personal significance do not generate any reactions one way or another.

In the social learning view, self-regulated incentives alter performance mainly through their motivational function (Bandura, 1976). Contin-

gent self-reward improves performance not because it strengthens preceding responses. When people make self-satisfaction or tangible gratifications conditional upon certain accomplishments, they motivate themselves to expend the effort needed to attain the desired performances. Both the anticipated satisfactions of desired accomplishments and the dissatisfactions with insufficient ones provide incentives for actions that increase the likelihood of performance attainments.

Much human behavior is regulated through self-evaluative consequences in the form of self-satisfaction, self-pride, self-dissatisfaction, and self-criticism. The act of writing is a familiar example of a behavior that is continuously self-regulated through evaluative self-reactions. Writers adopt a standard of what constitutes an acceptable piece of work. Ideas are generated and rephrased in thought before they are committed to paper. Provisional contractions are successively revised until authors are satisfied with what they have written. The more exacting the personal standards, the more extensive are the corrective improvements.

People also get themselves to do things they would otherwise put off by making tangible outcomes conditional upon completing a specified level of performance. In programs of self-directed change, individuals improve and maintain behavior on their own over long periods by arranging incentives for themselves (Bandura, 1976; Goldfried & Merbaum, 1973; Mahoney & Thoresen, 1974). In many instances, activities are regulated through self-prescribed contingencies involving both evaluative and tangible self-rewards. Authors influence how much they write by making breaks, recreational activities, and other tangible rewards contingent on completing a certain amount of work (Wallace, 1977), but they revise and improve what they write by their self-evaluative reactions.

Conceptual Bypass of the Self System

The notion that people can exercise some influence over their own behavior and change their environment was not enthusiastically received by adherents of unidirectional environmental determinism. Alternative conceptions were proposed that would make behavior explainable without postulating any self-generated influences. One solution is to redefine the phenomenon out of existence. Self-directed change through personally arranged incentives was relabeled as a process of self-awareness (Catania, 1975) or as a stimulus signalling

that a response had been executed (Rachlin, 1974). The assumptions on which such redefinitions are based and the contravening evidence are discussed at length elsewhere (Bandura, 1976) and need not be repeated here.

The second, and more commonly used, solution is to execute a regress of causes. By locating a remote environmental factor that might affect self-reactions, self-generated influences are thereby converted into simple operants. As Stuart (1972) succinctly put it, "The behaviors commonly ascribed to self-control can be functionally analyzed as a special subset of operant responses which are, in fact, under situational control" (p. 130). The organism thus becomes simply a repository of self-control responses waiting to be externally activated, but otherwise it possesses no capacity to generate guides and incentives for its own actions. But causal regression is a no more convincing disposal of self-generated influences than is renaming, because for every environmental cause that is invoked, one can find a prior personal cause of that environment.

Some conceptual regressions of self-generated influences to situational causes treat reciprocal influences as rivalrous or even as confounding factors. This view is exemplified by Jones, Nelson, and Kazdin (1977), who consider external influences to be "plausible rival interpretations" of the changes people achieve by arranging conditional incentives for themselves. The situational contenders in unidirectional analyses assume several different forms. A commonly cited external candidate is "reinforcement history." As Jones et al. (1977) note, self-reward partly depends upon prior training in how to judge and set standards of performance. This is certainly true. Values and generic standards of self-reward are extracted from diverse experience.

Having external origins, of course, in no way detracts from the fact that, once established, self-produced influences operate as contributory factors in the regulation of behavior. Ascribing a generalizable capability to past experiences cannot substitute for current influences arising through exercise of that capability, any more than one would attribute Shakespeare's literary masterpieces to his prior instruction in the mechanics of writing. A unidirectional environmentalist might well contend that literary creations are products of the sum total of past situational influences. No one would argue with the view, however limited its predictive value, that human ingenuity incorpo-

rates some aspects of past experiences. A social learning analysis, however, emphasizes the reciprocally interacting influences of personal and environmental factors in the innovative process. By their actions, people partly determine the nature of their experiences; through their capacity to manipulate symbols and to engage in reflective thought for innovative action, they can generate novel ideas and fashion new environments for themselves and others.

In laboratory investigations of self-regulatory processes, behavioral standards are transmitted by selective consequences (Bandura & Mahoney, 1974; Mahoney, Bandura, Dirks, & Wright, 1974) or through modeling (Bandura, 1976). In educational and clinical applications of self-reinforcement practices, the procedures on how to set performance goals and regulate one's own behavior are usually conveyed by instruction. To Jones et al. (1977), instruction on self-influence exteriorizes the locus of regulation.

Externalizing determinants in instructions, like the embodiment of control in reinforcement histories, fails to do justice to the complexities of the regulatory process. As we have previously seen, one must distinguish between the mechanics and the agency of behavior regulation. An environment may provide information for developing self-regulatory skills, but the recipients play an active role in what information they extract from ongoing events and when and how they use the acquired skills. Instructions are merely sources of information that become influences through cognitive processing rather than by reflexive adoption. It is not uncommon for people to improvise on information conveyed by instructions to create their own performance guides (Bandura & Simon, 1977). Indeed, a major challenge to the investigation of self-regulatory processes, whether they involve self-observation, goal setting, cognitive rehearsal, or self-generated consequences, is that people do not simply react mechanically to situational influences—they actively process and transform them.

It will be recalled from the earlier discussion that in order for people to regulate their own behavior through self-managed incentives, they have to know what they are doing and to measure their behavior against personal standards of what constitutes a worthy performance. Hence, self-monitoring and goal setting are indispensable constituents in the process, rather than ancillary components that can be plugged in or disconnected from a self-regulatory system. Jones et al. (1977) spec-

ulate about how self-observation, goal setting, and situational demands might account for the effects of contingent self-reward. An issue of contributory influence need not be cast in terms of rival determinants. A large body of evidence exists showing that people who reward their own behavior achieve significantly higher levels of performance than those who perform the same activities under instruction but receive no reinforcement, are rewarded noncontingently, or monitor their own behavior and set goals for themselves but do not reward their attainments (Bandura & Perloff, 1967; Bellack, 1976; Felixbrod & O'Leary, 1973; Glynn, 1970; Jeffrey, 1974; Litrownik, Franzini, & Skenderian, 1976; Mahoney, 1974; Montgomery & Parton, 1970; Speidel, 1974; Switzky & Haywood, 1974).

Exclusive reliance on physical events in behavioristic conceptions results in neglect of the role of self-evaluative reactions in the regulation of behavior. Consider, for example, the view set forth by Jones et al. (1977) that "although self-monitoring frequently is evaluated independently of self-reinforcement, the reverse is not the case" (p. 164). The first portion of the statement is debatable, the second is inconceivable. Self-monitoring can be regarded as independent of self-reinforcement only if the analysis is confined solely to material self-consequences of action. In fact, it is difficult for people to monitor their performances without setting goals for themselves and responding evaluatively to their behavior. Most people value their self-respect and the self-satisfaction derived from a job well done more highly than they do reinforcement tokens. To ignore the influential role of self-evaluative reactions in the self-regulation of behavior is to disavow a uniquely human capacity.

Self-reinforcement has never been evaluated independently of self-monitoring, nor is there much prospect that it ever will, simply because it would require an impossible feat. People cannot reward their behavioral attainments contingently if they do not know what they are doing. Observation of one's performances is a necessary precondition for contingent self-reward, not a handy but disconnectable component. Nor, for reasons given above, can evaluative self-reactions be easily dissociated from self-monitoring and goal-setting operations. To restate a central thesis of this article, self-generated influences cannot be excised from among the determinants of human behavior without sacrificing considerable explanatory and predictive power.

It might be argued that after self-regulatory functions are established, the self system operates in a wholly automatic fashion. Environmental stimuli trigger the regulatory mechanism to produce predictable outcomes, in the manner of cybernetic control. Were this the case, functional relationships could be established between environmental stimuli and responses without knowing much about the characteristics and processes of the self system. Such an analysis, however, rests on a number of improbable assumptions. The operational limits of the cybernetic model are too numerous to provide an adequate account of self-directed change. Consider only a few of the complexities involved. At the first step, a self-regulatory system requires close and reliable monitoring of behavior. In reality, most performances are difficult to codify because they are multifaceted, with each aspect varying on a number of relevant dimensions. Consequently, one must rely on integrative judgment rather than on preset mechanical sensors. In addition to complexities in the reading of behavior, self-observation is usually episodic rather than continuous. The poorer the quality of self-observation, the more difficult is the attainment of self-directed change (Kazdin, 1974; Mahoney, Moore, Wade, & Moura, 1973).

The demands on personal judgment are even heavier in the referential operations, which cannot rely solely on the preset properties of the system. Performances must be evaluated in terms of varying arrays of circumstances under which they occur and measured against reference standards that synthesize several sources of comparative information. Here we are dealing with evaluative and composite comparative judgments rather than with a mechanical comparator that checks the readings from a sensor against a preprogrammed criterion as in the model of cybernetic control. Nor is there anything automatic about the amount, type, and temporal administration of self-consequences.

To automate a self-regulation system one would have to preprogram (a) an elaborate set of intricate sensors that could decipher instantly information contained in novel combinations of relevant variables that appear in multifarious varieties, (b) a comparator that contained all the possible referential standards derivable from the various comparative factors in the relational network, and (c) a device whereby differential comparative signals would automatically select and trigger particular self-reactions from a wide variety of possible responses. The system would, of course, require

precise and continuous self-monitoring. These conditions are achievable in mechanical and biological systems that perform a limited routine function and hence involve only a few possible responses regulated by a few variables. A thermostat, for example, is sensitive only to variations in temperature, it can only turn off or on, and it is ever watchful.

Because of the complexity of behavioral functioning at "input," "throughput," and "output," cognitive processing serves in place of reflexive mechanics. The more complex the activities that are self-regulated, and the less particularized the regulatory decision rules, the more judgmental factors enter the process, and the more the process departs from the mechanical servocybernetic metaphor.

Incomplete preprogramming has some decided benefits. A wholly automated psychocybernetic self system would produce completely predictable responsiveness but at the heavy price of rigidity. When adaptive demands vary significantly across situations and times, as they typically do, what is functional under one set of circumstances becomes dysfunctional under different circumstances. Preprogrammed feedback sensitivity to immediate benefits would often produce aversive long-run consequences. An automaton that is self-guided by instant feedback to fixed internal referents would repeatedly direct itself into serious difficulties or even out of existence. In actuality, self-regulation operates in terms of basic preset properties, but it also relies on reflective judgment in assessing behavioral events, in rendering referential comparisons, and in selecting self-responses. To achieve full automaticity would require complete automation of judgment as well. Those who hold a wholly "robotic" view of the process face the task of explaining how automatons program automatons and whether a regress of programmers ultimately leads to inventive nonautomatons with a capacity for reflective thought.

Reciprocal Influence of External Factors on Self-Regulatory Functions

Social learning theory regards self-generated influences not as autonomous regulators of behavior but as contributory influences in a reciprocally interacting system. A variety of external factors serve as reciprocal influences on the operation of a self system. They can affect self-regulatory processes in at least three major ways: They are involved in the development of the component functions in

self-regulatory systems; they provide partial support for adherence to self-prescribed contingencies; and they facilitate selective activation and disengagement of internal contingencies governing conduct.

DEVELOPMENT OF SELF-REGULATORY FUNCTIONS

The development of capabilities for self-reaction requires adoption of standards against which performances can be evaluated. These internal criteria do not emerge in a vacuum. Behavioral standards are established by precept, evaluative consequences accompanying different performances, and exposure to the self-evaluative standards modeled by others (Bandura, 1976, 1977b; Masters & Mokros, 1974). People do not passively absorb behavioral standards from the environmental stimuli that happen to impinge upon them. They extract generic standards from the multiplicity of evaluative reactions that are exemplified and taught by different individuals or by the same individuals on different activities and in different settings (Bandura, 1976; Lepper, Sagotsky, & Mailer, 1975). People must therefore process the divergent information and eventually arrive at personal standards against which to measure their own behavior.

Associational preferences add another reciprocal element to the acquisition process. The people with whom one regularly associates partly influence the standards of behavior that are adopted. Value orientations, in turn, exercise selective influence on choices of activities and associates (Bandura & Walters, 1959; Krauss, 1964).

EXTERNAL SUPPORTS FOR SELF-REGULATORY SYSTEMS

In analyzing regulation of behavior through self-produced consequences, one must distinguish between two different sources of incentives that operate in the system. First, there is the arrangement of self-reward contingent upon designated performances to create proximal incentives for oneself to engage in the activities. Second, there are the more distal incentives for adhering to the self-prescribed contingencies.

Adherence to performance requirements for self-reward is partly sustained by periodic environmental influences that take a variety of forms (Bandura, 1977b). First, there are the negative sanctions for unmerited self-reward. When standards are being acquired or when they are later

applied inconsistently, rewarding oneself for undeserving performances is more likely than not to evoke critical reactions from others. Occasional sanctions for unmerited self-reward influence the likelihood that people will withhold rewards from themselves until their behavior matches their standards (Bandura, Mahoney, & Dirks, 1976). Personal sanctions operate as well in fostering such adherence. After people adopt codes of conduct, when they perform inadequately or violate their standards they tend to engage in self-critical and other distressing trains of thought. Anticipated, thought-produced distress over faulty behavior provides an internal incentive to abide by personal standards of performance (Bandura, 1977b).

Negative inducements, whether personal or social, are not the most reliable basis upon which to rest a system of self-regulation. Fortunately, there are more advantageous reasons for exercising some influence over one's own behavior through self-aranged incentives. Some of these personal benefits are extrinsic to the behavior; others derive from the behavior itself.

People are motivated to institute performance contingencies for themselves when the behavior they seek to change is aversive. To overweight persons, the discomforts, maladies, and social costs of obesity create inducements to control their overeating. Similarly, students are prompted to improve their study behavior when failures in course work make academic life sufficiently distressing. By making self-reward conditional upon performance attainments, individuals can reduce aversive behavior, thereby creating natural benefits for their efforts.

The benefits of self-regulated change may provide natural incentives for adherence to personal prescriptions for valued activities as well as for unpleasant ones. People often motivate themselves by conditional incentives to enhance their skills in activities they aspire to master. Here the personal benefits derived from improved proficiency support self-prescription of contingencies. Self-generated inducements are especially important in ensuring continual progress in creative endeavors, because people have to develop their own work schedules for themselves. There are no clocks to punch or supervisors to issue directives. In analyzing the writing habits and self-discipline of novelists, Wallace (1977) documents how famous novelists regulate their writing output by making self-reward contingent upon completion of a certain amount of

writing each day whether the spirit moves them or not.

If societies relied solely on inherent benefits to sustain personal contingencies, many activities that are tiresome and uninteresting until proficiency in them is acquired would never be mastered. Upholding standards is therefore socially promoted by a vast system of rewards including praise, social recognition, and honors. Few accolades are bestowed on people for self-rewarding their mediocre performances. Direct praise or seeing others publicly recognized for upholding excellence fosters adherence to high performance standards (Bandura, Grusec, & Menlove, 1967).

Modeling is a powerful means for establishing behavior, but it has rarely been studied as a maintenance factor. Considering that human behavior is extensively regulated by modeling influences, there is every reason to expect that seeing others successfully regulate their own behavior by conditional incentives would increase the likelihood of adherence to self-prescribed contingencies in observers.

Although self-regulatory functions are developed and occasionally supported by external influences, this does not negate the fact that exercise of that function partly determines how people behave. In the case of arduous tasks, environmental inducements alone often fail to produce change, whereas the same inducements with contingent self-reward prove successful (Bandura & Perloff, 1967; Bellack, 1976; Mahoney, 1974; Switzky & Haywood, 1974; Flaxman & Solnick, Note 1). Competencies developed through the aid of self-reward enable people to activate environmental influences that would otherwise not come into play. This is because most environmental influences are only potentialities until actualized by appropriate action. In still other instances, the behavior fashioned through self-reward enables people to alter important aspects of their environment.

Because personal and environmental determinants affect each other in a reciprocal fashion, attempts to assign causal priority to these two sources of influence reduce to the "chicken-or-egg" debate. The quest for the ultimate environmental determinant of activities regulated by self-influence becomes a regressive exercise that can yield no victors in explanatory contests, because for every ultimate environmental cause that is invoked, one can find prior actions that helped to produce it.

SELECTIVE ACTIVATION AND DISENGAGEMENT OF SELF-REACTIVE INFLUENCES

The third area of research on the role of external factors in self-regulation centers on the selective activation and disengagement of self-reactive influences (Bandura, 1977b). Theories of internalization that portray incorporated entities (e.g., the conscience or superego, moral codes) as continuous internal overseers of conduct are usually at a loss to explain the variable operation of internal control and the perpetration of inhumanities by otherwise humane people.

In the social learning analysis, considerate people perform culpable acts because of the reciprocal dynamics between personal and situational determinants of behavior rather than because of defects in their moral structures. Development of self-regulatory capabilities does not create an invariant control mechanism within a person. Self-evaluative influences do not operate unless activated, and many situational dynamics influence their selective activation.

After ethical and moral standards of conduct are adopted, anticipatory self-censuring reactions for violating personal standards ordinarily serve as self-deterrants against reprehensible acts (Bandura & Walters, 1959). Self-deterring consequences are likely to be activated most strongly when the causal connection between conduct and the detrimental effects it produces is unambiguous. There are various means, however, by which self-evaluative consequences can be dissociated from reprehensible behavior. Figure 4 shows the several points in the process at which the disengagement can occur.

One set of disengagement practices operates at the level of the behavior. What is culpable can be made honorable through moral justifications and palliative characterizations (Gambino, 1973; Kelman, 1973). In this process, reprehensible conduct is made personally and socially acceptable by portraying it in the service of beneficial or moral ends. Such cognitive restructuring of behavior is an especially effective disinhibitor because it not only eliminates self-generated deterrents but engages self-reward in the service of the behavior.

Another set of dissociative practices operates by obscuring or distorting the relationship between actions and the effects they cause. By displacing and diffusing responsibility, people do not see themselves as personally accountable for their actions and are thus spared self-prohibiting reactions (Ban-

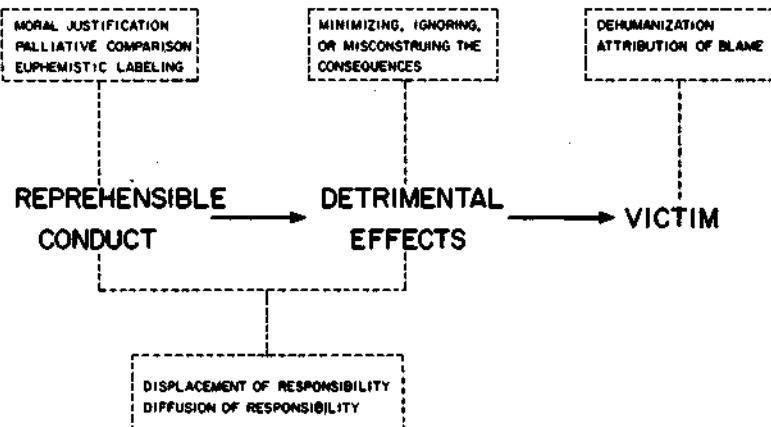


Figure 4. Mechanisms through which behavior is disengaged from self-evaluative consequences at different points in the behavioral process.

dura, Underwood, & Fromson, 1975; Milgram, 1974). Additional ways of weakening self-detering reactions operate by disregarding or obscuring the consequences of actions. When people embark on a self-disapproved course of action for personal gain, or because of other inducements, they avoid facing the harm they cause. Self-censuring reactions are unlikely to be activated as long as the detrimental effects of conduct are disregarded.

The final set of disengagement practices operates at the level of the recipients of injurious effects. The strength of self-evaluative reactions partly depends on how the people toward whom actions are directed are viewed. Maltreatment of individuals who are regarded as subhuman or debased is less apt to arouse self-reproach than if they are seen as human beings with dignifying qualities (Zimbardo, 1969). Detrimental interactions usually involve a series of reciprocally escalative actions in which the victims are rarely faultless. One can always select from the chain of events an instance of defensive behavior by the adversary as the original instigation. By blaming victims, one's own actions are excusable. The disengagement of internal control, whatever the means, is not achieved solely through personal deliberation. People are socially aided in this process by indoctrination, scapegoating, and pejorative stereotyping of people held in disfavor.

As is evident from preceding discussion, the development of self-regulatory functions does not create an automatic control system, nor do situational influences exercise mechanical control. Personal judgments operating at each subfunction pre-

clude the automaticity of the process. There is leeway in judging whether a given behavioral standard is applicable. Because of the complexity and inherent ambiguity of most events, there is even greater leeway in the judgment of behavior and its effects. To add further to the variability of the control process, most activities are performed under collective arrangements that obscure responsibility, thus permitting leeway in judging the degree of personal agency in the effects that are socially produced. In short, there exists considerable latitude for personal judgmental factors to affect whether or not self-regulatory influences will be activated in any given activity.

Reciprocal Influence of Personal Factors on Reinforcement Effects

Reinforcement has commonly been viewed as a mechanistic process in which responses are shaped automatically and unconsciously by their immediate consequences. The assumption of automaticity of reinforcement is crucial to the argument of unidirectional environmental control of behavior. One can dispense with the so-called internal link in causal chains only if persons are conceived of as mechanical respondents to external stimuli. The empirical evidence does not support such a view (Bandura, 1977b; Bower, 1975; Mischel, 1973; Neisser, 1976). External influences operate largely through cognitive processes.

During ongoing reinforcement, respondents are doing more than simply emitting responses. They develop expectations from observed regularities about the outcomes likely to result from their

actions under given situational circumstances. Contrary to claims that behavior is controlled by its immediate consequences, behavior is related to its outcomes at the level of aggregate consequences rather than momentary effects (Baum, 1973). People process and synthesize contextual and outcome information from sequences of events over long intervals about the action patterns that are necessary to produce given outcomes.

The notion that behavior is governed by its consequences fares better for anticipated than for actual consequences (Bandura, 1977b). We have already reviewed research demonstrating how the same environmental consequences have markedly different effects on behavior depending on respondents' beliefs about the nature of the relationships between actions and outcomes and the meaning of the outcomes. When belief differs from actuality, which is not uncommon, behavior is weakly influenced by its actual consequences until more realistic expectations are developed through repeated experience. But it is not always expectations that change in the direction of social reality. Acting on erroneous expectations can alter how others behave, thus shaping the social reality in the direction of the expectations.

While undergoing reinforcing experiences, people are doing more than learning the probabilistic contingencies between actions and outcomes. They observe the progress they are making and tend to set themselves goals of progressive improvement. Investigators who have measured personal goal setting as well as changes in performance find that external incentives influence behavior partly through their effects on goal setting (Locke, Bryan, & Kendall, 1968). When variations in personal goals are partialled out, the effects of incentives on performance are reduced. Performance attainments also provide an important source of efficacy information for judging one's personal capabilities. Changes in perceived self-efficacy, in turn, affect people's choices of activities, how much effort they expend, and how long they will persist in the face of obstacles and aversive experiences (Bandura, 1977a; Brown & Inouye, 1978).

Because of the personal determinants of reinforcement effects, to trace behavior back to environmental "reinforcers" by no means completes the explanatory regress. To predict how outcomes will affect behavior, one must know how they are cognitively processed. To understand fully the mechanisms through which consequences change behavior, one must analyze the reciprocally contributory influences of cognitive factors.

Reciprocal Determinism as a Generic Analytic Principle

The discussion thus far has primarily addressed issues regarding the reciprocal interactions between behavior, thought, and environmental events as they occur at the individual level. Social learning theory treats reciprocal determinism as a basic principle for analyzing psychosocial phenomena at varying levels of complexity, ranging from intrapersonal development, to interpersonal behavior, to the interactive functioning of organizational and societal systems. At the intrapersonal level, people's conceptions influence what they perceive and do, and their conceptions are in turn altered by the effects of their actions and the observed consequences accruing to others (Bandura, 1977a; Bower, 1975). Information-processing models are concerned mainly with internal mental operations. A comprehensive theory must also analyze how conceptions are converted to actions, which furnish some of the data for conceptions. In social learning theory, people play an active role in creating information-generating experiences as well as in processing and transforming informative stimuli that happen to impinge upon them. This involves reciprocal transactions between thought, behavior, and environmental events which are not fully encompassed by a computer metaphor. People are not only perceivers, knowers, and actors. They are also self-reactors with capacities for reflective self-awareness that are generally neglected in information-processing theories based on computer models of human functioning.

At the level of interpersonal behavior, we have previously examined how people reciprocally determine each others' actions (Bandura et al., 1960; Patterson, 1975; Raush et al., 1974). Although the mutuality of behavior may be the focus of study, the reciprocal processes involve cognition as well as action. At the broader societal level, reciprocal processes are reflected in the interdependence of organizational elements, social subsystems, and transnational relations (Bandura, 1973; Keohane & Nye, 1977). Here the matters of interest are the patterns of interdependence between systems, the criteria and means used for gauging systemic performances, the mechanisms that exist for exercising reciprocal influence, and the conditions that alter the degree and type of reciprocal control that one system can exert on another.

It is within the framework of reciprocal determinism that the concept of freedom assumes meaning (Bandura, 1977b). Because people's concep-

tions, their behavior, and their environments are reciprocal determinants of each other, individuals are neither powerless objects controlled by environmental forces nor entirely free agents who can do whatever they choose. People can be considered partially free insofar as they shape future conditions by influencing their courses of action. By creating structural mechanisms for reciprocal influence, such as organizational systems of checks and balances, legal systems, and due process and elective procedures, people can bring their influence to bear on each other. Institutional reciprocal mechanisms thus provide not only safeguards against unilateral social control but the means for changing institutions and the conditions of life. Within the process of reciprocal determinism lies the opportunity for people to shape their destinies as well as the limits of self-direction.

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Tests of the Generality of Self-Efficacy Theory¹

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The present set of studies tested the explanatory and predictive generality of self-efficacy theory across additional treatment modalities and behavioral domains. Microanalysis of changes accompanying symbolic modeling indicates that this mode of treatment enhances coping behavior partly through its effects on perceived efficacy. Cognizing modeled mastery of threats increased phobics' self-percepts of efficacy, which, in turn, predicted their specific performance attainments on tasks of varying threat value. Examination of efficacy probes revealed that making efficacy judgments has no effect on subsequent avoidance behavior or on fear arousal. The close congruence found between changes in self-efficacy and different forms of coping behavior in the treatment of agoraphobia provides some evidence for the generality of efficacy theory across different areas of functioning. Microanalysis of anticipatory and performance fear arousal accompanying varying strengths of self-efficacy also lends support for the social learning conception of fear arousal in terms of perceived coping ineffectiveness.

Over the years different modes of treatment have been devised and new ones are continually being proposed. Not only are the procedures diverse but the explanations of how they work are equally varied. Social learning theory postulates a common mechanism of psychological change—different

¹This research was supported by Public Health Research Grant M-5162 from the National Institute of Mental Health. The authors are grateful to Seanna Adamson for administering the assessment procedures and to Evelyn Nast for her able assistance with the cognitive modeling treatment. We are deeply indebted to Sue Lampson for her valuable aid with the assessment phase of the agoraphobia study and to the staff of the Terrap treatment center for their generous help with this research.

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modes of influence alter coping behavior partly by creating and strengthening self-percepts of efficacy (Bandura, 1977). Perceived efficacy enhances psychosocial functioning through its effects on choice behavior, effort expenditure, persistence, and self-guiding thought (Bandura, 1980).

In our previous research we have shown that perceived efficacy predicts level of behavioral change, regardless of whether self-efficacy is developed through enactive mastery, through vicarious experiences, or by eliminating fear arousal. The present studies were aimed at testing further the generality of self-efficacy theory across additional treatment modalities and different behavioral domains.

Kazdin (1973, 1974a) has developed an interesting symbolic modeling treatment that relies on cognitive execution of threatening activities as the principal vehicle of change. In this approach, people who suffer from fears and behavioral inhibitions visualize others coping successfully with threatening situations. Such cognitive enactments have proven effective in reducing phobic behavior and in enhancing assertiveness in people who are easily intimidated. This approach is generally called covert modeling, but for purposes of the present discussion it will be designated as cognitive modeling to indicate its principal modality of operation.

The success of this method has been well established, but the mechanism by which cognitive enactments boost coping behavior remains to be clarified. In the social learning analysis, repeated imaginal conquests of threats enhances performance by increasing perceived coping efficacy. Consistent with this formulation, a number of modeling variables that increase the efficacy value of vicariously derived information have been shown to augment the power of cognitive modeling. One such factor is similarity to the model (Kazdin, 1974b), which increases the personal relevance of modeled performances for observers' perceptions of their own efficacy. Observers also benefit more from seeing models overcome their difficulties by determined coping effort than by observing facile performances by adept models (Kazdin, 1973). Diversified modeling, in which feared activities are mastered by a variety of models, is superior to visualizing the same performances by a single model (Kazdin, 1975, 1976). If people of varying characteristics can succeed, then observers have a reasonable basis for increasing their own sense of efficacy.

To test the theory that cognitive modeling alters coping behavior by increasing self-percepts of efficacy, the perceived efficacy and approach behavior of severe snake phobics were measured prior to, and after, receiving cognitive modeling. Since symbolic modes of treatment typically produced only moderate changes (Bandura, 1977), the potentiating modeling variables discussed above were included in the treatment. It was hypothesized that the level and strength of perceived efficacy instated by cognitive modeling would predict individual performance accomplishments.

Generality of Self-Efficacy Theory

An untreated control group was not included because it is the relationship between efficacy judgment and performance on specific tasks that is of central interest in this study. Accounting for intragroup variability and variations in performance by individuals across different tasks imposes far more stringent explanatory and predictive requirements than does simply demonstrating that treatment enhances efficacy and performance relative to a control group. Kazdin (1973, 1976) has already demonstrated in several studies that the changes accompanying cognitive modeling are due to the cognitive enactments rather than to visualization of threats or to the effects of assessment. Moreover, previous research using identical measurement procedures with similar phobics shows that repeated testing alone produces little or no change in either self-efficacy, behavior, or fear arousal (Bandura, Adams, & Beyer, 1977; Bandura & Barab, 1973; Bandura, Blanchard, & Ritter, 1969).

The question arises as to whether making efficacy judgments in itself can affect performance by creating public commitment and pressures for consistency. In applying the microanalytic procedure, special precautions are taken to minimize any possible motivational effects of the assessment itself. Judgments of self-efficacy are made privately, rather than stated publicly. Judgments of level and strength of efficacy are made for a variety of activities in situations varying in threat value and familiarity in advance of behavior tests, rather than immediately prior to each performance task. Nevertheless, to evaluate any possible effects of efficacy probes, matched phobics received the cognitive modeling treatment either with or without assessment of self-efficacy, and subsequent changes in their coping behavior and level of fear arousal were compared.

The preceding and earlier experiments (Bandura & Adams, 1977; Bandura et al., 1977) examined the predictive power of efficacy theory across different modes of treatment applied to the same type of behavioral dysfunction. An additional study was conducted to examine the generality of this theory across different behavioral domains. For this purpose, severe agoraphobics were selected whose lives were markedly constricted by profound coping ineffectiveness that makes common activities seem filled with danger. As a result, they exhibited acute behavioral problems in diverse areas of functioning.

Self-efficacy and performance attainments were measured before and after the agoraphobics received an intensive form of participant modeling treatment that relies heavily on enactive mastery experiences. It was hypothesized that participant modeling would restore a strong sense of coping efficacy and that behavioral changes in different domains of activity would correspond closely to level of efficacy change.

Behavioral attainments in treatment provide raw data that must be cognitively appraised for their efficacy value. Similar past performances

can yield differential perceived efficacy (Bandura & Adams, 1977) because many factors affect performance that have little to do with operative capability, as, for example, the amount of external aid received, the amount of effort expended, and the situational circumstances of performance. Judgment of personal efficacy thus involves an inferential process in which the relative contribution of various personal and situational factors to performance successes and failures must be weighted. Hence it was further hypothesized that level of behavioral change would show closer congruence to self-efficacy than to performance attainments in treatment.

GENERALITY OF EFFICACY THEORY ACROSS TREATMENT MODALITIES

Subjects

Subjects whose lives were adversely affected by snake phobias of long standing were recruited through advertisements placed in newspapers serving the community. Of the 17 subjects who participated in the study, 4 were males and 13 were females. They ranged in age from 17 to 52 years, with a mean age of 32 years.

Pretreatment Measures

Multifaceted measures were used to provide the data required for a microanalysis of changes in self-efficacy, avoidance behavior, and fear arousal.

Behavioral Avoidance. The test of avoidance behavior consisted of a series of 29 performance tasks requiring increasingly more threatening interactions with a red-tailed boa constrictor. The set of tasks required subjects to approach a glass cage containing the snake, to look down at it, to touch and hold the snake with gloved and bare hands, to let it loose in the room and return it to the cage, to hold it within 12 cm of their faces, and finally to tolerate the snake crawling in their laps while they held their hands passively at their sides.

A female tester administered all the assessment procedures. Prior to measuring phobic behavior, subjects were given factual information about the characteristics and habits of snakes to eliminate moderately fearful subjects who might be emboldened by factual information alone. Those who could not enter the room containing the snake received a score of zero; subjects who did enter were asked to perform the various tasks in the graded

Generality of Self-Efficacy Theory

series. To control for any possible influence of expressive cues from the tester, she stood behind the subject and read aloud the tasks to be performed.

The avoidance score was the number of snake-interaction tasks the subject performed successfully. Those who could lift the snake inside the cage with a gloved hand were considered insufficiently fearful and were not included in the experiment. To maximize the generality of the findings, all people who were sufficiently phobic on the behavior test were selected for study.

Fear Arousal Accompanying Approach Responses. In addition to measuring performance capabilities, the degree of fear aroused by each approach response was assessed. During the behavioral test, subjects rated orally, on a 10-interval scale, the intensity of fear they experienced when each snake approach task was described to them (anticipatory fear), and again while they were performing the corresponding behavior (performance fear). These fear ratings for all the approach tasks completed were averaged to provide the index of fear arousal. The mean level of fear elicited by responses that subjects performed before treatment was compared with the fear levels in the posttest for the same subset of approach responses, and for the total number of approach responses they completed successfully.

Efficacy Judgments. In the pretest phase efficacy judgments were measured after the test of behavior avoidance so that subjects would have some understanding of what types of performances were required. Separate measures were obtained of the magnitude, strength, and generality of their perceived efficacy.

Subjects were provided with the list of performance tasks included in the behavioral test and instructed to designate those they judged they could perform as of then. For each task so designated, they rated the strength of their efficacy on a 100-point scale, ranging in 10-unit intervals, from high uncertainty through intermediate values of certainty to complete certitude. The *level* of self-efficacy was the number of performance tasks subjects designated they expected to perform with a value above 10, which was the lowest point on the scale signifying virtual impossibility. *Strength* of self-efficacy was computed by summing the magnitude scores across tasks and dividing the sum by the total number of performance tasks. To gauge the *generality* of self-efficacy, subjects rated the level and strength of their perceived efficacy in coping with an unfamiliar snake as well as with a boa constrictor similar to the one used in treatment.

Self-efficacy was measured following the behavioral pretest, after treatment but prior to the behavioral posttest, and after completing the posttest. These judgments were recorded privately and remained so during the behavior tests to minimize any motivational inducements to improve

performance that could arise had the judgments been communicated publicly to the examiner.

Treatment Conditions

Of the 17 subjects, 12 were individually matched according to pretest avoidance behavior and randomly assigned to conditions either with or without measurement of perceived efficacy after the treatment. These two matched groups were comparable in sex distribution and age, and on all of the pretest measures.

Five additional subjects were added to the group, receiving treatment with subsequent efficacy measurement to expand the size of the sample for correlational and microanalytic evaluation of the relationship between efficacy judgment and performance. To control for any possible bias in the administration of the treatment, the therapists had no knowledge of the conditions to which the subjects were assigned.

Cognitive Modeling

Three therapists, two females and one male, administered to subjects individually the cognitive modeling treatment in five sessions, each of which lasted 45 minutes. Prior to receiving the treatment, subjects practiced imagining vividly two scenes—a person shopping at a local shopping center and then waiting for the arrival of a friend. After subjects achieved a clear image of each scene, they were instructed to describe it aloud. The therapist queried for details, guided attention to nuances of the model's behavior and affective reactions, and otherwise encouraged production of detailed imagery. The purpose of the practice items was to provide familiarity with the general procedure and to create the set for vivid visualization.

A set of hierarchically arranged threatening scenes involving interactions with snakes was used during treatment. The situations ranged from mildly threatening performances, such as looking at caged snakes, to highly intimidating encounters with them. Each scene was described briefly by the therapist, whereupon subjects visualized them in full detail and signaled by raising their finger when they achieved a clear image. Each scene was held for 15 seconds from the time a vivid image was signaled.

Subjects visualized four different models performing the set of threatening activities. They first visualized a same-sexed model of comparable age performing the tasks, then an older opposite-sexed model, then an older same-sexed model, and finally a model similar in age but opposite in sex. In accordance with the coping modeling format, each model performed each task twice, initially with some apprehension but eventually achieving fearless mastery.

Posttreatment Measures

All subjects were tested for behavioral avoidance and fear arousal accompanying approach response within a week after completing treatment. To gauge the generality of changes, subjects' approach behavior was measured initially toward a corn snake of markedly different coloration and then with the red-tailed boa used in the pretest. The two snakes were shown, in a separate study, to be of equivalent threat value as measured by subjects' avoidance behavior and fear arousal. Subjects were tested with the dissimilar snake first to minimize possible transfer effects from performance improvements during the posttest, which would be more likely to occur in dealing with a familiar threat a second time than in coping with a new one.

Subjects in the condition combining treatment with assessment of efficacy judgments were additionally tested for the level and strength of their perceived efficacy. Efficacy judgments were assessed prior to, and after, the behavioral posttest. The female tester who conducted the pretest administered the posttreatment measures.

RESULTS*Effects of Making Efficacy Judgments*

Figure 1 presents graphically the combined degree of change in approach behavior and fear arousal by subjects who received cognitive modeling with and without subsequent efficacy assessment.

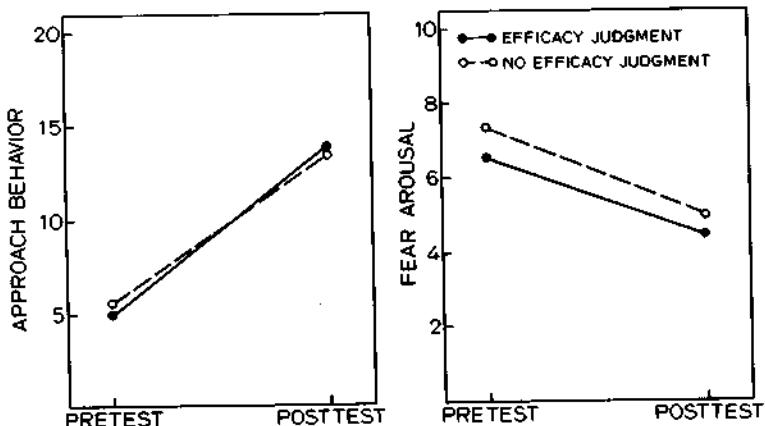


Fig. 1. Changes in approach behavior and fear arousal accompanying cognitive modeling treatment by subjects who did, or did not, make efficacy judgments.

Two-way analyses of variance, with efficacy measurement and phases of the experiment serving as the factors, were performed on the data. The analyses revealed highly significant improvements beyond the $p < .005$ level of confidence on all behavioral and fear reduction measures, whether computed separately on data from tests with the two snakes or on the pooled data. However, making efficacy judgments had no effect either on posttest approach behavior, $F(1,10) = .00$, or on fear reduction on either the initial subset of approach responses, $F(1,10) = .20$, or on the total approach responses, $F(1,10) = .14$. The latter analyses are based on data pooled across the similar and dissimilar threats. Making efficacy judgments similarly had no effect on subsequent behavior or fear arousal when the scores are analyzed separately for the two test snakes.

Efficacy Analysis of Cognitive Modeling

The mean level of perceived efficacy and approach behavior displayed by the expanded sample of subjects whose self-judged efficacy was measured after treatment are presented graphically in Figure 2. Table I shows the significance of the changes achieved by subjects, as evaluated by the t test for correlated means.

Level of Self-Efficacy

Comparison of level of perceived efficacy prior to treatment and following treatment, but before the behavior posttest, reveals that cognitive

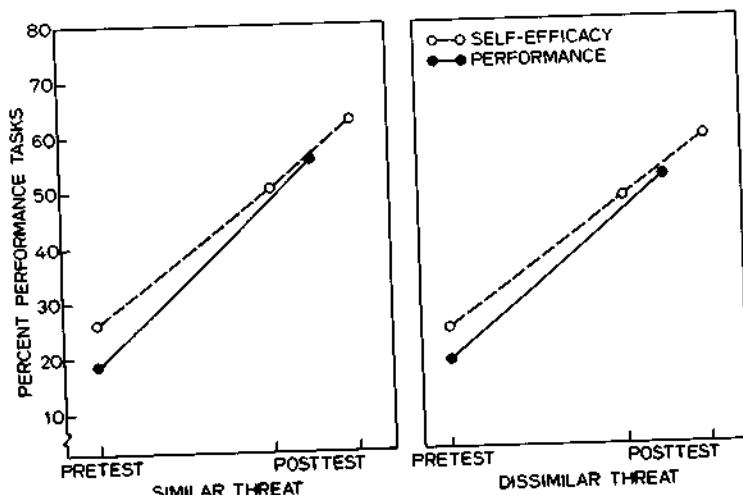


Fig. 2. Level of self-efficacy and approach behavior displayed by subjects toward different threats before and after receiving the cognitive modeling treatment.

Generality of Self-Efficacy Theory**Table I.** Significance of Intragroup Changes in Self-Efficacy, Approach Behavior, and Fear Arousal

Measure	Cognitive Modeling: Pretest vs. posttest
Level of self-efficacy	
Total	3.76 ^b
Similar threat	4.03 ^b
Dissimilar threat	3.48 ^b
Strength of self-efficacy	
Total	3.43 ^b
Similar threat	3.08 ^b
Dissimilar threat	3.73 ^b
Approach behavior	
Total	6.46 ^c
Similar threat	5.76 ^c
Dissimilar threat	4.73 ^c
Fear arousal	
Initial approach	
Total	5.79 ^c
Similar threat	6.32 ^c
Dissimilar threat	3.61 ^b
Total approach	
Total	2.98 ^b
Similar threat	3.48 ^b
Dissimilar threat	2.13 ^a

^a $p < .05$.^b $p < .01$.^c $p < .001$.

modeling significantly enhances self-efficacy toward similar and dissimilar threats alike (Table I). Subjects also exhibited comparable significant increases in approach behavior toward both threats. In accord with prediction, the higher the level of perceived efficacy at the completion of treatment, the higher was the level of approach behavior ($r = .70$, $p < .01$).

*Microanalysis of Congruence Between
Self-Efficacy and Performance*

Correlations between aggregate measures furnish some information on the extent to which changes in self-efficacy are accompanied by changes in behavior. But the most precise index of the relationship is provided by a microanalysis of the congruence between perceived efficacy and performance at the level of individual tasks. The microanalytic measure of congruence is obtained by recording whether or not subjects judge themselves capable of performing each of the various tasks at the end of

treatment and computing the percent of accurate correspondence between efficacy judgment and actual performance.

Although subjects received the same treatment and had the same duration of exposure to cognized coping interactions with the threat, they exhibited markedly different levels of approach behavior upon completing the treatment. Their posttreatment performances ranged from 3% to 100% of the tasks, with a mean performance attainment of 47%. Self-efficacy was a highly accurate predictor of performance on tasks varying in difficulty with both threats (81% congruence). The efficacy-behavior congruence was identical for the similar (81%) and the dissimilar (81%) threat.

The preceding indices of congruity are based on all of the assessment tasks, some of which subjects performed in the pretest. When the micro-analysis is conducted only on the subset of tasks that subjects had never performed in the pretest assessment, the degree of congruence between perceived efficacy at the end of treatment and subsequent behavior is equally high toward similar (76%) and dissimilar (76%) threats.

The assessment methodology and the type of phobic condition used in this and earlier studies were the same (Bandura & Adams, 1977; Bandura et al., 1977). Thus the congruence values obtained in this series of experiments provide evidence bearing on the generality of self-efficacy theory in predicting behavioral changes fostered by different modes of treatment. As shown in Figure 3, perceived self-efficacy is an equally accurate predictor of individual task performance, regardless of whether efficacy is enhanced by enactive mastery experiences, by vicarious performance attainments, by eliminating emotional arousal to threats, or by cognitive coping.

Inspection of efficacy and performance levels in Figure 3 suggests that subjects who undergo enactive and vicarious mastery treatments overestimate slightly their efficacy, whereas those relying on imaginal mastery judge themselves slightly less efficacious than their subsequent performance. However, except for the borderline difference for live modeling ($t = 2.00, p < .10$), the small differences between perceived efficacy and subsequent performance are not statistically significant.

Strength of Self-Efficacy

In the preceding analysis a weak sense of self-efficacy received the same weight as one reflecting complete certitude. However, efficacy theory postulates that intensity and persistence of effort, and hence level of performance, vary as a function of strength of perceived self-efficacy.

Cognitive mastery enhances strength as well as level of perceived efficacy. Prior to treatment, subjects held very weak expectations of their

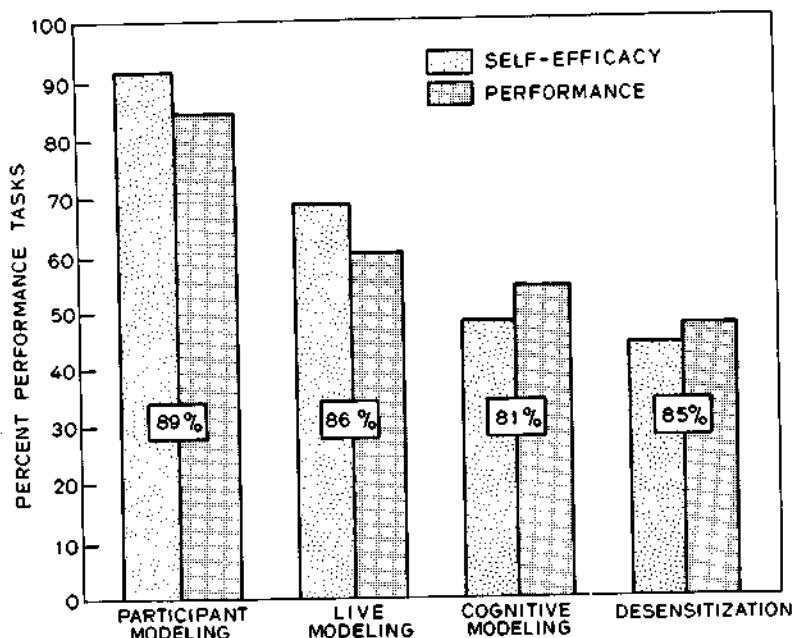


Fig. 3. Degree of congruence between self-efficacy and behavior shown by subjects after completing either participant modeling, live modeling, systematic desensitization, or the cognitive modeling treatment. The percentages reported on the bar graphs show the degree of congruence between efficacy judgments and subsequent performance for individual tasks.

performance capabilities (20%). The cognitive treatment, however, nearly doubled the strength of self-efficacy (36%). As shown in Table I, these improvements are highly significant both for threats analyzed separately and for the pooled data. The stronger the perceived efficacy at the completion of treatment, the higher are the performance attainments ($r = .74$, $p < .005$).

Perceived Coping Efficacy and Fear Arousal

Cognitive modeling produced substantial reductions in fear arousal accompanying the initial subset and the total approach responses toward both threats. Table I presents the results of the statistical analyses of these fear decrements.

It will be recalled that strength of subjects' coping efficacy and their subsequent anticipatory and performance fear arousal were measured separately for each threatening task. Microanalyses based on individual

tasks provide the most detailed evidence on how level of fear arousal varies with perceived coping efficacy. To assess the generality of the postulated relationship, data were analyzed from previous studies of enactive, vicarious, and emotive treatments (Bandura & Adams, 1977; Bandura et al., 1977), as well as for cognitive modeling. The strength of subjects' perceived efficacy after treatment for each task they subsequently performed in posttest was recorded, as was the amount of fear they experienced in anticipation and while performing each of these tasks. The mean fear intensity corresponding to varying strengths of coping efficacy was then computed.

Figure 4 shows the intensity of fear arousal plotted as a function of perceived efficacy. Participant modeling created such strong self-efficacy that there were only a few instances in which subjects receiving this form of treatment expressed an efficacy judgment below a value of 80. The fear

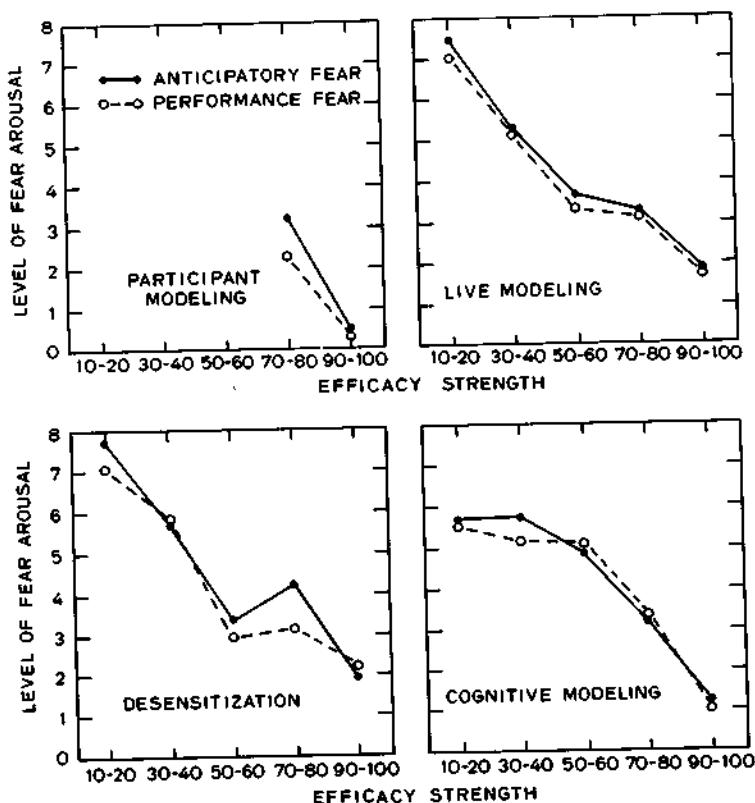


Fig. 4. Relationship between perceived efficacy and level of fear arousal after enhancement of self-efficacy through different modes of treatment.

arousal associated with the few efficacy judgments falling at and below this value was therefore pooled to obtain a stable data point for this group in the lower range of efficacy.

The overall findings show that perceived inefficacy is accompanied by high anticipatory and performance fear arousal, but as strength of perceived efficacy increases, fear arousal declines. At high strengths of self-efficacy threatening tasks are performed with virtually no apprehensiveness. The nature of the relationship between perceived inefficacy and fear arousal is essentially the same regardless of whether percepts of coping capabilities are enhanced enactively, vicariously, emotively, or cognitively.

GENERALITY OF EFFICACY THEORY ACROSS BEHAVIORAL DOMAINS

Agoraphobia is especially well-suited for testing the generality of self-efficacy theory because of the multidimensional nature of this disorder. Agoraphobia is traditionally defined as fear of public places, but the dysfunction is manifested in diverse ways. Agoraphobics cannot shop in stores and supermarkets because they find the lines, turnstiles, and crowds too intimidating. Public facilities, such as theaters and restaurants, which arouse feelings of being helplessly trapped in crowds, become dangerous territories to be avoided. Fear of elevators, escalators, and heights further constrict the range of the navigable environment. For those who cannot venture forth in automobiles even as a passenger, their world is confined to what is within walking distance of their homes. The boundaries of their world shrink even more drastically for those who feel so ineffectual in dealing with everyday events that they become virtual prisoners in their homes.

The treatment, which was developed and implemented by Hardy (1976), relies on enactive mastery experiences as the principal means for instilling a strong sense of coping efficacy. It includes group sessions in which clients are taught how to identify situational and ideational elicitors of fear, how to manage fear arousal through emboldening thought and self-relaxation, and how to deal assertively with social situations in which they are disregarded or exploited. But the critical ingredient of treatment involves field mastery experiences.

As in the participant modeling approach (Bandura, 1976), the therapists, who accompany clients to community settings, draw on whatever performance induction aids are needed to enable them to deal successfully with what they dread. Activities are modeled in easily mastered steps. Joint performance with the therapist, who offers physical assistance when needed, facilitates performances that clients would not consider doing on their own. They are further aided in mastering activities they find highly intimidating by using graded subtasks and gradually lengthening the time of

performance. Whenever clients cognize frightening scenarios, cognitive response-induction aids are also employed—self-debilitating ideation is supplanted by coping task-oriented thoughts (Meichenbaum, 1977). Should these induction aids prove insufficient, the severity of the threat itself is reduced. Thus, for example, clients who are unable to enter a supermarket begin their shopping activities in a small store where there were no crowds, waiting lines, and intimidating rows of checkers.

The specific mastery tasks differ across clients depending on their pattern of dysfunction. Those who fear automobile travel ride cars in residential areas, busier streets, and eventually freeways and mountain roads. Those who shun supermarkets and department stores make shopping trips to progressively larger stores. Clients who fear heights ride escalators and elevators and climb to balconies of buildings. Those who experience intense anxiety in restaurants gradually extend the time they spend in restaurants. In helping clients master their fear of open and public spaces, they are aided through participant modeling to walk progressively longer distances from the treatment center. As treatment progresses, therapists reduce their support and guided participation to authenticate the clients' coping capabilities.

METHOD

Subjects

The participants were 11 agoraphobics, 10 females and 1 male, each of whom came with a support person from various regions of the country for an intensive 10-day treatment. They ranged in age from 19 to 69 years, with a mean age of 47 years. In seeking relief from their distress, all of these clients had been on heavy tranquilizer regimens and all but two had undergone one or more psychiatric treatments without achieving any significant change in their agoraphobic condition. The present brief but intensive treatment program was especially designed for agoraphobics residing in locales that lack effective treatments for such incapacitating fears.

This treatment format permits a precise efficacy analysis of psychological change because it eliminates the many extraneous influences that ordinarily operate during the course of an extended treatment program. On the assessment side, self-efficacy and performance attainments were measured in new situations, thereby reducing confounding from differential familiarity with the community settings in which performances are measured. On the treatment side, each of the 10 days was devoted

entirely to treatment, whereupon the clients returned after their field work to their motel located a few blocks from the treatment center. Thus there was minimal confounding of the process of change by concurrent extratherapeutic experiences, as is the case when treatment sessions are interspersed over a long time in one's home environment. This made it possible to maintain a precise record of each client's performance accomplishments during the period of treatment, which is required for comparing how well self-efficacy and past performance predict subsequent behavioral change.

Pretreatment Measures

In a preliminary screening procedure, clients were presented with a list of activities that agoraphobics often find threatening and they were asked to rate on a 4-point scale the severity of distress they experience in each of these areas. Their perceived efficacy and phobic behavior was then systematically assessed in those areas of functioning that posed moderate to severe threats for them.

Self-Efficacy. A set of eight efficacy scales was devised for the various activities agoraphobics commonly find frightening. They included such things as traveling by automobile, using elevators and escalators and climbing stairs to high levels, dining in restaurants, browsing and shopping in supermarkets, and venturing forth alone from the treatment center. Each scale consisted of a series of progressively more challenging performance tasks. For example, in assessing perceived efficacy to venture into public territory, the tasks included walking alone a few steps beyond the door of the treatment center, to the sidewalk, one-fourth of a block, across the street, a distance of one, three, and five blocks, and finally, completing a half-mile course through busy areas of the city. The performance tasks were explicitly defined, but the performance settings were designated in terms of their generic properties rather than particularized in a specific setting. Thus clients judged whether they could climb a flight of stairs to a 12-story balcony of a building and look down for 30 seconds, without detailing a specific building. The scales were structured in this way to tap generic self-percepts of efficacy.

Clients were given the efficacy scales in their problem areas and instructed to designate the tasks they judged they could perform as of then. For each task so designated, they rated the strength of their perceived efficacy on the standard 100-point scale. The level of self-efficacy was the number of performance tasks clients judged they could perform with a value above 10, which was the lowest point on the scale indicating utmost

uncertainty. Strength of self-efficacy in each area of functioning was computed by summing the magnitude scores across tasks and dividing the sum by the total number of performance tasks in the particular scale.

Perceived efficacy was measured at 4 points in the sequence of events: before and after the behavioral pretest, at the completion of the 10-day treatment program, and after the behavioral posttest. Judgments of level and strength of efficacy were made privately, rather than stated publicly, to minimize any possible motivational effects of the assessment itself.

Coping Behavior. The tests of coping behavior consisted of series of performance tasks that were progressively more intimidating. Automobile travel included such items as sitting in a car for several minutes and riding in residential areas, on minor arterial streets, on busy commercial thoroughfares, and on freeways in light and heavy traffic. The shopping task tested whether clients could enter a supermarket, browse in different areas of the store, wait in line with their selections, and purchase a designated number of items through express and regular checkout lines.

Coping with threats of high places was measured in terms of three sets of tasks. The performance tasks included in the test of avoidance of elevators measured whether clients could enter elevators, remain in them with doors opened and closed, and then ride to upper floors in different buildings. Similar hierarchical tasks were used to assess whether clients could stand near, and then ride, escalators up and down different floor levels in different buildings. The heights test required climbing flights of stairs to each of 12 floors of a high-rise building and looking down from a balcony at each level for 30 seconds.

In measuring ability to cope with restaurant situations, clients were asked to enter restaurants, to select tables at varying distances from the door, and to order and eat progressively more food items. Fear of walking through city streets alone was indexed by the tasks described earlier.

The behavioral tests were standardized by clearly specifying the community settings to be used for the performance tasks, the sequences in which they were to be administered, and the criteria of successful performance. To evaluate the generality and treatment effects, the community settings chosen for the behavioral tests differed from those used in the field mastery treatment.

Four female experimenters conducted the behavioral tests before and after treatment with the cases assigned to them. Only the behavioral dimensions on which clients exhibited severe dysfunction (e.g., they could not walk alone beyond a block of the treatment center; they could not ride an escalator one floor; they could not walk to the first aisle of a supermarket) were included in the assessment of changes accompanying treatment. Two separate intensive groups, of 9 and 11 clients each, were administered the pretest procedures. Approximately half of the clients in

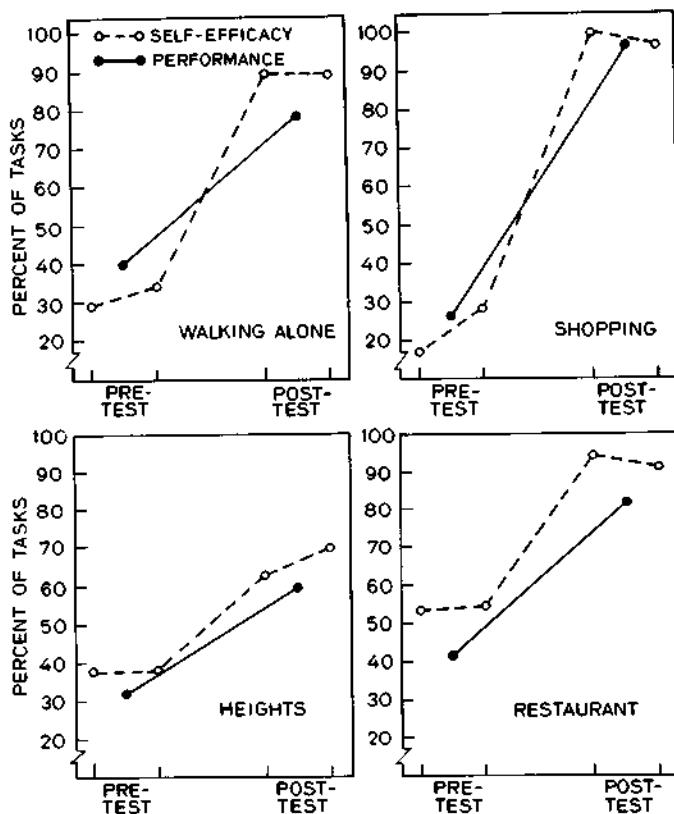


Fig. 6. Level of self-efficacy and coping behavior displayed by subjects in different areas of functioning before and after receiving treatment.

tioning. Because only two of the clients were unable to ride in an automobile as a passenger, the improvements they achieved in this activity were included in the aggregate measure but could not be analyzed separately. Table II summarizes the significance of these changes.

Self-Efficacy

The behavioral test itself produced no significant changes in either level or strength of self-efficacy regardless of whether it was administered before or after treatment. Thus in both phases of the study the clients had a good sense of their coping capabilities and did not alter their self-appraisal

Table II. Significance of Intragroup Changes Across Phases and Areas of Functioning^d

Measure	Areas of functioning				
	Total	Walking alone	Shopping	Heights	Restaurants
Level of self-efficacy					
Pretest (pre ₁ -pre ₂)	.28	.72	.02	.01	.02
Posttreatment (pre ₂ -post ₁)	32.10 ^c	53.64 ^c	17.58 ^b	9.02 ^b	13.59 ^b
After posttest (post ₁ -post ₂)	.05	.00	.02	.89	.21
Strength of self-efficacy					
Pretest (pre ₁ -pre ₂)	.79	2.06	.64	.11	.50
Posttreatment (pre ₂ -post ₁)	63.13 ^c	19.00 ^b	55.00 ^c	11.91 ^b	22.77 ^c
After posttest (post ₁ -post ₂)	.61	.18	2.04	1.37	.10
Coping behavior	9.92 ^c	3.70 ^a	5.43 ^b	5.09 ^b	5.16 ^b
Fear arousal					
Initial approach	5.84 ^c	3.87 ^a	3.36 ^a	5.02 ^b	2.64 ^a
Total approach	5.85 ^c	3.71 ^a	3.44 ^a	5.58 ^b	2.66 ^a
Fear proneness:					
Number of fears					
Total	3.68 ^b		Total	4.94 ^c	
Animal	3.23 ^b		Animal	3.89 ^b	
Social	1.62		Social	5.44 ^c	
Physical injury	1.62		Physical injury	5.15 ^c	
Classical	3.79 ^b		Classical	4.79 ^c	
Miscellaneous	2.51 ^a		Miscellaneous	2.45 ^a	

^ap < .05.^bp < .01.^cp < .001.

^dEfficacy changes are evaluated by the *F* test; changes in coping behavior and fear are evaluated by the *t* test for correlated means.

as a result of being tested for what they could do. However, both level and strength of efficacy were substantially boosted by the enactive mastery treatment. These increases were highly significant in each of the different areas of functioning as well as on the aggregate measure (Table II).

Coping Behavior

The notable improvements in coping behavior, which correspond closely to level of efficacy change, were significant for the aggregate measure and in all of the various behavioral domains.

Product-moment correlations were computed between the aggregate measure of perceived efficacy at the end of the treatment program and level of coping behavior. Consistent with findings of the studies with ophidiophobics, perceived efficacy is positively related to performance attainments. The higher the level of self-efficacy ($r = .78$, $p < .01$) and the

each group (5 and 6 clients, respectively), met the stringent criterion on one or more dimension for inclusion in the assessment of therapeutic change.

Fear Arousal Accompanying Coping Responses. During the behavioral tests, clients rated orally, on a 10-interval scale, the intensity of fear they experienced when each performance task was described to them, and again while they were performing the corresponding behavior. These ratings of anticipatory and performance fear arousal for the tasks completed were averaged within each behavioral dimension to provide an index of level of fear arousal.

Fear Proneness. As the final task in the pretreatment assessment, clients completed a comprehensive fear inventory containing 20 items in each of the following classes of fear: physical afflictions and injuries, animals, interpersonal encounters, classical phobias, and a collection of miscellaneous fears. They rated their fear toward each object or situation on 5-point scales describing increasing degrees of distress. The mean intensity of fear was scored separately for each of the five categories and summed across all of the items to provide an overall measure of vulnerability to fear arousal.

Implementation of the Treatment Program

As will be recalled from the earlier discussion, the treatment program included preparatory group sessions and field mastery experiences. The support persons, usually spouses, accompanied the clients to the group sessions. Different aspects of the group sessions, such as training in self-relaxation, proximal goal setting, and assertiveness and self-expressiveness, were conducted by different members of the treatment staff. Previous field work suggested that agoraphobics are inclined to discount the significance of their performance successes when they are all achieved with only one field therapist. Successes gained under such circumstances may be partly misattributed to the external social support when, in fact, they reflect restored coping capabilities. To minimize this negating process, clients were helped to gain mastery over what they feared by different field therapists both within and across behavioral dysfunctions. A total of seven field therapists, several of whom were ex-agoraphobics, conducted the enactive-mastery phase of the treatment.

Through adept use of performance induction aids the field therapists helped the agoraphobics individually to move out into the environment and to expand their coping skills. Whenever they became unduly distressed they retreated momentarily and then moved forward again with appropriate performance supports. As the clients developed their coping capabilities, the field therapists reduced their support and guided participation. They

assigned the clients progressively more challenging tasks to perform alone while the therapist remained in the vicinity. During the self-directed mastery phase of the treatment, solo excursions and activities were arranged for clients to carry out on their own.

For each session the field therapists recorded on a standard protocol listing the hierarchical mastery tasks how many were attempted and the clients' reactions each time a task was presented to them—whether they declined, tried but retreated, tried and succeeded, or surpassed the level of performance aimed for at that time.

Posttreatment Assessment

At the end of the treatment series the assessment procedures used in pretest phase were readministered. As in the pretest, the efficacy scales were administered prior to, and following, the behavioral avoidance tests.

RESULTS

The changes in level of self-efficacy and coping behavior are shown in Figure 5 for the pooled data and in Figure 6 for the separate areas of func-

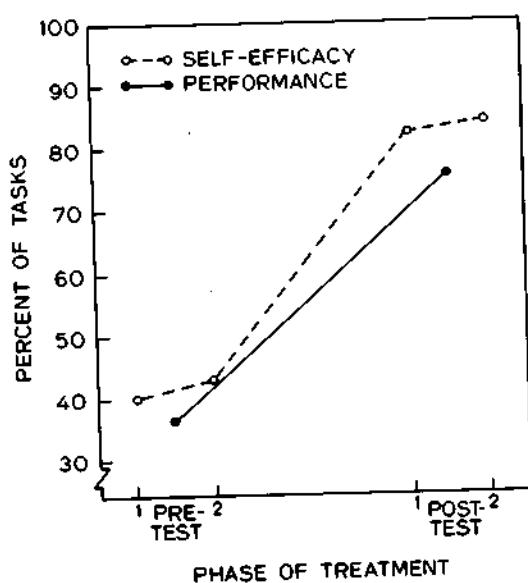


Fig. 5. Changes in self-efficacy and coping behavior averaged across different areas of functioning.

stronger the self-percepts of efficacy ($r = .70, p < .01$) the greater is the coping behavior.

*Microanalysis of Congruence Between Self-Efficacy
and Performance*

The results of primary interest concern the degree of congruence between self-efficacy and performance on individual tasks. The correspondence between efficacy judgment and whether or not clients could subsequently perform the various tasks in their areas of dysfunction was computed. Self-efficacy was an accurate predictor of performance in the behavioral tests on 79% of the tasks for the pretest phase of the study, and in 88% of the tasks in the posttreatment assessment. When the microanalysis was conducted only on the subset of tasks that clients had not performed in the pretest, the degree of congruence between perceived self-efficacy at the end of treatment and subsequent performance was 80%.

*Relative Predictiveness of Past Performance
and Self-Efficacy*

It was previously noted that the clients' performance attainments on the hierarchical mastery tasks during the course of treatment were recorded in detail. These data provide a basis for comparing the relative success of past performance and self-efficacy in predicting behavioral accomplishments in the posttreatment assessment. Dining in restaurants was excluded from this analysis because the clients often ventured into restaurants as a group along with the therapists and support persons. On the other occasions they typically ate their meals with their support person, if not with some other members of the group. Since performance attainments with social supports are likely to exceed those achieved on one's own, this activity would yield an inflated measure of past performance.

The main discrepancy between performance attainments in the field treatment and test performance (26%) was more than double the discrepancy between perceived efficacy and test performance (10%). This difference between performance and efficacy predictors was significant as evaluated by the t test for correlated means ($t = 2.17, p < .05$).

Fear Arousal

Table II shows the significance of changes in level of fear elicited by coping responses subjects performed before treatment with fear levels reported in the posttest for the same subset of coping responses and for the

total number of coping responses they completed. Following treatment clients experienced considerably less anticipatory and performance fear arousal in each of the behavioral domains.

Data from the fear-proneness inventory provide some additional evidence on the generalized effects of treatment on vulnerability to fear arousal in widely different areas of functioning. In the posttreatment assessment clients reported fewer fears and widespread decreases in intensity of fears of varied threats ranging from animals to physical injury to interpersonal situations and to miscellaneous threats (Table II).

DISCUSSION

The overall findings of this series of studies provide several lines of support for the theory that perceived efficacy mediates changes in coping behavior and fear arousal. It was previously shown that self-efficacy can be enhanced by efficacy information conveyed through several different treatment modalities. The analysis of changes accompanying symbolic modeling reveals that repeated cognitive mastery of threats also boosts perceived coping efficacy.

The most stringent tests of a theory explore the links between environment influences, indicants of the critical mediating process, and action. It is much easier to show that behavior bears some relationship to environmental factors than to demonstrate that, in fact, the antecedent influences operate on behavior through the hypothesized mechanism. Results of the microanalytic procedure confirm that self-percepts of efficacy—whether produced enactively, vicariously, emotively, or cognitively—predict not only level of behavioral change resulting from different modes of treatment but variations in coping behavior by different individuals receiving the same type of treatment, and even specific performance attainments by individuals on different tasks. The close congruence found between self-efficacy and action in the treatment of agoraphobia provides further evidence for the generality of efficacy theory across behavioral domains as well as across treatment modalities.

That efficacy is a good predictor of coping behavior in nonenactive modes of treatment is of special interest because, in these approaches, persons observe or cognize coping performances but they themselves do not perform the feared activities. Consequently, they have no behavioral data for forming generalizable perceptions of their own capabilities. They raise their sense of coping efficacy on the basis of indirect sources of efficacy information. It is in the nonenactive treatments, where the same environmental input typically produces widely variable behavior, that theories eschewing cognitive processes are fraught with explanatory and

predictive difficulties. This is the arena in which the generality of competing theories about the mechanisms of change are best put to test.

It is possible to generate alternative explanations for particular subsets of data, but the mechanism proposed in the present theory appears to account equally well for the diverse sets of findings. It might be argued, for example, that self-efficacy is an accurate predictor of performance in the enactive mode of treatment because people were judging their future performance from their past behavior. However, this type of interpretation lacks explanatory and predictive value for the vicarious, emotive, and cognitive treatments, in which perceived efficacy is an equally accurate predictor of performance changes, although the persons engaged in no overt behavior. They therefore had no behavioral cues for forming generalizable perceptions of their own capabilities.

Even in the enactive treatment perceived efficacy is often a better predictor of behavior in generalization tests than is past performance. Moreover, the gains in self-efficacy derived from the same partial enactive mastery during the course of treatment predicts differential performance attainments on threatening tasks that individuals had never done before (Bandura & Adams, 1977). Behavior is raw data that must be cognitively appraised for its efficacy value. The same past performances can yield differential perceived efficacy because many factors affect performance that have little to do with operative capability. Judgment of personal efficacy thus involves an inferential process in which the relative contribution of various personal and situational factors to performance successes and failures must be weighted. The degree to which people are likely to raise their perceived efficacy through performance successes will depend upon, among other factors, the difficulty of the task, the amount of effort they expend, the amount of external aid they receive, the situational circumstances under which they perform, and the temporal pattern of their successes and failures.

Theorists who conceive of thoughts as by-products of conditioned responses that do not enter into the determination of behavior view efficacy judgments as epiphenomenal accompaniments of conditioned autonomic responses (Eysenck, 1978; Wolpe, 1978). This type of analysis, which gives causal primacy to autonomic responses, rests on the assumption that autonomic responses regulate avoidance behavior. Dual-process theory has its many critics (Bolles, 1972; Herrnstein, 1969; Schwartz, 1978). A large body of evidence from different lines of research reveals no consistent relationship between autonomic responses and avoidance behavior (Bandura, 1978; Black, 1965; Rachman & Hodgson, 1974; Rescorla & Solomon, 1967). Given that autonomic arousal is a poor predictor of avoidance behavior and that self-efficacy can predict avoidance behavior rather well, arousal can hardly serve as the superordinate cause of both self-

efficacy and behavior. If efficacy judgment is an epiphenomenal by-product of autonomic arousal, then arousal should be an equally precise predictor of avoidance behavior, which it is not. Indeed, in the social learning view, it is largely perceived inefficacy in coping with potentially injurious situations that produces autonomic arousal. Evidence that perceived efficacy predicts achievement, as well as fearful, behavior extends the generality of the theory (Brown & Inouye, 1978; Schunk, Note 1). Explanatory mechanisms that are sufficiently integrative to account for diverse types of behavior have decided advantages over conceptual approaches that require separate theories for different classes of behavior.

The present research addressed the issue of whether making efficacy judgments in itself can affect performance. The findings show that recording efficacy judgments had no effect either on subsequent avoidance behavior or on fear arousal. Distressed phobics who spend time and effort to gain relief from their debilitating condition have ample personal inducements to change, regardless of whether or not they record their self-appraisals of coping efficacy. Strong personal motivation easily overrides any extraneous situational factors. If performance expectations are made publicly in an evaluative context just before each item is attempted, the assessment procedure might well create public commitment and involvement, especially on tasks that hold little interest for subjects (Dweck & Gilliard, 1975; Zajonc & Brickman, 1969). However, there is some evidence to suggest that performance on an achievement task is the same regardless of whether subjects do or do not make prior efficacy judgments, even though they were made publicly just prior to each trial (Brown & Inouye, 1978).

Any alternative causal explanation for the different lines of evidence would have to invoke a superordinate mediator that controls both efficacy judgment and behavior. Such a mediator would have to be an exceedingly complex one to account adequately for the diverse sets of relationships. To cite but a few examples, it would have to affect differentially efficacy judgments and behavior resulting from maximal enactive mastery; it would have to produce different levels of self-efficacy from equivalent reductions in experienced fear arousal and cognitive mastery; it would have to produce variable efficacy judgments from similar partial mastery experiences; and it would have to explain congruence between efficacy judgment and behavior across markedly different types of behavior. Social learning theory posits a central processor of efficacy information. That is, people process, weight, and integrate diverse sources of information concerning their capabilities, and they regulate their choice behavior and effort expenditure accordingly.

The research with the agoraphobics was aimed at elucidating the role of perceived efficacy in the process of change in diverse areas of functioning rather than to gauge the power of the treatment itself. A repeated-measures

design provides the type of data needed for testing the value of self-efficacy in predicting variation in behavioral changes between individuals receiving the same treatment and within individuals across a wide variety of tasks. Considering that the agoraphobics had undergone extended prior treatments with little benefit, there is every reason to conclude that their substantial behavioral improvements within a 10-day period were due in large part to the treatment. Given these promising results, systematic tests of comparative effectiveness and component analyses seem warranted.

Before arriving for treatment the clients completed a questionnaire exploring the predisposing determinants, onset, and past treatments of their agoraphobic behavior, which sheds some interesting light on this condition. These reports revealed two types of onset conditions. In some cases the agoraphobic reaction was first elicited in an acutely distressing situation involving helpless confinement (e.g., being trapped in an immense snowstorm; awakening suddenly at night in an enclosed wagon). In other cases the agoraphobic behavior arose from massive accumulation of everyday problems that eventually overwhelmed the clients' coping capabilities. Regardless of whether the distress reflected sudden or mounting problems, the result was an intense panic reaction that left the clients with a profound sense of coping inefficacy.

Following the panic experience, the clients' thoughts centered increasingly on their vulnerability to disintegrative loss of control in public situations. They began to dread excursions outside the home because the aversive experiences recurred unpredictably. Since distress subsided in the safety of the home, it took on powerful security value. Once perceptions of coping efficacy were undermined, even mild distress in taxing situations foreboded disintegrative loss of control. As a result, the clients generalized their phobic avoidance to increasing domains of functioning in which they had never suffered disabling experiences.

The self-report data also provide some evidence on social learning factors that may have predisposed the clients to adopt agoraphobic solutions to their personal distress. In the majority of cases (64%), at least one or more family members, usually the mother or an older sister, exhibited agoraphobic behavior. Indeed, the present sample included a mother and daughter pair. Thus, for many of the clients, agoraphobic reactions to stress were habitually modeled in the family.

Evidence that enactive mastery restores behavioral functioning underscores the need to distinguish between historical and contemporary determinants of dysfunctional behavior. After a disintegrative experience undermines a person's perceptions of his coping capabilities, the resulting "head problem"—profound perceived inefficacy—becomes a major cause of the continuing self-debilitation. The original undermining stressors may have diminished or ceased altogether, but the inefficacy problem lingers.

Dysfunctional patterns of behavior can be successfully eliminated by mastery experiences that cultivate strong personal efficacy but appear to be little affected by insight into their origins. As the findings show, the higher the level of self-efficacy, the greater is the stress tolerance and the more venturesome is the behavior.

Results of the present series of studies indicate that perception of one's coping capabilities affects emotional arousal as well as behavior. In the social learning view of fear arousal, it is mainly perceived inefficacy in coping with potentially aversive events that makes them fearsome (Bandura, 1980). To the extent that one can prevent, terminate, or lessen the severity of aversive events there is little reason to fear them. Several lines of evidence from studies of the effects of perceived controllability on human stress are consistent with this formulation (Averill, 1973; Miller, 1979; Miller & Grant, Note 2). Being able to wield behavioral control over aversive events reduces autonomic arousal even though the control is unexercised. It is the self-knowledge of coping efficacy rather than its application that reduces arousal. People who believe they can exercise some control over aversive events display less autonomic arousal and performance impairment than those who believe they lack personal control, even though they are all subjected to the same aversive stimulation.

That perceived efficacy may operate as a cognitive mechanism by which controllability reduces fear arousal receives support from microanalysis of anticipatory and performance arousal as a function of varying strengths of coping efficacy. On tasks for which people judged themselves efficacious, a low strength of efficacy was accompanied by high anticipatory and performance arousal, whereas a strong sense of efficacy resulted in little fear arousal. As they approached the upper bounds of their perceived efficacy with weaker assuredness, they performed threatening activities with a great deal of fear.

Evidence that perceived efficacy predicts level of fear arousal regardless of whether self-percepts of coping efficacy are developed enactively, vicariously, emotively, or cognitively adds generality to the social learning formulation. However, the relationships obtained in the latter studies are based solely upon experiential measures of fear arousal. Further tests of this theory must examine how perceived coping efficacy affects level of arousal as measured physiologically.

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Self-Evaluative and Self-Efficacy Mechanisms Governing the Motivational Effects of Goal Systems

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The present research tested the hypothesis that self-evaluative and self-efficacy mechanisms mediate the effects of goal systems on performance motivation. These self-reactive influences are activated through cognitive comparison requiring both personal standards and knowledge of performance. Subjects performed a strenuous activity with either goals and performance feedback, goals alone, feedback alone, or without either factor. The condition combining performance information and a standard had a strong motivational impact, whereas neither goals alone nor feedback alone effected changes in motivation level. When both comparative factors were present, the evaluative and efficacy self-reactive influences predicted the magnitude of motivation enhancement. The higher the self-dissatisfaction with a sub-standard performance and the stronger the perceived self-efficacy for goal attainment, the greater was the subsequent intensification of effort. When one of the comparative factors was lacking, the self-reactive influences were differentially related to performance motivation, depending on the nature of the partial information and on the type of subjective comparative structure imposed on the activity.

The capability for intentional and purposive human action is rooted in cognitive activity. Social learning theory postulates two cognitively based mechanisms of motivation that serve such telic purposes. One mechanism operates anticipatorily through the exercise of forethought. By representing foreseeable outcomes symbolically, future consequences can be converted into current motivators and regulators of behavior. The second major source of cognitive motivation derives from internal standards and self-evaluative reactions to one's performances (Bandura, 1977a).

The motivational effects of setting goals, which provides the standard against which performance is gauged, have been amply documented in different lines of research conducted under both controlled and naturalistic conditions. The evidence is relatively consistent in showing that explicit challenging goals enhance performance motivation (Locke, Shaw, Saari, & Latham, 1981). However, the

psychological mechanisms through which personal standards create motivational effects and how these mechanisms govern motivation under different patterns of performance information have received less attention. It is to these issues that the present research addresses itself.

In the social learning analysis, self-motivation through performance standards operates largely through an internal comparison process (Bandura, 1978). When people commit themselves to explicit standards or goals, perceived negative discrepancies between what they do and what they seek to achieve creates self-dissatisfactions that serve as motivational inducements for enhanced effort. Both the anticipated self-satisfactions for matching accomplishments and the self-dissatisfactions with substandard performances provide incentives for heightened effort.

Performance motivation is not posited to be a monotonically increasing function of degree of perceived discrepancy. Performances that fall markedly short of standards are apt to give rise to discouragement and goal abandonment. Moderately discrepant performances, which leave construal of the standard as attainable (Atkinson, 1964; Locke, 1968), are likely to activate self-dissatisfactions that spur efforts to bring performance in line with

This research was supported by Public Health Research Grant M-5162-20 from the National Institute of Mental Health. We are indebted to William L. Haskell, Stanford Medical Center, for the loan of the ergometer equipment.

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valued standards. Attainments that match or surpass personal standards create self-satisfactions that serve as positive inducements for further pursuits.

Activation of self-evaluative processes through internal comparison requires both personal standards and knowledge of the level of one's performance. It follows from this formulation and Locke's goal theory (1968) that neither knowledge of performance without standards nor standards without knowledge of performance provides a basis for self-evaluative reactions and thus has little motivational impact. There is some empirical evidence to suggest that this is indeed the case (Becker, 1978; Strang, Lawrence, & Fowler, 1978). Simply adopting goals, whether easy or personally challenging ones, without knowing how one is doing seems to have no appreciable motivational effects.

Results of studies varying the properties of goals are also in accord with the postulated self-evaluative mechanisms (Bandura & Schunk, 1981; Bandura & Simon, 1977; Locke, 1968; Steers & Porter, 1974). Explicitness, challengeability, and temporal proximity of subgoals and standards are conducive to enlisting self-reactive influence by specifying the amount and type of effort required to fulfill the goals. Such properties augment the motivational impact of goals. Empirical verification of the self-reactive causal link would provide a conceptual framework within which to analyze the features of goal systems that carry motivational potential.

The self-efficacy mechanism also plays a central role in human agency and self-motivation (Bandura, 1981, 1982). It is partly on the basis of self-percepts of efficacy that people choose what to do, how much effort to mobilize for given activities, and how long to persevere at them (Bandura, 1977b; Brown & Inouye, 1978; Schunk, 1981; Weinberg, Gould, & Jackson, 1979). Whether negative discrepancies between standards and performance are motivating or discouraging is likely to be influenced by people's perceptions of their efficacy to attain the standards they set for themselves. Those who have a low sense of self-efficacy may be easily discouraged by failure, whereas those who are assured of their capabilities for goal attainment intensify their

efforts when their performances fall short and persist until they succeed.

The present research was primarily designed to test the notion that self-evaluative and self-efficacy mechanisms operate differentially in performance motivation, depending on the structure of comparative performance factors. The guiding conceptual scheme posits that both of these self-processes jointly regulate effort under conditions permitting cognitive comparison between a standard and knowledge of performance. To test this notion, conditions were created in which both comparative factors were present, one of the comparative factors was lacking, or both were absent. Subjects performed a strenuous physical activity on an ergometric device under conditions including either goals with performance feedback, goals alone, feedback alone, or without the presence of either factor. To equalize the constituent factors across subjects and treatment conditions, the goals involved a 40% increase in effortful performance and feedback of a 24% gain in performance. These values were selected to create a moderate negative discrepancy sufficient to activate self-disatisfied reactions without unduly undermining self-percepts of efficacy for goal attainment. The research of Atkinson (1964) and Locke (1968) indicates that a moderate discrepancy is well suited for this purpose. After the performance session in which the requisite goal and feedback conditions were created, subjects recorded their level of self-satisfaction with their performance and their perceived self-efficacy for goal attainment, whereupon their effortful performance was again measured.

By systematically varying the comparative factors and measuring the posited self-processes antecedently, the integrated design permits a dual level of verification of requisite conditions for motivational enhancement tied to mediating self-processes. It was predicted that subjects in the condition combining goals with performance feedback would display the highest gains in effortful performance. On the premise that self-evaluative and self-efficacy mechanisms are most consistently activated in the service of motivation only when goals and feedback information are both present, it was hypothesized that subjects receiving either goals or feedback alone would lack an essential

comparative element and, hence, would not differ from those receiving neither of these factors.

As the primary test of the theory under examination, it was predicted that in the condition combining goals with feedback, the magnitude of performance gains would vary as a function of level of self-dissatisfaction and perceived self-efficacy for goal attainment. The higher the subjects' self-dissatisfaction, the more they would increase their performance to bring it in line with their standard. The higher their self-percepts of efficacy, the greater effort they would mount to attain their goal. Subjects who were self-dissatisfied with their substandard performance but judged themselves highly efficacious in attaining their goal would show the highest performance gains. In contrast, those who judged themselves ineffectual and were not unduly self-dissatisfied would mobilize the weakest effort. In conditions in which one or both comparative factors are lacking, the mediating mechanisms are likely to operate variably depending on what partial information is available and on subjective provision of the missing comparative factor.

Method

Subjects

The subjects were 45 men and 45 women drawn from an introductory psychology course. Twenty subjects, equally divided by sex, were randomly assigned to each of four treatment conditions. Ten subjects were similarly assigned to a self-judgment control condition designed to determine whether recording one's self-satisfaction and self-percepts of efficacy, in itself, had any reactive effects on performance.

General Procedure and Apparatus

The introductory instructions describing the nature of the study were identical for all subjects. The experiment was presented as part of a program of research ostensibly designed to identify performance tasks that might eventually prove useful for planning and evaluating postcardiovascular rehabilitation programs. It was further explained that the information being gathered would not only aid development of diagnostic devices but also provide normative data on physical stamina at different age levels. The relation between cardiovascular fitness and performance on aerobic tasks was then described to lend further credibility to the activity.

The performance task apparatus was a Schwinn Air-Dyne ergometer in the form of an exercise device that uses a wind vane system to provide variable air resistance.

In its modified form, the ergometer was operated by alternatively pulling and pushing two arm levers. The exerted force rotated a wheel with fanlike wind vanes, creating resistance for the physical effort.

The ergometer task was chosen for a number of reasons. This effortful activity combined with the rationale was received with uniformly high credibility. It yielded a precise measure of performance effort with virtually no upper limit. Because it required considerable effort over extended periods, the task provided a stringent test of how the postulated determinants and mechanisms affect the mobilization and maintenance of performance motivation. Finally, the task itself provided little implicit feedback regarding performance level, which allowed for credible prearranged feedback. Because subjects could not easily discern quantitative variations in their physical output across sessions, goals and feedback information could be systematically varied without jeopardizing the perceived veridicality of the feedback.

The ergometer was connected by a cable to a work load indicator with an odometer in the adjoining room. The odometer readings were recorded at 1-minute intervals during the 5-minute sessions so as to capture any variations in performance during the session. To measure precisely the performance effort expended, the odometer readings were converted to kilopond meter units. Kilopond units are indices of work output that consider both the speed at which the ergometer is operated and the exponential increase in air resistance with increasing speed. The five sets of kilopond scores resulting from the five 1-minute intervals were summed to obtain a total performance score for each session.

Before starting the experiment, subjects completed a background questionnaire that asked about their age, sex, height, weight, and smoking habits. It was included both to add further credence to the prior instructions and to increase the naturalness of the assessment, in a later session, of self-reactions imbedded among filler items ostensibly tapping other aspects of physical status. They also filled out a physical-readiness questionnaire designed to exclude any subject for whom extended physical exertion would be medically contraindicated. Only one subject, who reported a history of cardiovascular problems, was excluded on this basis.

Subjects removed their watches to control for possible variations in the regulation of effort by checking the time elapsed. They were informed that each performance session would last 5 minutes but were not told how many sessions they would complete. The latter procedure was instituted to eliminate the possibility that subjects might intensify their performance in the third session if they knew it was their final effort.

The experimenter concluded the general instructions by explaining that he would be in the adjoining room tending to the recording instruments during each performance session. The subject would be signaled when to begin and end each session via an intercom system.

Baseline Performance Session

All subjects performed the ergometer task alone for a 5-minute baseline period. Pretesting indicated that a 5-

minute session required substantial performance effort without being overly fatiguing.

Following the baseline assessment, subjects were randomly assigned within sex groupings to treatment conditions. The random order of assignment was devised for the entire sample at the outset of the study. After each subject completed the baseline session, the experimenter removed a cover card that revealed the condition to which the particular subject was assigned. Thus, the experimenter had no prior knowledge of the subjects' condition assignments during the baseline session.

Goal Setting and Feedback Variations

In conditions including goal setting, subjects selected a goal for performance improvement in subsequent sessions. The experimenter explained that in coronary rehabilitation programs patients have goals for increasing their physical activity. These goals vary across cases. Therefore they would perform the ergometer task with goals to shed light on the effects of this goal variability.

Goals were not simply assigned to subjects. Rather, they ostensibly selected their own goal level. An apparent-choice procedure was used to increase subjects' sense of self-determination and commitment to the goal (Kiesler, 1971; Langer, 1975). They were told that to study goal levels representative of the range found in a rehabilitation program, they would choose one goal from among a wide range of goal levels. It was explained that in rehabilitation programs, goals are set based on the patient's current physical status. However, because this psychological information was not available for participants in the present study, there was no basis for assigning particular goals to particular subjects. Hence, subjects would simply select one from among a variety of goals.

Different goal levels representing percentage decrements and percentage improvements above baseline performance were printed on cards. After the full range of goal levels was inspected, the experimenter placed all the goal cards in a cloth bag attached to a wooden rim and handle, shook the bag, and presented it to the subject, who selected a goal. Unbeknownst to the subject, the choice was prearranged to be a 40% increase in performance above baseline performance. This was achieved by flicking a hidden switch on the bottom of the handle, automatically switching compartments of the bag so that subjects were selecting their goals from a preloaded set of goal cards, all of which represented a 40% performance increase.

A 40% goal level was chosen for several reasons. It represented an attainable goal, a negative performance discrepancy from it would appear credible, and neither the goal nor the performance discrepancy was so high as to undermine perceived self-efficacy in attaining it.

Subjects in conditions that did not include goals received the identical information as did their goal-setting counterparts concerning how coronary rehabilitation patients strive for different goals of increased physical activity as part of their recovery program. They were all given the same information about goals and striving for performance improvement to equate the groups for the suggestion of increased effort. The experiment thus provided a clear test of the motivational contribution of actual goal adoption.

To control for any possible experimenter bias, all the information for creating the requisite conditions for the main phase of the experiment was presented remotely via

a video system. The experimenter explained that he had to reset the recording instruments after the second session. Thus, the video system would be used to convey further information. Subjects then performed the ergometer task for 5 minutes alone in the room, whereupon they were instructed through the intercom to turn on the video terminal.

The performance feedback and goal-setting information was printed on subsets of cards that could be combined to include goals and feedback, goals alone, feedback alone, or neither. A camera in the adjoining room transmitted the relevant information to the video screen. In the feedback-alone conditions the sign read "Your performance score for the last session was _____ % _____ your first session." The experimenter wrote "24" and "above," respectively, in the blanks. This feedback information, independent of the subject's actual performance, was written in the blanks to avoid the impression that the feedback may have been prearranged. For subjects in goals-alone conditions, the sign read, "The goal you were aiming for is _____." The experimenter filled in "+40%." The above two subsigns were combined for subjects in the goals and feedback condition, informing them that they had attained a 24% increase in performance and were aiming for a 40% increase.

For subjects in all conditions, the next sign that appeared on the screen instructed them to complete a questionnaire that was next to the video terminal.

Measurement of Self-Evaluation and Perceived Self-Efficacy

The questionnaire contained the two measures of central interest: subjects' level of self-satisfaction with their performance and their perceived self-efficacy at reaching various performance attainments. These scales were embedded in a set of filler items (cast in the same format) measuring exercise routines and general physical status.

In measuring self-evaluative reactions, subjects rated their self-reactions on a 25-point scale, ranging from "highly self-satisfied," through "neutral," to "highly self-dissatisfied." They first rated their level of self-satisfaction or dissatisfaction with their performance in the second session, which they had just completed. Subjects could be pleased with their prior progress but self-dissatisfied were they to achieve the same level of performance on their subsequent attempts. Hence, for the second rating, subjects rated how self-satisfied or self-dissatisfied they would be if they attained the same level of performance in the next session.

Subjects recorded their perceived self-efficacy for goal attainments on an efficacy scale that described 14 possible levels of performance attainments relative to the baseline level. The goal attainments varied in 10% intervals from a 50% decrement to an 80% increase above the baseline level. For each of the 14 performance levels, subjects rated the strength of their perceived efficacy that they could attain them on a 100-point scale, ranging in 10-unit intervals from "high uncertainty" to "intermediate values of certainty" to "complete certitude." The strength of subjects' perceived efficacy that they could achieve a 40% performance increase was the pertinent efficacy measure.

Performance Test

After the assessment of self-processes, subjects were instructed via the intercom to resume the ergometer task.

They engaged in the effortful activity for 5 minutes, during which their performance was recorded.

At the conclusion of the formal experiment, subjects completed a questionnaire in which those in the goal conditions rated their perceptions of the attainability of a 40% increase in performance. Subjects in conditions without goals were asked if they had spontaneously set any performance goals for themselves and, if they had, to describe their goals. The groups did not differ on the earlier filler items on which they rated their physical stamina and the type and amount of physical activity they regularly perform each week.

Results

Effects of Self-Judgments

To test for possible reactive effects of recording one's self-evaluative reactions and self-percepts of efficacy, the sample of 10 subjects randomly selected for this purpose performed with goals and feedback but did not record their self-evaluative reactions and self-percepts of efficacy. The questionnaire they completed contained only the filler items. Their performance was compared against that of subjects who also performed with goals and feedback after recording their self-satisfaction and perceived self-efficacy. The analysis revealed no significant difference between the groups in performance change, $t(28) = .70$. Nor did these two groups differ in how they responded to the postexperiment questionnaire. Recording self-judgments thus had no reactive effects.

Initial Effects of Goal Setting

As a first step toward creating the requisite treatment conditions, after the baseline performance half of the subjects received a goal of improving their performance by 40%. Subjects increased their performance level 42% without goals and 85% with goals. These performance changes were analyzed by a two-way analysis of variance with goals and sex as factors. To equalize variances, a square root transformation was performed on the scores. The analysis revealed a significant main effect for goals, $F(1, 76) = 16.26, p < .001$. As will be shown below, this initial gain carried over, but goals alone produced no further increment in performance motivation. Neither sex nor the interaction between sex and goals had any significant effect on change in performance.

At the end of the second performance session, the appropriate groups received perfor-

mance feedback, all groups recorded their self-satisfaction and self-efficacy, and all groups then performed the effortful task again. In the second session the conditions comprising goals and feedback and feedback alone exist in name only. It is the performance of subjects in the final session, when all four treatment conditions were fully formed and operating, that bears on the major hypotheses, to which we turn next.

Effects of Goal Setting and Feedback on Effortful Performance

To test how the structure of comparative factors effects changes in level of motivation, the percentage increase in effortful performance above that of the second session was computed. In Figure 1 the mean percentage increases are plotted as a function of treatment conditions. Subjects who had the benefit of both goals and feedback more than doubled their performance over and above those subjects receiving either the goal alone, feedback alone, or neither factor.

Baseline performance levels could have influenced later performance change. An analysis of covariance was therefore computed, with treatment conditions and sex as factors and

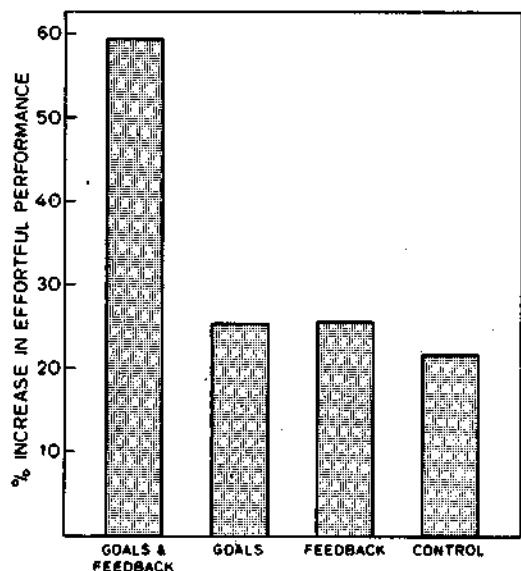


Figure 1. Mean percentage increase in effortful performance under conditions varying in goals and performance feedback.

the first session performance as the covariate. A linear contrast showed that subjects in the condition combining goals with feedback outperformed those in the other conditions, $F(1, 71) = 18.42, p < .0001$, which did not differ from each other. The same pattern of results is obtained if analysis of covariance is performed on performance scores in the third session, with performance in the second session serving as the covariate. Goals with feedback surpassed the other conditions, $F(1, 71) = 5.59, p < .025$, which did not differ from each other. The analysis failed to yield any significant effects on performance change for sex either independently or in interaction with treatment conditions.

Mechanisms Governing Motivation Effects

Mean levels of perceived self-efficacy and self-evaluation in the various treatment conditions are presented in Table 1. The self-processes did not differ in mean level, but the condition combining a goal with feedback of a substandard gain substantially increased the variance of how self-satisfied subjects would be with a similar future performance as compared both to feedback alone, $F(19, 19) = 2.64, p < .05$, and to the control condition, $F(19, 19) = 2.15, p < .06$. However, as hypothesized, these self-processes relate to performance motivation in strikingly different ways when the requisite comparative factors are fully present than when they are present only partially or not at all.

Product-moment correlations were computed between the indices of the self-processes and percentage performance change. Degree of self-dissatisfaction with the preceding performance and self-dissatisfaction if the same level of performance was attained in the next

session were each correlated with percentage of subsequent performance change. It is the predictiveness of the second self-evaluative measure that is of greatest interest because it more closely reflects the future performance attainments subjects judge they must fulfill to feel self-satisfied. The role of perceived self-efficacy as a performance motivator was evaluated by correlating strength of perceived self-efficacy for a 40% goal attainment with percent of performance change. Correlational analyses were conducted separately for each of the four treatment conditions based upon 18 degrees of freedom for each group. The complete set of correlations is presented in Table 2.

Complete Comparative Factors (Goal Plus Feedback)

Social learning theory posits that dependable activation of self-evaluative mechanisms requires both goals and performance feedback. Correlational analyses conducted on data from the condition combining goals with feedback information indeed confirmed that self-dissatisfaction is predictive of performance change (Table 2). The more self-dissatisfied subjects were with the substandard performance they had just completed, the more they heightened their next performance ($r = .37, p = .05$). Level of self-dissatisfaction with the same substandard performance were it to occur on the next session was even more predictive of subsequent performance gains ($r = .51, p = .01$).

Perceived self-efficacy is also predictive of the performance changes exhibited by subjects who had the benefit of goals and feedback. The more self-efficacious they were that they could attain the 40% goal, the more highly they boosted their next performance ($r = .45,$

Table 1
Mean Levels of Perceived Self-Efficacy and Self-Evaluation in the Treatment Conditions

Self-process	Goal + feedback		Goal		Feedback		Control	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Perceived self-efficacy	85.0	25.4	81.5	24.1	77.5	20.7	67.8	26.6
Self-dissatisfaction								
Prior performance	10.4	3.8	9.8	4.0	11.0	3.0	8.3	3.8
Future performance	10.1	5.9	9.8	4.5	9.6	3.6	8.6	4.0

Table 2

Relation of Self-Evaluation and Perceived Self-Efficacy to Effortful Performance Under Conditions in Which the Requisite Comparative Factors of a Goal System Are Present or Absent

Self-process	% change in effortful performance (Session 3 relative to Session 2)				% change in effortful performance (fifth minute relative to first minute of Session 3)			
	G + F	G	F	C	G + F	G	F	C
Perceived self-efficacy	.45**	.57***	-.32	-.09	.43**	.14	-.24	-.19
Self-dissatisfaction								
Prior performance	.37*	-.44*	-.18	.27	.36	.03	.08	.22
Future performance	.51**	-.24	-.59***	.24	.68****	-.20	-.03	.24

Note. G = goal; F = feedback; C = control.

* $p = .05$. ** $p < .03$. *** $p < .01$. **** $p < .001$.

$p < .025$). Correlations were also computed between performance effort and perceived self-efficacy to accomplish each of the 14 performance levels included in the efficacy scale. Subjects' perceived efficaciousness to attain the 40% goal exceeded the correlations at each of the 13 remaining levels, a pattern that is highly significant ($p < .001$, as estimated by binomial test). Self-satisfaction and percepts of self-efficacy were not significantly related in any of the conditions.

It is postulated that self-dissatisfaction and perceived self-efficacy jointly determine performance changes. To test this, indices of self-dissatisfaction with future substandard performance and perceived self-efficacy for goal attainment were converted to standardized T scores, combined, and correlated with performance change. This composite index of the mediating self-processes was highly predictive of subsequent performance change ($r = .63$, $p < .002$).

The joint operation of these two motivational self-processes in the condition combining an explicit goal with feedback is most graphically revealed by categorizing subjects in terms of whether they expressed self-dissatisfaction with future substandard performance and whether their perceived self-efficacy for goal attainment exceeded the 50% strength value. The mean percentage changes in performance as a function of varying combinations of these self-processes are presented in Figure 2. As may be seen in the left-hand panel, subjects who were both self-dissatisfied but highly self-efficacious displayed huge performance gains. The self-inefficacious but self-

satisfied subjects manifested little performance change. If at least one of the two self-processes was strongly operative, subjects achieved moderate performance gains. Because the efficacious-dissatisfied and the inefficacious-satisfied subjects performed comparably, these two groups were combined to increase the subgroup size for statistical analysis. Even though the subgroups—formed by dichotomizing scores on the two self-processes—were small within this total sample of 20 subjects, the variations in effortful performance were significant, $F(2, 17) = 4.10$, $p < .04$.

These two self-processes even predict changes in performance motivation over the course of the session. For this temporal analysis the difference in physical effort exerted between the first minute and the last minute of the final session was computed and correlated with the indexes of the self-processes (Table 2). Self-dissatisfaction with future substandard performance ($r = .68$, $p < .001$) and self-efficacy for goal attainment ($r = .43$, $p < .03$), both singly and in combination ($r = .72$, $p < .001$), predicted the degree of performance change over time.

As shown in the right-hand panel of Figure 2, the self-dissatisfied but self-efficacious subjects greatly accelerated their performance effort, those who were either self-dissatisfied or self-efficacious sustained their performance effort, and those who judged themselves ineffectual to fulfill the goal and were satisfied with a 24% future increase slackened their efforts and showed a substantial decline in performance by the end of the session. Because the means for the high-efficacy-low-dissatis-

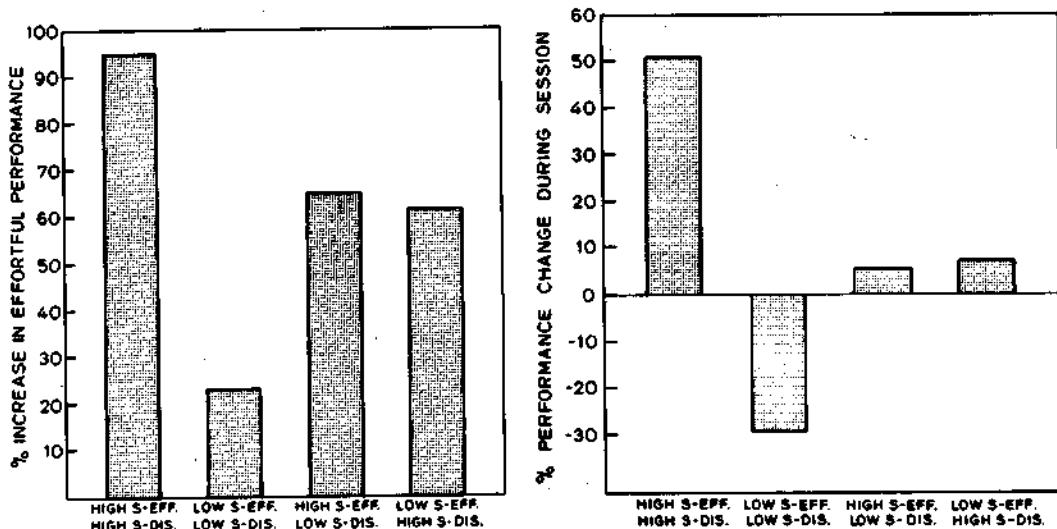


Figure 2. Mean percentage change in effortful performance by subjects in the goals and feedback condition as a function of differential combinations of levels of self-dissatisfaction (S-DIS) and perceived self-efficacy (S-EFF) for goal attainment. (The left-hand panel shows the mean change for the entire session; the right-hand panel shows the mean change between the first and final minute of the session. The number of subjects in each of the four combinations of self-processes was as follows: High S-EFF-High S-DIS, 4; Low S-EFF-Low S-DIS, 6; High S-EFF-Low S-DIS, 6; Low S-EFF-High S-DIS, 4.)

faction and the low-efficacy-high-dissatisfaction subgroups were virtually identical and the η^2 s were small, these two subgroups were combined for the ANOVA. These differential patterns of motivational change are highly significant, $F(2, 17) = 14.73, p < .001$.

Of the subjects in the ineffectiveness-satisfied subgroup, 83% perceived the selected goal as virtually unattainable, whereas only 7% of the remaining subjects considered the goal beyond their reach. These differential perceptions of goal attainability, which can markedly affect goal adherence, are highly significant ($z = 3.45, p < .001$).

Partial Comparative Factors

Subjects who performed with either goals alone or feedback alone lacked one of the critical elements to regulate their effort effectively through self-reactive influence unless they supplied the missing element subjectively. Correlational analyses indeed reveal that the constituent self-reactive influences operate differentially in performance motivation depending on which comparative factor is lacking.

Feedback-alone condition. Subjects in the feedback-alone condition were informed that they had improved by 24% but had no explicit goal to judge whether the gain was exemplary or insufficient. The extent to which they were self-satisfied with this performance gain was unrelated to subsequent performance change, but the more satisfied they were with maintaining a similar future gain, the greater was their performance ($r = -.59, p < .01$, two-tailed). Enhanced effort is thus related to satisfaction under feedback of progress alone but to discontent when that same level of progress is viewed in relation to a seemingly difficult standard of a 40% gain.

When people engage in an ongoing activity and are periodically informed of their performance attainments, some spontaneously set goals for themselves (Bandura & Simon, 1977). In the feedback-alone condition 70% of the subjects indeed reported in the postexperiment questionnaire that they set performance standards for themselves on their own. Those who set no goals for themselves achieved no change (.4%), those who aimed to sustain their improvement realized a modest gain (27%), and those who set themselves the more demanding

goal of bettering their improvement raised their level of performance substantially (40%). This pattern of differences is significant even with the limited sample size, $F(2, 16) = 3.51$, $p = .05$. In contrast, self-set goals had no effect on performance effort in the condition in which subjects received no performance feedback.

Whether knowledge of a 24% increase in performance is indicative of self-efficacy or self-inefficacy depends on what goals, if any, subjects set for themselves as suitable markers of capability. Because subjective goal setting varied widely, perceived self-efficacy for a 40% goal attainment bore no significant relation to performance change in the feedback-alone condition.

Goal-alone condition. In the goal-alone condition, subjects aimed for a 40% increase in performance but had no objective knowledge of how they were doing. The stronger the subjects' self-efficaciousness that they could attain such a goal, the greater was their performance change ($r = .57$, $p < .005$). The correlation of perceived self-efficacy to attain the 40% goal with performance effort was higher than the correlations at all but one (60% goal) of the 13 levels of goal attainment. This pattern is highly significant ($p < .002$, as estimated by the binomial test). In this condition, in which subjects had only their subjective performance impressions to go on, it was self-satisfaction with their imagined attainment that was related to subsequent performance change ($r = -.44$, $p < .05$, two-tailed), but degree of self-evaluation for a similar future performance was not.

No Comparative Factors (No Goal, No Feedback)

In the condition in which subjects lacked both goals and knowledge of how they performed, they had little basis for either appraising or regulating their ongoing performance effort. Self-processes were unrelated to performance change (see Table 2).

Discussion

The findings of the present study support the theory that goal systems gain motivating power through self-evaluative and self-efficacy

mechanisms activated by cognitive comparison. Goals enhanced performance effort only under conditions combining a personal standard with performance feedback of progress toward it. Neither goals alone nor performance feedback alone, both of which lack an essential comparative ingredient, effected change in motivational level. When first adopted, goals alone produced a performance gain that carried over, but they did not generate any further increments in motivation in the absence of performance knowledge. Although goals alone did not further augment performance motivation, persistence of the initial boost enabled the subjects who performed with goals alone to surpass the controls. The pattern of results at the point at which all conditions were fully operative is consistent with Locke's goal theory (Locke et al., 1981).

Analysis of performance effort as a function of self-set standards under conditions of feedback alone is also in accord with the view that both performance knowledge and a standard of comparison are needed to produce motivational effects. For the most part, the self-prescribed goals were of a general sort and not unduly challenging. Nevertheless, participants who set no goals were outperformed by those who set themselves the goal of sustaining their performance gain, who, in turn, were outperformed by those who sought to better their past attainment. These goals were of a more qualitative sort of sustaining or surpassing one's prior accomplishments (e.g., "I want to do as well as the time before . . . do better than the previous session.") rather than stated in terms of explicit quantitative levels of performance change. Although such goals had motivating potential in the context of performance knowledge, the rise in performance effort for feedback with qualitative self-set standards was less than that for the same feedback with a challenging (40%) quantified standard. These findings are congruent with those of previous studies showing that explicit goals are more motivating than are general ones (Latham & Yukl, 1975; Locke, 1968). Self-set goals had no motivating potential without performance information in the control condition.

Results of the correlational analyses support the proposition that goal systems affect per-

formance motivation in part through self-evaluative and self-efficacy mechanisms. Moreover, the findings shed interesting light on how these self-mechanisms operate in performance motivation when only partial comparative information is available. When performance information is combined with a standard of comparision, the higher the self-dissatisfaction with a substandard performance and the stronger the perceived self-efficacy for goal attainment, the greater is the subsequent intensification of effort. In a recently completed study employing a path analysis, Locke and his colleagues (Locke, Frederick, Lee, & Bobko, Note 1) found that perceived self-efficacy affects the level of self-set goals, strength of goal commitment, and level of cognitive performance.

When one of the requisite comparative factors is lacking, the relation of self-reactive influences to performance motivation depends on the nature of the partial information provided or that performers fashion for themselves. Thus, in the condition providing only feedback, knowledge of a 24% gain in performance carried no absolute value. It represented a commendable accomplishment if judged against subjective modest aspirations but a failure if evaluated against subjectively invoked high standards. Subjects' reports of their self-set goals reveal that many of them either set no goals for themselves (45%) or aimed for the same level of performance gain (25%). For subjects in this condition, a 24% gain constituted positive or success feedback. The more pleased subjects were with sustaining this level of improvement, the more effortfully they behaved. In contrast, a 24% gain when one is aiming for a 40% increment constitutes negative or failure feedback. Discontent with the prospect of similar failure in the future spurred subjects to greater effort. Inverted meaning of the performance feedback thus produces inverse relations between self-evaluation and performance motivation.

The findings that self-evaluative reactions operated differently on motivation under varying comparative structures testify to the complexity of the relation between self-satisfaction and motivation. With goals and performance feedback, self-dissatisfaction affects effort (see also Locke, Cartledge, & Knerr, 1970), whereas with either goals alone or feed-

back alone, effort seems to be governed by level of self-satisfaction.

Variable self-prescribed standards similarly confer diverse self-efficacy value on the same performance gain. Subjects oriented toward sustaining their level of effortful performance are likely to raise their self-percepts of efficacy on learning that they surpassed their past achievements by 24%, whereas those who ask much of themselves might interpret the same performance gain as a sign of physical inefficacy. Perceived self-efficacy in attaining a 40% goal therefore bore no consistent relation to subsequent effort in the feedback-only condition. However, in the goal-alone condition, in which all performers aimed for the same challenging standard but had to guess how they were doing, the stronger their perceived self-efficaciousness for goal attainment and the more pleased they were with whatever they surmised their prior performance to be, the more they heightened their effort.

Self-reactive influences are least likely to be activated in any consistent way in different individuals by conditions providing neither evaluative standards, performance information, nor even distinct implicit feedback concerning the level of performance. Not surprisingly, the latter condition, which was devoid of information for monitoring, gauging, and regulating one's effort, yielded no significant correlates.

In the present study, predicted relations were tested under conditions in which performance was moderately discrepant from personal standards. The informative next stage for research is to clarify further the precise nature of the relation between self-percepts of efficacy, self-evaluation, and performance motivation when attainments diverge from personal standards across a wide range of positive and negative magnitudes. Recall that social learning theory postulates a linear positive function between perceived self-efficacy for goal attainment and effort but a nonlinear one between degree of goal discrepancy and effort, as mediated through self-evaluative reactions.

Theorists working within the framework of achievement motivation have addressed the issue of task difficulty mainly in terms of success expectancy and valuation of goal attainment (Atkinson & Raynor, 1974; Feather, 1982). Because these two factors are considered

to be inversely related, performance is highest for tasks of moderate difficulty, although Heckhausen (1977) posits a somewhat lower success probability than does Atkinson as being maximally motivating. In the goal theory developed by Locke (1968), performance is linearly related to goal difficulty as long as performers continue to adhere to taxing goals. By expanding the self-process probes to include revision of goals, as well as perceived self-efficacy and self-satisfaction with prior and future attainments, the paradigm developed for the present experiment might help shed some additional empirical light on subprocesses mediating effort when attainments diverge from standards in degree and direction.

Performances that fall markedly short of standards are likely to be demotivating by undermining perceived self-efficacy. To the extent that performers judge the standard as exceeding their capabilities, they are apt to lower their standard and demand less of themselves. Such adjustments would lower effort and performance (Feather, 1982; Locke, 1968). Of interest is the threshold strength value below which reduced self-efficaciousness results in goal abandonment. As already noted, moderately discrepant attainments heighten motivation to fulfill standards that appear attainable through extra effort. When dissatisfaction combines with self-efficaciousness, effort is mobilized to master the challenge. The third pattern of interest concerns attainments that either fall just short of challenging standards or exceed them. High accomplishments that strengthen perceived self-efficaciousness are likely to lead performers to raise their standards (Lewin, Dembo, Festinger, & Sears, 1944), thus creating new motivating discrepancies for themselves. Under the latter circumstance, the pattern of self-subprocess regulation of motivation would include satisfaction with prior attainments—but discontent with similar future ones—high self-efficaciousness, and raised aspirations.

Depending on their direction and magnitude, goal discrepancies can raise the motivational potential of one of the self-reactive factors while lowering the motivational potential of the other. Thus, large negative discrepancies increase self-dissatisfaction but lower perceived self-efficacy for goal attainment. However, a decrement in self-efficacy

sufficient to prompt adoption of a lower standard would serve to moderate evaluative self-reactions. For example, when provided with feedback of a substandard performance, some of the subjects in the present study seemed to abandon their goal as unattainable and were no longer unduly self-dissatisfied with moderate progress. Smaller negative discrepancies reduce self-dissatisfaction but strengthen self-percepts of efficacy. Further research is needed to determine the relative susceptibility of these two self-reactive factors to failed efforts and how they may combine and compensate for each other as motivators of action.

Social learning theory distinguishes between the effects of strength of perceived self-efficacy on effort during learning and during execution of established skills (Bandura, 1982). In approaching learning tasks, persons who perceive themselves to be supremely self-efficacious in the undertaking may see little need to invest much preparatory effort in it (Salomon, in press). However, in applying acquired skills, strong belief in one's self-efficaciousness intensifies and sustains the effort needed to realize challenging goals, which are difficult to attain if one is plagued by self-doubts. In short, self-doubts create an impetus for learning but hinder adept use of established skills.

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Received August 27, 1982

Revision received April 21, 1983 ■

Perceived Self-Efficacy and Pain Control: Opioid and Nonopioid Mechanisms

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In this experiment, we tested for opioid and nonopioid mechanisms of pain control through cognitive means and the relation of opioid involvement to perceived coping efficacy. Subjects were taught cognitive methods of pain control, were administered a placebo, or received no intervention. Their pain tolerance was then measured at periodic intervals after they were administered either a saline solution or naloxone, an opiate antagonist that blocks the effects of endogenous opiates. Training in cognitive control strengthened perceived self-efficacy both to withstand and to reduce pain; placebo medication enhanced perceived efficacy to withstand pain but not reductive efficacy; and neither form of perceived self-efficacy changed without any intervention. Regardless of condition, the stronger the perceived self-efficacy to withstand pain, the longer subjects endured mounting pain stimulation. The findings provide evidence that attenuation of the impact of pain stimulation through cognitive control is mediated by both opioid and nonopioid mechanisms. Cognitive copers administered naloxone were less able to tolerate pain stimulation than were their saline counterparts. The stronger the perceived self-efficacy to reduce pain, the greater was the opioid activation. Cognitive copers were also able to achieve some increase in pain tolerance even when opioid mechanisms were blocked by naloxone, which is in keeping with a nonopioid component in cognitive pain control. We found suggestive evidence that placebo medication may also activate some opioid involvement. Because placebos do not impart pain reduction skills, it was perceived self-efficacy to endure pain that predicted degree of opioid activation.

Pain is a complex psychobiologic phenomenon influenced by psychosocial factors rather than simply a sensory experience arising directly from stimulation of pain receptors. Level of pain depends not only on the intensity of sensory stimuli but on how attention is deployed, how the experience is cognitively appraised, the coping strategies used to modulate pain, and modeled reactions to nociceptive stimulation (Craig, 1983; Turk, Meichenbaum, & Genest, 1983). The same intensity of nociceptive stimulation can thus give rise to varying conscious perceptions of pain. Evidence that psychosocial determinants play an important role in perceived pain has led to the development of psychobiologic models of pain (Melzack & Wall, 1982).

A number of psychological procedures have been shown to attenuate pain and raise pain tolerance. Placebos can bring pain relief to many people. The analgesic potency of placebos mimics variations in the impact of drugs, producing additive effects, dose-level effects, and greater pain relief from a placebo injec-

tion than from a placebo pill (Evans, 1974). Cognitive coping strategies, which rely extensively on attentional diversion and cognitive restructuring of painful experiences, have also proven effective in alleviating pain (Hilgard & Hilgard, 1975; McCaul & Malott, 1984; Turk et al., 1983). Self-relaxation serves as another means of lessening pain (Sanders, 1979).

Although pain control by psychological means is well established, the mechanisms by which they enhance pain tolerance are less well understood. In this experiment, we sought to clarify the relation between psychological and physiological mechanisms of pain control. Perceived self-efficacy is one psychological mechanism that has been shown to mediate different forms of physiological activation and health-related behavior (Bandura, in press; O'Leary, 1985a). Perceived self-efficacy is concerned with people's judgments of their capabilities to execute given levels of performance and to exercise control over events. Judgments of personal efficacy affect what courses of action people choose to pursue, how much effort they will put forth in a given endeavor, how long they will persevere in the face of aversive experiences, whether their thought patterns help or hinder their endeavors, and how much stress they experience in coping with taxing environmental demands (Bandura, 1986).

There are several ways in which perceived coping efficacy can bring relief from pain. People who believe they can alleviate suffering will likely mobilize whatever ameliorative skills they have learned and will persevere in their efforts. Those who doubt their controlling efficacy are likely to give up readily in the absence of quick results. A sense of coping efficacy also re-

This research was supported by Public Health Research Grant MH-5162-25 from the National Institute of Mental Health. We are grateful to Amy Kohn and Martin Juneau for their valuable assistance with the conduct of this research and to Robert DeBusk for use of the medical laboratory facilities. We are indebted to Jon Levine for his generous help regarding the procedural and naloxone aspects of the study and his helpful comments on an earlier draft of this article.

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duces distressing anticipations that create aversive physiological arousal and bodily tension, which only exacerbate pain sensations and discomfort (Bandura, Reese, & Adams, 1982; Bandura, Taylor, Williams, Mefford, & Barchas, 1985). The attentional resources available at any given moment are severely limited (Kahneman, 1973). It is hard to attend to more than one thing at a time. Dwelling on pain sensations makes them more noticeable and thus more difficult to bear. Perceived self-efficacy can lessen experienced pain by diverting attention from pain sensations to competing engrossments. To the extent that pain sensations are supplanted in consciousness, they are felt less.

Results of several lines of research indicate that perceived self-efficacy can mediate the analgesic potency of different psychological procedures. Reese (1983) found that cognitive techniques, self-relaxation, and placebos all increase perceived self-efficacy to cope with pain, with cognitive techniques being most effective. The more self-efficacious the people judged themselves to be, the less painful they experienced later cold pressor tests and the higher was their pain threshold and pain tolerance. Holroyd and his colleagues (Holroyd et al., 1984) demonstrated that perceived self-efficacy, created by false feedback during biofeedback training, predicted reduction in tension headaches, whereas the actual amount of control over muscular activity achieved in treatment was unrelated to the incidence of subsequent headaches. Changes in perceived self-efficacy to regulate pain, induced through bogus social comparative feedback, similarly predict magnitude of change in pain tolerance (Litt, 1987).

That perceived self-efficacy makes pain easier to control is further corroborated by studies of acute and chronic clinical pain. In a study of primiparous women who had completed childbirth classes, Manning and Wright (1983) found that the higher their perceived self-efficacy that they could exercise control over pain while giving birth, the longer they tolerated labor pain before requesting medication and the less pain medication they used. Shoor and Holman (1984) documented the influential role of perceived self-efficacy in coping with the chronic pain of arthritis. When patients are equated for degree of physical debility and other relevant factors, those who believe they can exercise some influence over their pain and arthritic condition lead more active lives and experience less pain. O'Leary (1985b) found that training in self-regulatory skills increased the perceived efficacy of patients suffering from rheumatoid arthritis to reduce pain and to pursue potentially painful activities. The stronger their perceived coping efficacy, the less pain they experienced, the less they were disabled by their arthritis, and the greater reduction they achieved in inflammation of their joints.

Research has clarified some aspects of the physiological mechanisms mediating pain reduction. Studies by Levine and his associates with postoperative dental pain indicate that endogenous opioids can be activated by a placebo (Levine, Gordon, & Fields, 1978; Levine, Gordon, Jones, & Fields, 1978). A socially administered placebo produces analgesia that is antagonizable by naloxone, whereas unsignaled mechanical infusion of the placebo has no analgesic effect (Levine & Gordon, 1984). There is some evidence to suggest that placebo-induced

analgesia may involve both a nonopioid component and a stress-analgetic component that is antagonizable by naloxone (Gracely, Dubner, Wolske, & Deeter, 1983).

It might be reasoned from research with animals on stress-induced analgesia that coping efficacy may enhance pain control mainly through nonopioid mechanisms. Stress can activate endogenous opioids that block pain transmission (Maier, Laudenslager, & Ryan, 1985). Thus, the pain reactivity of animals who have controlled shock offset is unaffected by opiate antagonists, whereas yoked animals who experienced equivalent amounts of shock without being able to control it display pain analgesia that is counteracted by opiate antagonists. It is not the physically painful stimulation per se but the psychological stress over its uncontrollability that seems to be a key factor in opioid activation.

At first sight, helplessness theory and self-efficacy theory appear to be at odds on how controlling efficacy relates to pain tolerance and the mechanisms mediating it. Endurance of pain is associated with deficient control in helplessness theory but with controlling efficacy in self-efficacy theory. A plausible explanation for the seemingly contradictory findings is in terms of the markedly different consequences of control in the types of coping situations used.

The exercise of control produces fundamentally different conditions of pain stimulation in the common animal and human coping situations that would argue for some opioid involvement with high self-efficacy. In the typical animal study, control promptly terminates pain stimulation. By contrast, in the human situation, active exercise of personal efficacy can attenuate conscious pain, but in so doing it can promote even more taxing pursuits that heighten the level and duration of pain stimulation. Indeed, a strong sense of coping efficacy often increases engagement in pain-generating activities to the point where it can create stressful predicaments. Thus, for example, self-efficacious people suffering from arthritis generate pain and discomfort when they first take on more vigorous activities, or subjects experience more severe pain stimulation the longer they endure the cold pressor task. Indeed, in the cold pressor situation, continuing exercise of controlling efficacy through cognitive means eventually heightens pain to the point where it begins to overwhelm one's coping capabilities. The stress of failing control with mounting pain in later stages of coping would activate opioid systems. According to this conception of the human coping process, both opioid and nonopioid mechanisms operate in the regulation of pain, but their relative contribution varies with degree of controlling efficacy and stages of coping. A nonopioid mechanism would subserve pain tolerance while cognitive control is effectively exercised, but an opioid mechanism would come into play in later stages of coping when control techniques are no longer sufficient to attenuate increasing pain or to block it from consciousness.

This study was designed to test for opioid and nonopioid mechanisms of pain control and the relation of opioid involvement to perceived coping efficacy when perceived self-efficacy is enhanced by placebos or by cognitive control strategies. Subjects were taught cognitive methods of pain control, were administered a placebo presented as a medicinal analgesic, or received no intervention. Following the treatment phase, their

perceived efficacy to control and reduce pain and their tolerance of cold pressor pain were measured. In all conditions, subjects were then administered either naloxone or a saline solution, and thereafter their perceived self-efficacy and their pain tolerance were measured at periodic intervals.

We predicted that because instruction in cognitive strategies imparts skills for controlling pain, it would prove more effective than placebos in enhancing perceived coping efficacy and pain tolerance. The stronger the subjects' perceived coping efficacy, the longer they would be able to endure mounting pain. On the assumption that pain tolerance under the treatment conditions reflects some opioid involvement that is antagonizable by naloxone, we predicted that naloxone subjects would display lower pain tolerance than would their saline counterparts after the time needed for the drug impact had elapsed. The stronger the perceived efficacy, the greater should be the naloxone counteraction of analgesia. Subjects taught cognitive means for attenuating the impact of pain stimulation were also expected to be able to achieve some increase in pain tolerance independent of opioid mechanisms. The control condition was not expected to produce any opioid involvement because subjects would terminate the pain task quickly. Hence, naloxone and saline controls should not differ from each other.

Method

Subjects

The subjects were 36 men and 36 women drawn from an introductory psychology course. They were randomly assigned to conditions, balanced for sex, with 12 subjects in each of the four treatment conditions and two control groups. Two subjects in the cognitive control condition who later received saline and 1 placebo subject who later received naloxone achieved maximal pain tolerance in the posttreatment assessment. Inclusion of these subjects is appropriate for evaluating the power of treatment, but it could preclude changes for the subsequent phase of the study because their tolerance was already at the highest level and could not increase any further. A maximum posttreatment level is not as problematic for the naloxone subject because it provides the greatest leeway for reductive change in pain tolerance, and naloxone was expected to decrease rather than raise pain tolerance. Nevertheless, 3 additional subjects were added from the same subject pool and substituted in the test of opioid involvement. The experiment was presented as part of a program of research investigating psychological and physiological mediators of pain.

Pain Tolerance Test

Pain was induced with the cold pressor procedure. Two insulated containers were used in the tests of pain tolerance. One container filled with warm water kept at 37 °C was used before each cold pressor test. The other container was divided into two compartments by a wire screen, with ice in one side and ice-free water in the other. The water was circulated by a submerged bilge pump and maintained at a constant temperature of 0 °C.

Subjects were instructed to place their dominant hand in the warm water for 3 min to equalize initial hand temperatures. They were then asked to immerse their hand in the ice water for as long as they could. The test had a 5 min ceiling. The pain tolerance score was the number of seconds subjects were able to keep their hands in the ice water. Those whose pain tolerance exceeded 2.5 min in this screening assessment

were excluded from the study. The mean pretest pain tolerance was 56 s. The study was confined to subjects who had difficulty coping with pain to provide a stringent test of the treatments and to allow wide latitude for change. Forty percent of all the subjects who had been pretested met this criterion.

Perceived Self-Efficacy

Self-efficacy scales were devised to measure perceived self-efficacy to withstand pain and perceived self-efficacy to reduce its intensity. To familiarize subjects with the format for recording their self-efficacy judgments, they first completed a practice scale measuring their self-judged capability to lift objects of varying weights. In judging their perceived efficacy to tolerate pain, subjects were presented with 20 items representing increasing lengths of cold pressor stimulation, ranging from 15 s to 5 min. The items in the scale measuring pain reduction efficacy described four severities of pain ranging from dull to excruciating and for each severity three degrees of pain reduction, namely small, moderate, or large reductions. On each scale, subjects checked the items they judged they could perform. For each item so designated, they rated the strength of their perceived self-efficacy on a 100-point scale, ranging in 10-unit intervals from high uncertainty through intermediate values of certainty to complete certitude.

Prior research has shown that recording self-percepts of efficacy to control pain has no reactive effects on pain tolerance (Reese, 1983). The measures of strength of perceived self-efficacy to cope with pain were obtained by dividing the summed magnitude scores by the total number of items.

Subjects who met the selection criterion on the initial cold pressor test were scheduled for participation in the formal experiment several days later at a research facility of the Stanford Medical Center. They were administered a pretreatment cold pressor test and judged their efficacy to withstand and to reduce pain, both before and after the test of pain tolerance.

Treatment Conditions

Subjects were randomly assigned to one of three conditions, each of which lasted 30 min.

Cognitive coping. Subjects assigned to the cognitive coping condition received instruction and practice in using different cognitive strategies for alleviating pain. These strategies included attention diversion from pain sensations to other matters, vivification of engrossing imagery, dissociation of the limb in pain from the rest of the body, cognitive transformation of pain as nonpain sensations, and self-encouragement of coping efforts.

Subjects were provided with several examples of each strategy. They selected those they believed would be most effective and practiced them. This individualized approach was used to ensure that subjects could choose and switch strategies quickly when they later had to manage cold pressor pain.

Placebo medication. Subjects in the placebo condition were given a placebo pill and asked to wait for 30 min for the drug to take effect. The placebo was administered by a male physician who described it as a widely used medicinal analgesic. To enhance further the credibility of the placebo administration, the physician conducted a brief screening interview as to whether subjects were currently taking any medication or were allergic to any kind of medication.

Control condition. Subjects assigned to the control condition received the same orienting instructions, but they simply waited for 30 min. This group provided a control for the effects of the common instructional component and repeated measurements.

Posttreatment Assessment

At the end of the 30-min period, all subjects were administered the self-efficacy scales, then the cold pressor test, and then readministered the self-efficacy scales. All the treatments were conducted by two female experimenters, and all the measurement procedures were administered by a separate female tester at all points of assessment. To control for any possible bias, the assessor had no knowledge of the treatment conditions to which any subject had been assigned.

Naloxone Intervention

To test whether changes in pain tolerance are mediated by activation of the endorphin system, half the subjects in each condition received an injection of 10 mg of naloxone, an opiate antagonist. The other half were given a placebo injection of saline solution. The subjects were informed at the outset of the experiment that the injection would contain a drug that may affect the physical mechanism controlling pain but that its individual effects on the experience of pain were not yet fully known. The physician administered the injections under a double-blind procedure. Neither the physician nor the tester knew whether the subjects received naloxone or saline.

Postinjection Tests

The self-efficacy scales were administered before and after each of three cold pressor tests during the 60-min period following the injection. The assessments were performed at 5, 20, and 60 min after the injection. The lengthier times were chosen because Levine, Gordon, and Fields (1978) found that naloxone antagonist effect does not become evident until after about 20 min.

Results

Analysis of variance on pretest scores showed that the groups did not differ initially in their perceived self-efficacy either to withstand or reduce pain or in their actual ability to tolerate pain. Nor were there any significant sex differences or interactions between sex and treatment effects in percentage change as a function of treatment on any of the measures.

Perceived Coping Self-Efficacy

The mean percentage change in perceived self-efficacy compared with the pretest level is plotted in Figure 1 for the different treatment conditions. Treatment had a highly significant effect on perceived self-efficacy both to withstand pain, $F(2, 67) = 5.31, p < .01$, and to reduce pain, $F(2, 67) = 9.17, p < .001$.

In intragroup comparisons, evaluated by the t test for correlated means, control subjects displayed no significant changes in either form of perceived self-efficacy. Administration of the placebo raised subjects' perceived self-efficacy to withstand pain, $t(24) = 4.20, p < .001$, but did not alter their perceived efficacy to effect reductions in pain. Training in cognitive coping strategies heightened perceived self-efficacy both to withstand pain, $t(25) = 4.01, p < .001$, and to reduce it, $t(25) = 3.32, p < .005$.

In analysis of intergroup differences, subjects in the cognitive control condition judged themselves considerably more efficacious at withstanding pain than did subjects in the placebo condition, $t(49) = 2.30, p < .025$, or in the control group, $t(47) =$

$3.14, p < .01$. The cognitive copers also judged themselves much more efficacious at reducing pain than did the placebo subjects, $t(48) = 3.61, p < .01$, or the control subjects, $t(48) = 3.98, p < .001$. The differences between the placebo and control conditions in perceived self-efficacy to withstand or to reduce pain were not statistically significant.

Posttreatment Pain Tolerance

Treatment effects were evaluated in terms of percentage change in pain tolerance because this measure controls for individual differences in initial ability to withstand pain and has been shown to be more sensitive to treatment influences than are simple difference scores (Hilgard et al., 1974). Figure 1 presents the mean percentage change from the pretest level in tolerance of cold pressor pain as a function of treatment conditions.

The obtained significant treatment effect, $F(2, 67) = 8.15, p < .001$, was due mainly to the noteworthy power of cognitive control. Cognitive copers substantially increased their ability to tolerate pain stimulation, $t(25) = 4.02, p < .001$, and surpassed both the placebo, $t(49) = 3.49, p < .001$, and control, $t(48) = 3.66, p < .001$, subjects in this regard. The latter two groups did not alter their pain tolerance and were similar in this respect in the immediate posttreatment assessment. However, at the 60-min posttreatment assessment, placebo subjects who had received saline significantly increased their pain tolerance (23%) compared with their pretest level, $t(11) = 2.01, p < .05$. In contrast, control subjects who had received saline showed no significant (12%) change in pain tolerance, $t(11) = 1.20$.

Relation of Perceived Self-Efficacy to Pain Tolerance

Product-moment correlations between perceived self-efficacy at the end of treatment and pain tolerance were computed separately for the different treatment conditions. When the obtained correlations were of comparable magnitude, they were averaged across treatments by means of an r -to- z transformation.

Self-efficacy to withstand pain. Subjects' perceptions of their efficacy to withstand and reduce pain were correlated with their level of pain tolerance at the end of treatment. Perceived self-efficacy to withstand pain and to reduce pain were related at a moderate positive level in all three conditions. The average correlation was $r(70) = .30, p < .01$.

Perceived self-efficacy to withstand pain was uniformly highly related to pain tolerance regardless of whether subjects were in the cognitive ($r = .64$), placebo ($r = .61$), or control ($r = .90$) condition. The average correlation between perceived self-efficacy and pain tolerance was $r(71) = .75, p < .0001$. The average correlation between level of pain tolerance in the pretest and perceived self-efficacy to endure pain in the posttreatment assessment was $r(71) = .84, p < .0001$. Pretest pain tolerance also correlated with posttreatment pain tolerance, $r(71) = .82, p < .0001$. Perceived self-efficacy retained its significant relation to pain tolerance even when pretest pain tolerance was partialled out, $r(71) = .20, p < .05$. The more strongly subjects believed they could endure pain, the longer they tolerated painful stimulation.

People's perceptions of their efficacy to cope with pain un-

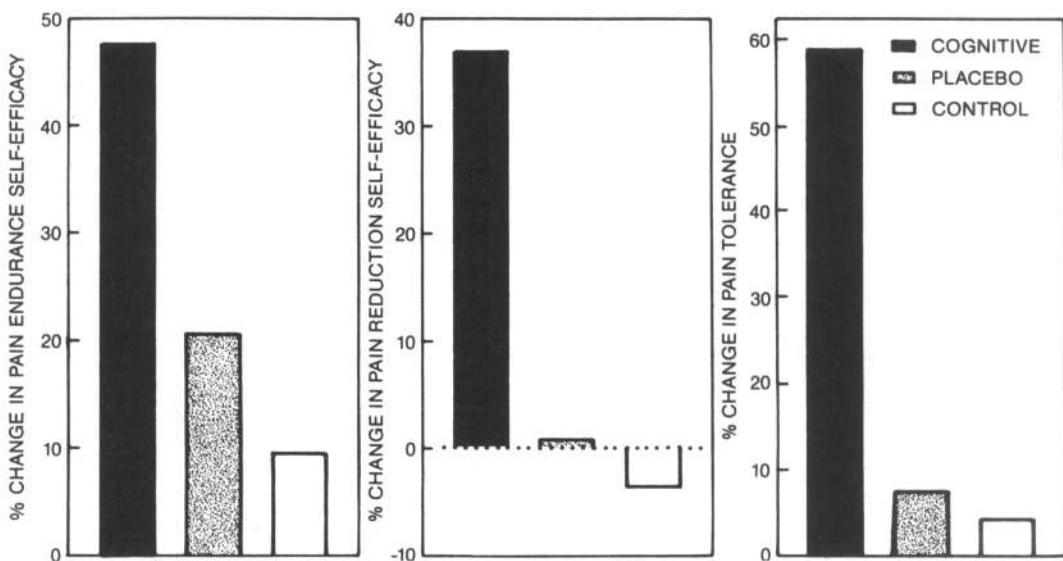


Figure 1. Mean percentage change from the pretest level in perceived self-efficacy and pain tolerance as a function of treatment conditions.

doubtedly influenced how long they tolerated pain in the pretest. It is not as though perceived self-efficacy affected future pain tolerance but had no effect whatsoever on pretest pain tolerance. Because pretest tolerance partly reflects the influence of perceived self-efficacy, partialing out prior tolerance also removes the perceived efficacy component from the effect of subsequent perceived efficacy on pain tolerance. Hence, partial coefficients most likely underestimate the magnitude of the actual relation between perceived self-efficacy and endurance of pain.

Self-efficacy to reduce pain. Perceived self-efficacy to reduce pain represents a more active exercise of personal control. How long subjects could tolerate pain in the pretest was related across conditions to the strength of their belief that they could alleviate pain, $r(72) = .21, p < .05$. In the placebo condition, in which the presumed medicinal aid would be regarded as the main source of enhanced control, perceived reductive efficacy did not correlate with pain tolerance in the posttreatment phase ($r = -.13$). However, for the cognitive copers and control subjects, who had to draw on their own coping resources to ameliorate pain, the stronger their posttreatment belief that they could reduce pain, the longer they tolerated the mounting pain stimulation, $r(48) = .34, p < .01$. However, the partial coefficient controlling for pretest tolerance ($r = .08$) is nonsignificant.

Test for Opioid Mechanism

In Figure 2, the percentage change in pain tolerance from the posttreatment level is plotted as a function of whether subjects received saline or naloxone. The critical test of opioid activation involves intratreatment comparison between naloxone and saline conditions. If endogenous opiates have been activated, naloxone subjects should exhibit lower pain endurance than should their saline counterparts. If there is no opioid involvement, whether subjects receive naloxone or saline should make no

difference. The differences between these two conditions in percentage change in pain tolerance were tested at each of the three postinjection periods for each of the treatment conditions. However, the comparisons of primary interest concerned the predicted naloxone antagonistic effects in the placebo and cognitive control conditions at the 20-min and 60-min periods.

Naloxone and saline control subjects did not differ significantly at any point. The pain tolerance of subjects in the placebo condition rose over time for those administered saline but declined over time for those given naloxone. Indeed, at the end of the 60-min period, 83% of the saline subjects had raised their pain endurance, whereas only 42% of the naloxone subjects had done so. The difference between these two proportions, which is highly significant ($z = 2.07, p < .02$), assumes added import from evidence that naloxone had no effect in the control condition. Subjects were just as likely to raise their pain tolerance with naloxone (58%) as with saline (42%) ($z = .78, ns$).

Because of a highly divergent subject, the difference between the saline and naloxone conditions in percentage change in pain tolerance at the 60-min period was not statistically significant. One of the placebo subjects in the naloxone condition had been replaced with another subject because he had reached the maximum level of tolerance in the posttreatment test. Naloxone had a marked effect on this subject's ability to endure pain, producing a 68% decrease in pain tolerance. A Mann-Whitney U test with this subject included yielded a marginally significant naloxone antagonistic effect at the 60-min test for magnitude of change in pain tolerance ($z = 1.52, p = .06$).

The subjects whose coping efficacy was enhanced by cognitive pain control techniques show evidence of opioid activation after sufficient time had elapsed for naloxone to exert its antagonistic effect. When tested at 20 min, cognitive copers who were given naloxone were much less able to endure pain than were those who were administered the saline solution, $t(22) = 1.96, p <$

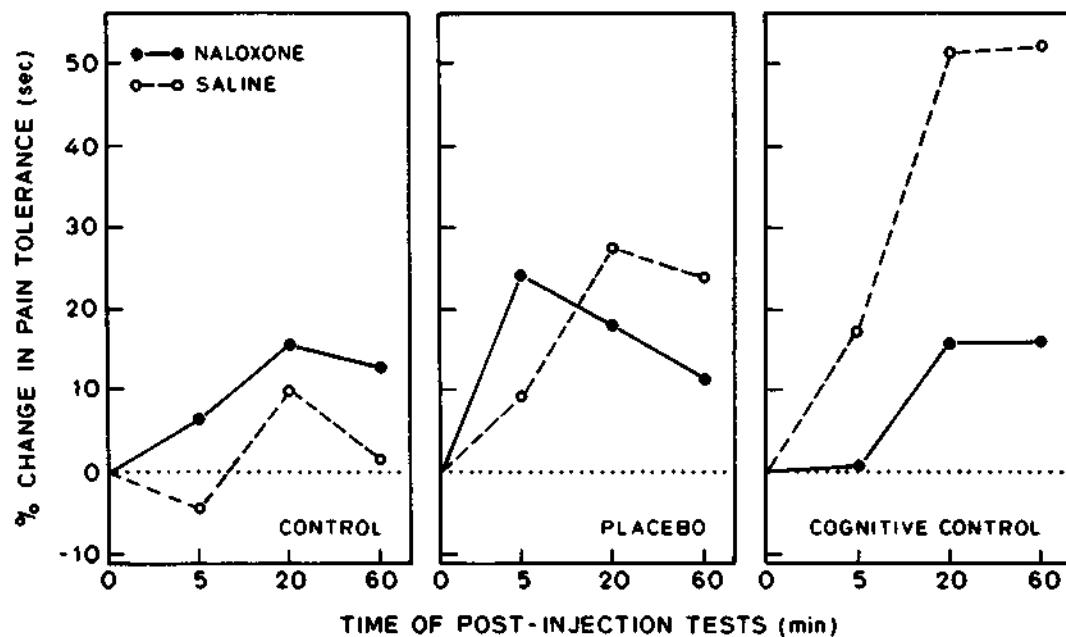


Figure 2. Mean percentage change in pain tolerance from the posttreatment level at each of three postinjection periods as a function of whether subjects received saline or naloxone.

.05. Naloxone cognitive copers also displayed lower pain tolerance than did saline cognitive copers at the 60-min test, although at a slightly lower level of significance, $t(22) = 1.56$, $p < .06$.

The perceived self-efficacy of cognitive copers at the end of treatment to withstand pain did not predict the extent to which naloxone affected pain tolerance. However, perceived self-efficacy to reduce pain, which involves a more active exercise of personal control, predicts the magnitude of the naloxone effect at 20 min, the point at which naloxone had the greatest impact. The higher the posttreatment perceived self-efficacy to reduce pain, the more naloxone reduced subjects' pain endurance, $r(10) = .48$, $p = .058$. At the 60-min test, where there seemed to be somewhat less opioid involvement, perceived self-efficacy to reduce pain was still moderately related to the extent of the naloxone effect, $r(10) = .37$, but with the small number of subjects the correlation fell short of significance.

Initial level of pain tolerance correlated negatively, though nonsignificantly, with degree of naloxone effect at 20 min ($r = -.18$) and 60 min ($r = -.33$) and at .12 with posttreatment reductive self-efficacy. The strength of the relation between perceived self-efficacy to reduce pain and degree of opioid activation is further increased at both the 20-min ($r = .51$, $p < .05$) and 60-min ($r = .44$, $p < .08$) periods when initial level of pain tolerance is controlled by partial correlation.

Placebo medication strengthened perceived self-efficacy to endure pain but did not alter perceived capability to alleviate it. For placebo subjects, it is the former aspect of perceived self-efficacy that predicts the extent to which naloxone reduced pain tolerance in the 60-min test, where there appeared to be some opioid involvement. The stronger the perceived self-efficacy to withstand pain at the end of treatment, the greater the naloxone

antagonistic effect ($r = .54$, $p < .03$). The partial coefficient ($r = .56$, $p < .025$) was also significant.

As might be expected, no significant correlations were found between perceived self-efficacy and analgesia in conditions and test periods in which naloxone had no opioid antagonistic effect.

Test for Nonopioid Mechanism

In the preceding tests for opioid involvement, differences between saline and naloxone subgroups within each treatment constituted the relevant comparison. Although subjects preassigned to the saline and naloxone subgroups were comparable in the posttreatment assessment before receiving the injection, percentage change in pain tolerance was calculated from the posttreatment level to control for even any minor variations within treatments. Tests for attenuation of pain stimulation through a nonopioid mechanism of operation are concerned with differences between treatments under conditions of opioid blockage. Therefore, for this analysis, percentage change in pain tolerance at each of the three postinjection tests was calculated from the pretest baseline level. A nonopioid mechanism is indicated if treatment subjects surpass control subjects in pain tolerance in the subgroups in which opioid mechanisms are blocked by naloxone. If pain tolerance is regulated solely by opioid mechanisms, cognitive control should produce no increases in pain tolerance under naloxone.

The mean changes in pain tolerance achieved by the three naloxone subgroups are plotted in Figure 3 for each test period. Unlike naloxone blockage, which takes time to produce its effects, cognitive control can be exercised fully from the outset.

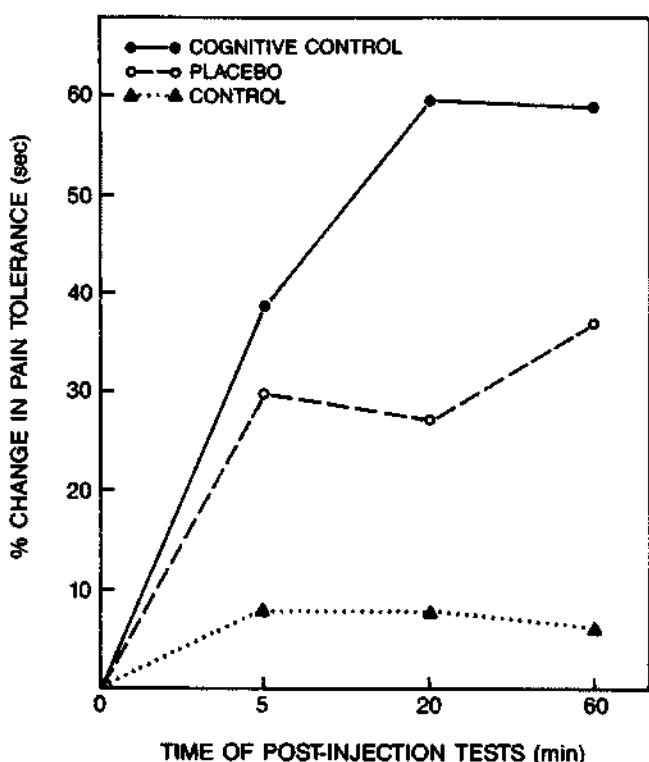


Figure 3. Mean percentage change in pain tolerance from pretest level at each of three postinjection periods achieved by cognitive copers, placebo, and control subjects when opioid mechanisms were blocked by naloxone.

Indeed, cognitive copers significantly increased their pain endurance at every test: at 5 min, $t(10) = 3.49, p < .005$; at 20 min, $t(11) = 3.33, p < .005$; and at 60 min, $t(11) = 2.63, p < .025$. Neither the modest increases by the placebo subjects nor the minimal changes by the controls reached statistical significance at any of the time points. In intergroup comparisons, the changes achieved by the cognitive copers surpassed those of the controls at 5 min, $t(20) = 2.42, p < .025$; at 20 min, $t(22) = 2.36, p < .025$; and at 60 min, $t(22) = 1.97, p < .05$. The intermediate changes displayed by the placebo subjects did not differ significantly from those in the cognitive or control conditions.

Discussion

Results of this experiment attest to the effectiveness of cognitive control of pain and to the influential role that perceived self-efficacy plays in this process. Training in cognitive control strategies heightened perceived self-efficacy to endure and to alleviate pain. The enhanced perceived self-efficacy was accompanied by a substantial increase in pain tolerance. These changes, achieved by cognitive control in both perceived self-efficacy and pain tolerance, far surpassed those by the placebo and control conditions.

Placebo medication had a differential impact on perceived endurance self-efficacy and reductive self-efficacy. Subjects believed they were better able to withstand pain with the aid of a

supposedly pain-relieving medication. However, success in reducing experienced pain depends on effective exercise of pain-ameliorating skills, which medication alone does not provide. Placebo medication did not persuade subjects that they became more capable of exercising reductive control over pain. These findings underscore the value of measuring different aspects of perceived self-efficacy in research designed to elucidate the exercise of control over pain and other complex affective states.

In accord with previous findings (Evans, 1974), about one third of the subjects displayed a positive placebo response as reflected in a notable increase in pain tolerance. However, another common finding that generally receives little attention in the literature is that about a quarter of the subjects show a negative placebo response. The net effect is a lack of an overall change in the immediate posttreatment test. But as placebo subjects continued to cope with pain, they eventually increased their pain tolerance. The nature of the placebo response is predictable from how the placebo affected subjects' perceived self-efficacy to withstand pain. Subjects who judged themselves efficacious in bearing pain given the supposed medicinal aid were good pain endurers, whereas those who continued to doubt their efficacy to manage pain despite receiving the placebo medication were less tolerant of pain. To persons with low perceived self-efficacy, the evident failure to achieve relief from pain even with the help of a medicinal analgesic gives further testimony for their coping inefficacy.

The variable effects of placebos on perceived self-efficacy most likely reflect past correlated experiences with medication. If acting on self-percepts of efficacy in conjunction with medication usually brought them substantial pain relief, people would come to judge themselves more efficacious to reduce pain with a medicinal aid. The regulatory function of perceived self-efficacy would be enlisted as well by placebo medication presented as a pain killer. The enhanced perceived self-efficacy produced by placebo medication would activate pain-relieving processes. In contrast, people who had often experienced no relief or even heightened pain despite medication would not be at all persuaded that placebo medication has enhanced their capability to relieve pain. Indeed, a low sense of efficacy to exercise control over pain may diminish the potency even of genuine analgesics. That correlated experiences affect how people respond to placebo medication was demonstrated by Voudouris, Peck, and Coleman (1985). They produced both positive and reverse placebo effects by having people experience decreases or increases in nociceptive stimulation after taking placebo medication. Whether the effects of such correlated experiences are mediated by changes in perceived coping self-efficacy remains to be determined.

Placebos have been shown to exert a more potent analgesic effect, as measured by ratings of felt intensity of pain, in studies of severe clinical pain (Gracely et al., 1983; Levine & Gordon, 1984). Because such pain is prolonged and cannot be promptly terminated when it becomes unbearable, it is much more stressful. As previously noted, heightened stress can activate opioid-mediated analgesia.

Perceived self-efficacy predicted how well subjects managed pain. The stronger their beliefs in their ability to withstand pain, the longer they endured mounting pain, regardless of whether

their perceived self-efficacy was enhanced by cognitive means or placebo medication or varied preexistently without any intervention. Perceived self-efficacy to withstand pain retains its relation to pain tolerance when initial differences in pain tolerance are controlled. Converging lines of evidence from investigations of both laboratory and clinical pain indicate that perceived self-efficacy operates as an important cognitive factor in the control of pain (Holroyd et al., 1984; Litt, 1987; O'Leary, 1985b; Reese, 1983; Shoor & Holman, 1984).

Perceived self-efficacy to reduce pain related positively to pain tolerance in the cognitive and control conditions but negatively in the placebo condition. Cognitive copers and controls had to rely on their own personal skills to effect reductions in pain. The stronger they believed in their capabilities to do so, the longer they endured mounting pain. However, this relation stems in part from preexisting capability to tolerate pain, which may itself partly reflect the exercise of perceived coping self-efficacy. Placebo medication seemed to undermine the active exercise of personal efficacy. To the extent that subjects expected analgesic medication to see them through the painful experience, they would be less inclined to mobilize and sustain coping efforts.

The effects of pharmaceuticals on perceived self-efficacy have received scant attention thus far but raise issues with important implications for treatments based solely or partly on medication. A perceived self-efficacy that rests entirely on medicinal aid will not survive withdrawal of medication (Chambliss & Murray, 1979a, 1979b). Programs that combine medication with development of coping skills can have diverse effects on perceived self-efficacy, depending on how the relative contribution of these two factors is cognitively appraised and weighted. If medication helps to create conditions that enable people to acquire generalizable skills they might otherwise fail to develop, it can enhance perceived self-efficacy. If medication facilitates skill development, and the contribution of the skill component is emphasized and medication is given little weight, it will have no additive effect. And finally, medication can undermine the efficacy-enhancing value of skill development if coping successes are ascribed to medicinal aids rather than to improved capability (Craighead, Stunkard, & O'Brien, 1981).

Efficacious exercise of cognitive control over pain sensations enables people to tolerate high levels of painful stimulation. However, the more protracted their efficacy-sustained endurance, the more pain and stress they eventually create for themselves. Indeed, subjects who had prolonged their endurance substantially struggled with increasing stress as they approached the limit of their capabilities and began to experience the pain as unbearable. Thus, for cognitive copers, a nonopioid mechanism would contribute to pain tolerance during the coping phase, when the exercise of cognitive control contravenes pain sensations, but an opioid mechanism would be enlisted in later stages of coping as people experience the stressful predicament of mounting pain with failing cognitive control. An appropriate next step in this line of research is to compare the level of opioid activation during phases of successful and failing cognitive control.

The findings of this study provide some evidence for both an opioid-mediated component and a nonopioid component for

attenuating the impact of pain stimulation by cognitive means. For cognitive copers administered saline, the combined action of both mechanisms contributed to their ability to endure painful stimulation. They displayed a sizable increase in pain tolerance. In contrast, cognitive copers who were administered naloxone, an opiate antagonist, found it more difficult to manage pain. However, evidence that the cognitive copers were able to increase their pain tolerance even under opioid blockage lends support for a nonopioid component in the exercise of cognitive pain control. It could be argued that naloxone did not produce complete opioid blockage. However, the use of a high dosage of naloxone, which in other studies has been shown to block opioid activity fully, would argue against such an interpretation.

The correlational findings provide new information on how different forms of self-efficacy relate to opioid activation. Coping with heightened pain accompanying naloxone requires active exercise of strategies for alleviating pain rather than mere forbearance. People who judge themselves good pain copers would be especially distressed by their eventual ineffectiveness to manage their pain. It is perhaps for these reasons that the degree of opioid activation is best predicted by perceived capability to reduce pain. The stronger the subjects' perceived self-efficacy to reduce pain, the greater was the opioid activation. An alternative possibility to mediation through stress is that self-efficacy expectations directly activate the central nervous system to release pain-blocking opioids independent of stress. Evidence that animals can learn to activate their endogenous opiate systems in the presence of cues formerly predictive of painful experiences (Watkins & Mayer, 1982) adds some credence to the possibility of direct central activation.

Our findings also provide suggestive evidence that placebo medication may activate some opioid involvement. After the full time had elapsed for naloxone to exert its antagonistic effect, subjects in the naloxone condition were less able to tolerate pain than were those who had been given saline. Because placebo medication had its major impact on perceived self-efficacy to withstand pain, it was this expression of efficacy that predicted degree of opioid involvement.

Studies of acute pain arising from dental surgery provide strong evidence of placebo-induced analgesia that is blocked by naloxone (Gracely et al., 1983; Levine & Gordon, 1984). The weaker placebo response and opioid involvement obtained in this experiment may be due to the fact that cold pressor pain is much less stressful than acute clinical pain, which is more intense, prolonged, and cannot be terminated at will. However, evidence is conflicting on whether acute clinical pain involves a stress-activated opioid component. Surgery is not only stressful but also involves some physical trauma that can activate a variety of complicating physiological processes. The role of stress in placebo analgesia can perhaps be best clarified by examining naloxone hyperalgesia accompanying placebo medication with and without psychologically induced stress. How perceived self-efficacy arising from placebo medication might activate release of pain-relieving opiates independent of stress is also an intriguing issue that awaits further research.

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Received April 29, 1986

Revision received September 30, 1986

Accepted February 25, 1987 ■

Translating Cognition Into Action: The Role of Visual Guidance in Observational Learning

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ABSTRACT. This experiment examined the role of two forms of visual guidance in facilitating the translation of cognitive representations into action. Subjects matched a modeled action pattern either concurrently with the model or after the modeled display. They then either did or did not visually monitor their actions during tests of production accuracy in the model's absence. Acquisition of the cognitive representation was assessed periodically. Concurrent matching of modeled actions or visual monitoring of productions both increased the level of observational learning. The more accurate the cognitive representation, the more skilled were subsequent reproductions of the modeled actions. After acquiring proficiency in converting cognition to action, subjects maintained their level of performance accuracy even though modeled and visual-monitoring guidance were withdrawn. These results are in accordance with the theory that cognitive representation mediates response production and that corrective adjustments through visual guidance aid in the translation of conception into action.

ACCORDING TO THE SOCIAL cognitive theory of observational learning (Bandura, 1986), information conveyed by modeled performances is extracted through selective attention to critical features and transformed into a cognitive representation of the actions by symbolic coding and cognitive rehearsal. The cognitive representation guides response production and provides a standard against which performance feedback is compared for corrective adjustments.

In addition to attentional and retention processes that determine the acquisition of cognitive representations, a conception-matching pro-

This research was supported by Public Health Research Grant MH-5162-25 from the National Institute of Mental Health. We gratefully acknowledge the assistance of Scott Estes, Michael Kolasa, Jeffrey LaVigne, Mark Wiseley, and Richard Zraick in the conduct of the experiment.

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cess governs the translation of cognitive representations into action. If the critical features of the component responses comprising the modeled action pattern are readily represented and easily producible, accurate representational guidance of response production can be achieved with little in the way of performance and informative feedback (Bandura & Jeffery, 1973; Gerst, 1971). However, in modeled activities comprising intricate component responses, difficulties arise in detecting and encoding their critical features. As a result, initial performances are likely to be flawed (Martens, Burwitz, & Zuckerman, 1976). It is also possible that some features of action patterns are too fine-grained to represent cognitively (Adams, 1984). A recent study of observational learning, however, shows that learners were able to encode and symbolically represent even the timing requirements of modeled rapid movements (Adams, 1986).

Monitored performance provides the vehicle for converting representations to skilled actions. Production of modeled actions will be flawed if feedback accompanying performance is insufficient to permit ready detection and correction of mismatches between conception and action. The transformational production mechanism has been addressed in a series of studies on observational learning of an action pattern that normally lies outside the visual field (Carroll & Bandura, 1982, 1985). Concurrent visual monitoring of performance facilitates reproduction of a modeled action pattern, but not until an adequate cognitive representation of it has been formed. After people have translated accurate representation into corresponding behavior by closely monitored performances, they execute them skillfully without requiring modeling guides or ongoing feedback.

The present experiment was primarily designed to clarify further the role of visual guidance in the action production process. The basic conception-matching process by which cognition is converted to action can be aided by two forms of visual guidance. The first involves visual coordination of performance with a cognitive representation of the modeled actions. Visual monitoring aids error correction by identifying mismatches between performance feedback and one's knowledge of the modeled actions.

The second form of visual guidance for structuring behavior involves visual coordination of performance with ongoing modeled actions. This type of guidance is not solely an external matching process. To match a novel intricate activity as it is being rapidly modeled strains attentional and coordinative capabilities by requiring execution of matching actions at the same time they are being modeled. Having a representation of the action parameters can greatly aid the matching process through anticipatory guidance of attention and action.

Both forms of visual guidance serve to reduce the discrepancy between cognitive representation and performance of modeled actions by aiding in error detection and correction and, thereby, decreasing performance errors. Similarly, the literature on the role of response guidance in skill development also suggests that a variety of proce-

dures that minimize performance errors can facilitate learning of motor tasks (e.g., Holding, 1965; Singer, 1977; Welford, 1976). However, the relationship between guidance procedures and cognitive representation of actions has received little attention.

The present study analyzed the contribution of the preceding two forms of visual guidance to the conception-matching process of observational learning. Subjects observed a model perform a novel action pattern that would normally lie outside their field of vision. They then attempted to match the action pattern either by performing concurrently with the model or by performing separately after completion of the modeled display. Within each of these conditions, subjects then either did or did not visually monitor their actions during tests of their ability to reproduce from memory what had been modeled. At selected points in the series, the accuracy of subjects' cognitive representation of the modeled activity was measured. In a final phase of the experiment, all subjects were tested for reproduction accuracy of the modeled actions without the model being present and without being able to visually monitor their actions.

Extensive pilot research revealed that without some conception of the action pattern subjects have great difficulty in concurrently matching the modeled behaviors as they are being displayed. Other research has similarly shown that previewing a tracking pattern before physically tracking it improves performance accuracy (Poulton, 1957; Pew, 1974). Physical tracking has also been found to require more attentional and processing resources than observation of tracking (Klein & Posner, 1974). Therefore, subjects in the concurrent matching condition as well as those in the separate matching condition first observed the modeled actions before attempting to perform them.

It was predicted that both visual coordination of performance with modeled actions and visual monitoring of actions during reproduction tests would facilitate skilled reproduction from memory relative to the control condition in which these factors were absent. It was also predicted that the facilitative effect of both forms of visual guidance would increase as the accuracy of the cognitive representation increased.

There was no a priori basis for predicting whether behavior can be structured better by visual monitoring of one's reproductions or by concurrently matching the modeled actions. It might be reasoned that the condition providing both forms of visual coordination should produce the highest level of observational learning. However, the dual sources of guidance would not yield added benefits if they provided redundant information, or if the task of matching the model and subsequently monitoring one's actions exceeded information-processing capacities (Broadbent, 1958).

Finally, it was predicted that after subjects had acquired an accurate cognitive representation and routinized its translation into action, skilled execution would be largely regulated and maintained by lower control systems and would no longer require modeled guidance or continual visual monitoring.

Method

Subjects

Twenty male and 20 female right-handed, paid volunteers were recruited from among undergraduate students at the University of Arizona. Subjects of each sex were randomly assigned in equal numbers to each of four conditions.

Modeling Stimuli and Apparatus

The modeled action pattern and paddle device used by subjects for response production were the same as that used in a prior experiment (Carroll & Bandura, 1982). Hence, only a brief description of these aspects of the experiment will be presented here.

Each subject watched a video monitor showing a male model performing a complex action pattern containing nine different response components, which varied in the spatial configuration and movement of the arm, wrist, and paddle. The first response component or starting position of the modeled action pattern was for 5 s. The eight subsequent response components were then each modeled for 2 s, with a 1.5-s transitional movement between the component actions. The complete action pattern took 33 s to execute. This complex action pattern was constructed so as to encompass common aspects of intricate activities. It required both correct patterning and temporal sequencing of actions, some of which were readily codable while others contained features that were highly subtle.

The modeled display presented only the extreme right portion of the body, as videotaped from behind the model, so that observers would not have to transform the modeled actions. A 19-in. (48.26 cm) video monitor was used to play back the action pattern. The camera angles for recording the model's and subjects' performances were kept approximately equal, so that the visual stimuli resulting from the model's performance would closely approximate those that subjects, themselves, would receive when attempting to reproduce the demonstration. Previous research has shown that a marked discrepancy between these camera angles tends to retard observational learning of intricate activities (Roshal, 1961) and avoidance responses (Greenwald & Albert, 1968).

A second videocassette recorder was used to record subjects' reproductions of the modeled action pattern. A manual switching device connected to the two videocassette recorders allowed subjects in the visual monitoring conditions to observe their performances on the video monitor, whereas those not scheduled to observe their performances saw a neutral gray, imageless raster on the monitor. Connected to the second videocassette recorder was a smaller, 12-in. (30.48 cm) monitor which was used by the operator to observe subjects' performances when no image appeared in the larger monitor.

Procedure

Subjects sat before the large video monitor. The angle on the video camera, located behind them, was adjusted so as to make visual feedback from each subject's performance similar to visual feedback from the modeled action pattern.

Subjects were informed by a male experimenter that the study dealt with the learning of movement patterns. They were told to put on a pair of plastic safety goggles, which were painted black and which had their lenses removed. Although subjects reported being unable to view their movements, which were performed to the right side and back of the head, they wore the goggles to further insure the unobservability of the action pattern. Subjects were instructed to watch the video monitor at all times.

After demonstrating the correct grip for holding the paddle handle, the experimenter moved the subject's arm to correspond to the correct starting position twice. Subjects then twice practiced the correct grip and the designated starting position. They were instructed to attend closely to the position of the model's arm, wrist, and paddle in order to reproduce the action pattern accurately. They were also told to report when they had completed their attempt to reproduce the modeled action pattern.

Subjects in the concurrent matching conditions first observed the modeled action pattern, followed by a 26-s unfilled retention interval. Then they concurrently performed the modeled actions as they watched them being produced. Subsequently, they were tested for their ability to reproduce from memory the modeled actions.

Subjects in the separate matching condition first observed the modeled action pattern, then performed it from memory, then observed the modeled action pattern again, and subsequently were tested for their ability to reproduce the modeled actions. In all experimental conditions performances preceding each reproduction test occurred without visual monitoring.

The above sequences of phases equated all experimental conditions for number of matching performances and for number of modeled presentations, while keeping total time constant. An unfilled retention interval of 26 s was chosen because prior research (Carroll & Bandura, 1985) found that this was the mean time taken by subjects to execute the modeled action pattern.

Half of the subjects within each of the above conditions were able to see their actions on the video monitor during the tests for reproduction accuracy. The remaining half were not provided with the opportunity to visually monitor their actions.

All subjects repeated the sequence of phases described above four times. In addition, they were tested for reproduction accuracy on a final set of two trials without the aid of prior performance with the model or visual monitoring. Thus, all subjects were tested a total of six times for their ability to reproduce from memory the modeled action pattern.

After the second, fourth, and sixth test trials, the accuracy of the cognitive representation of modeled actions was assessed by a recognition test of component responses and a pictorial-arrangement test of knowledge of the correct sequence of component responses.

Cognitive Representation

In the *recognition test*, subjects were presented photographs of the nine response components of the action pattern along with photographs of three highly-similar distractors for each component. The response components and distractors were photographed directly from the video monitor to ensure equivalence of the former to the recorded modeled pattern. Each component and its distractors were mounted on a separate page according to a predetermined random sequence, with the restriction that no two components could occur on successive pages in the same sequence as displayed in the modeled action pattern. The spatial arrangement of components and distractors on each page was also randomly determined. Each time subjects were tested for recognition memory they were presented different random orders of components and their accompanying distractors. They recorded their choice of correct components by writing the alphabetic letter printed next to each photograph. Ten s were allowed for each of these choices. The accuracy of cognitive representation was scored by awarding one point for each correct choice. The maximum score was 9.

In the *pictorial-arrangement test*, which immediately followed the test for recognition, subjects were shown photographs of the nine response components, depicted in a scrambled order. They were instructed to arrange the photographs from left to right in the order which accurately reflected the sequence of component responses exhibited by the model. The scrambled orders, which differed for each of the three presentations of the photographs, were randomly selected, with the restriction that no two components could occur in the same order as depicted in the demonstration. Subjects were allowed a maximum of two minutes to complete this task. The accuracy of cognitive representation was scored by awarding one point for any two response components correctly sequenced. The maximum score was 8.

Following the tests for cognitive representation after the fourth reproduction test trial, all subjects were told they would no longer see the modeled action pattern before being tested for reproduction accuracy. Subjects who had engaged in concurrent matching of the demonstration and/or visually monitored their reproductions were informed that these sources of guidance would no longer be available. Thus, the final block of two reproduction test trials occurred consecutively without either source of visual guidance.

Experimental Design

The effects of model-matching lag (concurrent or separate match-

ing) and monitoring of reproductions (presence or absence) were analyzed by a 2×2 mixed-design ANOVA; reproduction blocks (three blocks of two test trials each) constituted the within-subjects factor. Prior to performing an ANOVA on each of the dependent variables, a Multivariate Analysis of Variance (MANOVA) was performed as an omnibus test of significance.

Scoring of Reproduction Accuracy

Each response component and preceding transition movement were scored for reproduction accuracy. These segments were played back and viewed separately by freezing the frame or frames at which subjects completed the action component. Subjects were awarded two points for a perfect match to the modeled component in form and sequence. One point was awarded if the reproduction contained a minor, but discernible, error in wrist, arm, or paddle position, on component or transition movement, or if the component was correct but produced out of sequence. Subjects received no points if their component reproduction differed markedly from the modeled pattern in one or more features. The more errors subjects made in form and sequence the lower was their reproduction score. The maximum score possible was 18 points for each of the six reproduction attempts.

Accuracy of matching modeled actions was scored in precisely the same way as it was on reproduction test trials.

Reproductions and matching performances of a sample of pilot subjects ($n = 20$) were independently rated by two judges to ensure proficiency in using the scoring criteria. To increase interrater reliability, photographs of each response component were displayed while subjects' reproductions and matching performances were being scored. These same judges then independently rated the performances of all the subjects in the main experiment. The judges had no knowledge of the hypotheses or the conditions to which subjects had been assigned. The reliability coefficients computed for each of the three blocks of reproductions were $r = .91$; $r = .94$; $r = .92$, respectively. Overall reliability, based on the Fisher r to z' transformation, was $r = .92$. Reliability coefficients for the two blocks of matching performances were $r = .90$ and $r = .95$, respectively. The overall reliability was $r = .93$.

Results

Data for males and females were pooled because the gender factor produced no significant differences on any of the three response measures ($F_s < 1$).

Before reporting the results on the effects of the treatment conditions on reproduction accuracy, it is important to verify that subjects were, in fact, able to achieve simultaneous matching of the modeled actions. Otherwise, concurrent matching would have been an experimental condition in name only. Those who matched the modeled actions con-

currently did so with high accuracy even on the first block of trials (83.3% of the maximum score of 36) and continued to match well in the second block of trials (84.1%). Dunn's multiple comparison procedure (Kirk, 1982) indicates that the level of accuracy did not differ significantly either across trial blocks or between concurrent matchers who could or could not observe their reproductions during test trials ($p > .05$).

The multivariate analysis (MANOVA) yielded significant between-subjects main effects for model-matching lag, $F(3, 34) = 12.57$, $p < .001$, for monitoring, $F(3, 34) = 8.29$, $p < .001$, and for the interaction between model-matching lag and monitoring, $F(3, 34) = 7.45$, $p < .001$. Significant within-subjects effects included a main effect for reproduction blocks, $F(6, 31) = 70.99$, $p < .001$, but neither of the two-factor interactions were significant. The triple interaction between reproduction blocks, model-matching lag, and monitoring, however, achieved significance, $F(6, 31) = 2.45$, $p < .05$. Univariate ANOVAs were then performed on each of the dependent variables.

Reproduction Accuracy

Figure 1 presents percentage accuracy of reproduction scores as a function of model-matching lag and monitoring across blocks of reproduction attempts. Results of analysis of variance revealed significant main effects for model-matching lag, $F(1, 36) = 20.15$, $p < .001$, and for monitoring, $F(1, 36) = 8.96$, $p < .005$. A significant interaction between model-matching lag and monitoring, $F(1, 36) = 17.70$, $p < .001$, was also found. Analysis of the simple effects of this interaction indicated that concurrent matching was superior to separate matching for subjects who could not observe their reproductions, $F(1, 36) = 18.90$, $p < .001$, but not for those who could monitor the adequacy of their reproductions ($F < 1$).

The within-subjects portion of the ANOVA indicated that reproduction accuracy increased significantly over blocks, $F(2, 72) = 110.70$, $p < .001$, which is due primarily to the substantial improvement in the second block of productions. The interactions between blocks and model-matching lag and between blocks and monitoring did not approach significance. However, the triple interaction between blocks, model-matching lag, and monitoring was significant, $F(2, 72) = 5.05$, $p < .01$. Analysis of the simple effects indicated that the difference between concurrent and separate matching for those subjects tested without visual monitoring was significant on the first, $F(1, 108) = 11.13$, $p < .001$, second, $F(1, 108) = 30.93$, $p < .001$, and third, $F(1, 108) = 35.96$, $p < .001$, blocks of reproduction. In contrast, the difference between concurrent and separate matching failed to approach significance on any of the three blocks for those who reproduced the modeled actions with the benefit of visual monitoring. The triple interaction appears to be caused primarily by the relatively

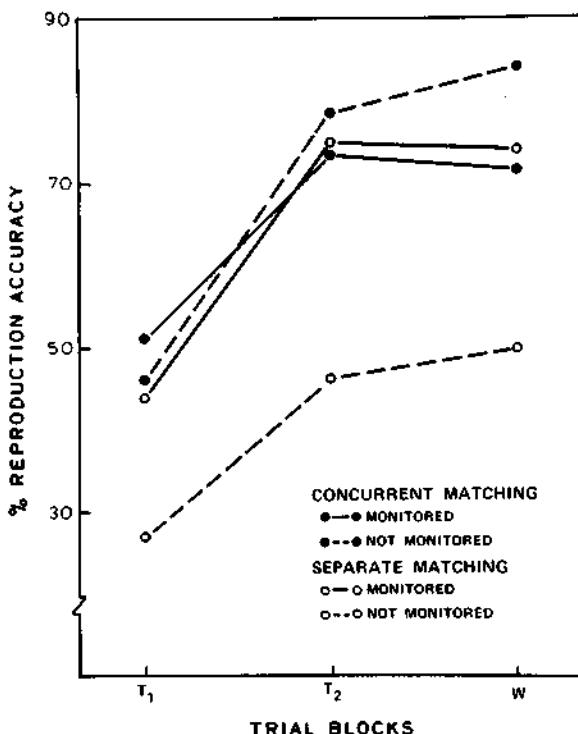


Figure 1. Percentage reproduction accuracy as a function of model-matching lag and monitoring of blocks of reproduction test trials. (T = test trial blocks; W = test trial block in which modeling and visual monitoring of reproductions are completely withdrawn.)

steeper increase in reproduction accuracy by conditions which were provided concurrent matching and/or visual monitoring as compared to the one that had neither source of guidance.

Dunn's multiple comparison procedure indicates that on each of the three reproduction blocks the three experimental conditions that had the benefit of concurrent matching and/or visual monitoring did not differ from each other, but each was significantly superior to the condition deprived of both of these sources of visual guidance ($p < .01$). Within-subject comparisons indicate that all experimental conditions increased their accuracy of reproducing the modeled actions between Block 1 and Block 2 ($p < .01$). As Figure 1 shows, subjects in all conditions maintained their level of reproduction accuracy on the last block, even though all the sources of external guidance were withdrawn.

Because it was predicted that development of the cognitive representation is necessary before subjects can profit from either concurrent matching or visual monitoring, subjects' performance on the first trial of Block 1 was analyzed by a one-way ANOVA. The results re-

vealed no differences in reproduction accuracy among the experimental conditions, $F(3, 36) = 1.30$. It was not until the second reproduction attempt of Block 1, by which time subjects had four exposures to the modeled actions, that differences among conditions emerged, $F(3, 36) = 6.24, p < .01$. The nature of the differences are the same as those reported above for the blocks of reproductions.

The t test for correlated means was used to determine whether the highly accurate execution of the modeled actions during concurrent matching carried over to performance during reproduction tests. On Block 1, concurrent matching was associated with decreased accuracy on reproduction trials regardless of whether subjects could monitor their reproductions, $t(9) = 6.33, p < .001$, or not, $t(9) = 6.97, p < .001$. On Block 2, neither of the concurrent matching conditions showed a decrement ($p > .10$). In contrast, on Block 1, the separate matching condition provided with visual monitoring on reproduction trials performed better on these trials than on matching trials, $t(9) = 3.33, p < .01$. However, there was no difference on Block 2, $t(9) = 2.18, p > .05$. Because the separate matching condition not provided with visual monitoring on reproduction trials achieved a low level of accuracy on matching trials, it is not surprising that performance accuracy on reproduction and matching trials did not differ on either block ($t < 1$).

Cognitive Representation

Subjects showed an increasing ability to distinguish correct components from incorrect ones, $F(2, 72) = 147.83, p < .001$, in successive tests of component recognition. The mean scores at each of the three tests were 4.72, 7.52, and 7.75, respectively. Subjects' performance on the pictorial-arrangement test mirrored that found for recognition, $F(2, 72) = 128.58, p < .001$. The mean scores at each of the three tests were, in order, 3.38, 6.20, and 6.70. Neither model-matching lag, monitoring, nor any of the interactions affected rate of acquisition of the cognitive representation.

Relationship Between Cognitive Representation and Reproduction Accuracy

In order to determine the relationship between conception and action, level of cognitive representation was correlated with the accuracy of reproducing the action pattern. Because the correlations did not differ significantly across experimental conditions, they were averaged using Fisher's r to z' transformation. Increases in component recognition were associated with increases in reproduction accuracy, $r = .34, p < .05$. Similarly, the better the representation of sequential ordering of the components, the higher was the reproduction accuracy, $r = .64, p < .001$. The two measures of representation correlated positively, but nonsignificantly, $r = .14$.

The relationship between representation and reproduction was further analyzed in terms of the temporal ordering of these factors by correlating the accuracy of the cognitive representation with accuracy of performance on the first trial of each subsequent block of reproductions. For all experimental conditions, as knowledge of component sequencing increased on the first test so did the accuracy of the subsequent reproduction, $r = .48$, $p < .001$. Similarly, component sequencing scores on the second test were significantly correlated with scores on the subsequent reproduction trial, $r = .36$, $p < .025$. With regard to component recognition, scores on the first test were not significantly associated with the succeeding reproduction scores, $r = .14$, whereas the correlation between recognition and subsequent reproduction did achieve significance on the second test, $r = .32$, $p < .05$.

Discussion

The results of the present experiment reveal that observational learning is greatly facilitated by opportunities to structure the appropriate action pattern by visually coordinating one's performances with either the modeled actions or a retained conception of them. Neither source of visual guidance affected the accuracy of initial reproductions of the modeled actions.

Concurrent matching produced almost perfect performance of the modeled actions from the outset. However, subjects displayed a substantial loss in accuracy when they first tried to reproduce the modeled actions from memory before they had a clear representation of them. After acquiring a more precise cognitive representation, subjects could reproduce the modeled actions just as accurately from memory of them as from matching the ongoing modeled performances. These patterns of results suggest that production proficiency was mediated by representational acquisition rather than being directly forged by accurate performances cued by modeling stimuli.

Correlational analyses showing that the better the cognitive representation the more accurate were the subsequent reproductions also lend support for representational guidance. Similar relationships between representation and action were found in previous studies using the same task (Carroll & Bandura, 1982, 1985). Findings of other studies have shown that observational learning is enhanced by cognitive representation which is manipulated independently of any performance opportunities by providing subjects with effective coding strategies (Bandura & Jeffery, 1973; Bandura, Jeffery, & Bachica, 1974). Subjects who had cognitively represented complex modeled actions during exposure to the model subsequently executed the action pattern with considerable accuracy, whereas those who failed to develop an accurate cognitive representation could not produce the behavior. Such findings increase confidence that a causal relationship underlies the correlation between cognition and action.

The finding in our study that the cognitive representation increased in accuracy over trials but was unaffected by either visual monitoring or concurrent matching suggests that the cognitive representation develops primarily as a function of the number of exposures to the modeled information. It also suggests that the superiority of the visual guidance conditions lies mainly in their facilitating the translation of cognition into action. More specifically, while performing with the modeled actions, subjects in the concurrent matching condition use the visual information provided by the demonstration to guide their matching performances. Discrepancies between their performances and modeled information are reduced by corrective adjustments in their actions. A similar translation process operates under separate matching except that the corrective adjustments in action must rely on detection of mismatches with a retained representation of the modeled pattern. Subjects in this condition are aided in the process of error detection and correction by the provision of visual monitoring during reproduction tests. In fact, they achieved a level of observational learning comparable to that of subjects who had the model to guide their matching performances. Subjects, however, who engaged in separate matching and could not observe their actions during reproduction tests achieved a low level of observational learning.

With improved cognitive representation and repeated experience in translating conception to action, subjects routinize the activity to the point where they are no longer dependent on visual monitoring or modeled guidance. Although subjects who could neither coordinate their actions to those of the model nor see what they were doing also have experience in translating cognition to action, they must rely on impoverished feedback accompanying their reproductions to detect and reduce discrepancies between cognitive representation and action.

In contrast to the facilitative effect of visual monitoring under separate matching, reproduction accuracy under concurrent matching was not increased by visual monitoring. As noted earlier, visual monitoring may not have had a facilitative effect because it provides redundant information or because it increases competing attentional demands that could produce some interference. The latter is suggested by the finding that subjects in the concurrent matching conditions who reproduced modeled actions without visual monitoring became increasingly more proficient compared to their counterparts who visually monitored their reproductions. The difference between concurrent matching conditions might possibly have increased even further with additional experience in converting representational guidance to action.

As noted earlier, the modeled activity was designed so as to increase the generality of the findings to the observational learning and production of complex action patterns. This multifaceted action pattern comprised an intricate set of components requiring both differential patterning and temporal sequencing of actions. Some of the movements were readily codable whereas others involved highly subtle

shifts in form, transition, and position that are more difficult to discern. Having clarified some aspects of visual monitoring systems in observational learning, the research needs to be extended to articulate further the way in which the different forms of visual guidance operate in the transformational mechanism. For this purpose, a variety of action parameters—spatial patterning, temporal sequencing, codability, amplitude, speed—need to be varied singly and in combination.

The present study contributes to the growing body of evidence indicating that cognition plays an important role in motor learning (e.g., Adams, 1984, 1986; Bandura, 1986; Marteniuk, 1976; Newell, 1978). It also highlights the contribution of visually-guided performance to the process of matching action to cognitive representation. More generally, observational learning provides an excellent paradigm for investigating the relationship between cognition and action (Adams, 1984). Because observers acquire primarily symbolic representation for subsequent response production, assessment of what has been learned can be made independently of performance by means of verbal construction tests, recognition tests, pictorial-construction tests, and other methods. Virtually all learning phenomena resulting from direct experience can occur vicariously by observing the behavior of others and its consequences (Bandura, 1986). Hence, the cognitive component of traditional motor learning variables, such as knowledge of results, can also be investigated within the observational learning paradigm by having subjects view unskilled models who receive informative response feedback (Adams, 1986).

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Submitted July 24, 1986
Revision submitted December 17, 1986

9

Organisational Applications of Social Cognitive Theory

by
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Abstract:

Social cognitive theory explains psychosocial functioning in terms of triadic reciprocal causation. In this causal model, behaviour, cognitive and other personal factors and environmental events all operate as interacting determinants that influence each other bidirectionally. This article focuses on how personal factors that contribute importantly to this dynamic interaction can be altered to improve the level of organisational functioning.

Keywords:

SOCIAL COGNITIVE THEORY; ORGANISATIONAL FUNCTIONING; MASTERY MODELLING; BELIEFS; GOAL SYSTEMS

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This article was an invited address presented to the Australian Graduate School of Management in the University of New South Wales, August 1988, as the Sir Walter Scott Distinguished Visiting Professor.

Australian Journal of Management, 13, 2, December 1988, © The University of New South Wales

Social cognitive theory explains psychosocial functioning in terms of triadic reciprocal causation (Bandura 1986). In this causal model, behaviour, cognitive and other personal factors, and environmental events all operate as interacting determinants that influence each other bidirectionally. The present article focuses on how personal factors that contribute importantly to this dynamic interaction can be altered to improve the level of organisational functioning. Three aspects of social cognitive theory are especially relevant. They include: developing competencies through mastery modelling, strengthening people's beliefs in their capabilities so they make better use of their talents, and enhancing self-motivation through goal systems.

1. Developing Competencies Through Modelling

1.1 Guided Mastery Modelling

Modelling is being widely used with good results to develop intellectual, social and behavioural competencies (Bandura 1986). The method that produces the best results includes three major elements: First, the appropriate skills are modelled to convey the basic competencies. Second, the people receive guided practice under simulated conditions so they can perfect the skills. Third, they are helped to apply their newly learned skills in work situations in ways that will bring them success.

1.2 Modelling

Modelling is the first step in developing competencies. Complex skills are broken down into subskills. The subskills are then modelled on videotape in easily mastered steps. After the subskills are learned by this means they can be combined into complex strategies that can serve different purposes. Effective modelling teaches general rules and strategies for dealing with different situations rather than only specific responses. Trainees need to learn how to apply the rules with different people and under different circumstances. Providing many brief examples demonstrates how the rules can be widely applied and adjusted to fit changing conditions.

Human competency requires not only skills, but also self-belief in one's capability to use those skills well. Modelling influences must be designed to build self-assurance as well as to convey skills. The impact of modelling on beliefs about one's capabilities is greatly increased by perceived similarity to the models. Trainees more readily adopt modelled ways if they see individuals similar to themselves solve problems successfully with the modelled strategies than if they see the models as very different from themselves.

1.3 Guided Skill Perfection

After trainees understand the new skills they need guidance and opportunities to perfect them. Proficiency requires extensive practice. Initially, they put to test their newly acquired skills in simulated situations where they need not fear making

mistakes or appearing inadequate. This is best achieved by rôle-playing in which they practice handling the types of situations they have to manage in their work environment.

In perfecting their skills, people need informative feedback on how they are doing. Videotape replays are widely used for this purpose. Simply being shown replays of one's own behaviour usually does not produce much improvement (Hung and Rosenthal 1981). Such uninstructed self-observation does not ensure that trainees will notice what they are doing wrong or that they will figure out what kind of changes they need to make. Moreover, observing flawed performances can weaken trainees' beliefs in their capabilities. If performance feedback is to produce good results, it must direct attention to the corrective changes that need to be made. It should be given in such a way as to build self-assurance in one's capabilities. This is achieved by calling attention to successes and improvements, while correcting deficiencies.

The feedback that is most informative and achieves the greatest improvements relies on corrective modelling. In this approach, the subskills which have not been adequately learned are identified, and effective ways of performing them are modelled by those who are proficient at it. Trainees then rehearse those subskills until they master them. The simulated practice is continued until trainees can perform the skills proficiently and spontaneously.

1.4 Transfer Program: Self-Directed Success

Modelling and practice under simulated conditions are well suited for creating competencies. But new skills are unlikely to be used for long unless they prove useful when they are put into practice in work situations. People must experience sufficient success using what they have learned to believe in themselves and in the value of the new ways. This is best achieved by a transfer program in which newly acquired skills are first tried on the job in situations likely to produce good results. Trainees are assigned selected problems to manage in their everyday situation. Then they discuss their successes and where they ran into difficulties. As trainees gain skill and confidence in handling easier situations, they gradually take on more difficult problems. If people have not had sufficient practice to convince themselves of their new effectiveness, they apply the skills they have been taught weakly and inconsistently. They rapidly abandon their skills when they fail to get quick results or when they experience difficulties.

Mastery modelling is now increasingly used to develop competencies. But its potential is not fully realised if training programs do not provide sufficient practice to achieve proficiency in the modelled skills, or if they lack an adequate transfer program that helps people to experience success with their new skills in their natural environment. When modelling is combined with guided practice and success experiences, this method produces excellent results. Because people learn and perfect effective ways of behaving under lifelike conditions, problems of transferring the new skills to everyday life are reduced.

1.5 Organisational Applications

Let us now consider some examples in which guided mastery modelling has been applied and evaluated in work organisations. Supervisors have important impact on the morale and productivity of an organisation. They are often selected for their technical competencies, but their success in their supervisory rôle largely depends on their interpersonal skills to guide and motivate their supervisees. Mastery modelling programs have been devised to teach supervisors the interpersonal skills they need in order to work effectively through others.

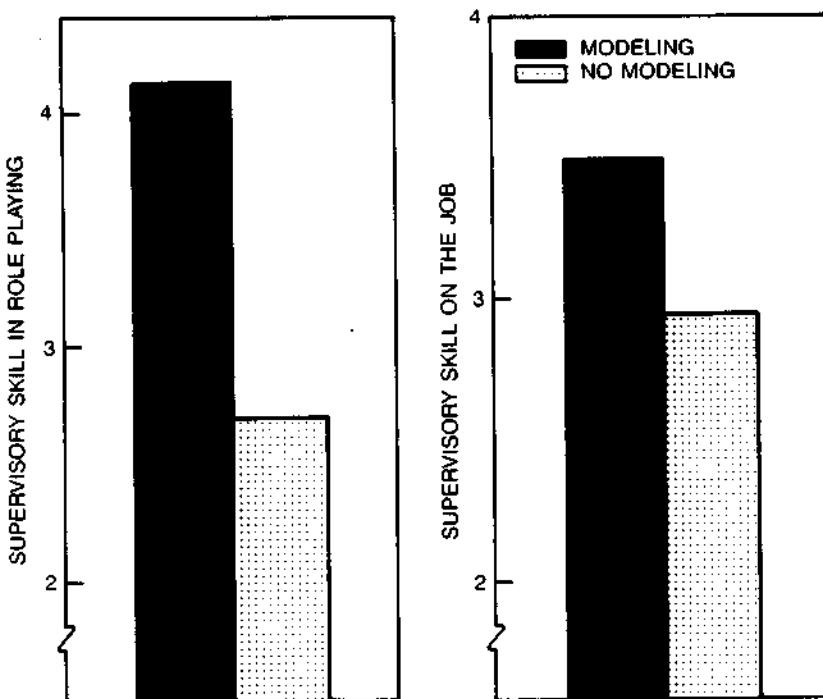
Latham and Saari (1979) provide one such example. They used videotape modelling to teach supervisors how to: increase motivation; give recognition; correct poor work habits; discuss potential disciplinary problems; reduce absenteeism; handle employee complaints; and overcome resistance to changes in work practices. Summary guidelines of the skills being modelled were provided to aid memory of the rules and strategies. The group of supervisors discussed and then practiced the skills in rôle-playing, using incidents they had previously had to manage in their work. They received instructive feedback to help them improve and perfect their skills.

To facilitate transfer of skills from the training situation to their work environment, at the end of each session the supervisors were given written copies of the guidelines. They were asked to use the skills they had learned with one or more employees on the job during the next week. They later reported their successes or difficulties in applying the skills. If they encountered problems, the incidents were re-enacted and the supervisors received further training through instructive modelling and rôle-playing on how to manage such situations.

Figure 1 shows the differences in supervisory skills between supervisors who had received the mastery modelling and those who had not. The graph on the left shows how well supervisors resolved supervisor-employee problems enacted in rôle-play situations three months after training. The graph on the right shows the ratings of the supervisors' performance on the job one year after training.

Supervisors who had received the mastery modelling training performed more skillfully both in rôle-playing situations and on the job than did supervisors who had not received the training. Merely explaining to supervisors the rules and strategies on how to handle problems on the job without modelling and guided practice did not improve their supervisory skills. To enhance supervisory skills, supervisors need instructive modelling, guided practice with corrective feedback, and help in transferring the new skill to the job situation.

Porras and his colleagues have examined how a mastery modelling program affects the morale and productivity of organisations (Porras, Hargis, Patterson, Maxfield, Roberts, and Bies 1982). In one plant, first-line supervisors participated in the mastery modelling program to improve their supervisory skills with methods similar to those used by Latham. Two other plants of the same company did not receive the modelling-based program. Supervisors who had the benefit of the modelling program improved and maintained their supervisory problem-solving skills as rated by their employees. The plant in which the modelling program was applied had a lower absentee rate, lower turnover of employees, and a higher level

**Figure 1**

Degree of improvement in supervisory competencies exhibited by supervisors who had received the mastery modelling program and those who had not. (Plotted from data of Latham and Saari, 1979.)

of productivity in a six-month follow-up assessment.

2. Perceived Self-Efficacy

Modelling with guided practice is a highly effective method for developing skills and competencies. But there is a difference between possessing skills and being able to use them well and consistently under difficult circumstances. Success requires not only skills but also strong self-belief in one's capabilities to exercise control over events to accomplish desired goals. People with the same skills may, therefore, perform poorly, adequately, or extraordinarily, depending on whether their self-beliefs of efficacy enhance or impair their motivation and problem-solving efforts.

2.1 Diverse Effects of Self-Efficacy Beliefs

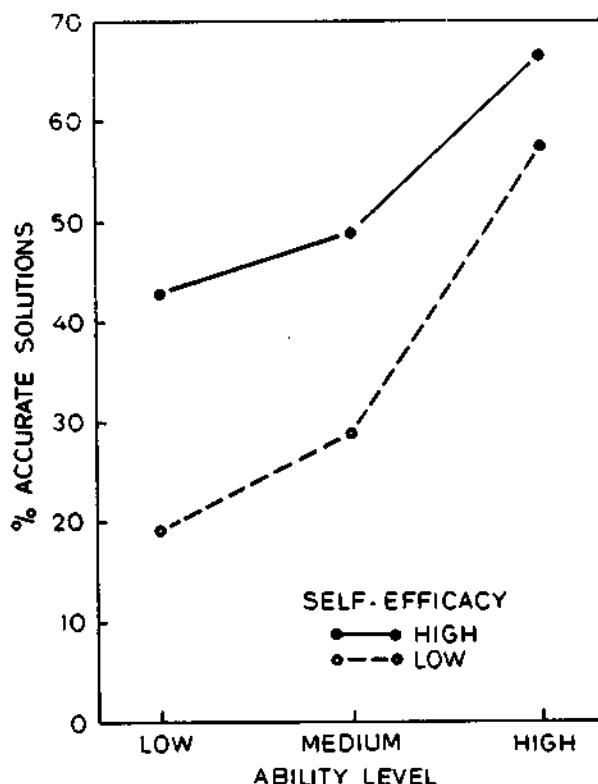
People's beliefs about their capabilities can effect their lives in many ways (Bandura 1988a,b,c). Such self-beliefs influence: the kinds of choices they make; how much effort they will put forth in what they do; how long they will persevere in the face of difficulties and setbacks; their resilience and bounce-back capacity after suffering failures or setbacks; and whether their thought patterns are self-hindering or self-aiding. People with a strong sense of efficacy focus their attention on how to master tasks. Those plagued by self-doubts dwell on all the things that can go wrong. Visualising failure scenarios undermines performance. Efficacy beliefs also affect the amount of stress and depression people experience in coping with environmental demands. In stress and depression, perceived self-efficacy is concerned not only with coping capabilities but with one's ability to control distressing trains of thought. It is not the mere occurrence of apprehensive thoughts but the inability to turn them off that is anxiety provoking. The exercise of control over one's own consciousness is captured well in the Chinese proverb: "You cannot prevent the birds of worry and care from flying over your head. But you can stop them from building a nest in your head." Let us now examine these diverse effects of beliefs of personal efficacy.

2.2 Choice Behaviour

In executing their rôles, people have to make decisions about what courses of action to pursue and how long to continue what they have undertaken. Such decisions are partly determined by judgements of personal efficacy. People avoid tasks and challenges they believe exceed their capabilities. But they undertake and perform confidently tasks they judge themselves capable of managing.

That belief in one's capabilities is a key to optimal use of one's skills is shown in a study by Collins (1982). She selected students at three levels of mathematical ability. At each level of ability she found students who were highly self-assured or those who distrusted their ability. All the students were then given difficult problems to solve. Within each level of ability, students who believed in their capabilities were quicker to discard faulty strategies. They solved more problems, as shown in Figure 2. They also chose to rework more of those they failed, and did so more accurately. Self-efficacy belief also influenced causal ascriptions of failure. Students who regarded themselves as highly efficacious attributed their failures to lack of effort, whereas those who were plagued by self-doubts ascribed their failures to deficient ability. As this study shows, people who perform poorly may do so because they lack the skills or because they have the skills but they lack self-belief to use them effectively.

Research by Locke and his colleagues demonstrates how people's beliefs in their capability affect their productive creativity (Locke, Frederick, Lee, and Bobko 1984). After people's ability to think creatively was measured, they were taught strategies on how to improve creative thinking. The more the training increased people's beliefs in their capabilities, the higher the goals they set for themselves, the more strongly they remained committed to achieving their goals, and the more

**Figure 2**

Mean levels of mathematical solutions achieved by students as a function of mathematical ability and perceived mathematical self-efficacy. (Plotted from data of Collins, 1982.)

productive they were in coming up with creative ideas.

People's beliefs about their capabilities can have a profound effect on the direction their development takes, by influencing the career paths they follow. The choices made in earlier years create different competencies and interests which determine the occupational options that can be realistically considered. The stronger people's self-belief of efficacy, the more career options they consider to be possible for themselves and the better they prepare themselves educationally for different occupational pursuits (Betz and Hackett 1986; Lent and Hackett 1987). People often restrict their career options because they believe they lack the necessary capabilities, although they have the actual ability. The self-limitation

arises from self-doubts rather than from inability. Women are especially prone to limit their interests and range of career options by self-beliefs that they lack the necessary capabilities for occupations traditionally dominated by men, even when they do not differ from men in actual ability.

Technological changes often reinstate old self-belief barriers requiring new remediation. For example, computer literacy is becoming increasingly important in career development and advancement. Boys are more likely than girls to master computers, which they see as necessary for their future. Socialisation practices that breed a low sense of efficacy to use computer tools are creating new career barriers for women (Miura 1987a). Boys express higher efficacy to program and operate computers than do girls. College students who distrust their capabilities show less interest and inclination to acquire computer competencies, and see computer literacy as less relevant to their careers (Miura 1987b).

2.3 Motivational Impact of Self-Efficacy Beliefs

People's beliefs in their capabilities affect their motivation as well as the activities they undertake. Significant human accomplishments require perseverant effort. It is renewed effort in the face of difficulties and setbacks that usually brings success. To give up prematurely limits one's accomplishments. Self-doubts can set in fast after a few failures or reverses. The important matter is not that difficulties arouse self-doubt—which is a natural immediate reaction—but the recovery from difficulties. Some people quickly recover their self-confidence, others lose faith in their capabilities. It is resiliency of self-belief that counts.

In his revealing book, titled *Rejection*, John White (1982) provides vivid testimony that the striking characteristic of people who have achieved eminence in their fields is an inextinguishable sense of efficacy and a firm belief in the worth of what they are doing. This self-belief system enabled them to override repeated early rejections of their work. A robust sense of personal efficacy provides the needed staying power.

Many of our literary classics brought their authors repeated rejections. James Joyce's *The Dubliners* was rejected by 22 publishers. The novelist, Saroyan, accumulated several thousand rejections before he had his first literary piece published. Gertrude Stein continued to submit poems to editors for twenty years before one was finally accepted. Now, that's invincible self-efficacy. Such extraordinary persistence in the face of massive unintermitting rejection defies explanation in terms of either reinforcement theory or utility theory. Over a dozen publishers rejected a manuscript by E. E. Cummings. When he finally got it published by his mother the dedication read: "With no thanks to..." followed by the long list of publishers who had rejected his book.

A sense of humour also helps endurance. A resilient author was able to paper all four walls of his room with the thousands of rejection slips he had received. He preferred the 8×11-inch rejection notices to the 3×5 ones, because they covered more space. From time to time, he threw rejection parties with invitations written on the backs of his surplus rejection slips. The negative

responses sometimes go beyond rejection slips. One writer received a little pile of ashes from the publisher to whom he submitted his prized manuscript.

Early rejection is the rule, rather than the exception, in other creative endeavours. The Impressionists had to arrange their own art exhibitions because their works were routinely rejected by the Paris Salon. A Paris art dealer refused Picasso shelter when he asked if he could bring in some of his paintings from out of the rain. Van Gogh sold only one painting during his life. Rodin was repeatedly rejected by the Beaux-Arts school in Paris. The portrait of Whistler's mother was condemned for her first nineteen years to the "cellar of the rejected," by the Royal Academy of artists. She was resurrected and sold for a few pounds to a pawn broker. Today she hangs majestically in the Louvre. The musical works of most renowned composers were initially greeted with derision. Stravinsky was run out of Paris by an enraged audience, and critics, when he first served them the *Rite of Spring*. Many other composers suffered the same fate, especially in the early phases of their career. The brilliant architect, Frank Lloyd Wright, was one of the more widely criticised and rejected architects during much of his career.

To turn to more contemporary examples, Hollywood initially rejected Fred Astaire for being only "a balding, skinny actor, who can dance a little." Decca Records turned down a recording contract with the Beatles with the non-prophetic evaluation, "We don't like their sound. Groups of guitars are on the way out." Whoever issued that rejective pronouncement must cringe at each sight of a guitar. And the rejection list goes on.

It is not uncommon for authors of scientific classics to report repeated initial rejection of their work, often with hostile embellishments. For example, John Garcia, who eventually won well-deserved recognition for his fundamental psychological discoveries, was once told by a reviewer of his manuscript that one is no more likely to find the phenomenon he discovered than bird droppings in a cuckoo clock. Verbal droppings of this type demand tenacious self-belief, to continue the tortuous search for new Muses.

Scientists often reject theories and technologies that are ahead of their time. Eminent scientists had this to say about airplanes: "Flight by machines heavier than air is impractical and insignificant, if not utterly impossible." They regarded the notion of rockets in 1902 as: "Interesting, but the impossibility of ever doing it is so certain that it is not practically useful." Considering the cold reception given to innovations, it is not surprising that the time between conception and technical realisation is awfully long: radio - 24 years; radar - 35 years; television - 53 years; antibiotics - 30 years; silicone - 38 years. The moral of the *Book of Rejections* is that rejections should not be accepted too readily as indicants of personal failings. To do so can be self-limiting.

People's self-beliefs of efficacy determine how much effort they will exert in an endeavour and how long they will persevere in the face of obstacles (Bandura 1988a). The stronger the belief in their capabilities, the greater and more persistent are their efforts. When faced with difficulties, people who have self-doubts about their capabilities reduce their efforts and settle for mediocre solutions or give up

altogether, whereas those who have a strong belief in their capabilities exert greater effort to master the challenge. Strong perseverance usually pays off in performance attainments. Because knowledge and competencies are achieved by sustained effort, people who give up easily because they disbelieve their capabilities make poor use of their talents and give up a good deal of control over their lives. The goals people set for themselves operate as powerful self-motivators. We shall see later that how people judge their capabilities affects the goals they adopt, and whether they become discouraged or motivated by disappointing performances.

2.4 Perceived Self-Efficacy and Stress and Depression

People's beliefs in their capabilities affect how much stress and depression they experience, as well as the activities they choose to pursue, and the level of their motivation. People who believe they can cope with difficult tasks and situations are not upset by them. Those who believe they cannot manage difficult situations experience much stress. They think about their deficiencies. They see situations as full of obstacles. They worry about potential troubles that rarely, if ever, happen. In so doing, they distress themselves and impair their performances. Belief in one's capability is thus a key factor in determining how disturbing life stressors are to people.

Inability to cope with events that affect one's life can give rise to depression. People are vulnerable to depression and performance impairment when they judge themselves as deficient in capabilities, but see similar others succeed. The satisfactions people derive from what they do are determined by the standards against which they measure their accomplishments. People who become easily depressed set high standards for themselves, well above their perceived capabilities, and they tend to belittle their accomplishments. High aspirations are self-motivating, rather than self-discouraging, if one's accomplishments are measured against attainable subgoals rather than distant aspirations.

2.5 Sources of Perceived Self-Efficacy

Mastery Experiences. People's beliefs about their capabilities can be instilled and strengthened in four principal ways. Information that is relevant for judging personal efficacy is not inherently instructive. A distinction must be drawn between information conveyed by experiences and the information as selected, weighted, and integrated into self-efficacy judgements. The most effective way of developing a strong sense of efficacy is through *success experiences*. Performance successes build a strong sense of capability. Failures create self-doubts. But if people experience only easy successes they come to expect quick results and are easily discouraged by failure. A resilient sense of efficacy requires experience in overcoming obstacles through perseverant effort. Some setbacks and difficulties in human pursuits serve a useful purpose in teaching that success usually requires sustained effort. After people become assured of their capabilities through repeated successes, they can manage setbacks and failures without being adversely

effected by them.

Vicarious Experience. The second way of strengthening self-beliefs is by *modelling*. Ready access to proficient models builds competencies for dealing with interpersonal and work situations. Acquiring new skills strengthens beliefs in one's capabilities. Modelling also affects self-efficacy beliefs through a social comparison process. People partly judge their capabilities in comparison with others. Seeing people similar to oneself succeed by sustained effort raises observers' beliefs about their own capabilities, whereas observing similar others fail despite high effort lowers observers' judgements of their own capabilities and undermines their efforts.

Social Persuasion. Social persuasion is a third way of increasing people's beliefs that they possess the capabilities to achieve what they seek. Realistic encouragements that lead people to exert greater effort are more likely to bring success than if people are troubled by self-doubts. But to raise unrealistic beliefs of personal efficacy runs the risk of inviting failures that discredit persuaders and undermine perceptions of personal efficacy.

Successful motivators and efficacy builders do more than convey positive appraisals. In addition to raising people's beliefs in their capabilities, they assign tasks to them in ways that bring success and avoid placing them prematurely in situations where they are likely to fail. To ensure progress in personal development, success is measured in terms of self-improvement rather than by triumphs over others.

Physiological State. People also rely partly on their level of bodily stress in judging their capabilities. They read their emotional arousal and tension as signs of vulnerability to poor performance. In activities involving strength and stamina, people judge their fatigue, aches, and pains as signs of physical incapability. The fourth way of modifying self-beliefs of efficacy is to reduce people's bodily stress and how they interpret their bodily states.

2.6 The Power of Self-Efficacy Belief

The findings of different lines of research show that people who have a strong belief in their capabilities think, feel, and behave differently from those who have doubts about their capabilities. People who doubt their capabilities shy away from difficult tasks. They have low aspirations and weak commitment to the goals they choose to pursue. Failure wrecks their motivation. They dwell on their personal deficiencies, the difficulties of the task, and adverse consequences of failure. Such negative thinking disrupts their efforts by diverting attention from how best to perform tasks to preoccupation with personal deficiencies and possible calamities. They give up quickly in the face of difficulties and are slow to recover their confidence following failure or setbacks. Because they judge insufficient performance as deficient aptitude, it does not require much failure for them to lose faith in their capabilities. They fall easy victim to stress and depression.

In contrast, a strong belief in one's capabilities increases personal functioning in many ways. People who have high assurance in their capabilities approach difficult tasks as challenges to be mastered, rather than as threats to be avoided. Such an efficacious outlook fosters interest and strong involvement in activities. They set themselves challenging goals, and maintain strong commitment to them. They increase their effort in the face of failures or setbacks. They quickly recover their self-confidence after setbacks. People who believe strongly in their capabilities attribute failure to insufficient effort, which supports a success outlook. They approach threatening situations with assurance that they can exercise some control over them. As a result, they experience low stress. Such a self-confident outlook produces performance accomplishments, reduces stress, and lowers vulnerability to depression.

2.7 Benefits of Optimistic Self-Appraisal of Efficacy

Human attainments and positive well-being require an optimistic belief in one's capabilities. This is because social realities are fraught with difficulties. They are full of obstacles, adversities, frustrations, failures, and inequities. People must have a strong belief in their capabilities to sustain the effort needed to succeed.

People who experience much distress have been compared in their skills and beliefs in their capabilities with those who do not suffer from such problems. The findings show that it is often the normal people who are distorters of reality. But they display self-enhancing biases and distort in the positive direction. People who are socially anxious or prone to depression are often just as socially skilled as those who do not suffer from such problems. But the normal ones believe they are much more adept than they really are. The nondepressed people also have a stronger belief that they exercise some control over situations.

The successful, the venturesome, the sociable, the nonanxious, the nondepressed, the social reformers, and the innovators take an optimistic view of their personal capabilities to exercise influence over events that affect their lives. If not unrealistically exaggerated, such self-beliefs foster positive well-being and performance accomplishments. The strength of groups and organisations also lies partly in people's sense of collective efficacy that they can master problems and achieve desired results by concerted group effort.

2.8 Managerial Self-Efficacy

Robert Wood and I have conducted a series of studies on how managerial perceived efficacy affects organisational productivity, using a computer simulation of an organisation (Wood and Bandura 1988b). MBA students serve as managerial decision-makers. They know the organisational subfunctions that have to be performed, and they have a list of employees with a description of each one of them—their skills, experience, motivational level, and the quality of their work. Their task is to match employees to jobs. They also have to make decisions about three motivational systems to optimise the group's performance. For each employee, they have to decide what goals to set for them, what type, and amount

of instructive feedback to give them, and how to use social incentives to enhance job accomplishments.

They make their decisions from a set of options and record them in the computer. For example, in goal setting they can set no goals, encourage the employees to do their best, try to match a standard production time, better it, or approach it by a set of easier subgoals. A mathematical model computes the hours the group took to complete a work order, based on how employees were allocated to jobs and how well the managers used the three motivational systems. They manage a series of job orders and receive feedback after each job on how long it took the group to complete it.

2.9 *Conceptions of Ability*

Belief systems influence whether people interpret their experiences in ways that strengthen or undermine their sense of personal efficacy. One important belief system is concerned with how people view ability. People's conceptions of intellectual ability can have powerful impact on how well they function (M. Bandura and Dweck 1988; Dweck and Elliott 1983). Two major conceptions have been identified. In one perspective, ability is viewed as an acquirable skill that can be continually enhanced by gaining knowledge and perfecting one's competencies. People with this conception adopt an inquisitive, learning goal. They seek challenging tasks that provide opportunities to expand their knowledge and competencies. They regard errors as a natural, instructive part of mastering new activities. One learns from mistakes. They view high effort as the way to gain competencies. They judge their capabilities more in terms of personal progress than by comparing themselves against others.

In the contrasting perspective, people view ability as a more or less fixed capacity with which they come equipped. For them, situations in which they might do poorly carry high threat. They regard errors and mistakes as indications they are not smart. They often compare themselves against others and become easily threatened and discouraged when others surpass them. They prefer tasks that minimise errors and permit them to demonstrate proficiency at the expense of learning new skills. They regard high effort as indicative of low ability.

When faced with difficult tasks, people who view ability as an acquirable skill take a *task-diagnostic* focus on what is causing problems and how best to master the challenges. Those who regard ability as a fixed capacity take a *self-diagnostic* focus on personal deficiencies and possible adverse outcomes. Such intrusive thinking undermines effective use of capabilities by diverting attention from how best to master challenges to self-evaluative preoccupations.

In an organisational management study we instilled these different conceptions before the managers began the task (Wood and Bandura 1988a). In the acquirable skill condition, the managers were told that, like any other activity, decision making is a skill that is developed through practice. The more one works at it, the more capable one becomes. In the fixed capacity condition, the managers were told that decision making reflects their basic intellectual aptitude. The higher

their underlying cognitive capacities, the better their decision making.

In managing the simulated organisation, the MBAs received a series of job orders. After each set of six production orders, they rated their perceived managerial efficacy and the production goals they were aiming to achieve. We also measured how efficiently they used strategies to discover how best to motivate their employees.

As shown in Figure 3, managers who regarded decision-making ability as an acquirable skill maintained a strong sense of efficacy in the face of performance standards that are difficult to fulfill. They set challenging goals for themselves. They used good problem-solving strategies. They did well in fostering organisational productivity.

Managers who viewed decision-making ability as reflecting their basic intellectual capacities began to lose confidence in themselves as they encountered problems. They lowered their aspirations for the organisation. Their problem-solving deteriorated. Organisational productivity declined.

People who are ineffectual in running organisations tend to find fault with others. The MBAs who suffered a loss in perceived efficacy were quite uncharitable in their views of their employees. They regarded them as unmotivatable, unworthy of supervisory effort, and, given the option, they would have fired some of the employees. These findings illustrate the vulnerability of talent to the undermining effects of self-disbelief.

2.10 Perceived Controllability and Performance Standards

Another important belief system is concerned with people's beliefs about how much personal control they can exercise over things in their everyday life. There are two aspects to the exercise of control (Bandura 1986; Gurin and Brim 1984). The first concerns the level of self-efficacy to effect changes by productive use of capabilities and enlistment of effort. This constitutes the personal side of the transactional control process. The second aspect concerns the changeableness or controllability of the environment. Social environments differ in their opportunity structures, the constraints they place on personal efficacy and in their modifiability. Belief systems about the modifiability of the environment can affect the extent to which people take advantage of potential opportunities in the situations in which they find themselves.

We examined the impact of beliefs about organisational controllability on the self-regulatory factors governing decision-making that can enhance or impede group attainments (Bandura and Wood 1988). Prior to managing the simulated organisation, one group of MBAs was told that organisations are not that easily predictable or controllable. Work habits of employees are not easily changeable, even by good guidance. Small changes do not necessarily improve overall outcomes. A second group was told that organisations are predictable and controllable. Work habits of employees are changeable through good guidance. Small changes can set in motion processes that can improve overall outcomes. Some of the MBAs were assigned easily reachable standards of organisational

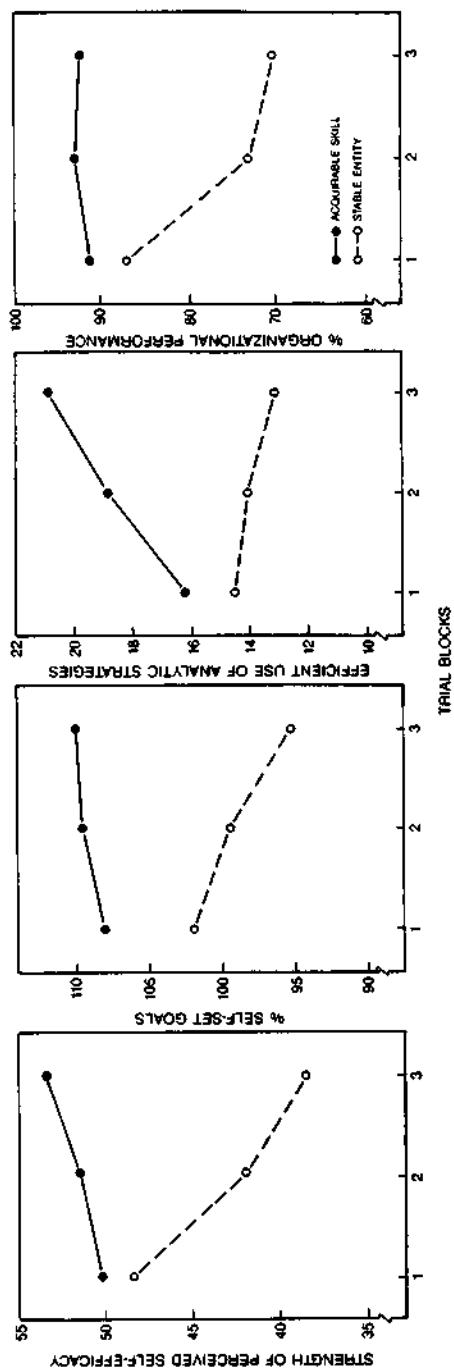


Figure 3

Changes in perceived managerial self-efficacy, the performance goals set for the organisation relative to the preset standard, effective use of analytic strategies, and achieved level of organisational performance across blocks of production trials under acquirable skill and entity conceptions of capability. Each trial block comprises six different production orders (Wood and Bandura 1988a).

productivity, others were given tough productivity standards.

The contrasting effects of beliefs about controllability may be seen in Figure 4. Managers who were led to believe they can influence organisational attainments by their actions maintained a robust sense of managerial efficacy, even when changes did not come easily. They adopted high organisational goals. They figured out ways of producing significant organisational attainments. Managers who believed that there was little they could do to change things lost faith in their capabilities when their efforts failed to produce quick results. Their aspirations declined and the organisational accomplishments decreased.

These findings underscore the considerable contribution of self-belief systems and nonability factors to performance attainments. Figure 5 portrays the paths of influence through which the different self-regulatory factors affect organisational attainments. The arrows in the path diagram represent the causal links and the numbers on the arrows indicate the strength of the influence. At the outset, the managers relied heavily on their past accomplishments in judging their managerial efficacy and setting their goals. But with further experience, the belief they formed about their capabilities became a more powerful determinant of their aspirations, strategic thinking, and organisational attainments.

3. Self-Regulation and Motivation Through Goal Systems

Social cognitive theory also emphasises human capacities for self-direction and self-motivation (Bandura 1988a). In exercising self-directedness, people adopt internal standards, they keep track of their behaviour and they arrange incentives for themselves to sustain their efforts until they accomplish what they set out to do. Through self-evaluative reactions, they keep their conduct in line with their standards.

Many of the activities that people perform are aimed at obtaining outcomes that are far in the future. Therefore, they have to create for themselves guides and motivators in the present for activities that lead to those desired futures. This is achieved by adopting goals and by evaluating one's progress in relation to those goals.

3.1 Different Effects of Goals

Goals can improve psychological well-being and accomplishments in several ways.

Motivational Effects. First, goals have strong motivational effects. They provide a sense of purpose and direction. Goals raise and sustain the level of effort needed to reach them. When people are unclear about what they are trying to accomplish, their motivation is low and their efforts are poorly directed. Specific, challenging goals lead to better performance than do general goals to do well or no goals at all (Latham and Lee 1986; Locke, Shaw, Saari, and Latham 1981; Mento, Steel and Karren 1987). Clear production goals increase productivity.

Self-Efficacy Effects. Goals not only guide and motivate performance. They also

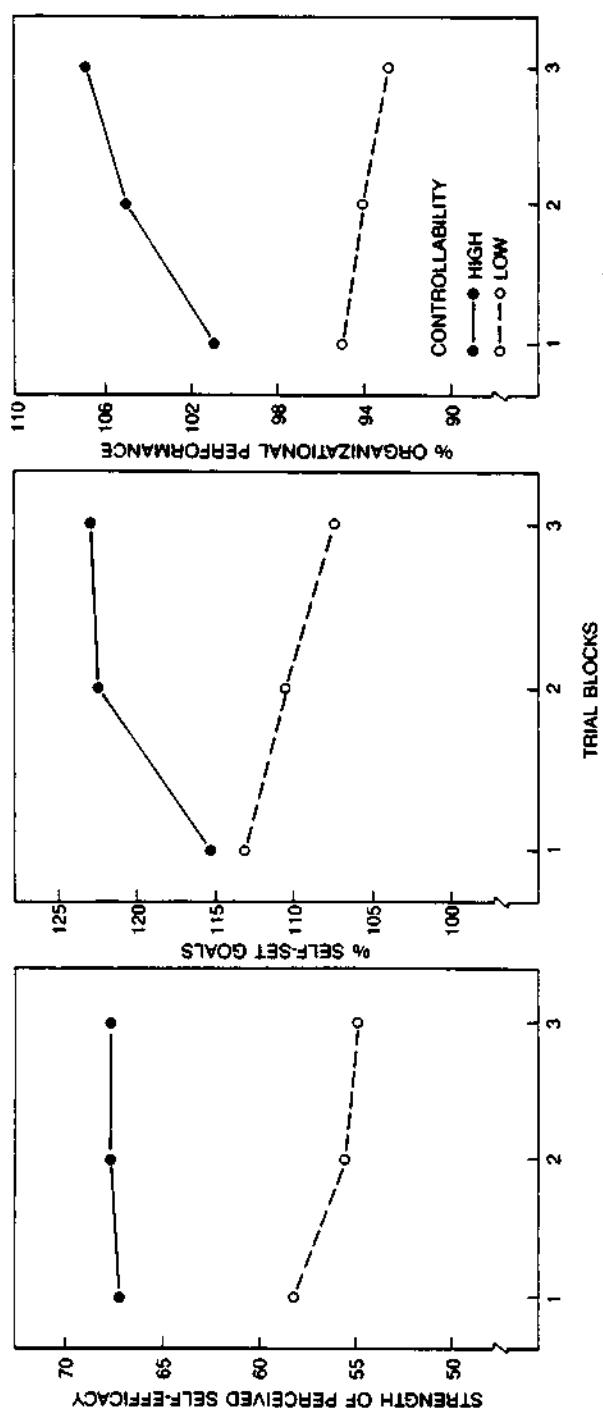


Figure 4

Changes in strength of perceived managerial self-efficacy, the performance goals set for the organisation, and level of organisational performance for managers who operated under a cognitive set that organisations are controllable or difficult to control. Each trial block comprises six different production orders (Bandura and Wood 1988).

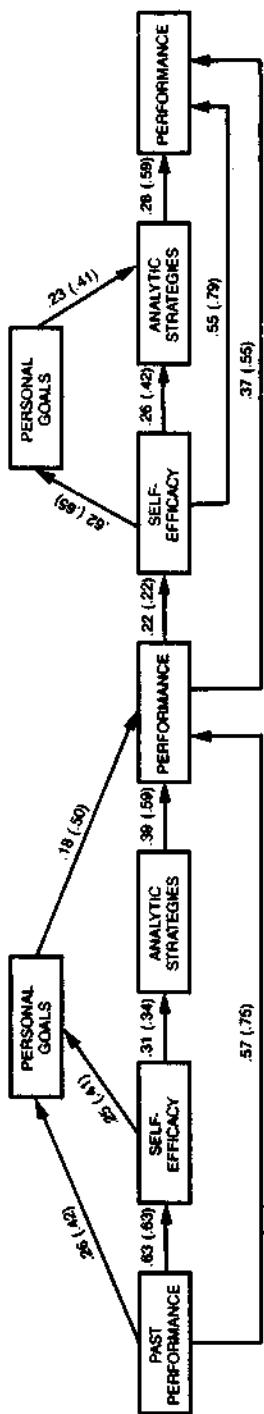


Figure 5

Path analysis of causal structures. The initial numbers on the paths of influence are the significant standardised path coefficients ($p < 0.05$); the numbers in parentheses are the first-order correlations. The network of relations on the left half of the figure are for the initial managerial efforts, and those on the right half are for later managerial efforts (Wood and Bandura 1988b).

help to build people's beliefs in their capabilities. Without standards against which to measure their performances, people have little basis for judging how they are doing or for evaluating their capabilities. Subgoals serve this purpose well (Bandura and Schunk 1981). Success in attaining challenging subgoals increases people's self-beliefs in their capabilities.

Interest Effects. Accomplishing desired goals also creates self-satisfaction and increases interest in what one is doing. For example, to mountain climbers, it is not crawling on slippery rocks in foul weather that is intrinsically satisfying. It is the satisfactions derived from personal triumphs over lofty peaks that sustains deep engrossment in the activity. Malone (1981) analysed what it is about computer games that captures the interest of players for hours on end. He found that interesting computer games had challenging goals. Uninteresting ones did not.

Goals have these beneficial effects when they serve as challenges, rather than as onerous dictates. Motivation through aspiration provides a continuing source of personal efficacy, interest, and satisfaction. Without aspiration and active involvement in what they are doing, people are unmotivated, bored, and uncertain about their capabilities.

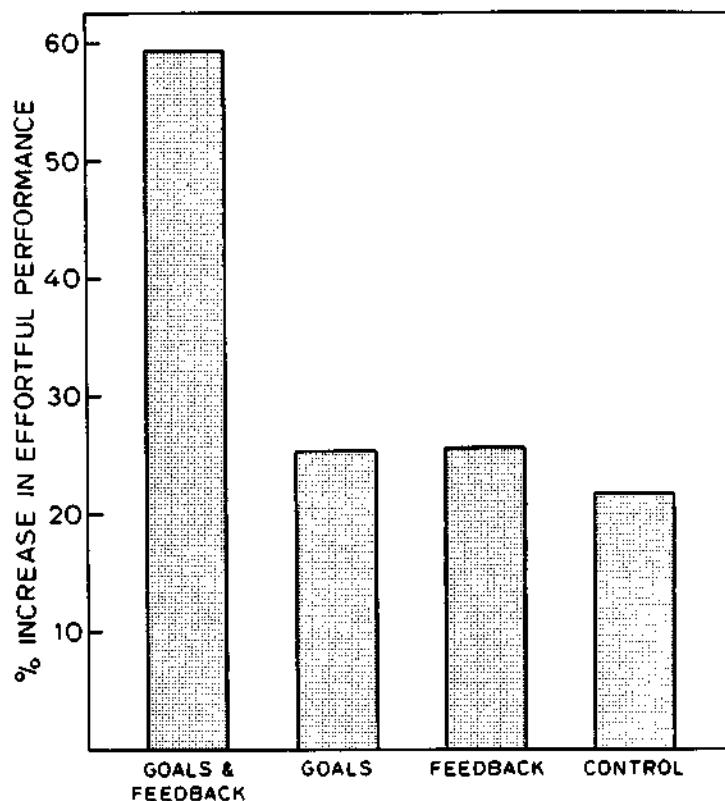
3.2 Psychological Mechanisms in Self-Motivation by Goals

The mechanisms through which goals motivate have been the subject of study. Goals link people's self-evaluation to what they are doing. People experience satisfaction when they reach or surpass their goals. When their performances fall short of the goal they seek to achieve, this creates self-dissatisfaction that motivates increased effort. Once they commit themselves to explicit standards or goals, they exert the effort needed to accomplish their goals.

Motivation through goals requires commitment to a clear goal and feedback of how one is doing. Having goals without knowing how one is doing, or knowing how one is doing without having any goals, does not increase motivation. When one of the comparative factors is missing, people cannot evaluate their performances. This is shown in a study we conducted in which people tried to increase their level of productivity on a task (Bandura and Cervone 1983). They increased their motivation only when they had a challenging goal and received feedback of progress (Figure 6). Goals without feedback, and feedback without goals, had no effect on their motivation.

Performances that fall short of goals can be motivating or discouraging. How people react to substandard performance will depend on their beliefs about their capability to attain their goals. Those who doubt their capabilities are easily discouraged by failure. Those who are confident in their capabilities to achieve their goal increase their efforts when their performances fall short. They persevere until they succeed.

The way in which motivation is influenced by people's self-evaluation and beliefs about their capabilities is shown in Figure 7. They rated how satisfied or disappointed they were when their performance fell short of their goal and their

**Figure 6**

Percent change in level of motivation under conditions combining goals with performance feedback, goals alone, feedback alone, or with none of these factors (Bandura and Cervone 1983).

level of confidence that they could attain their goal. They then performed the task again. People who felt disappointed with a deficient performance but were highly confident that they could attain the goal increased their effort to succeed (Figure 7). Those who doubted their capabilities to attain the goal and were not too disappointed by their deficient performance abandoned the goal and lost their motivation. Either discontent with a deficient performance or strong belief in one's capabilities alone produces a moderate increase in motivation.

People's beliefs in their capability likewise predict how success affects their motivation. When accomplishments require strong effort, people do not necessarily expect to surpass each attainment with an even greater one. Figure 8

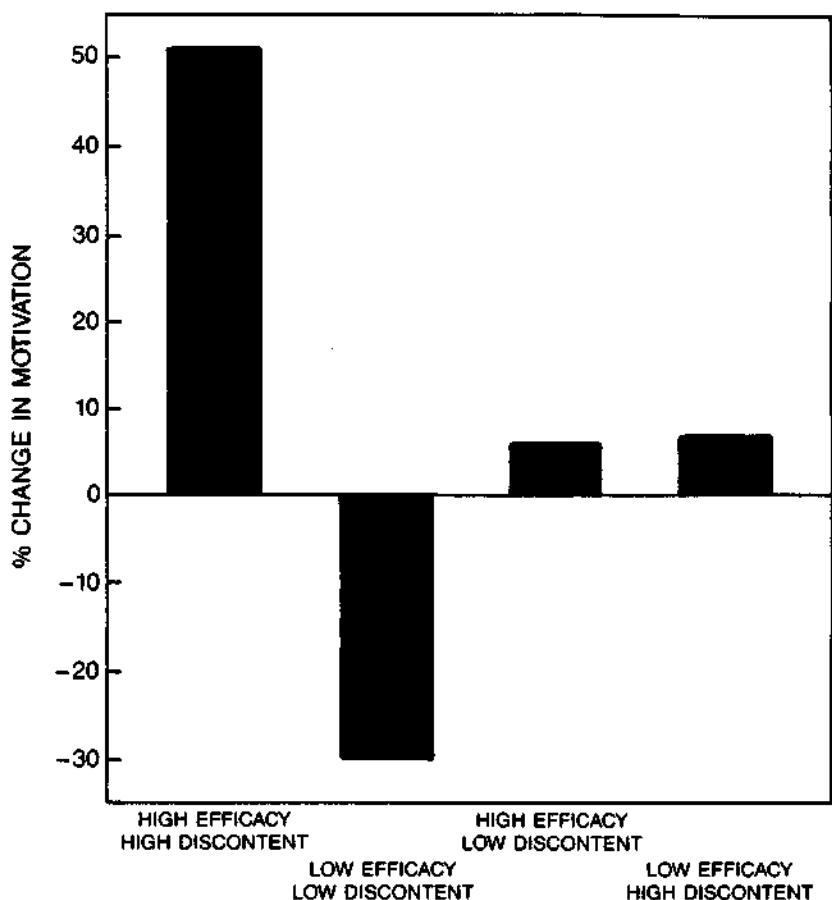
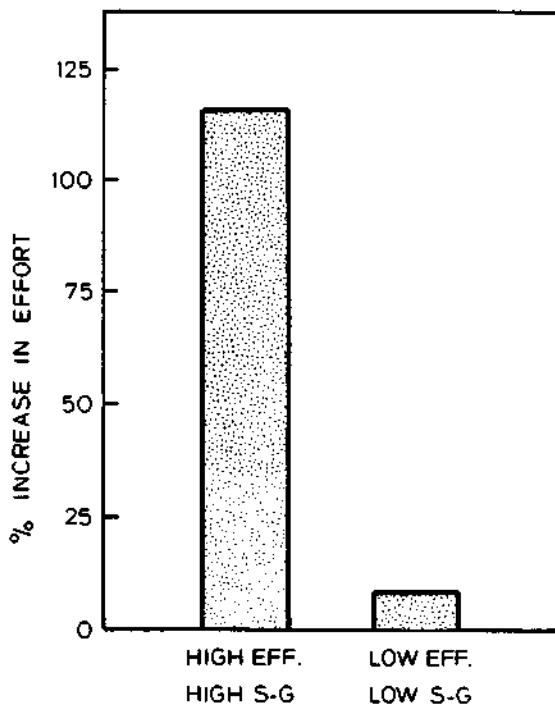


Figure 7

Percent changes over time in motivational level under conditions combining goals and performance feedback as a function of different combinations of levels of self-dissatisfaction and perceived self-efficacy for goal attainment (Bandura and Cervone 1983).

shows how people's beliefs in their capabilities affect their motivation when they surpass their goal through hard work. Those who strongly believe in their capabilities create new motivators for themselves by setting higher goal challenges for themselves. Those who doubt they could do as well again lower their goals. Their motivation declines.

These same self-influences have been shown to operate in work situations. Earley (1986) studied how employees' beliefs in their capabilities affect their productivity in manufacturing industries in England and in the United States.

**Figure 8**

Percent change in motivational level after mastering a difficult goal depending on people's self-efficacy beliefs (*EEF*) and the new goal challenges (*S-G*) they set for themselves (Bandura and Cervone 1986).

Employees were taught better ways of producing tyres. They were then given production goals. Showing employees better production techniques increased their belief in their capabilities. The more they increased their self-belief of efficacy, the more strongly they accepted the production goals, and the higher was their productivity.

To summarise, goals are highly effective motivators. To increase the motivational effects of goals: people must commit themselves to definite goals, their belief in their capability to attain adopted goals should be strengthened, and they need informative feedback as to how they are doing so they can compare their performance with what they desire to achieve. Goals affect motivation through self-evaluative reactions to one's performances and beliefs in one's capabilities for goal attainment.

3.3 Motivating Goal Characteristics

Goals do not automatically operate as motivators. Certain characteristics of goals determine whether or not they will be motivating.

Definiteness. Whether goals create incentives and guides is partly determined by their explicitness (Locke et al. 1981). Definite goals give clear guides for performance and for evaluating how one is doing. General goals are too vague to regulate motivation or behaviour.

Goal Challenge. The level at which goals are set also affects motivation. Challenging goals create strong interest and involvement in activities and motivate higher performance than do easy goals. Csikszentmihalyi (1975) has studied people in different pursuits who become deeply engrossed in their work. He found that such highly motivated people set for themselves challenges that match their perceived capabilities and they can see themselves making progress toward their goal.

If goals are set too high, most performances prove disappointing and reduce motivation to continue. Because people often set overly ambitious goals for themselves, they experience much failure that reduces, rather than sustains, their efforts.

Goal Proximity. The timing or *proximity* of goals is another important factor. The motivating power of goals is partly determined by how far into the future they are set. Short-term, or proximal, goals raise effort and direct what one does in the short-run. Distant goals are too far removed in time to be effective self-motivators. Usually, there are too many competing influences in everyday life for distant aims to exert much control over current behaviour. By focusing on the distant future, it is all too easy to put off work in the present. This is captured well in the adage: "The more procrastinating the persons, the more they expect to do tomorrow." Motivation is best maintained by setting a long-range goal that sets the course for one's endeavours. A series of attainable subgoals guides and sustains the efforts along the way.

We tested the benefits of subgoal challenges with students who were seriously deficient in mathematics. They studied a programmed course that explained the necessary mathematical operations. One group set daily subgoals of learning a different mathematical skill each day. A second group set a long-term goal of learning all the mathematical skills by a future time. A third group of students studied the course without any goals. A fourth group did not receive the course. The effects of goal proximity are summarised in Figure 9.

Students who motivated themselves with proximal subgoals earned the mathematical skills better, became more confident in their mathematical capabilities, and developed greater interest in mathematics than did students who had only the long-term goal in mind. Students with only long-range goals did not do any better than students who studied the same course without any goals.

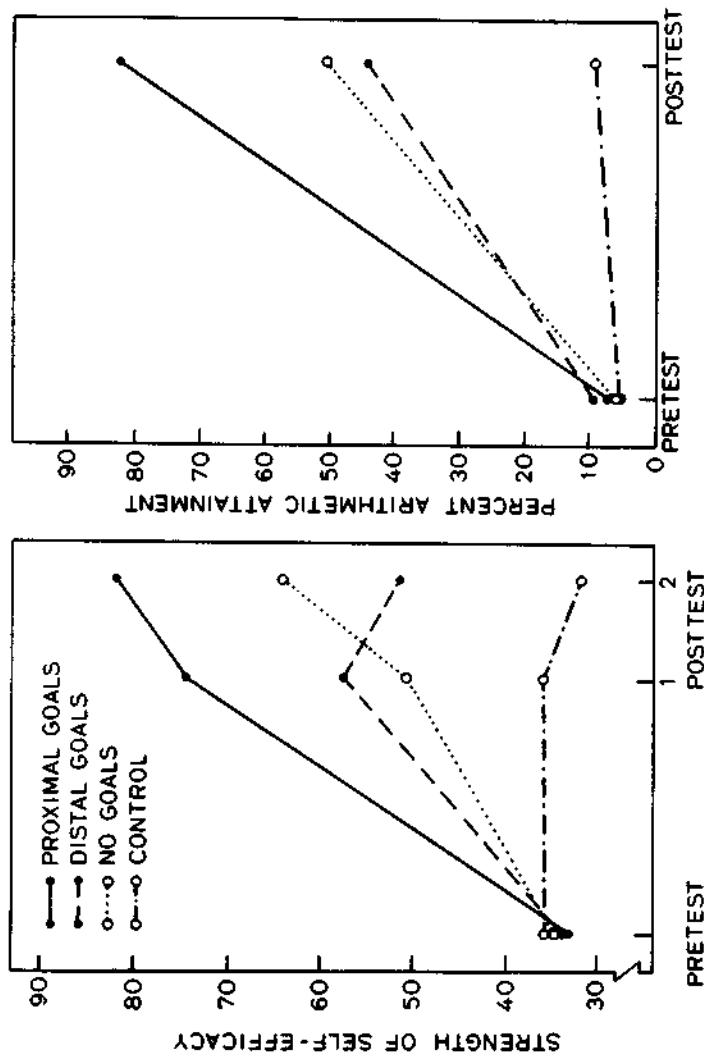


Figure 9

The left panel shows the strength of student's perceived mathematical efficacy at the beginning of the study (pretest), after they completed the self-directed learning (Post 1) and after they took the mathematical post-test (Post 2). Students in the control group were assessed without the intervening self-directed learning. The right panel displays the student's level of mathematical achievement before and after the self-directed learning (Bandura and Schunk 1981).

Making difficult tasks easier by breaking them down into a series of subgoals also helps to reduce self-demoralisation through high aspiration. The same accomplishment indicates significant progress when evaluated against a short-term subgoal, but it may appear disappointing if compared against long-range lofty aspirations. People can be making good progress but deriving little sense of accomplishment because of the wide disparity between current standing and distal aspiration.

Research by Frayne and Latham (1987) illustrates a further application of self-regulation to work situations. They designed a program to reduce employee absenteeism, which disrupts work schedules, increases costs, and decreases productivity. Employee absenteeism costs the United States industries about thirty billion dollars (U.S.) each year. It is a serious, costly problem.

Employees who often missed work were taught in groups how to manage their motivation and behaviour more effectively. They kept a record of their work attendance. They analysed the personal and social problems that prevented them from getting to work. They were taught strategies for overcoming these obstacles. They set themselves short-term goals for work attendance, and rewarded themselves for meeting their goals. A control group of employees did not receive the program in self-regulation.

Training in self-regulation increased employees' beliefs in their capabilities to overcome the obstacles that led them to miss work. They improved their work attendance and maintained these changes over time (Figure 10). The higher their self-belief in their capabilities, the better was their work attendance. The employees expressed a strong positive attitude toward the training program. By increasing their work attendance they were able to gain benefits for themselves.

3.4 Participation in Goal Setting

Goals will not have much motivational effect if there is little personal commitment to them. When people play an active rôle in setting goals, they are likely to be strongly invested in them. They implement the goals more effectively and experience greater satisfaction with their work. The benefits of goal setting are, therefore, most likely to be realised if people are active participants in setting the goals they pursue.

4. Concluding Remarks

The value of a psychological theory is judged not only by its explanatory and predictive power, but also by its operational power to improve human functioning. Many conceptual systems are dressed up in appealing terminology but remain prescriptively ambiguous on how to effect psychological changes. Social cognitive theory provides explicit guidelines on how to equip people with the competencies, self-regulatory capabilities, and a resilient sense of efficacy that enables them to enhance their psychological well-being and personal accomplishments.

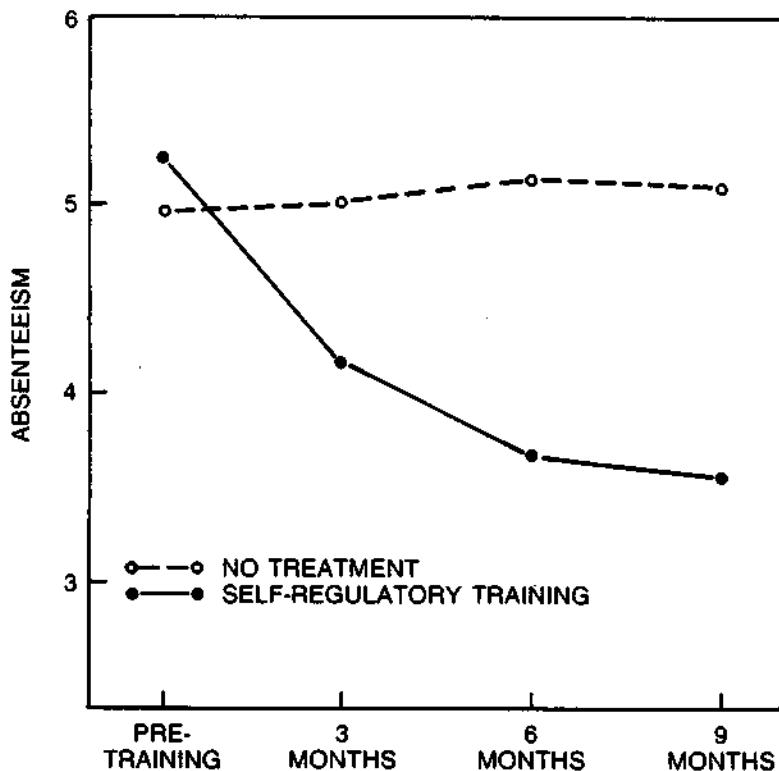


Figure 10

Reduction in absenteeism by employees who had the benefit of the self-regulatory program and those who did not. (Plotted from data of Frayne and Latham 1986.)

(Date of receipt of final typescript: August 1988.)

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Impact of Perceived Self-Efficacy in Coping With Stressors on Components of the Immune System

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This experiment examined the impact of experimentally varied perceived self-efficacy in exercising control over stressors on components of the immunological system. Immunological changes while coping with phobic stressors were measured within an intrasubject control design that included a baseline phase, an efficacy-acquisition phase, and a maximal-efficacy phase. In each of these phases, perceived coping self-efficacy, level of autonomic and endocrine activation, and several components of the immunological system were measured. Development of strong perceived self-efficacy to control phobic stressors had an immunoenhancing effect. A slow growth of perceived self-efficacy, heart rate acceleration, and cortisol activation attenuated immunological system status during the efficacy-acquisition phase. Rapid growth of perceived self-efficacy also predicted maintenance of immunoenhancement during the maximal perceived self-efficacy phase.

The recent years have witnessed a major shift in the perspective on health. The biopsychosocial perspective (Engle, 1977), which focuses on the interactive influence of psychosocial and biological factors on health and illness, is replacing the traditional biomedical model, which focuses on pathogens and somatic dysfunctions. This broadened perspective has fostered diverse lines of research designed to clarify the role of personal-

ity factors in health functioning (Matarazzo, Weiss, Herd, Miller, & Weiss, 1984; Rodin & Salovey, 1989; Taylor, 1990). One can distinguish between two levels of research on the psychosocial determinants and mechanisms of health and illness (Bandura, in press). The more basic level aims to elucidate the mechanisms through which psychosocial factors affect biological systems that mediate health and illness. The second level of research concerns the exercise of behavioral control over modifiable aspects of health.

Stress has been implicated as an important contributing factor to many physical dysfunctions (Goldberger & Breznitz, 1982; Krantz, Grunberg, & Baum, 1985). Recent investigations with animals identified controllability as a key organizing principle regarding the nature of stress effects. Exposure to stressors with a concomitant ability to control them has no adverse effects. However, exposure to the same stressors without the ability to control them activates neuroendocrine and opioid systems and impairs various components of the immune system (Coe & Levine, in press; Maier, Laudenslager, & Ryan, 1985; Shavit & Martin, 1987).

Although the impact of perceived control on human health outcomes has been the subject of much research (Langer, 1983; Peterson & Stunkard, 1989; Rodin, 1986; Schulz, 1976), the influence it exerts on the immune system has received little attention. Our understanding of the effects of uncontrollable stressors on immunocompetence is based mainly on experimentation with animals involving uncontrollable physical

This research was supported by Public Health Research Grant MH-5162-25 from the National Institute of Mental Health (NIMH) to Albert Bandura, by a biomedical research grant from Rutgers University to Ann O'Leary, and by Research Grant HD02881 from the National Institute of Child Health and Human Development and Research Scientist Award MH-19936 from NIMH to Seymour Levine.

A major portion of the data of this multifaceted project was collected by Sue A. Wiedenfeld as the basis for her doctoral dissertation. We are deeply indebted to the many people who assisted us in this project: Mike McGrath for his valuable advice on immunological factors, Edgar Engelman and Dennis Sasaki for performing the T cell subset analyses, Helen Hu for performing the cortisol analysis, Betty Berdahl for processing the heart rate data, and Barr Taylor, Andrea Sutherland, Hugh McDevitt, May Koo, Beth Lee, Lisa Hellrich, Paul Endo, and Jennifer Watson for their valuable help with other aspects of the project.

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stressors. Stressors take diverse forms and can produce different patterns of physiological activation. This places certain limitations on extrapolation of conclusions across different species, stressors, and patterns of controllability. Uncontrollable physical stressors are not only stressful but also inflict some physical trauma that can activate a variety of complicating physiological processes. Most of the important stressors with which humans have to cope involve psychological threats (Lazarus & Folkman, 1984). Moreover, stress reactions are governed largely by perception of coping self-efficacy rather than being triggered directly by the objective properties of threats and environmental demands (Bandura, 1988b). It is the perception of environmental threats as exceeding one's coping capabilities that becomes the stressful reality. Research into the immunological effects of ineffectual control, therefore, needs to be broadened and extended to events and psychological processes that have high ecological relevance to human coping.

Efforts to determine the immunologic effects of psychological stressors in humans have relied extensively on correlational or quasi-experimental studies in which occurrences of life stressors are related to the incidence of infectious illnesses or to indexes of immunologic functioning (Jemmott & Locke, 1984; O'Leary, 1990; Palmblad, 1981). Exposure to stressors is usually accompanied by impairment of the immune system (Kiecolt-Glaser & Glaser, 1987). Evidence also suggests that improving people's capabilities to ameliorate stress reactions may be immunoenhancing (Kiecolt-Glaser et al., 1986, 1985). Although these lines of research have clarified some aspects of ineffectual control of stressors, experimental studies are needed to verify the direction of causality.

The present research investigated the impact on human immune functioning of experimentally varied perceived self-efficacy in coping with a psychological stressor. Human coping involves an important feature that is rarely systematically examined in either animal laboratory paradigms or human field studies. In animal experimentation, controllability is usually studied as a fixed dichotomous property in which animals either exercise complete control over physical stressors or they have no control whatsoever. In contrast, human coping usually entails an ongoing process of developing and reappraising one's coping efficacy rather than unalterable self-efficacy in the face of unremitting bombardment by stressors. Most human stress is activated in the course of learning how to exercise control over recurring stressors. Stress activated in the process of acquiring coping self-efficacy may have very different effects than stress experienced in aversive situations with no prospect in sight of ever gaining any self-protective efficacy. It would not be evolutionarily advantageous if acute stressors invariably impaired immune function, because of their prevalence in everyday life. If this were the case, people would experience high vulnerability to infective agents. The present experiment was designed to provide a refined analysis of how gaining a sense of coping mastery over stressors affects immune function.

In social cognitive theory (Bandura, 1986, 1988b), perceived self-efficacy to exercise control over potentially threatening events plays a central role in stress reactions. Threat is not a fixed property of situational events. Rather, it is a relational property concerning the match between perceived coping capabilities and potentially hurtful aspects of the environment. Peo-

ple who believe they can exercise control over potential threats do not conjure up apprehensive cognitions and are not stressed by them. But those who believe they cannot manage threats experience high levels of stress.

That perceived coping efficacy operates as a cognitive mediator of stress has been tested by creating different levels of perceived coping self-efficacy and relating them at a microlevel to different manifestations of stress. Perceived inefficacy in controlling psychological stressors is accompanied by high levels of subjective stress, autonomic activation, and plasma catecholamine secretion (Bandura, Reese, & Adams, 1982; Bandura, Taylor, Williams, Mefford, & Barchas, 1985; Ozer & Bandura, 1990). The combined results from the different manifestations of stress are consistent in showing that stress reactions are low when people cope with stressors in their perceived self-efficacy range. Self-doubts in coping efficacy produce substantial increases in subjective stress and physiological activation. After perceived coping self-efficacy is strengthened to the maximal level, coping with the previously intimidating tasks no longer elicits differential physiological activation. Perceived self-inefficacy in exercising control over stressors also activates endogenous opioid systems (Bandura, Cioffi, Taylor, & Brouillard, 1988). The latter effect is of special interest in light of evidence that some of the immunosuppressive effects of inefficacy in controlling stressors, such as reduced natural killer cell cytotoxicity, are mediated by release of endogenous opioids (Shavit & Martin, 1987). When opioid mechanisms are blocked by an opiate antagonist, the stress of coping inefficacy loses its immunosuppressive power.

Because physiological systems are highly interdependent, the types of biological reactions that have been shown to accompany perceived coping inefficacy are involved in the regulation of immune systems. Hormonal mediation of immune function has received some study (Borysenko & Borysenko, 1982; Coe & Levine, in press). Uncontrollable stressors increase the release of corticosteroids and catecholamines. Elevated levels of corticosteroids inhibit lymphocyte metabolism, interfere with the process of lymphocyte proliferation (Borysenko & Borysenko, 1982), and inhibit production of interferon and Interleukin-1 (Benedovsky, del Rey, Sorkin, & Dinarello, 1986; Munck, Guyre, & Holbrook, 1984). Increased levels of cortisol have been associated with decreased lymphocyte response to mitogen stimulation and diminished ability to destroy foreign cells (Claman, 1972). However, corticosteroids may have differential effects on immune function depending on their level. These and other findings support a mediating role of cortisol in immunologic response to stressors, although the form of the relation requires further specification.

Results also yield some support for autonomic regulation of the immune system. Several mechanisms of operation have been proposed: They include release of catecholamines resulting in redistribution of lymphocytes into the bloodstream and reduced lymphocyte response to mitogens (Crary, Borysenko, et al., 1983; Crary, Hauser, et al., 1983; Landmann et al., 1984), changes in splenic activity related to levels of norepinephrine (Benedovsky, del Rey, & Sorkin, 1985), autonomic secretion of neuroregulatory peptides that alter the cellular environment (Maclean & Reichlin, 1981), and direct autonomic innervation of lymphoid organs (Williams et al., 1981). To help clarify possi-

ble mediating linkages under changing controlling self-efficacy, this experiment included measures of endocrine and autonomic activity.

In studying the immunologic effects of differential levels of perceived coping self-efficacy, we used an experimental paradigm combining a strong phobic stressor with a powerful efficacy-induction procedure that has shown promise for clarifying other psychobiological linkages (Bandura et al., 1982; Bandura et al., 1985). This paradigm permits examination of causal relationships under laboratory conditions with a high degree of control. Because a high sense of controlling self-efficacy can be quickly instilled, it is possible to create conditions incorporating a chronic stressor with differential levels of perceived controlling self-efficacy. In the mastery phase of the study, the phobia is eradicated, so that all participants gain lasting relief from a chronic stressor while contributing to knowledge.

In the present experiment, immunologic changes in snake phobics with a low sense of coping efficacy were measured under three conditions within an intrasubject control design. These conditions included a baseline control phase involving no exposure to the phobic stressor, a perceived self-efficacy-acquisition phase in which subjects were exposed to the phobic stressor as they attempted to gain a sense of coping efficacy, and a perceived maximal self-efficacy phase in which they coped with the same phobic stressor for the same duration after they had developed a complete sense of coping efficacy. In each of these phases, we measured strength of perceived coping self-efficacy, heart rate acceleration, cortisol activation, and several components of the immunologic system.

On the basis of evidence that uncontrollable stress operates as an immunosuppressant, it would be predicted that immune functions should be attenuated during perceived coping inefficacy but restored during maximal perceived self-efficacy. However, in this experiment, perceived coping self-efficacy is a changing, rather than a fixed, property. Evidence that acquisition of skills to control stress can be immunoenhancing (Kiecolt-Glaser et al., 1986, 1985) suggests that the direction and magnitude of immunological change is related to the rate of growth of perceived coping self-efficacy. Attenuation of immune function would be associated with slow growth of perceived coping self-efficacy and high levels of autonomic and endocrine activity.

Method

Subjects

The subjects were 20 severe snake phobics, 19 women and 1 man, recruited through radio, television, and newspaper announcements. They ranged in age from 25 to 48 years, with a mean age of 37 years. The experiment was conducted in two laboratories using identical procedures. Of the total sample, 15 subjects were studied at Stanford University, 5 were studied at Rutgers University.

Subjects were screened by telephone to exclude those 49 years or older because of immunological changes in later years (Schleifer, Keller, Bond, Cohen, & Stein, 1989). In addition, those who took medication likely to affect immune function—such as antihypertensives, antihistamines, anti-inflammatory drugs, and antidepressants—were also excluded. Forty-six people were excluded because they exceeded the age level or were on medication.

The subjects' phobic dread of snakes seriously impaired and constricted their lives and created continual distress for them. They avoided social, recreational, and vocational activities that might have brought them into contact with a snake, however remote the possibility, such as hiking, camping, gardening, bicycling, swimming in lakes, or traveling to rustic areas. The most pervasive aversive consequences of the phobia were thought-produced distress. They were plagued by recurrent intrusive thoughts of dreadful encounters with snakes. Even a picture or the mere mention of a snake would trigger perturbing ruminative thoughts over which they could exercise little control. They all suffered recurrent nightmares in which they were threatened and pursued by menacing snakes. The phobic threat was clearly a strong chronic stressor.

Monitoring and Control of Health-Related Behavior

Physical and health factors known to affect immune function were closely monitored and, where possible, controlled. Prior to each session, subjects recorded on a standard form any recent illnesses, medications they had taken, changes in their weight and quantity and quality of sleep, amount of exercise, consumption of caffeinated coffee, alcoholic beverages, and cigarettes, use of birth control pills, and the menstrual cycle phase. Subjects exhibited no significant differences in these health-related factors across the three phases of the experiment. To standardize controllable factors that could affect immune function, for 24 hours before the baseline session and each of the subsequent sessions, subjects were instructed to restrict their consumption of caffeine and alcohol and to limit their level of exercise. Their recorded reports indicate they followed these instructions. Because menstruation is accompanied by hormonal changes, we assessed the menstrual cycle phase. There was no confounding of menstrual cycle phase across the three phases of the experiment.

Pretest Assessment

Behavioral test. Subjects were tested for the severity of their phobic behavior with a series of 21 coping tasks requiring increasingly more threatening interactions with a corn snake. The set of tasks required subjects to approach the caged snake, to place their hands in the cage, to touch and hold the snake with gloved and bare hands, to let it loose in the room and return it to the cage, to hold it within 12 cm of their face, and, finally, to tolerate the snake crawling in their lap while they held their hands at their sides.

The behavioral test was discontinued when the subject could not complete a performance task in the hierarchical series. Those who could place a bare hand in the cage were considered insufficiently phobic and were not included in the experiment. All subjects who met this criterion participated in the study. The sample of subjects included in the study were severely phobic. Seventy-five percent of them could not even come close to the glass cage; the remainder could approach the cage but were not about to place their hands in it.

Perceived coping self-efficacy. Subjects were provided with the list of coping tasks included in the behavioral test and instructed to rate the strength of their capability to perform the different coping activities. They rated the strength of their perceived self-efficacy on a 100-point scale, ranging in 10-unit intervals from high uncertainty (0), through intermediate values of certainty, to complete certitude (100). The mean strength of perceived self-efficacy was computed by summing the magnitude scores across coping tasks and dividing the sum by the total number of tasks. The test-retest reliability for this measure was found to be high ($r = .86$) in previous studies (Bandura, Adams, & Beyer, 1977).

Subjects' perceived self-efficacy was measured before and after the test of phobic behavior. They exhibited a uniformly weak sense of

coping efficacy before the behavior test ($M = 11$), and they remained highly ineffectual after the test ($M = 13$).

Intragroup Control Design

The experiment included three phases. In the initial baseline phase, subjects were tested without any exposure to the phobic stressor to provide a control period against which to evaluate the effects of differential levels of perceived coping self-efficacy on immune function. In the self-efficacy-growth phase, subjects coped with the phobic stressor in the context of acquiring a sense of efficacy. In the final maximal-self-efficacy phase, subjects coped with the same stressor after their perceived self-efficacy had been raised to the maximum level. An intergroup control design was not used because it would be unrealistic to expect subjects to commit large blocks of time during working hours, either unoccupied or filled with irrelevant activities, restrict exercise and consumption of coffee and alcohol preceding the sessions, and repeatedly undergo multifaceted physical and psychological assessments over lengthy sessions without any alleviation of their phobic dysfunction.

Note, however, that the present experiment is founded on a large body of prior research using the same mode of efficacy induction and the same measures of perceived self-efficacy with the same phobic threat (Bandura, 1988a). The links between the efficacy-induction procedure; changes in perceived self-efficacy; and subsequent changes in subjective distress, coping behavior, autonomic activation, and catecholamine secretion have already been verified in these prior controlled studies. Moreover, matched phobics in control conditions who do not receive the efficacy-induction intervention achieve little or no change in perceived self-efficacy, anxiety arousal, or coping behavior (Bandura et al., 1977; Bandura, Blanchard, & Ritter, 1969; Blanchard, 1970).

The sessions were conducted in the mornings at identical time periods to control for any circadian effects on immune and endocrine function. Moreover, to control for any possible weekday effects, all subjects except one also completed all phases of the experiment on the same weekday for the 3 successive weeks. Each phase of the study was separated by 1 week to eliminate any possible carryover effects on immune function from one phase to another. Female experimenters conducted the sessions in the two laboratories. Except for the higher cortisol levels in the Rutgers subsample, there were no significant differences between the subgroups from the two laboratories on any of the measures at any phase of the experiment.

Baseline Phase With No Exposure to Stressors

At least 1 week after subjects had completed the screening procedures, they participated in the control session to provide a baseline of immune function and other aspects of psychobiological functioning in the absence of any exposure to the stressor. The following baseline measurements were conducted.

Autonomic function. To provide an index of autonomic activation, subjects' heart rate was measured throughout the 1-hour baseline session following a 5-min adaptation period. A cardiac holter monitor with a tape readout provided the mean heart rate for every 1-min interval.

Immunological indexes. Thirty ccs of blood were drawn for the immunological assays at the end of the baseline session. Total number of lymphocytes and helper and suppressor T cell numbers were used to provide a general measure of immune integrity. T cells play a prominent regulatory role in the immune system. They mediate hypersensitivity reactions, destroy cancerous cells and viruses, and regulate the activity of the humoral immune system. The total number of lymphocytes and subsets of T4 helper and T8 suppressor cells were measured

through the process of cellular immunofluorescence at the Stanford University Blood Bank using a Fluorescence Activated Cell Sorter (FACS) machine (R. A. Hoffman, Kung, Hansen, & Goldstein, 1980). The ratio of T4 cells to T8 cells, a clinically significant index of the modulation of immunity, was derived from these values. Expression of the Interleukin-2 receptor was measured during the cellular immunofluorescence process for enumerating lymphocytes and T cell subsets. Expression of Interleukin-2 receptor is an indication of activation, generally assumed to reflect exposure to antigenic stimulation. HLA-DR is a receptor found on B cells and on activated T cells. Because only about 1% of cells with HLA-DR are T cells, HLA-DR can be taken to be a measure of B cell numbers.

Endocrine function. Saliva cortisol was used to measure activation of the pituitary-adrenal cortical system, a highly sensitive marker of psychological stress (Baum, Grunberg, & Singer, 1982; Levine, 1983). The saliva samples were obtained after the adaptation period and at the end of the session. This hormone is a stable molecule in saliva that is highly correlated (.89) with plasma cortisol levels (Umeda et al., 1981). Cortisol concentrations in saliva have been found to be independent of flow rate (Riad-Fahmy, Read, Walker, & Griffiths, 1982). Because stress can reduce salivation, subjects were given a lemon drop to stimulate the flow of saliva. The same quantity of saliva was collected across subjects and phases of the experiment. The saliva was spun, and the supernatant was frozen at -5 °C. Saliva cortisol was measured in triplicate by radioimmunoassay (Klemm & Gupta, 1975).

Perceived self-efficacy. At the end of the baseline session, subjects' strength of perceived self-efficacy was measured with the efficacy scale described earlier.

Psychosocial measures. Several measures of psychosocial factors that might affect immune function were also administered at the end of the baseline session. They included a perceived stress scale that measured the degree to which people perceive situations in their life as stressful (Cohen, Kamarck, & Mermelstein, 1983). The University of California, Los Angeles Loneliness Scale measured degree of satisfaction with social activities and relationships (Russell, Peplau, & Cutrona, 1980). An anger expression scale that assessed the degree to which people suppress or express angry feelings (Speilberger et al., 1985) and the Beck Depression Inventory (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) were also administered. The subjects did not exhibit high levels of psychosocial dysfunction on these inventories, which attenuates correlations by the restricted range of scores. Indeed, these measures showed little consistent relationship to degree of change in immune status.

Anticipatory stress. A major component of stress over potentially threatening events arises from anticipatory self-arousal and thoughts of one's coping inefficacy rather than only by actual encounters with threats (Bandura, 1986; Bandura et al., 1988). Therefore, to measure the level of anticipated activation, subjects recorded their level of anticipatory stress on rating scales on each of the 2 days immediately preceding the second phase, involving exposure to the stressor while acquiring perceived coping self-efficacy. These scales measured level of anxiety and intrusive thoughts about reptiles, apprehensiveness over the forthcoming exposure to a snake, and general physical tension. On each of the two days, subjects rated their stress reactions in the morning, afternoon, and evening. In addition, they recorded any sleep disturbance and any dreams about reptiles. These measures were designed to evaluate the level of anticipatory stress subjects experienced as they were about to confront their phobic threat.

Exposure to Stressor While Acquiring Perceived Coping Self-Efficacy

In the self-efficacy induction phase of the experiment, all subjects participated in a 2-hr session of structured activities designed to enable

them to confront and cope with the snake. The experimenter first modeled effective coping strategies and then provided guided mastery experiences by enlisting mastery performance aids to enable subjects to engage in progressively more threatening interactions with the phobic object (Bandura, Jeffery, & Wright, 1974). The coping activities were reduced to graduated tasks of easily mastered steps; joint performance with the experimenter enabled the participants to perform tasks they would not consider doing on their own; graduated times of performance emboldened the participants to risk threatening tasks they would have refused if they had to perform them for a long time at the outset. As they increased their sense of efficacy, the duration of coping involvement was extended; physically protective aids were also introduced, if necessary, to promote self-efficacy-enhancing experiences. With increasing growth of perceived self-efficacy, the mastery aids were discontinued to verify that the coping attainments stemmed from the exercise of personal agency rather than from mastery aids. Self-directed mastery experiences were then arranged to strengthen and generalize perceived self-efficacy.

As in the baseline session, heart rate was monitored throughout the session. Saliva samples were obtained and perceived coping self-efficacy was measured before, at the midpoint, and at the end of the two-hr session. The blood sample was drawn for immunologic assays at the end of the session.

Maximizing the Strength of Perceived Coping Self-Efficacy

All subjects also participated in an additional 2-hr session, during which they received further guided mastery to raise their perceived coping self-efficacy to maximal strength of 100 for each coping task in the efficacy scale. Their perceived efficacy was measured before, at the midpoint, and at the end of this session. Thus, all subjects received two sessions of structured mastery experiences, which provided a uniform period for measuring the rate of growth of perceived coping efficacy. Although subjects began at baseline with a weak sense of efficacy, they differed in the rate with which they acquired a strong sense of coping efficacy. Subjects who had not achieved the maximal level of perceived coping self-efficacy by the end of the second session received additional guided mastery with periodic efficacy assessments until they judged themselves maximally self-efficacious for each coping task.

Exposure to Stressor With Maximal Perceived Coping Self-Efficacy

After subjects had achieved a maximal sense of coping self-efficacy, they participated in a 2-hr session at the same time on the same weekday of the following week. During this session, subjects performed the different coping activities with the snake but with a maximal sense of perceived coping self-efficacy. Saliva samples were obtained, and subjects' perceived coping self-efficacy was measured at the same three points in the session as in the earlier phases. Their heart rate was monitored throughout, and the blood sample was drawn at the end of the session.

Results

Anticipatory Stress

Subjects experienced moderate anticipatory stress 2 days before and even more elevated stress the day immediately preceding the efficacy-acquisition phase of the experiment. The rise in level of stress over the 2 days was significant for each manifestation of stress and for the aggregated measure, $t(19) = 3.75$,

$p < .001$. These data corroborate a relatively high level of anticipatory stressful self-arousal. Some sleep disturbance was also reported by half the subjects, but it did not worsen over the 2 days.

Perceived Coping Self-Efficacy

The mean strength of perceived coping self-efficacy at each of the three phases of the experiment is presented in Figure 1. A one-way analysis of variance revealed the changes to be highly significant, $F(8, 144) = 259.34, p < .0001$. Analyses of variance were also computed for changes in perceived self-efficacy within each of the three phases. Subjects exhibited an extremely weak sense of coping efficacy at the outset of the baseline phase and did not change in this regard at the midpoint and final assessment of the session.

Subjects began the stressful inefficacy phase at the same low-perceived-efficacy level as at the end of the baseline period. However, their perceived self-efficacy progressively increased in strength as they continued to gain experience in coping with the phobic stressor, $F(2, 38) = 88.45, p < .0001$. In pairwise comparisons, they judged themselves more efficacious at the midpoint, $t(19) = 8.35, p < .001$, and at the end of the phase, $t(19) = 10.96, p < .001$, than when they first began the coping session. The rise in perceived self-efficacy strength between the latter two points was also significant, $t(19) = 7.02, p < .0001$.

Subjects substantially increased in perceived strength of coping self-efficacy from the end of the self-efficacy-acquisition phase to the beginning of the maximal self-efficacy phase of the experiment, $t(19) = 6.44, p < .0001$. As shown in Figure 1, subjects displayed essentially maximal perceived self-efficacy throughout the third phase. However, at the outset of the session, 7 subjects rated their coping self-efficacy slightly less than the maximal level ($M = 97$), which yielded small but significant differences at the $p < .05$ level in comparison with the midpoint and endpoint assessments. The striking increase in perceived coping self-efficacy was reflected in marked changes in activities and thought patterns as recorded by subjects in the postexperiment questionnaire. All subjects (100%) reported complete relief from perturbing intrusive thoughts and nightmares, and all but 1 subject reported complete freedom of action in settings and activities they had phobically avoided. These qualitative data corroborate the results of the formal self-efficacy assessment that the requisite condition of perceived controlling efficacy was, indeed, achieved.

Changes in Level of Heart Rate and Cortisol Activation

In the baseline period, subjects had no exposure to the phobic stressor. Although they had equivalent exposure to the phobic stressor during the high- and low-efficacy phases of the study, note that they performed different sets of coping activities in the latter two phases. During much of the self-efficacy-acquisition phase, many of the subjects were able to deal with only the weakest threats, whereas in the maximal perceived self-efficacy phase, they performed the most menacing activities, such as having the snake crawl on them and bringing it to their face. The effects on heart rate and cortisol activation of more taxing coping activities in the final phase would offset

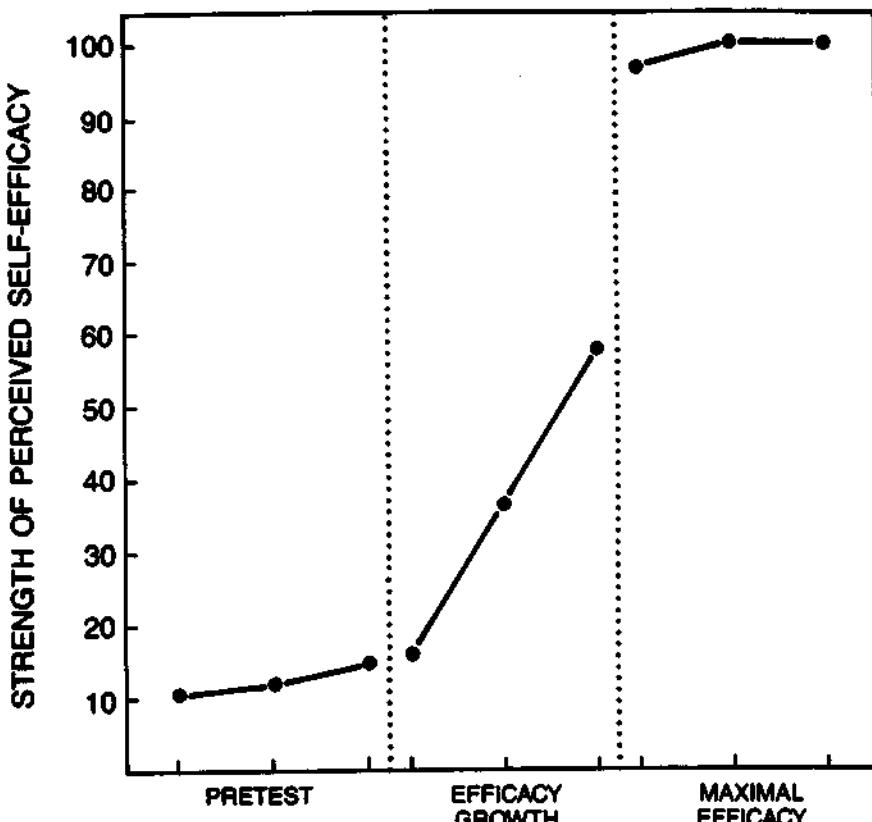


Figure 1. Strength of perceived coping self-efficacy at three points at each of the three phases of the experiment.

differences arising from divergence in perceived coping self-efficacy. In addition, subjects expressed some excitement over demonstrating their spectacular coping triumph in the maximal self-efficacy phase of the experiment.

Subjects' baseline heart rate was 78 bpm. During the efficacy-acquisition phase, their heart rate rose by 11% in relation to the baseline level, $t(18) = 4.30, p < .001$, and declined by 3% from the efficacy-acquisition to the maximal self-efficacy phase.¹ The same pattern of results is obtained for mean level of heart rate at the three phases as for relative change in heart rate. Analyses of variance of these data reveals a significant phase effect, $F(2, 36) = 9.75, p < .001$. In paired comparisons, the heart rate acceleration in the efficacy-acquisition phase was highly significant, $F(1, 18) = 18.22, p < .001$, but the decline in the maximal-efficacy phase was not.

Changes in cortisol activation followed a similar recurrent pattern across phases. Cortisol is highly responsive to novel elements and situational changes. The cortisol level subjects displayed after gaining familiarity with situational and coping demands provided the most informative measure of level of endocrine activity. If subjects continued to display an elevated level of cortisol after they had been thoroughly familiarized with the range of coping tasks introduced in the session, it would reflect a high level of phobic stress. Therefore, subjects' level of cortisol at the end of each session served as the main measure in the analyses. Subjects displayed elevated cortisol

levels at the beginning of each phase but as the session progressed, cortisol levels declined. As subjects gained familiarity with the experimental setting, their initially high cortisol activation ($M = 0.60$) diminished across sessions, $F(2, 36) = 41.76, p < .001$. The decrease in average cortisol level of 32% from the baseline value to the efficacy-acquisition phase was significant, $t(19) = 3.86, p < .001$, but the 5% decline from the efficacy-acquisition to the maximal efficacy phase was not.

We saw earlier that when phobics performed the same coping tasks under differential strength of perceived self-efficacy, heart rate, blood pressure, and catecholamine secretion were elevated under weak perceived self-efficacy and dropped to a low level under maximal strength of perceived self-efficacy

¹ During the maximal-self-efficacy phase, 1 subject exhibited an extreme heart rate throughout the session that diverged markedly from her heart rate levels in previous sessions and from all other measures signifying absence of stress. This highly anomalous heart rate suggested sustained periods of supraventricular tachycardia. The tremendous fluctuation in her heart rate along with periods of sustained extreme heart rate was consistent with this condition (Rosen & Bauernfiend, 1983). The pattern was too aberrant to reflect sympathetic stimulation nor did it fit a technical malfunction. Although this subject displayed the anomalous heart rate only in the maximal self-efficacy phase, this subject was not included in any analyses involving heart rate.

Table 1
The Means and Standard Deviations for Each of Several Components of the Immune System at Each of Three Phases of the Experiment

Immune component	Experimental phase					
	Baseline		Efficacy growth		Maximal efficacy	
	M	SD	M	SD	M	SD
Lymphocytes	1,572	400	1,867	607	1,813	591
Total T cells	1,124	295	1,364	473	1,256	414
Helper T cells	721	196	873	326	819	290
Suppressor T cells	370	143	427	174	408	163
Helper/suppressor	2.22	1.07	2.21	0.81	2.11	0.62
Interleukin-2	41	34	46	85	22	19
HLA-DR	216	93	283	139	263	180

(Bandura et al., 1982; Bandura et al., 1985). The pattern of cortisol secretion in the present study is in accord with the findings of Nesse and his colleagues (Nesse et al., 1985) that cortisol elevation is highest in anticipation of treatment for phobic dysfunction.

Cortisol and heart rate activation were unrelated in the baseline and maximal self-efficacy phases. However, in the self-efficacy-acquisition phase, in which there was significant autonomic activation, heart rate acceleration was significantly associated with elevated cortisol level, $r(17) = .44$, $p < .05$. Growth of perceived self-efficacy was unrelated to level of cortisol or heart rate. However, the more rapid the acquisition of perceived self-efficacy, the lower was the subjects' heart rate in the maximal efficacy phase, compared with their baseline level, $r(17) = -.51$, $p < .025$.

Immune Changes as a Function of Perceived Coping Self-Efficacy

The immunological system status at each of the three phases of the experiment is summarized in Table 1. Percentage changes in immunological system components during exposure to the phobic stressor in the acquisition and maximal self-efficacy phases were computed in relation to level of immuno-competence in the baseline phase. Figure 2 presents the pattern of immune change as a function of perceived coping self-efficacy. The effects were analyzed in terms of percentage of change, to control for individual differences in baseline levels. The significance of the differences across phases are provided in Table 2.

For purposes of expository convenience, the terms immunoenhancement and immunosuppression are used simply as descriptors for quantitative increases and decreases, respectively, in the various components of the immune system. The predominant changes were increases in the immunological system status during the phase in which subjects initially confronted the stressor ineffectively but continued to develop their sense of coping efficacy. The immunoenhancement was significant for all lymphocyte functions. Coping with growing perceived self-efficacy raised the total number of lymphocytes and T lymphocytes and increased helper and suppressor T cells without disrupting the balance between them. HLA-DR also increased

substantially during the efficacy-acquisition phase. Expression of the Interleukin-2 did not change significantly.

During the subsequent phase, when subjects coped with the stressor with a maximal sense of efficacy, immunological system status changed toward the baseline level. However, the change was not complete, in that subjects continued to display significantly higher lymphocyte and helper T cell function, marginally higher suppressor T cell function, and higher HLA-DR than they did at the baseline phase (Table 2).

Divergent Patterns of Immune Changes

Exposure to the stressor during the perceived self-efficacy-acquisition phase produced two markedly divergent patterns of immune responses. For most of the indexes of immunological system status, approximately three quarters of the subjects exhibited immunoenhancement, and the remaining subjects experienced a decline in immunological system status. For both immunoenhancers and immunoattenuators, the level of immunological system components changed toward their baseline level during the phase in which subjects coped with the stressor with maximal perceived self-efficacy (Figure 3).

Predictors of Changes in Immunological System Status

The hypothesized predictor variables were correlated with percentage change from baseline values in each immunological component for each of the two coping phases of the study. The first variable was growth of perceived coping self-efficacy as indexed by the percentage change in self-efficacy strength from the beginning of the guided mastery session to the end of the supplemental session received by all subjects. As previously noted, both cortisol and autonomic activity have been found to exert immunosuppressive effects. Subjects' level of cortisol at the end of the efficacy-acquisition phase was used in the analysis. Mean heart rate during the efficacy-acquisition phase was the third variable in the analysis.

Table 3 contains the pattern of zero-order correlations with changes in immunological indexes. In accord with prediction, the findings generally showed that slow growth of perceived

Table 2
Significance of the Changes in Immune Status From the Baseline Level to Exposure to the Stressor During Acquisition and Maximal Perceived Coping Self-Efficacy

Measure	Baseline vs. efficacy acquisition		Baseline vs. maximal efficacy		Efficacy acquisition vs. maximal efficacy
	t	p	t	p	
Lymphocytes	2.67	.02	2.42	.05	0.78
Total T cells	2.80	.02	1.87	.08	1.48
Helper T cells	2.87	.01	2.17	.05	1.16
Suppressor T cells	2.16	.05	1.73	.10	0.33
Helper/suppressor T cells	0.81		0.27		0.52
Interleukin-2	0.90		1.10		1.61
HLA-DR	2.80	.02	2.02	.06	0.31

self-efficacy, high cortisol activation, and heart rate acceleration were associated with lower immunological status during the efficacy-acquisition phase. The immunological change from the efficacy-acquisition phase to the maximal efficacy phase represents mainly a decline toward the baseline level.

Rate of growth of perceived self-efficacy emerged again as a consistent predictor of immunological change during the perceived maximal-efficacy phase. The slower the subjects' growth of perceived efficacy, the more their immunological status declined toward their baseline level. High cortisol activation was related to lower lymphocyte count and helper:suppressor ratio. Heart rate predicted only lymphocyte count during this phase.

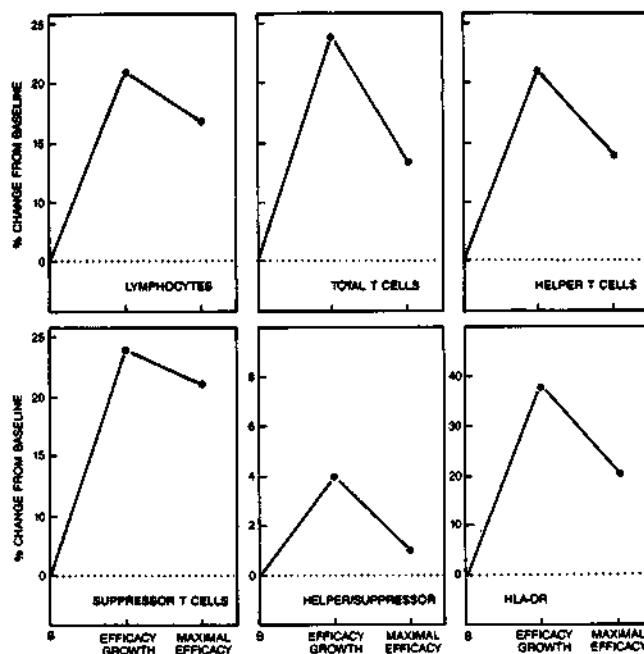


Figure 2. Changes in components of the immune system experienced as percentage of baseline values during exposure to the phobic stressor while acquiring perceived coping self-efficacy (efficacy growth) and after perceived coping self-efficacy develops to the maximal level (maximal efficacy).

Regression Analysis

Hierarchical regression analyses were performed to test the multivariate relation of the three stress-related variables to changes in immunological system components. Growth of perceived self-efficacy was considered the first factor because of its demonstrated paramount role in stress reactions (Bandura, 1988b). Cortisol, which can produce immunosuppressive effects at high levels, was entered as the second factor, followed by Heart Rate. The results of the regression analysis are summarized in Table 4.

During the efficacy-acquisition phase, the rises in lymphocytes and helper and suppressor T cells and HLA-DR were related to rapid growth of perceived coping self-efficacy, to low cortisol levels, and to a lesser extent to a low level of heart rate. Rate of growth of perceived coping self-efficacy also emerged as a strong predictor of the degree of decline in these immune components toward the baseline level in the maximal self-efficacy phase. Subjects who had rapidly acquired a strong sense of efficacy were less likely to exhibit declines in immune status. Cortisol level accounted marginally for declines in lymphocytes and in the ratio of helper to suppressor cells. Level of heart rate did not attenuate immunological status in the maximal-efficacy phase when the influence of the other variables was controlled.

Discussion

The findings of the present experiment are generally supportive of the hypothesis that perceived self-efficacy to exercise control over stressors is a modulator of immunological system status. The powerful guided mastery procedure made it possible to create differential levels of perceived coping self-efficacy under high experimental control and to examine the immunological effects of these intrasubject changes in perceived coping self-efficacy. The especially noteworthy finding is that stress activated in the process of gaining coping mastery is immunoenhancing rather than immunosuppressing. This is reflected in a higher level of lymphocyte and T cell function. Acquisition of perceived self-efficacy to control stressors produced more than simply transient changes in immunity. The increase in immunological competence was generally sustained over time as evi-

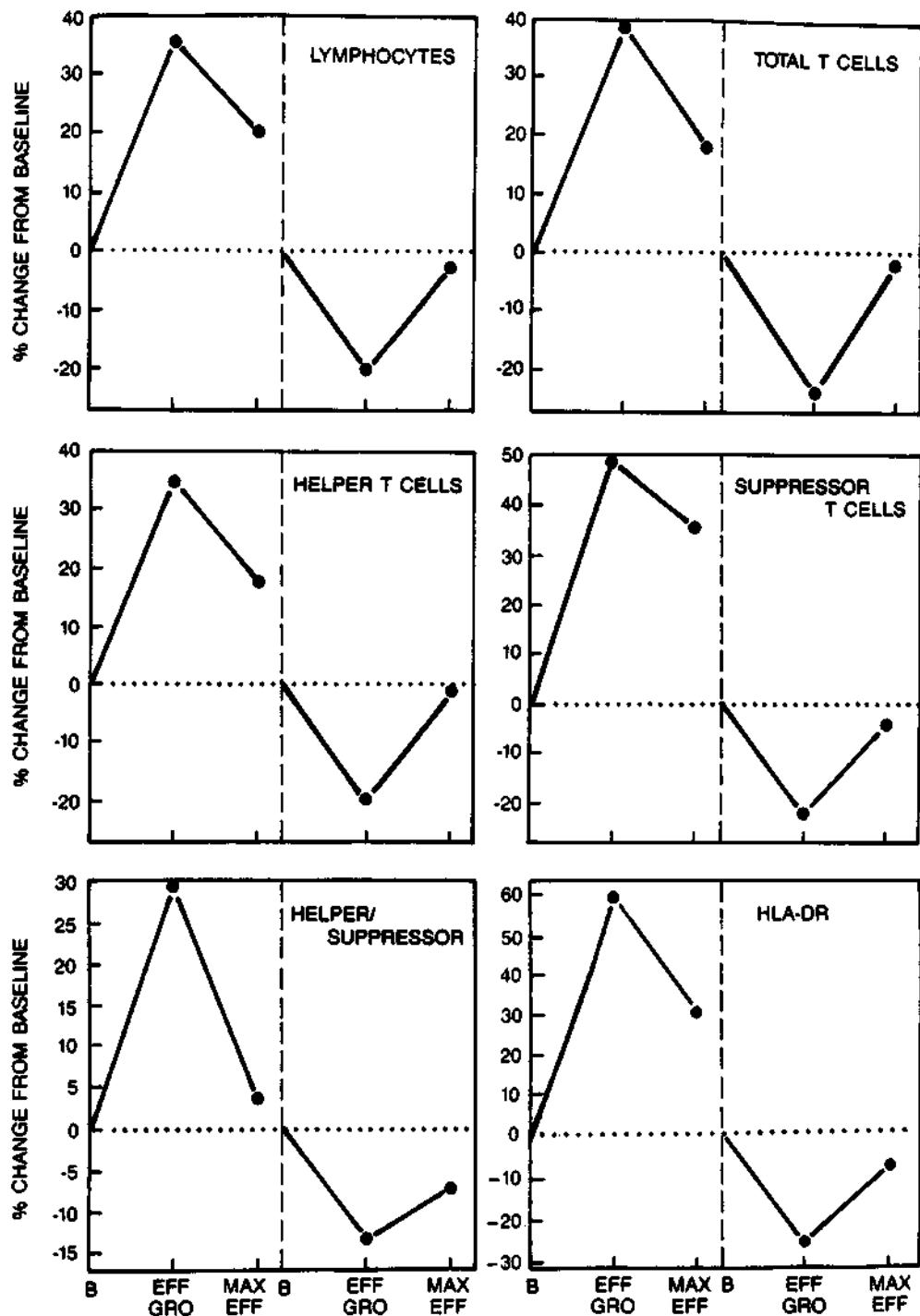


Figure 3. Divergent patterns of changes in immune states exhibited by two subgroups of subjects during acquisition of perceived self-efficacy to control stressors (Eff Gro) and after subjects developed a maximal sense of coping efficacy (Max Eff). B = baseline. The panels on the left portray the enhanced immune status displayed by about three quarters of subjects; the panels on the right portray the immunosuppressive reactions of the remaining subgroups of subjects.

dent in the significantly higher system status in the maximal perceived-self-efficacy phase than in the baseline phase.

Because HLA-DR is primarily expressed on B cells, the results of this study suggest that B cells, in addition to T cells, are

responsive to the stress of low perceived coping efficacy. That is, enhanced perceived self-efficacy affected the arm of the immune system governing humoral immunity as well as the cellular arm of the immune system. Interleukin-2 is a measure of T

Table 3
Correlations Between Stress-Related Variables and Percentage Change in Immune Status

Measure	Lymphocytes		Total T cells		Helper T cells		Suppressor T cells		Helper/suppressor		Interleukin-2		HLA-DR	
	r	p	r	p	r	p	r	p	r	p	r	p	r	p
Change from baseline to efficacy-acquisition phase														
Growth of efficacy	.46	<.03	.41	<.04	.39	<.05	.38	<.05	-.24	ns	.09	ns	-.51	<.02
Cortisol	-.43	<.03	-.38	<.06	-.40	<.05	-.43	<.03	.32	<.09	.29	ns	.43	<.06
Heart rate	-.40	<.05	-.35	<.07	-.28	ns	-.43	<.03	.37	<.06	-.26	ns	.36	ns
Change from efficacy-acquisition to maximal efficacy phase														
Growth of efficacy	-.42	<.04	-.48	<.02	-.44	<.03	-.50	<.02	.21	ns	-.46	<.03	-.30	ns
Cortisol	.40	<.04	.24	ns	.02	ns	.30	ns	-.40	<.04	.06	ns	.03	ns
Heart rate	.42	<.04	.24	ns	.06	ns	.33	<.08	-.36	<.06	.16	ns	.19	ns

Note. For growth of efficacy and cortisol, $n = 20$; for heart rate, $n = 19$.

cell activation; exposure to any pathogen activates T cells. The general lack of significant findings for Interleukin-2 can be best understood as consistent with the expectation that not all subjects would have been exposed to a pathogen during the course of this study. While the numbers of T cell subsets changed during the study, this is distinct from the activation of T cells, which is pathogen related, and would not be expected to occur in any systematic way.

Previous research has shown that the effects of stress on the immune system vary depending on the timing, intensity, and chronicity of stressors (Coe & Levine, in press; Keller, Weiss, Schleifer, Miller, & Stein, 1981). This study indicates that growth of perceived controlling efficacy over stressors is also an influential factor governing the direction and magnitude of stress effects on immunological status. Much human stress is

generated in coping transactions while competencies are being developed and expanded. Because the nature of the challenges to competence changes across the lifespan, the process of coping with stressors and new mastery demands is a continuing one. There are substantial evolutionary benefits to experiencing enhanced immunocompetence during development of coping capabilities vital for effective adaptation. The field of health psychology has focused heavily on the physiologically debilitating effects of stressors. The findings of this study are in accord with evidence from different lines of research presented by Dienstbier (1989) on the physiologically toughening effects of mastery over stressors.

Explaining variance in immunological status within experimental phases constitutes a more stringent test of hypothesized mechanisms than does accounting for the variance across

Table 4
Regression Analysis of Stress-Related Predictors of Change in Immune Status

Immune function	Growth of efficacy				Cortisol				Heart rate			
	r	R ² inc	F	p	r	R ² inc	F	p	r	R ² inc	F	p
Change from baseline to efficacy-acquisition phase												
Lymphocytes	.46	.21	4.70	.04	-.41	.17	4.70	.04	-.36	.13	4.04	.06
Total T cells	.41	.17	3.64	.07	-.37	.13	3.24	.09	-.32	.10	2.59	ns
Helper T cells	.39	.15	3.16	.09	-.38	.15	3.57	.08	-.25	.06	1.48	ns
Suppressor T cells	.38	.15	3.09	.10	-.42	.18	4.45	.05	-.39	.15	4.62	.05
Helper/suppressor T cells	-.24	.06	1.12	ns	.31	.10	1.96	ns	.34	.11	2.46	ns
Interleukin-2	.09	.008	0.14	ns	.29	.09	1.61	ns	.48	.23	5.42	.03
HLA-DR	.51	.26	6.40	.02	.42	.17	5.19	.04	.32	.10	3.32	.09
Change from efficacy-acquisition to maximal efficacy phase												
Lymphocytes	-.42	.17	3.76	.07	.39	.15	3.88	.06	.39	.15	4.28	.06
Total T cells	-.48	.23	5.24	.03	.23	.05	1.23	ns	.22	.05	1.04	ns
Helper T cells	-.44	.20	4.36	.05	.004	.00	0.0003	ns	.06	.003	0.06	ns
Suppressor T cells	-.50	.24	5.76	.03	.28	.08	1.98	ns	.31	.09	2.37	ns
Helper/suppressor T cells	.21	.05	0.84	ns	-.40	.16	3.38	.08	-.32	.11	2.25	ns
Interleukin-2	-.45	.21	4.36	.04	.03	.001	0.00	ns	.13	.02	0.32	ns
HLA-DR	-.30	.09	1.82	ns	.03	.0007	0.13	ns	.19	.035	0.59	ns

Note. For growth of efficacy and cortisol, $n = 20$; for heart rate, $n = 19$.

phases. Subjects varied considerably in the rate with which they acquired self-percepts of coping efficacy. Perceived coping inefficacy during the efficacy-acquisition phase attenuated immunological status. Perceived coping inefficacy also predicted the magnitude and direction of change in immunological status during the subsequent maximal self-efficacy phase. The slower the growth of perceived self-efficacy, the greater was the recovery from immunoattenuation after maximal perceived self-efficacy had been achieved. Rapid acquisition of perceived coping self-efficacy was thus accompanied not only by enhanced immune response, but by retention of increased level of immunological functioning during the maximal perceived-self-efficacy phase. Evidence that changes in immunological system components covary with variations in growth of perceived self-efficacy lends further credence to the contributory role of perceived controlling efficacy.

The findings also provide some support for cortisol regulation of immune function independent of the effects of perceived coping self-efficacy. The higher the endocrine activation, the more likely were subjects to experience attenuation in immune function as they were striving to gain coping mastery. Level of cortisol activation in the acquisition phase also predicted changes in lymphocyte function in the maximal self-efficacy phase, but cortisol level in the maximal phase did not. After subjects had become fully efficacious, their cortisol levels were low and varied little in this regard. Limited variance attenuates correlations. Although heart rate during efficacy acquisition correlated with changes in lymphocyte numbers in both the acquisition and maximal self-efficacy phases, it did not account for additional variance when the effects of perceived self-efficacy and cortisol activation were controlled. These findings concerning autonomic system involvement should be interpreted with caution because only one index of autonomic arousal was used. However, previous findings have shown that the pattern of changes in other autonomic indexes (i.e., systolic and diastolic blood pressure) accompanying self-efficacy enhancement are similar to those of heart rate (Bandura et al., 1982).

Evidence that rapid acquisition of perceived coping self-efficacy predicted enhanced immunocompetence after a strong sense of efficacy had been restored raises an interesting issue that warrants comment. These findings indicate that vigorous mastery of chronic stressors not only instills a strong sense of self-efficacy but leaves lasting changes that can serve as protective factors against adverse immunological effects of psychological stressors. High perceived self-efficacy gained commandingly may convey a more generalized sense of coping capability than if it is gained laboriously with prolonged stress. H. S. Hoffman (1969) showed that uncontrollable physical stressors can create vulnerabilities that leave some sensitivity to aversive events even after acquired fears have been eliminated through repeated nonreinforced exposure. Mastery modeling, of course, does much more in that it equips people with coping strategies and a resilient sense of efficacy to exercise control over potential threats. Results of the present study suggest that rapid development of perceived self-efficacy to exercise control over psychological stressors can instill a durable protection against aversive events. These findings add to other lines of evidence showing that development of stress-reduction capabili-

ties can decrease immunological vulnerability to recurrent stressors (Kiecolt-Glaser et al., 1986, 1985).

The results of this study can be understood in terms of two biochemical mediators of psychosocial influences on immunity: catecholamines, which are released with activation of the sympathetic-adrenal medullary system, and cortisol, the hormone associated with the pituitary-adrenal cortical system. In psychological terms, these two systems have been described as the *effort* and *distress* systems, respectively (Frankenhaeuser, 1983) or as the *fight-flight* and *conservation-withdrawal* systems (Henry & Stephens, 1977). Although the sympathetic adrenal cortical system is engaged primarily during fear and anger, activation of the pituitary-adrenal cortical system is thought to reflect perception that the threat is overwhelming. Activation of this latter system tends to be associated with more prolonged stressors, presumably because the organism is more likely to relinquish coping efforts in the face of unremitting threat.

Cortisol appears to be associated with suppression of immune function in both enumeration and functional measures (Cupps & Fauci, 1982), whereas catecholamines have mixed effects. Injections of epinephrine have been shown to increase numbers of blood lymphocytes while reducing their functional efficacy (Crary, Borysenko, et al., 1983; Crary, Hauser, et al., 1983; Eriksson & Hedfurs, 1977).

The major finding of this study—that lymphocyte numbers increase during efforts to master the phobic threat—suggests that catecholamine release may have been the predominant determinant of the immunological changes. Indeed, studies of the microrelation between strength of perceived self-efficacy and plasma catecholamine secretion have shown that catecholamines are released while phobics cope with threatening tasks for which they doubt their coping capabilities (Bandura et al., 1985).² The fact that subjects who displayed a decrease in lymphocytes evidenced slow acquisition of perceived efficacy and prolonged elevations in salivary cortisol is consistent with the research indicating immunosuppressant effects of cortisol.

The results concerning the relation of growth of perceived self-efficacy to immune changes may be of general relevance for the impact of perceived coping efficacy on these two important stress-physiological systems during active coping. That is, rapid acquisition of perceived coping efficacy may be associated with activation of the sympathetic nervous system—*effort* in Frankenhaeuser's terms—and slow efficacy acquisition with adrenal-cortical activation, or *distress*. Further investigation of this issue might add to our understanding of the biochemical effects of perceived coping efficacy.

The immune system includes multiple interacting subprocesses with intricate interconnections to other biological systems, all of which complicate evaluation of level of immunity. The clinical significance of the alterations in immune function accompanying changes in perceived coping self-efficacy re-

² According to this interpretation, it might be argued that heart rate, being a measure of autonomic arousal, should have been correlated positively with increased lymphocyte numbers. In fact, heart rate, which is determined by both sympathetic and parasympathetic stimulation, has not been found consistently to be correlated with serum catecholamines (Contrada et al., 1982; Esler, Hasking, Willett, Leonard, & Jennings, 1985).

mains to be determined. Nevertheless, knowledge of how efficacious control over stressors affects different aspects of the immune system is important to an eventual full understanding of the dual linkage between psychosocial influences, immune function, and disease processes.

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Received September 7, 1989

Revision received March 7, 1990

Accepted June 19, 1990 ■

PERCEIVED SELF-EFFICACY IN THE EXERCISE OF CONTROL OVER AIDS INFECTION

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ABSTRACT

This article analyzes the influential role played by perceived self-efficacy in the exercise of control over behavior that carries risk of AIDS (Acquired Immunodeficiency Syndrome) infection. Effective programs of self-directed change require four major components. The first is informational, designed to increase awareness and knowledge of health risks. The second component is concerned with development of the social and self-regulatory skills needed to translate informed concerns into preventive action. The third component is aimed at skill enhancement and building resilient self-efficacy through guided practice and corrective feedback in applying the skills in high-risk situations. The final component involves enlisting social supports for desired personal changes.

Prevention of infection with the AIDS (Acquired Immunodeficiency Syndrome) virus requires people to exercise influence over their own motivation and behavior. Social efforts designed to control the spread of AIDS have centered mainly on informing the public on how the human immunodeficiency virus (HIV) is transmitted and how to safeguard against such infection. It is widely assumed that if people are informed adequately about the AIDS threat they will take appropriate self-protective action. Heightened awareness and knowledge of health risks are important preconditions for self-directed change. Unfortunately, information alone does not necessarily exert much influence on refractory health-impairing habits. It has not slimmed the obese or eradicated cigarette smoking, despite its acknowledged hazard for cancer, respiratory disorders, and heart disease, nor has it made a substantial dent on nutritional patterns that create a high risk of cardiovascular disease in those who most need to change. It certainly will not make the sexually active celibate and impel intravenous drug users to renounce drugs, which are the two major transmitter modes for the AIDS virus.

To achieve self-directed change, people need to be given not only reasons to alter risky habits but also the means and resources to do so. Effective self-regulation of behavior is not achieved by an act of will. It requires certain skills in self-motivation and self-guidance (Bandura, 1986). Moreover, there is a difference between possessing coping skills and being able to use them effectively and consistently under difficult circumstances. Success, therefore, requires not only skills, but also strong self-belief in one's capabilities to exercise personal control.

Perceived self-efficacy is concerned with people's beliefs that they can exert control over their motivation and behavior and over their social environment. People's beliefs about their capabilities affect what they choose to do, how much effort they mobilize, how long they will persevere in the face of difficulties, whether they engage in self-debilitating or self-encouraging thought patterns, and the amount of stress and depression they experience in taxing situations. When people lack a sense of self-efficacy, they do not manage situations effectively, even though they know what to do and possess the requisite skills. Self-inefficacious

This article is an abridged version of a paper presented at the National Institutes of Mental Health and Drug Abuse Research Conference on *Women and AIDS: Promoting Health Behaviors*, Bethesda, MD, September 1987. Preparation of this article was facilitated by Public Health Research Grant MH-5162-25 from the National Institute of Mental Health.

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thinking creates discrepancies between knowledge and action.

Numerous studies have been conducted linking perceived self-efficacy to health-promoting and health-impairing behavior (Bandura, 1986, 1989; O'Leary, 1985). The results show that perceived efficacy can affect every phase of personal change—whether people even consider changing their health habits, how hard they try should they choose to do so, how much they change, and how well they maintain the changes they have achieved. In addition to influencing health habits, perceived coping ineffectiveness increases vulnerability to stress and depression and activates biochemical changes that can affect various facets of immune function (Bandura, 1989; Maier, Laudenslager, & Ryan, 1985).

Translating health knowledge into effective self-protection action against AIDS infection requires social skills and a sense of personal power to exercise control over sexual situations. As Gagnon and Simon (1973) have observed correctly, managing sexuality involves managing interpersonal relationships. Problems arise in following safer sex practices because self-protection often conflicts with interpersonal pressures and sentiments. In these interpersonal situations the sway of coercive power, allurements, desire for social acceptance, social pressures, situational constraints, and fear of rejection and personal embarrassment can override the influence of the best of informed judgment. The weaker the perceived self-efficacy, the more such social and affective factors can increase the likelihood of risky sexual behavior.

Exercise of personal control over sexual situations that carry risk of infection calls on skills and self-efficacy in communicating frankly about sexual matters and protective sexual methods and ensuring their use. Some of the people who perceive a personal risk of sexually transmitted disease are reducing the number of sexual partners and are more wary of engaging in sex with casual partners. Ignorance of a partner's sexual and drug activities has become a new risk factor. However, to rest self-protection on partners' reports of their sexual and drug history is a hazardous safeguard. Sexual ardor and impression management can readily expunge risky histories in personal disclosures. Survey studies reveal that even a majority of "monogamous" relationships are so in name rather than in actual practice. With increased heterosexual transmission of the AIDS virus, occasional sex with partners outside a monogamous relationship, especially those who have had bisexual or drug involvements, expands the range of potential risk.

Risk appraisal for AIDS infection is highly unreliable when the relevant risk factors remain concealed. Lacking knowledge of the behavioral history and serostatus of sexual partners, people tend to make their risk appraisals on the basis of social and physical ap-

pearances, which can be quite misleading because infected persons often remain asymptomatic for a long time. Even those who are well informed on safer-sex guidelines often err in their subjective appraisal of the extent to which they are putting themselves at risk of HIV infection. Bauman and Siegel (1987) found that gay men practicing hazardous sex underestimate the riskiness of their behavior as judged against epidemiologically established linkage to seropositivity. Misappraisals of riskiness of one's sexual practices tend to be associated with underestimation of personal susceptibility to infection and with misbeliefs that risky sex with a few regular partners is safe and that behavioral precautions that actually have no protective value (showering before and after sexual contact, healthful regimens, inspecting partners for lesions) will render risky sex safe. Such findings underscore the need for risk-reduction messages to describe not only risky sexual practices but also the common misbeliefs about factors that invest risky practices with false safety.

In managing sexuality, people have to exercise influence over themselves as well as over others. This requires self-regulatory skills in guiding and motivating one's actions. Self-regulation operates through internal standards, affective reactions to one's conduct, use of motivating self incentives, and other forms of cognitive self-guidance. Self-regulatory skills thus form an integral part of risk-reduction capabilities. They partly determine the social situations into which people get themselves, how well they navigate through them, and how effectively they can resist social inducements to potentially risky behavior. It is easier to wield control over preliminary choice behavior that may lead to troublesome social situations than to try to extricate oneself from such situations. This is because the antecedent phase involves mainly anticipatory motivators which are amenable to cognitive control; the entanglement phase includes stronger social inducements to engage in high-risk behavior which are less easily manageable.

In some countries, such as Africa, Latin America, and the Caribbean, AIDS is almost exclusively a heterosexually transmitted disease, with untreated venereal diseases increasing susceptibility to HIV infection. In Europe and the United States, the route of heterosexual transmission is mainly via bisexuals and intravenous drug users infected by sharing contaminated needles. Control of the spread of the AIDS virus by intravenous drug users requires risk-reduction strategies aimed at both drug and sexual practices. Relatively little effort has been devoted to developing interventions to prevent infection among intravenous drug users. This is a serious neglect because infected drug users are transmitting the virus heterosexually to their female sexual partners who, in turn, run a high chance of infecting their infants through perinatal transmission. As a result, AIDS

is taking an increasingly heavy toll on women and children, especially among ethnic minorities in impoverished environs where drug use is prevalent. Those who continue to inject drugs intravenously, despite cognizance of the threat of AIDS infection, need access to

sterile needles and knowledge on how to disinfect needles to safeguard against transmission of the virus. They need to be taught protective sexual practices to avoid infecting their sexual partners and persuaded to use them.

ROLE OF PERCEIVED SELF-EFFICACY IN THE CONTROL OF HIGH-RISK BEHAVIOR

Perceived Self -Efficacy and Adoption of Health Practices

People's beliefs that they can motivate themselves and regulate their own behavior plays a crucial role in whether they even consider altering habits detrimental to health. They see little point to even trying if they believe they cannot exercise control over their own behavior and that of others. Even people who believe their detrimental habits may be harming their health achieve little success in curtailing their behavior unless they judge themselves as having some efficacy to resist the instigators to it. This observation is corroborated in a longitudinal study conducted by McKusick, Wiley, Coates, and Morin (1986) of gay men's sexual behavior. Several psychological factors that could influence sexual risk-taking behavior were assessed. These included perceived threat that one is potentially at risk of exposure to the AIDS virus, degree of peer support for adopting low-risk sexual behavior, social skills necessary to negotiate protective sexual behavior, level of self-esteem, and perceived self-efficacy that one can take protective actions that lessen the risk of AIDS infection.

The spreading threat of AIDS has produced substantial changes in sexual practices in the gay community as shown in reduction of high-risk sexual acts and number of sexual partners. Perceived self-efficacy emerged as the best predictor of sexual risk-taking behavior. The lower the perceived self-efficacy, the higher the likelihood of engagement in sexual practices that carry a high risk of AIDS infection. Men who frequented bars and bath houses had a lower sense of efficacy than those who were committed to a monogamous relationship. Social skill in negotiating protective sexual activity was also associated with low-risk sexual practices.

Framing Health Messages

Efforts to encourage people to adopt health practices rely heavily on persuasive communications in health education campaigns. In such health messages, appeals to fear by depicting the ravages of disease are often used as motivators, and recommended preventive practices are provided as guides for action. People need enough knowledge of potential dangers to warrant action, but they do not have to be scared out of their wits to act, any more than homeowners have to be terrified to insure their households. Rather, what people need is sound information on how AIDS is transmitted, guid-

ance on how to regulate their behavior, and firm belief in their personal efficacy to turn concerns into effective preventive actions. Responding to these needs requires a shift in emphasis from trying to scare people into healthy behavior to empowering them with the tools for exercising personal control over their health habits.

The influential role of people's beliefs in their personal efficacy in adopting preventive health practices is shown by Beck and Lund (1981). They studied the persuasiveness of health communications in which the seriousness of a disease and susceptibility to it were varied. Patients' perceived efficacy that they could stick to the required preventive behavior was a good predictor of whether they adopted the preventive practices. Fear arousal had little effect on whether or not they did so. Slater (1989) has found similarly that perceived self-efficacy plays an influential role in the social diffusion of health practices promoted by mass media campaigns. The stronger the perceived self-efficacy, the more likely people are to adopt the recommended practices. The relationship remains even when multiple controls are applied for a host of other possible influences.

To be most effective, health communications should instill in people the belief that they have the capability to alter their health habits and should instruct them on how to do it. Communications that explicitly do so increase people's determination to modify habits detrimental to their health (Maddux & Rogers, 1983). Entrenched habits rarely yield to a single attempt at self-regulation. Success is usually achieved through renewed effort following failed attempts. To strengthen the staying power of self-beliefs, health communications should emphasize that success requires perseverant effort, so that people's sense of efficacy is not undermined by a few setbacks. Unfortunately, the possibility that the AIDS virus is transmittable to the immunologically vulnerable through a few sexual contacts with infected partners or sharing a few contaminated needles does not leave much room for carelessness.

An increased research effort is needed to determine how preventive health communications should be framed to maximize their impact on perceived self-regulatory efficacy. Self-efficacy theory provides one set of guidelines (Bandura, 1986). I shall consider later how symbolic modeling influences should be structured to maximize their psychosocial impact. Decision theory regarding risk perception and risky decisions provides other suggestions (Tversky & Kahneman, 1981). For ex-

ample, people interpret information regarding risky activities in terms of potential gains and potential losses. Persuasive communications have differential impact on perceived self-efficacy depending on whether they are framed in terms of gains or losses. Communications phrased in terms of benefits are less effective in altering detrimental habits than communications phrased in terms of personal losses. Examination of possible

mediating mechanisms shows that the more persuasive messages achieve their effects by raising perceived self-efficacy rather than by heightening fear or perceived threat (Meyerowitz & Chaiken, 1987). In designing national education campaigns we need to exploit our knowledge of social influence processes and the cognitive and affective mechanisms governing human motivation and behavior.

COMPONENTS OF EFFECTIVE SELF-DIRECTED CHANGE

An effective program of widespread change in detrimental lifestyle practices includes four major components: The first is informational, designed to increase people's awareness and knowledge of health risks. The second component is concerned with development of the social and self-regulatory skills needed to translate informed concerns into effective preventive action. The third component is aimed at skill enhancement and building resilient self-efficacy by providing opportunities for guided practice and corrective feedback in applying the skills in high-risk situations. The final component involves enlisting social supports for desired personal changes. Let us consider how each of these four components would apply to self-directed change of behaviors that pose high risk of AIDS infection.

Informational Component

The preconditions for change are created by increasing people's awareness and knowledge of the profound threat of AIDS. They need to be provided with a great deal of factual information about the nature of AIDS, its modes of transmission, what constitutes high risk sexual and drug practices, and how to achieve protection from infection. This is easier said than done. Our society does not provide much in the way of treatment of drug addiction; nor is it about to provide refractory drug users with easy access to sterile needles and other drug paraphernalia. It has little experience in how to reach and educate drug users on how to disinfect needles to reduce the risk of AIDS infection.

In the sexual domain, our society has always had difficulty talking frankly about sex and imparting sexual information to the public at large. Since parents generally do a poor job of it as well, most youngsters pick up their sex education from other, often less trustworthy and reputable sources outside the home or from the consequences of uninformed sexual experimentation. To complicate matters further, some sectors of the society lobby actively for maintaining a veil of silence regarding protective sexual practices on the belief that such information will promote indiscriminate sexuality. In their view, the remedy for the spreading AIDS epidemic is a national celibacy campaign for unweds and gays and faithful monogamy among the wedded. They oppose educational programs in the schools that talk

about sex methods that provide protection against AIDS infection.

The net result is that many of our public education campaigns regarding AIDS are couched in desexualized generalities that leave some ignorance in their wake. To those most at risk, such sanitized expressions as "exchange of bodily fluids" are not only uninformative but also may invest safe bodily substances with perceived infective properties. Even those more skilled in deciphering medical locutions do not always know what the preventive messages are talking about. For example, an intensive campaign spanning a full week was conducted on the Stanford campus, including public lectures, numerous panel discussions, presentations in dormitories, and condom distribution, all of which were widely reported in the campus newspaper. A systematic assessment of students' beliefs and sexual practices conducted several weeks later revealed that more than a quarter of the students did not know what constitutes "safer sex," and some of them had misconceptions of safer sex practices that, in fact, would present high risk of infection. Other findings of this study, which will be reviewed later, underscore the severe limitations of efforts to change sexual practices by information alone.

The informational component of the model of self-directed change includes two main factors—the informational content of the health communications and the mechanisms of social diffusion. Detailed factual information about AIDS must be imparted socially in an understandable, credible, and persuasive manner. Social cognitive theories provide a number of guidelines on how this might best be accomplished (Bandura, 1986; McGuire, 1984; Zimbardo, Ebbesen, & Maslach, 1977). However, developing effective AIDS prevention programs is only the first step; they must also be disseminated. Unlike other health risk-reduction campaigns which involve relatively prosaic habits, the risky habits for AIDS infection are laden with matters of illegalities and judged immoralities.

Informative health messages, however well designed, cannot have much social impact without effective means of dissemination. Because of their wide reach and influence, the mass media, especially television, can serve as a major vehicle of social diffusion of informa-

tion regarding health guidelines. However, a variety of diffusion vehicles must be enlisted in a public health campaign for several reasons. High costs and restricted access to television limit its availability. Moreover, television networks typically adopt a conservative stance on controversial matters. They have resisted getting into the act for fear that talk of protective sex practices will jeopardize advertising revenue by arousing the wrath of some sectors of their viewing audience. This resistance may eventually weaken as the AIDS virus is increasingly transmitted heterosexually, thus making it a more general societal problem rather than one confined to gays and drug users. However, it is unlikely that the television industry will offer much help if AIDS becomes mainly a disease of poor minorities. Existing social, religious, recreational, occupational, and educational organizations can serve as highly effective disseminators of preventive health guidelines. Wide cultural diversity requires that the messages of risk-reduction campaigns for AIDS be tailored to socioeconomic, racial, and ethnic differences in value orientations and disseminated through multiple sources to ensure adequate exposure (Mantell, Schinke, & Akabas, 1988).

Nontraditional social networks must be enlisted for high-risk groups who are beyond the reach of the usual community organizations. For example, in an educational program in San Francisco, "streetwise" counselors have been highly successful in reaching drug populations (Watters, 1987). After they become known in the social circles of drug users, the counselors help them with referrals to drug treatment programs. They offer them explicit instruction in safer sex practices. They teach intravenous drug users how to reduce the risk of AIDS by disinfecting needles with ordinary household bleach which kills the HIV virus. The disinfection procedure, which had rarely been used before, was adopted widely and applied consistently. Although this outreach program also increased the use of condoms, the drug users were much more conscientious in disinfecting needles than in protecting their sexual partners against sexually transmitted infection. Such findings underscore the need for sexual partners to exercise personal control in protecting their own health.

A comprehensive national program regarding the growing AIDS threat must address broader social issues as well as risky health practices. This is because the AIDS epidemic has far-reaching social repercussions. One of these issues concerns the widespread public fear of AIDS infection. Many people continue to believe that the AIDS virus can be transmitted by casual contact or by insect transmission and food handling, despite evidence to the contrary. Efforts by health professionals to dispel misapprehensions are discounted by many of those who are alarmed on the grounds that what is proclaimed safe currently may be discovered to be risky later. Fear gets translated into advocacy of laws requiring sweeping mandatory blood testing and iden-

tification and social restriction of those with antibodies to the HIV virus.

As AIDS imposes mounting financial burdens on society and strains medical and social service systems, members of high-risk groups may become targets of growing public hostility. Once entire groups get stigmatized because some of its members behave in high-risk ways, those who do not also become the objects of fear and hostility. The way in which they are treated socially may be dictated more by group identity than by their personal characteristics. Public alarm fueled by many misbeliefs enhances such stigmatization. Policy debates on how to control the spread of AIDS have become highly politicized. Prohibitionists argue that public health campaigns promote indiscriminate sex. Their critics argue that knowledge does not foster sexuality and that prohibitionists are intent at curtailing sex practices they find morally objectionable rather than at increasing the safety of sex. Uninformed public reactions to the AIDS threat require serious attention as do the risky health practices themselves, because they help to shape public policies and impose constraints on health education programs.

Development of Self-Protective Skills and Controlling Self-Efficacy

It is not enough to convince people that they should alter risky habits. Most of them also need guidance on how to translate their concerns into efficacious actions. In the Stanford survey mentioned earlier, after exposure to the intensive educational campaign less than half of the students who were sexually active used safer sex methods designed to prevent infection with sexually transmitted diseases. Most of them even avoided talking about the matter with their sexual partners. Studies conducted on other campuses similarly reveal that most sexually active students who are knowledgeable about AIDS do not adopt safer sex practices (Edgar, Freimuth, & Hammond, 1988). McKusick, Horstman, and Coates (1986) found that gay men were uniformly well informed about safer sex methods for protecting against AIDS infection, but those who had a low sense of efficacy that they could manage their behavior and sexual relationships were unable to act on their knowledge.

The ability to learn by social modeling provides a highly effective method for increasing human knowledge and skills. A special power of modeling is that it can transmit simultaneously knowledge and valuable skills to large numbers of people through the medium of videotape modeling. Knowledge of modeling processes identifies a number of factors that can be used to enhance the instructive power of modeling. Applications of modeling principles to AIDS prevention would focus on how to manage interpersonal situations and one's own behavior in ways that afford protection against infection with the AIDS virus. Both self-regu-

latory and risk-reduction strategies for dealing with a variety of situations would be modeled to convey general guides that can be applied and adjusted to fit changing circumstances.

I mentioned earlier that human competency requires not only skills but also self-belief in one's capability to use those skills well. Indeed, results of numerous studies of diverse health habits and physical dysfunctions reveal that the impact of different methods of influence on health behavior is partly mediated through their effects on perceived self-efficacy (Bandura, 1989). The stronger the self-efficacy beliefs they instill, the more likely are people to enlist and sustain the effort needed to change habits detrimental to health. Modeling influences should, therefore, be designed to build self-assurance as well as to convey rules for how to deal effectively with troublesome situations. The influence of modeling on beliefs about one's capabilities relies on comparison with others. People judge their own capabilities, in part, from how well those whom they regard as similar to themselves exercise control over situations. People develop stronger belief in their capabilities and more readily adopt modeled ways if they see models similar to themselves solve problems successfully with the modeled strategies, than if they see the models as very different from themselves (Bandura, 1986). To increase the impact of modeling, the characteristics of models such as their age, sex, and status, the type of problems with which they cope, and the situation in which they apply their skills, should be made to appear similar to the people's own circumstances.

Enhancement of Social Proficiency and Resiliency of Self-Efficacy

Proficiency requires extensive practice and this is no less true of managing the interpersonal aspects of sexuality. After people gain knowledge of new skills and social strategies, they need guidance and opportunities to perfect these skills. Initially, people practice in simulated situations where they need not fear making mistakes or appearing inadequate. This is best achieved by role-playing in which they practice handling the types of situations they have to manage in their social environment. They receive informative feedback on how they are doing and the corrective changes that need to be made. The simulated practice is continued until the skills are performed proficiently and spontaneously.

Not all the benefits of guided practice are due to skill improvement. Some of the gains result from raising people's beliefs in their capabilities. Experiences in exercising control over social situations serve as self-efficacy builders. This is an important aspect of self-directed change because if people are not fully convinced of their personal efficacy they undermine their efforts in situations that tax capabilities and readily abandon the skills they have been taught when they fail to get quick results or suffer reverses. The important matter

is not that difficulties rouse self-doubts, which is a natural immediate reaction, but rather the degree and speed of recovery from setbacks. It is *resiliency* in perceived self-efficacy that counts in maintenance of changes in health habits. The higher the perceived self-efficacy, the greater is the success in maintenance of health-promoting behavior (Bandura, 1989).

The influential role played by perceived self-efficacy in the management of sexual activities is documented in studies of contraceptive use by teenage women at high risk because they often engage in unprotected intercourse (Levinson, 1982). Such research shows that perceived self-efficacy in managing sexual relationships is associated with more effective use of contraceptives. The relationship remains when controls are applied for demographic factors, knowledge, and sexual experience.

Gilchrist and Schinke (1983) applied the main features of the multicomponent model of personal change to teach teenagers how to exercise self-protective control over sexual situations. They received essential factual information about high-risk sexual behavior and self-protective measures. Through modeling they were taught how to communicate frankly about sexual matters and contraceptives, how to deal with conflicts regarding sexual activities, and how to resist unwanted sexual advances. They practiced applying these social skills by role playing in simulated situations and received instructive feedback. The program significantly enhanced perceived self-efficacy and skill in managing sexuality.

Research by Kelly and his colleagues attests to the substantial value of self-regulatory programs for AIDS risk reduction (Kelly, St. Lawrence, Hood, & Brasfield, 1989). Gay men were taught through modeling, role playing, and corrective feedback on how to exercise self-protective control in sexual relationships and to resist coercions for high-risk sex. Multifaceted assessments showed that they became more skillful in handling sexual relationships and coercions, they markedly reduced risky sexual practices and used condoms on a regular basis. These self-protective practices were fully maintained in follow-up assessments. In contrast, matched control subjects continued to engage in unprotected high-risk sexual practices.

Combining factual information about health risks with development of risk-reduction efficacy produces good results. Because people learn and perfect effective ways of behaving under lifelike conditions, problems of transferring the new skills to everyday life are reduced. The mastery-modeling approach is readily adaptable in audio or videocassette format to self-protective behavior with regard to AIDS. Large-scale applications of self-instructional programs sacrifice the guided role-playing component. However, instruction in imaginal rehearsal, in which people mentally practice dealing with prototypic troublesome situations, boosts per-

ceived self-efficacy and improves actual performance (Bandura, 1986; Kazdin, 1978). The self-instructional approach, designed in a format suitable for mass distribution, has been shown to achieve some success in changing other refractory health-impairing behavior (Sallis et al., 1986).

Because of the high level of unprotected sexual activity and experimentation with drugs by teenagers, they are vulnerable to becoming the new high-risk group as transmitters of the AIDS virus (Mantell & Schinke, in press). Training materials need to be developed to assist parents and teachers on how to educate youngsters about AIDS. The mastery-modeling program developed by Gilchrist and Schinke (1983) provides a good prototype for application in schools. However, other channels of dissemination must be created to reach teenagers because of factional opposition to educational efforts in the schools that address self-protective behavior in an explicitly informative manner. A major segment of the teenage population can be reached by making informative audio tapes and videocassettes readily available in the settings they frequent, such as record and video stores.

Social Supports for Personal Change

People effect self-directed change when they understand how personal habits threaten their well-being, are taught how to modify them, and believe in their capabilities to marshal the effort and resources needed to exercise control. However, personal change occurs within a network of social influences. Depending on their nature, social factors can aid, retard, or undermine efforts at personal change. This is especially true in the case of sexual and drug practices.

People who are fully informed on the modes of HIV transmission and effective self-protective methods acquire the virus only if they allow it to happen. They often allow it to happen because interpersonal, sociocultural, religious, and economic factors operate as constraints on self-protective behavior. Some of those most at risk must contend with sociocultural obstacles to the use of prophylactic methods that afford protection against HIV infection. The major burden for self-protection against sexually transmitted diseases usually falls on women. Unlike protection against pregnancy, where women can exercise independent control, use of condoms requires them to exercise control over the behavior of men. Those men who possess coercive power over their partners resist the use of condoms if, in their view, it reduces their sexual pleasure, threatens their sense of manliness and authority, casts aspersions on their faithfulness, and carries the frightening implication that they may be carriers of disease. It is difficult for women to press the issue in the face of emotional and economic dependence, coercive threat, and subcultural prescription of compliant roles for them. Women who are enmeshed in relationships of imbalanced power, need to

be taught how to negotiate protected sex nonconfrontationally. At the broader societal level, attitudes and social norms must be altered to increase men's sense of responsibility for the consequences of their sexuality.

Risk reduction through alteration of subcommunity norms is an especially important vehicle for curbing the spread of AIDS among intravenous drug users. This is because drug use is often a socially shared activity. Restricted access to drug injection equipment and the legal problems of being caught with it promote risky common use of drug paraphernalia. Shooting galleries involving widespread sharing of contaminated needles provide the most fertile ground for spreading the virus. Preventive efforts aimed at drug subcultures show that drug users are reachable and instructable in safer practices. Thus, provision of protective information by outreach workers about AIDS transmission, needle-exchange programs, and instruction on how to sterilize needles can substantially reduce risky injection practices which lower infection rates among those who continue the drug habit (Des Jarlais, 1988; Watters, 1987). Needle-exchange programs do not propagate drug use, as some people have feared it might (Buning, van Brussel, & van Santen, 1988). As Des Jarlais notes, most drug users now know about the modes of AIDS transmission, but many are inadequately informed or misinformed about risk reduction techniques. For example, some dutifully wash needles in solutions that do not kill the virus. Although the subcommunity approach also serves as an excellent vehicle for enlisting drug users in treatment programs, there is not much that outreach workers can offer them because of the scarcity of treatment services.

Social influences rooted in indigenous sources generally have greater impact and sustaining power than those applied by outsiders for a limited time. A major benefit of community-mediated programs is that they can mobilize the power of formal and informal networks of influence for transmitting knowledge and cultivating beneficial patterns of behavior. A community-mediated approach is a potentially powerful vehicle for promoting both personal and social change in several ways. It provides an effective means for creating the motivational preconditions of change, for modeling requisite skills, for enlisting natural social incentives for adopting and maintaining beneficial habits, and for establishing protective practices as the normative standards of conduct. Generic principles of effective programs are readily adaptable at the subcommunity level to sociocultural differences in the populations being served. In the social diffusion of new behavior patterns, indigenous adopters usually serve as more influential exemplars and persuaders than do outsiders. Moreover, behavioral practices that create widespread health problems require group solutions that are best achieved through community-mediated efforts.

In their pioneering health-promoting programs, Far-

quhar and Maccoby have drawn heavily on existing community networks for transmitting knowledge and cultivating beneficial patterns of health behavior (Farquhar, Maccoby, & Solomon, 1984). This work provides a model of how to mobilize community resources to disseminate health information and to convey explicit guides on how to change refractory health habits. A program of self-directed change should be applied in ways designed to create self-sustaining structures within the community for promoting behavioral practices conducive to health. Persons in the community, who serve as local organizers, are taught how to design, coordinate, and implement the programs. By teaching communities how to take charge of their own change, self-directedness is fostered at the community level as well as at the personal level.

The substantial reductions in high-risk sexual practices by gay subgroups was achieved largely through effective self-empowering organization. They educated themselves, made safer sex practices the social norm, devised their own instructional programs to prevent HIV transmission, established mechanisms for diffusing this knowledge, issued regular updates on new research findings and available treatments, created social support systems to counteract despair and encourage meaningful life pursuits, and actively fostered lifestyle changes that might enhance immune function in those infected with the virus but not yet experiencing any symptoms. There have been some attempts at self-mobilization by drug-user subgroups for self-protective change, but these have been less successful (Friedman, de Jong, & Des Jarlais, 1988). Lack of educational and financial resources, illegalities surrounding drug activities, mistrusts, and the large amount of time devoted to supporting the drug habit impede efforts at self-organization. These conditions create a greater need for external aid in subgroup organization for risk reduction.

Attitudinal Impediments to Development of Psychosocial Models

There exist several attitudes that downgrade the priority for the development of psychosocial approaches to this deadly epidemic. One such view trivializes psychosocial approaches by regarding them as merely stopgap measures until a vaccine is discovered. The AIDS virus appears in many forms, it mutates rapidly, it invades

immune cells and not only evades destruction by the body's defense system but turns infected cells into producers of more viruses and destroys the very cells that provide protective immunity, it remains latent for long periods, and it may become more virulent over time. Considering these baffling biological properties, the quest for a vaccine that will provide protective immunity against the changing forms of this virus is likely to be a lengthy and frustrating one. Because viruses merge into the host cells the task of developing antiviral treatments that can kill the AIDS virus without destroying the host immune cells is a formidable one. Even the more limited goal of slowing or keeping the condition in check with antiviral drugs that do not produce serious toxicities presents an immense challenge. Sexually transmitted diseases, such as gonorrhea and syphilis, that have been with us for ages have thwarted vaccine development. Whether our advanced biotechnology will triumph over the AIDS virus, or the mutable virus will foil our biotechnology remains to be seen. In any event, AIDS will remain with us for a long time to come.

Another downgrading view rests on the belief that psychosocial influences cannot effect much change in the transmissive risky behaviors because they serve potent drives. Amenability of behavior to change differs considerably depending on whether one seeks to eliminate certain kinds of gratifications or to alter the means of gaining those gratifications. It is much more difficult to get people to relinquish behavior that is powerfully reinforced than to adopt safer forms of the behavior that serve the same function. In the case of AIDS prevention, people who are not about to give up drugs or their preferred forms of sexuality can achieve substantial protection against HIV infection by substituting safer behaviors for risky ones. Multifaceted psychosocial programs that equip people with protective knowledge, with the means and self-beliefs to exercise effective personal control, and provide social supports for their efforts at personal change can achieve highly beneficial results. Indeed, prevention programs that incorporate many of these elements have produced substantial reductions in risky sexual and drug-injection behaviors. Neglect or downgrading of psychosocial models for AIDS prevention will exact heavy personal tolls and impose mounting financial and social burdens on society.

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Selective Activation and Disengagement of Moral Control

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Moral conduct is motivated and regulated mainly by the ongoing exercise of self-reactive influence. But self-regulatory mechanisms do not operate unless they are activated, and there are different psychological mechanisms by which moral control can be selectively activated or disengaged from inhumane conduct. Self-sanctions can be disengaged by reconstruing detrimental conduct through moral justification, euphemistic labeling, and advantageous contrast with other inhumanities; by obscuring personal agency in detrimental activities through diffusion and displacement of responsibility; by disregarding or misrepresenting the harmful consequences of inhumane conduct; and by blaming and dehumanizing the victims. These mechanisms of moral disengagement operate not only in the perpetration of inhumanities under extraordinary circumstances, but in everyday situations where people routinely perform activities that bring personal benefits at injurious costs to others. Given the many psychological devices for disengagement of moral control, societies cannot rely solely on individuals, however honorable their standards, to provide safeguards against inhumanities. To function humanely, societies must establish effective social safeguards against moral disengagement practices that foster exploitive and destructive conduct.

The exercise of self-sanction plays a central role in the regulation of inhumane conduct. In the course of socialization, moral standards are adopted that serve as guides and deterrents for conduct. Once internalized control has developed, people regulate their actions by the sanctions they apply to themselves. They do things that give them self-satisfaction and a sense of self-worth. They

This article includes material from the book, *Social Foundations of Thought and Action: A Social Cognitive Theory* (Bandura, 1986) and from a chapter in Kurtines and Gewirtz (1990), *Handbook of Moral Behavior and Development: Theory, Research and Applications* (Vol. 1).

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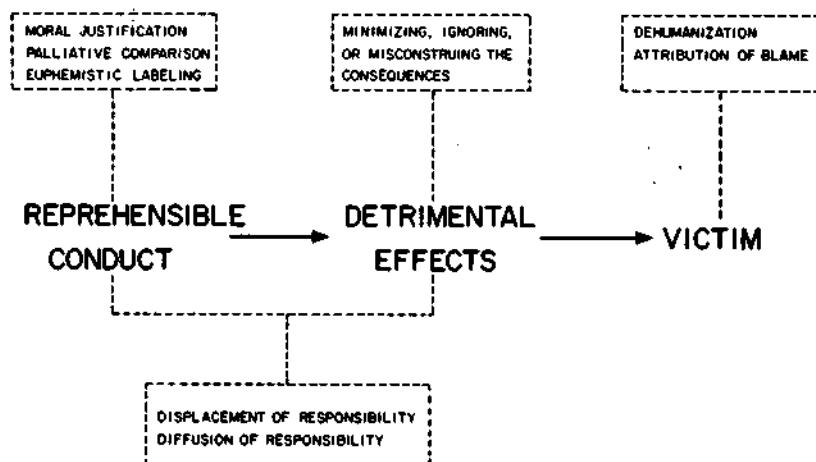


Fig. 1. Mechanisms through which moral self-sanctions are selectively activated or disengaged from reprehensible conduct at different points in the regulatory process. Source: Albert Bandura, *Social Foundations of Thought and Action: A Social Cognitive Theory*, © 1986, p. 376. Reprinted by permission of Prentice-Hall, Englewood Cliffs, NJ.

refrain from behaving in ways that violate their moral standards because such behavior will bring self-condemnation. Self-sanctions thus keep conduct in line with internal standards. But moral standards do not function as fixed internal regulators of conduct. Self-regulatory mechanisms do not operate unless they are activated, and there are many processes by which self-sanctions can be disengaged from inhumane conduct (Bandura, 1986, 1990a). Selective activation or disengagement of self-reactive control permits different types of conduct, given the same moral standards. Figure 1 shows the four major points in the self-regulatory process at which internal moral control can be disengaged from detrimental conduct. Self-sanctions can be disengaged by reconstruing conduct, obscuring causal agency, disregarding or misrepresenting injurious consequences, and blaming and devaluating the victims.

These mechanisms of moral disengagement have been examined most extensively in aggressive conduct. But selective disengagement of moral control is by no means confined to extraordinary inducements to aggression. People often experience conflicts where behavior they personally devalue can serve as the means for securing valued benefits. As long as self-sanctions override the force of external inducements, behavior is kept in line with personal standards. However, in the face of strong external inducements, such conflicts are often resolved by selective disengagement of self-sanctions. This enables otherwise considerate people to perform self-serving activities that have detrimental social effects.

Reconstructing Detrimental Conduct

Moral Justification

One set of disengagement practices operates on the construal of the behavior itself. People do not ordinarily engage in reprehensible conduct until they have justified to themselves the morality of their actions. What is culpable can be made righteous through cognitive reconstrual. In this process, detrimental conduct is made personally and socially acceptable by portraying it as in the service of moral purposes. People then can act on a moral imperative.

Although moral and cognitive restructuring can be easily used to support self-serving and destructive purposes, it can also serve militant action aimed at changing inhumane social conditions. By appealing to morality, social reformers are able to use coercive, and even violent, tactics to force social change. Vigorous disputes arise over the morality of aggressive action directed against institutional practices. Power holders often resist, by forcible means if necessary, pressures to make needed social changes that jeopardize their own self-interests. Resistance to warranted changes invites social activism. Challengers define their militant actions as morally justifiable means to eradicate harmful social practices. Power holders, in turn, condemn such activism as representing irresponsible resort to violent solutions or efforts to coerce changes that lack popular support.

Radical shifts in destructive behavior through moral justification are most strikingly revealed in military conduct. People who have been socialized to deplore killing as morally condemnable can be rapidly transformed into skilled combatants, who may feel little compunction and even a sense of pride in taking human life in combat. The conversion of socialized people into dedicated fighters is achieved not by altering their personality structures, aggressive drives, or moral standards. Rather, it is accomplished by cognitively restructuring the moral value of killing, so that it can be done free from self-censuring restraints (Sanford & Comstock, 1971; Kelman, 1973). Through moral sanction of violent means, people see themselves as fighting ruthless oppressors who have an unquenchable appetite for conquest, or protecting their cherished values and way of life, preserving world peace, saving humanity from subjugation to an evil ideology, or honoring their country's international commitments. The task of making violence morally defensible is facilitated when nonviolent options are judged to have been ineffective, and utilitarian justifications portray the suffering caused by violent counterattacks as greatly outweighed by the human suffering inflicted by the foe.

Over the centuries, much reprehensible and destructive conduct has been perpetrated by ordinary, decent people in the name of religious principles, right-

eous ideologies, and nationalistic imperatives. Individuals espousing high moral principles are inclined to resist arbitrary social demands to behave punitively, but they will aggress against people who violate their personal principles (Keniston, 1970). Throughout history countless people have suffered at the hands of self-righteous crusaders bent on stamping out what they considered evil. Rapoport and Alexander (1982) document the lengthy blood-stained history of holy terror wrought by religious justifications. Acting on moral or ideological imperatives reflects a conscious offense mechanism, not an unconscious defense mechanism.

When viewed from divergent perspectives, violent acts are different things to different people. It is often proclaimed in conflicts of power that one group's terroristic activity is another group's liberation movement fought by heroic freedom fighters. This is why moral appeals against violence usually fall on deaf ears. Adversaries sanctify their own militant actions but condemn those of their antagonists as barbarity masquerading under a mask of outrageous moral reasoning.

Terrorism and counterterrorism. Terrorists invoke moral principles to justify human atrocities (Bandura, 1990b). Moral justification is also brought into play in selecting counterterrorist measures. This poses more troublesome problems for democratic societies than for totalitarian ones. Totalitarian regimes have fewer constraints against using institutional power to control media coverage of terrorist events, to restrict individual rights, to sacrifice individuals for the benefit of the state rather than make concessions to terrorists, and to combat threats with lethal means. Democratic societies face the moral dilemma of how to justify countermeasures that take some toll on innocent lives in the process of curbing terrorists' atrocities, without violating the societies' own fundamental principles and standards of civilized conduct (Carmichael, 1982). Therefore, the use of violent countermeasures is typically justified on utilitarian grounds in terms of the benefits to humanity and the social order that curbing terrorist attacks will bring. The mass media, especially television, provide the best access to the public through their strong drawing power. For this reason, television is increasingly used as the principal vehicle of justification. Struggles to legitimize and gain support for one's causes and to discredit those of one's opponents are now waged more and more through the electronic media (Ball-Rokeach, 1972; Bassiouni, 1981).

Use of nuclear weapons and nuclear threats. The nuclear age has ushered in new magnitudes of risk that create major moral imperatives and paradoxes. Major disputes revolve around the morality of the development of nuclear weaponry and nuclear retaliatory policies (Churchill, 1983; Johnson, 1984; Lackey, 1984). Proponents of the deterrence doctrine justify threat of nuclear retaliation on the grounds that self-defense against grave dangers is morally obligatory.

National security is presumably ensured by maintaining a balance of potential nuclear destructiveness that will be mutually deterring. However, threats of nuclear retaliation have no deterrent effect unless the feuding nations believe their adversary has every intention to use such weapons in the event of a nuclear attack. Since virtually everyone concedes that it would be suicidal to use them, a nuclear deterrence doctrine paradoxically seeks to achieve a deterrent effect with threats of actions that no one in their right mind could conceive of ever taking. Hence, in efforts to add credibility to deterrence policies, nuclear weapons are menacingly deployed and nuclear systems are said to be preprogrammed so that a launch of offensive missiles will trigger a massive nuclear counterstrike semiautomatically.

Opponents of nuclear deterrence policies consider the development of nuclear weaponry and threats to use it, even in retaliation, as morally wrong. They regard a retaliatory strike that would inevitably produce vast human and ecological devastation as a ghastly act of vengeance that is irrational as well as immoral. A counterstrike after a failed deterrence would most likely achieve only massive mutual destruction through a series of nuclear exchanges with surviving missiles. In the aftermath, survivors would find themselves in a largely uninhabitable environment. In short, the moral logic of counterstrike threat is undermined by its self-destructive consequences. Because of the vast scope and magnitude of indiscriminate nuclear devastation, the traditional just-war tenets that sanction self-defense in order to avert grave harm afford little guidance in the use of nuclear weapons. What is immoral to do is immoral to threaten (Kavka, 1988). For opponents of nuclear systems, their indiscriminate destructiveness challenges the moral permissibility of nuclear powers inflicting the catastrophic risks of nuclear deterrence on the people of innocent nations who are granted no say in the matter (Lackey, 1985). What is immoral to do is also immoral to risk.

Euphemistic Labeling

Language shapes people's thought patterns, on which they base many of their actions. Activities can take on a very different appearance depending on what they are called. Euphemistic language thus provides a convenient device for masking reprehensible activities or even conferring a respectable status upon them. Through convoluted verbiage, destructive conduct is made benign and those who engage in it are relieved of a sense of personal agency. Laboratory studies reveal the disinhibitory power of euphemistic language (Diener et al., 1975). Adults behave much more aggressively when the act of assaulting a person is given a sanitized label than when it is called aggression.

In an insightful analysis of the language of nonresponsibility, Gambino (1973) identified the different varieties of euphemisms. One form, palliative expressions, is widely used to make the reprehensible respectable. Through the

power of hygienic words, even killing a human being loses much of its repugnancy. Soldiers "waste" people rather than kill them, intelligence operatives "terminate them with extreme prejudice" (Safire, 1979). When mercenaries speak of "fulfilling a contract," murder is transformed by admirable words into the honorable discharge of duty. Terrorists label themselves as "freedom fighters." Bombing attacks become "clean, surgical strikes," invoking imagery of the restorative handiwork of the operating room, and the civilians they kill are linguistically converted to "collateral damage" (Hilgartner, Bell, & O'Connor, 1982).

Sanitizing euphemisms, of course, also perform heavy duty in less loathsome but unpleasant activities that people are called upon to conduct from time to time. In the language of some government agencies, people are not fired, they are "selected out," as though they were receiving preferential treatment. In teaching business students how to lie in competitive transactions, the instructor speaks euphemistically of "strategic misrepresentation" (Safire, 1979). The television industry produces and markets some of the most brutal forms of human cruelty under the sanitized labels of "action and adventure" programming (Baldwin & Lewis, 1972). The acid rain that is killing our lakes and forests loses much of its virulence in its euphemistic form as "atmospheric deposition of anthropogenically derived acidic substances" (Hechinger, 1985). The nuclear power industry has created its own specialized set of euphemisms for the injurious effects of nuclear mishaps; an explosion becomes an "energetic disassembly," a reactor accident is a "normal aberration," and plutonium contamination is merely "infiltration" (*San Francisco Chronicle*, 1979).

The agentless passive form serves as a linguistic device for creating the appearance that culpable acts are the work of nameless forces, rather than people (Bolinger, 1982). It is as though people are moved mechanically but are not really the agents of their own acts. Gambino (1973) further documented how the specialized jargon of a legitimate enterprise can be misused to lend an aura of respectability to an illegitimate one. In the Watergate vocabulary, criminal conspiracy became a "game plan," and the conspirators were "team players"—a status calling for the qualities and behavior befitting the best sportsmen. The disinhibitory power of language can be boosted further by colorful metaphors that change the nature of culpable activities.

Advantageous Comparison

Whenever events occur or are presented contiguously, the first one colors how the second one is perceived and judged. By exploiting the contrast principle, moral judgments of conduct can be influenced by expedient structuring of the comparison. Thus, self-deplored acts can be made righteous by contrasting them with flagrant inhumanities. The more outrageous the contrasted actions, the more

likely it is that one's own destructive conduct will appear trifling or even benevolent. Promoters of the Vietnamese war and their supporters, for example, minimized the slaying of countless people by portraying it as a way of checking massive communist enslavement. Given this invidious comparison, perpetrators of the warfare remained unperturbed by the fact that the intended beneficiaries were being killed at an alarming rate. Domestic protesters, on the other hand, characterized their own violence against educational and political institutions as trifling, or even laudable, by comparing it with the carnage perpetrated by their country's military forces in foreign lands. Terrorists minimize their killings as the only defensive weapon they have to curb the widespread cruelties inflicted on their people. In the eyes of their supporters, risky attacks directed at the apparatus of oppression are acts of selflessness and martyrdom. Those who are the objects of terrorist attacks, in turn, characterize their own retaliatory violence as trifling, or even laudable, by comparing it with the carnage and terror perpetrated by terrorists. In social conflicts, injurious behavior usually escalates, with each side lauding its own behavior but morally condemning that of their adversaries as heinous.

Historical advantageous comparisons are also invoked as justifications for injurious behavior. For example, advocates of terrorist tactics strive to legitimize them by noting that the democracies of England, France, and the United States were born out of violence against oppressive rule. Apologists for the lawlessness and deceitfulness in the Iran-Contra weapons sales were quick to invoke transgressions by past political administrations as vindications.

Social comparison is similarly used to show that the social labeling of acts may depend more on the ideological allegiances of the labelers than on the acts themselves. Airline hijackings were applauded as heroic deeds when East Europeans and Cubans initiated this practice, but condemned as terrorist acts when the airliners of Western nations and friendly countries were commandeered. The degree of psychopathology ascribed to hijackers varied depending on the direction of the rerouted flights. Moral condemnations of politically motivated terrorism are easily blunted by social comparison because, in international contests for political power, it is hard to find nations that categorically condemn terrorism. Rather, they usually back some terrorists and oppose others.

Cognitive restructuring of behavior through moral justifications and palliative characterizations is the most effective psychological mechanism for disengagement of moral self-sanctions. This is because moral restructuring not only eliminates self-deterrants but engages self-approval in the service of destructive exploits. What was once morally condemnable becomes a source of self-validation. After destructive means become invested with high moral purpose, functionaries work hard to become proficient at them and take pride in their destructive accomplishments.

Obscuring Personal Agency

Displacement of Responsibility

Self-sanctions are activated most strongly when personal agency for detrimental effects is unambiguous. Another set of disengagement practices operates by obscuring or distorting the relationship between actions and the effects they cause. People will behave in ways they normally repudiate if a legitimate authority accepts responsibility for the consequences of the conduct (Diener et al., 1975; Milgram, 1974). Under conditions of displaced responsibility, people view their actions as springing from the dictates of authorities rather than from their own personal responsibility. Since they feel they are not the actual agent of their actions, they are spared self-prohibiting reactions. Displacement of responsibility not only weakens restraints over one's own detrimental actions but also diminishes social concern over the well-being of those mistreated by others (Tilker, 1970).

Most of the research on attributional analysis of moral judgment is concerned with whether people view their behavior as determined by external circumstances or hold themselves responsible for it (Ross & DiTecco, 1975; Rule & Nesdale, 1976). Perceptions of causal responsibility are reduced if the harmful consequences of actions are viewed as unintended or unforeseeable, or if the actions arose from the dictates of the situation. Within the attributional framework, these factors are usually studied as mitigators of moral judgment rather than as disengagers of moral self-sanctions.

Exemption from self-devaluation for heinous deeds by displacement of responsibility has been most gruesomely revealed in socially sanctioned mass executions. Nazi prison commandants and their staffs divested themselves of personal responsibility for their unprecedented inhumanities (Andrus, 1969). They claimed they were simply carrying out orders. Impersonal obedience to horrific orders was similarly evident in military atrocities, such as the My Lai massacre (Kelman, 1973). In an effort to deter institutionally sanctioned atrocities, the Nuremberg Accords were established, declaring that obedience to inhumane orders, even from the highest authorities, does not relieve subordinates of the responsibility of their actions. However, since victors are disinclined to try themselves as criminals, such decrees have limited deterrence effects without an international judiciary system empowered to impose penalties on victors and losers alike.

In formal studies of disengagement of self-sanctions through displacement of responsibility, authorities explicitly authorize injurious actions and hold themselves fully accountable for the harm caused by the activity. However, in the sanctioning practices of everyday life, responsibility for detrimental conduct is rarely assumed so explicitly, because only obtuse authorities would leave them-

selves accusable of authorizing heinous acts. They are concerned not only with adverse social consequences to themselves should advocated courses of action miscarry, but with their own loss of self-regard as a result of sanctioning human atrocities in ways that leave blood on their hands. Therefore, authorities usually invite and support detrimental conduct in insidious ways that minimize personal responsibility for what is happening. Moreover, the intended purpose of sanctioned destructiveness is usually disguised so that neither issuers nor perpetrators regard their actions as censurable. When reprehensible practices are publicized, they are officially dismissed as only isolated incidents arising through misunderstanding of what had, in fact, been authorized. Efforts are made to limit any blame to subordinates, who are portrayed as misguided or overzealous. Investigators who go searching for "smoking guns" display naïveté about the surreptitious manner in which culpable behavior is sanctioned and executed. Generally one finds mazy devices of nonresponsibility rather than smoking guns.

Kramer (1990) describes the great lengths to which Shī'ite clerics go to provide moral justifications for violent acts that seem to breach Islamic law, such as suicidal bombings and hostage taking. These efforts are designed not only to persuade themselves of the morality of their actions but to preserve their integrity in the eyes of other nations. The Islamic religious code permits neither suicide nor terrorizing innocent people. On one hand, the clerics justify such acts by invoking situational imperatives and utilitarian reasons, namely that tyrannical circumstances drive oppressed people to unconventional means to combat aggressors who wield massive destructive power. On the other hand, they reconstrue terrorist acts as conventional means, in which dying in a suicidal bombing for a moral cause is no different than dying at the hands of an enemy soldier. Hostages typically get relabeled as spies. When the linguistic solution defies credibility, personal moral responsibility is disengaged by construing terroristic acts as dictated by their foe's tyranny. Because of the shaky moral logic and disputable reconstruals involved, clerics sanction terrorism by indirection, they vindicate successful ventures retrospectively, and they disclaim endorsements of terroristic operations beforehand.

Displacement of responsibility also operates in situations in which hostages are taken. Terrorists warn officials of targeted regimes that if they take retaliatory action they will be held accountable for the lives of the hostages. At different steps in negotiations for the hostages' release, terrorists continue to displace responsibility for the safety of hostages on the reactions of the regime they are fighting. If the captivity drags on, terrorists blame the suffering and injuries that they inflict on the hostages on the regime for failing to make what they regard as warranted concessions to right social wrongs.

A number of social factors affect the ease with which responsibility for one's actions can be surrendered to others. High justification and social consensus about the morality of an enterprise aid in the relinquishment of personal

control. The legitimacy of the authorizers is another important determinant. The greater the legitimization and closeness of the authority issuing injurious commands, the higher is the level of obedience. The higher the authorities, the more legitimacy, respect, and coercive power they command, and the more willing are people to defer to them. Modeled disobedience, which challenges the legitimacy of the activities, if not the authorizers themselves, reduces the willingness of observers to carry out the actions called for by the orders of a superior (Meeus & Raaijmakers, 1986; Milgram, 1974; Powers & Geen, 1972). It is difficult to continue to disown personal agency in the face of evident harm following directly from one's actions. People are therefore less willing to obey authoritarian orders for injurious behavior when they see firsthand how they are hurting others (Milgram, 1974; Tilker, 1970).

Obedient functionaries do not cast off all responsibility for their behavior as though they were mindless extensions of others. If this were the case, they would act like automatons, only when told to. In fact, they are much more conscientious and self-directed in the performance of their duties. It requires a strong sense of responsibility to be a good functionary. In situations involving obedience to authority, people carry out orders partly to honor the obligations they have undertaken (Mantell & Panzarella, 1976). One must, therefore, distinguish between two levels of responsibility—duty to one's superiors, and accountability for the effects of one's actions. The self-system operates most efficiently in the service of authority when followers assume personal responsibility for being dutiful executors while relinquishing personal responsibility for the harm caused by their behavior. Followers who disowned responsibility without being bound by a sense of duty would be quite unreliable.

Diffusion of Responsibility

The deterrent power of self-sanctions is weakened when the link between conduct and its consequences is obscured by diffusing responsibility for culpable behavior. This is achieved in several ways. Responsibility can be diffused by division of labor. Most enterprises require the services of many people, each performing fragmentary jobs that seem harmless in themselves. The fractional contribution is easily isolated from the eventual function, especially when participants exercise little personal judgment in carrying out a subfunction that is related by remote, complex links to the end result. After activities become routinized into programmed subfunctions, attention shifts from the import of what one is doing to the details of one's fractional job—e.g., doing a good job assembling bombers on a production line (Kelman, 1973).

Group decision making is another common bureaucratic practice that enables otherwise considerate people to behave inhumanely, because no single individual feels responsible for policies arrived at collectively. Where everyone

is responsible, no one is really responsible. Social organizations go to great lengths to devise sophisticated mechanisms for obscuring responsibility for decisions that will affect others adversely. Collective action is still another diffusion expedient for weakening self-restraints. Any harm done by a group can always be ascribed, in large part, to the behavior of other members. People, therefore, act more harshly when responsibility is obfuscated by a collective instrumentality than when they hold themselves personally accountable for what they do (Bandura, Underwood, & Fromson, 1975; Diener, 1977; Zimbardo, 1969).

People often behave in harmful ways, not because responsibility is diffused by formal organizational arrangements, but because they all routinely engage in activities that contribute to negative effects. Their automobiles pollute the air they breathe, and they degrade their environment to produce the vast amounts of energy and products they consume. As a result of collective action, good environmentalists can also be polluters but blame others for degrading the environment. The more detrimental the collectively produced effects, the less people feel personally responsible for them (Shippee & Christian, 1978).

Disregard or Distortion of Harmful Consequences

Additional ways of weakening self-deterring reactions operate through disregard or misrepresentation of the consequences of action. When people choose to pursue activities harmful to others for personal gain, or because of social inducements, they avoid facing the harm they cause or they minimize it. They readily recall prior information given them about the potential benefits of the behavior but are less able to remember its harmful effects (Brock & Buss, 1962, 1964). People are especially prone to minimize injurious effects when they act alone, and thus cannot easily escape responsibility (Mynatt & Herman, 1975). In addition to selective inattention and cognitive distortion of effects, the misrepresentation may involve active efforts to discredit evidence of the harm they cause. As long as the detrimental results of one's conduct are ignored, minimized, distorted, or disbelieved, there is little reason for self-censure to be activated.

It is relatively easy to hurt others when their suffering is not visible, and when causal actions are physically and temporally remote from their effects. Our death technologies have become highly lethal and depersonalized. Mechanized weapon systems and explosive devices that can kill many people but be set off by someone at a distance illustrate such depersonalized action. Even high personal responsibility is a weak restrainer when aggressors do not know the harm they inflict on their victims (Tilker, 1970). In contrast, when people can see and hear the suffering they cause, vicariously aroused distress and self-censure serve as self-restraining influences. For example, in his studies of commanded aggression, Milgram (1974) found diminishing obedience as the victim's pain became more evident and personalized.

Most organizations involve hierarchical chains of command in which superiors formulate plans and intermediaries transmit them to executors, who then carry them out. The father removed individuals from the end results, the weaker is the restraining power of the foreseeable destructive effects. Kilham and Mann (1974) suggest that the disengagement of personal control is easiest for the intermediaries in a hierarchical system—they neither bear responsibility for major decisions nor are they a direct party to their execution. In performing the transmitter role they model dutiful behavior and further legitimize their superiors and their social policies and practices. Consistent with these speculations, intermediaries are much more obedient to destructive commands than are those who have to carry them out and face the results (Kilham & Mann, 1974).

Blaming and Dehumanizing Victims

Dehumanization

The final set of disengagement practices operates on the recipients of detrimental acts. The strength of self-evaluative reactions to injurious conduct partly depends on how the perpetrators view the people toward whom the behavior is directed. To perceive another as human activates empathetic or vicarious emotional reactions through perceived similarity (Bandura, 1990c). The joys and suffering of similar persons are more vicariously arousing than are those of strangers or of individuals who have been divested of human qualities. Personalizing the injurious effects experienced by others also makes their suffering much more salient. It is difficult to mistreat humanized persons without risking personal distress and self-censure. However, vicarious emotional activation is cognitively mediated rather than automatically elicited by the experiences of others. Ascriptions of insensateness to victims weakens vicarious self-arousal of distress to their suffering. Empathy is not aroused if recipients of maltreatment are seen as "unfeeling." Subhumans are not only regarded as lacking sensitivities, but as being influenceable only by severe methods.

Self-sanctions against cruel conduct can be disengaged or blunted by divesting people of human qualities. Once dehumanized, they are no longer viewed as persons with feelings, hopes, and concerns, but as subhuman objects. They are portrayed as mindless "savages," "gooks," "satanic fiends," or other despicable wretches. If dispossessing antagonists of humanness does not sufficiently blunt self-reproach, it can be eliminated by attributing bestial qualities to them. They become "degenerates," "pigs," and other bestial creatures. It is easier to brutalize victims when they are referred to as "worms" (Gibson & Haritos-Fatouros, 1986). The process of dehumanization is an essential ingredient in the perpetration of inhumanities. A Nazi camp commandant chillingly explained that the extreme lengths to which they went to degrade victims whom they were

going to kill anyway were not a matter of purposeless cruelty (Levi, 1987). Rather, the victims had to be degraded to the level of subhuman objects so that those who operated the gas chambers would be less burdened by distress. Similarly, over the years, slaves, women, manual laborers, and religious and racial minorities have been treated as chattel or as subhuman objects (Ball-Rokeach, 1972).

When persons are given punitive power, they treat dehumanized individuals much more punitively than ones who have been invested with human qualities. Dehumanization fosters different self-exonerative patterns of thought (Bandura, Underwood, & Fromson, 1975). When dealing with individuals who have been deprived of their humanness, people seldom condemn punitive conduct, and they create justifications for it. However, people disavow punitive actions and rarely create justifications for their use toward individuals depicted in humanized terms.

When several disengagement factors are combined, they potentiate each other rather than simply producing additive effects. Thus, combining diffused responsibility with dehumanization greatly escalates the level of punitiveness, whereas personalization of responsibility, along with humanization, have a powerful self-deterring effect.

Many conditions of contemporary life are conducive to impersonalization and dehumanization (Bernard, Ottenberg, & Redl, 1965). Bureaucratization, automation, urbanization, and high geographical mobility lead people to relate to each other in anonymous, impersonal ways. In addition, social practices that divide people into ingroup and outgroup members produce human estrangement that fosters dehumanization. Strangers can be more easily cast as insensate than can personal acquaintances.

Under certain conditions, the exercise of institutional power changes the users in ways that are conducive to dehumanization. This happens most often when persons in positions of authority have coercive power over others and adequate safeguards for constraining the behavior of power holders are lacking. Power holders come to devalue those over whom they wield control (Kipnis, 1974). In a simulated prison experiment (Haney, Banks, & Zimbardo, 1973), even college students, who had been randomly chosen to serve as either inmates or guards, when given unilateral power as guards, began to treat their charges in degrading, tyrannical ways. Thus, role assignment that authorized use of coercive power overrode personal characteristics in promoting punitive conduct. Systematic tests of relative influences similarly show that social influences conducive to punitiveness exert considerably greater sway over aggressive conduct than do people's personal characteristics (Larsen, Coleman, Forges, & Johnson, 1971).

The overall findings from research on the different mechanisms of moral disengagement corroborate the historical chronicle of human atrocities: It re-

quires conducive social conditions, rather than monstrous people, to produce heinous deeds. Given appropriate social conditions, decent, ordinary people can be led to do extraordinarily cruel things.

The power of humanization. Psychological research tends to focus extensively on how easy it is to bring out the worst in people through dehumanization and other self-exonerative means. The sensational negative findings receive the greatest attention. Thus, for example, the aspect of Milgram's research on obedient aggression that is widely cited is the evidence that good people can be talked into performing cruel deeds. However, to get people to carry out punitive acts, the overseer had to be physically present, and to repeatedly order them to act cruelly as they voiced their concerns and increasing objections. Orders to escalate punitiveness to more intense levels were largely ignored or subverted when remotely issued by verbal command. As Helm and Morelli (1979) note, this is hardly an example of blind obedience triggered by an authoritative mandate. Moreover, though it is less often noted, the evidence is equally striking that most people steadfastly refuse to behave punitively, even in response to strong authoritarian commands, if the situation is personalized by having them see the victim or requiring them to inflict pain directly rather than remotely.

The frequent emphasis on obedient aggression is understandable considering the prevalence and harmfulness of people's inhumanities to one another. However, there is considerable theoretical and social significance in the power of humanization to counteract cruel conduct. Studies examining this process reveal that it is difficult for individuals to behave cruelly toward others when they are humanized or even personalized a bit (Bandura et al., 1975). Even under conditions where punitive sanctions are the only means available and they are highly functional in producing desired results, those exercising that power usually cannot carry through punitive behavior toward humanized individuals. The affirmation of common humanity can bring out the best in others. In contrast, even in situations where punitive sanctions are dysfunctional because they usually fail to produce results, punitiveness is precipitously escalated toward dehumanized individuals. The failure of degraded individuals to change in response to punitive treatment is taken as further evidence of their culpability, justifying intensified punitiveness toward them.

The moderating influence of humanization is strikingly revealed in situations involving great threat of violence. Most abductors find it difficult to harm their hostages after they have gotten to know them personally. With growing acquaintance, it becomes increasingly difficult to take a human life cold-bloodedly. Humanization, of course, is a two-way process. Captives may also develop some sympathy for their captors as they get to know them. This phenomenon was graphically illustrated in a Stockholm incident in which people who were held hostage for six days by bank robbers began to sympathize with their criminal

captors and sided with them against the police (Lang, 1974). This hostage incident included several features that are especially conducive to development of human affinity (Bandura, 1990b). Most people support the death penalty in the abstract, but the more they know about particular convicted individuals, the less they favor executing them (Ellsworth, 1978). As Ellsworth explains it, in the absence of personal information, people conjure up an image of the most heinous criminal, an image that disposes them to favor punishment by death.

Attribution of Blame

Imputing blame to one's antagonists or to environmental circumstances is still another expedient that can serve self-exonerative purposes. In this process, people view themselves as faultless victims and see their detrimental conduct as compelled by forcible provocation. Detrimental interactions usually involve a series of reciprocally escalating actions, in which the antagonists are rarely faultless. One can always select from the chain of events an instance of the adversary's defensive behavior and consider it as the original instigation. One's own injurious conduct thus becomes a justifiable defensive reaction to belligerent provocations. Those who are victimized are not entirely faultless because, by their behavior, they usually contribute at least partly to their own plight. Victims can therefore be blamed for bringing suffering on themselves. Self-exoneration is similarly achievable by viewing one's destructive conduct as forced by circumstances rather than as a personal decision. By blaming others or circumstances, not only are one's own actions made excusable, but one can even feel self-righteous in the process.

Observers of victimization can be disinhibited in much the same way as perpetrators are by the tendency to infer culpability from misfortune. Seeing victims suffer maltreatment for which they are held partly responsible leads observers to derogate them (Lerner & Miller, 1978). The devaluation and indignation aroused by ascribed culpability, in turn, provide moral justification for even greater maltreatment. That attribution of blame can give rise to devaluation and moral justification illustrates how the various disengagement mechanisms are often interrelated and work together in weakening internal control.

Imputing blame operates as a prominent disengagement mechanism in sexually assaultive behavior toward women. Rapists and males who acknowledge a proclivity to rape subscribe to myths about rape embodying the various mechanisms by which moral self-censure can be disengaged (Feild, 1978; Malamuth, 1981). These beliefs hold rape victims responsible for their own victimization because they have supposedly invited rape by sexually provocative appearance and behavior, or by resisting sexual assault only weakly. Men blame rape victims more than women do. Trivialization and distortion of consequences to rape victims is another disengagement mechanism that comes into play. Men who are

inclined to assault sexually believe women secretly enjoy being raped. Anticipatory self-censure is eliminated when the traumatic effects of sexual assault are twisted into pleasurable ones for the victim. Such self-disinhibiting patterns of thinking predict proclivity to rape, whereas sexual attitudes, frustration, and quality of sex life do not (Briere & Malamuth, 1983).

Cross-cultural studies reveal that aggressive sexuality is an expression of the cultural ideology of male dominance (Sanday, 1981). Rape is prevalent in societies where violence is a way of life, male supremacy reigns, aggressive sexuality is valued as a sign of manliness, and women are treated as property. Rape is rare in societies that repudiate interpersonal aggression, endorse sexual equality, and treat women respectfully. Cultural ideologies that attach prestige to male dominance and aggressive sexuality weaken self-censure for sexual abuse of women. Cultural practices that belittle the role of women, and a flourishing pornography industry that dehumanizes them, further contribute to the self-disinhibition of aggression toward women (Malamuth & Donnerstein, 1984; Zillman & Bryant, 1984).

Justified abuse can have more devastating human consequences than acknowledged cruelty. Maltreatment that is not clothed in righteousness makes the perpetrator rather than the victim blameworthy. But when blame is convincingly ascribed to victims, they may eventually come to believe the degrading characterizations of themselves (Hallie, 1971). Moreover, ascriptions of blame are usually accompanied by discriminatory social practices that create the very failings that serve as excuses for maltreatment. Vindicated inhumanity is thus more likely to instill self-contempt in victims than inhumanity that does not attempt to justify itself.

Moral Disengagement Is Gradual

The disengagement devices discussed above will not instantaneously transform a considerate person into an unprincipled, callous one. Rather, the change is usually achieved through gradual weakening of self-sanctions, during which people may not fully recognize the changes they are undergoing. Initially, individuals are prompted to perform questionable acts that they can tolerate with little self-censure. After their discomfort and self-reproach have been diminished through repeated performances, the level of reprehensibility progressively increases until, eventually, acts originally regarded as abhorrent can be performed without much distress. Escalative self-disengagement is accelerated if inhumane behavior is construed as serving moral purposes and the people being subjected to maltreatment are divested of human qualities (Bandura et al., 1975; Gibson & Haritos-Fatouros, 1986).

Analyses of moral disengagement mechanisms usually draw heavily on examples from military and political violence. This tends to convey the impres-

sion that selective disengagement of self-sanctions occurs only under extraordinary circumstances. The truth is quite the contrary. Such mechanisms operate in everyday situations in which decent people routinely perform activities having injurious human effects, to further their own interests or for profit. Self-exoneration is needed to neutralize self-sanctions and to preserve self-esteem. For example, institutionalized racial and sexual discrimination, practices that take a heavy toll on their victims, require social justification, attributions of blame, dehumanization, impersonalized agencies to carry them out, and inattention to the injurious effects they cause. As another example, different industries, each with its public-spirited vindications, may cause harmful effects on a large scale, either by the nature of their products or the environmental contaminants they produce.

Concluding Remarks

The massive threats to human welfare stem mainly from deliberate acts of principle rather than from unrestrained acts of impulse. It is the principled resort to destructiveness that is of greatest social concern, but ironically it is the most ignored in psychological analyses of inhumanities. Given the existence of so many psychological devices for disengagement of moral control, societies cannot rely entirely on individuals, however righteous their standards, to provide safeguards against destructive ventures. Civilized conduct requires, in addition to humane personal codes, social systems that uphold compassionate behavior and renounce cruelty. Monolithic political systems that exercise concentrated control over the major vehicles of social influence can wield greater justificatory power than pluralistic systems that represent diverse perspectives, interests, and concerns. Political diversity and toleration of public expression of skepticism create conditions that allow the emergence of challenges to suspect moral appeals. To function more humanely, societies must establish effective social safeguards against the misuse of institutional justificatory power for exploitive and destructive purposes.

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AUTHOR'S RESPONSE

Some Reflections on Reflections

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Having ceded many late nights to this portly volume, it took forceful self-persuasion to put pen to paper again to prepare this invited commentary on the commentaries about it. I am grateful to the editor for including extensive reviews of *Social Foundations of Thought and Action* (Bandura, 1986) in the inaugural issue of this significant forum for theoretical contributions. The thoughtful reviews by Kihlstrom and Harackiewicz and by Lerner address themselves to the nature of the causal structure of social cognitive theory. This is a well-selected focus because the model of causality serves as the central integrating principle throughout the book. The social cognitive approach posits a system of triadic reciprocal causation in which (a) action, (b) inner personal factors in the form of cognitive, affective, and biological events, and (c) environmental influences all operate as interacting determinants. The analytic decomposition of triadic causality presents formidable empirical challenges. However, the temporal dynamics of triadic reciprocity ease some of the technical difficulties of verification. The mutual influences and their reciprocal effects do not all spring forth simultaneously. It takes time for a causal factor to exert its influence. The interacting factors, therefore, work their mutual effects sequentially over variable time courses. Due to the time lags in the operation of the triadic factors, it is possible to gain some understanding of how different segments of reciprocal causation operate without having to mount a Herculean effort to assess every possible interactant at the same time.

Different subspecialties of psychology center their inquiry on selected segments of reciprocity. Cognitive psychologists select the interactive relation between thought and action as their major sector of interest. They examine how conceptions, beliefs, self-percepts, and intentions shape and direct behavior. What people think, believe, and feel affects how they behave. The natural and extrinsic effects of their actions, in turn, partly determine their thought patterns and affective reactions.

Social psychologists examine the segment of reciprocity between the person and the environment in the triadic system. This line of inquiry adds to our understanding of how environmental influences in the form of modeling, tuition, and social persuasion alter cognitions and affective propensities. The reciprocal element in this segment of causation has been of central concern to the subspecialty of person perception. People evoke different reactions from their social environment by their physical characteristics, such as their age, size, race, sex, and physical attractiveness. They simi-

larly activate different reactions depending on their socially conferred roles and status.

Of all the different segments in the triadic causal structure, the reciprocal relationship between behavior and environmental events has received the greatest attention. Indeed, ethological, transactional, and behavioristic theories focus almost exclusively on this portion of reciprocity in the explanation of behavior. In the transactions of everyday life, behavior alters environmental conditions, and it is, in turn, altered by the very conditions it creates.

Clarifying how the various subsystems function interactively can advance understanding of important aspects of the superordinate causal system. What has been lacking is research on how the multiple reciprocal links of influences operate together and how the patterning and relative strength of the constituent factors in the causal structure change over time. Since the publication of the *Social Foundations* volume, Wood and I have been conducting microanalyses of triadic reciprocal causation using a dynamic computerized environment (Wood & Bandura, 1989b). The interactional causal structure is examined within the context of managing an organization. In this series of experiments, each of the major interactants in the triadic causal structure—cognitive, behavioral, and environmental—functions as an important constituent in the transactional system (Bandura & Jourden, 1989; Bandura & Wood, 1989; Wood & Bandura, 1989a; Wood, Bandura, & Bailey, in press). The cognitive determinant is indexed by self-beliefs of efficacy, cognized goals, and quality of analytic thinking. The options that are actually executed constitute the behavioral determinant. The properties of the environment, the level of challenge it prescribes, and its responsiveness to behavioral interventions represent the environmental determinant. The constituent factors in the ongoing transactional system are measured repeatedly. The findings of this program of research have helped to clarify how composite causal structures operate and how the relative contribution of the constituent factors changes over time.

As Lerner notes in his commentary, most developmental psychologists subscribe to a causal model emphasizing person-context interactions. However, almost all the research conducted within the framework of developmental contextualism examines selected segments of triadic reciprocal causation rather than the full causal structure. Our analytic tools are not as yet well equipped to encompass triadic reciprocity as it operates in the transactions of everyday life. However, microanalytic laboratory studies of triadic reciprocal causation advance knowledge on how such a causal

system operates. Both laboratory and naturalistic studies are, therefore, important to a full understanding of the nature of multifaceted interactional causal processes.

The discussion by Kihlstrom and Harackiewicz of the multidimensional nature of perceived self-efficacy raises the general issue of how personal causality is best conceptualized and assessed. The influential contribution of personal factors to human functioning is often insufficiently recognized because the issue tends to be cast in terms of *individual differences* rather than *personal determinants*. The difference in these conceptions is illustrated by instances in which a personal factor is necessary for certain types of performances but it is developed to the same level in different individuals. In this instance, interindividual variation in the personal factor is negligible but the personal causation is vital. Personal determinants operate as dynamic factors in causal structures rather than as static entities that people possess in differing amounts. The alternative perspectives on personal causation reflects more than variations in semantic labeling. The individual differences approach is rooted in trait theory, whereas the personal determinants approach is founded on a transactional model of causation.

Efforts to elucidate how personal determinants contribute to psychosocial functioning have relied extensively on omnibus tests of personal attributes designed to serve diverse purposes. Such omnibus measures contain a fixed set of items, many of which may have little relevance to a particular phenomenon of interest. It is unrealistic to expect measures of personal factors cast in generalities to shed much light on their contribution to psychosocial functioning in particular contexts and task domains. Trait measures usually yield, at best, modest correlations. Measures of this sort may have some practical value in that some predictive gain, however small, is better than sheer guesswork. But major progress in understanding how personal factors operate in causal structures is best advanced through microanalysis of interactive processes. This requires measurement of the personal determinants that are germane to particular classes of activities. Thus, for example, measures of perceived self-efficacy tailored to given domains of functioning have much more predictive power than do omnibus measures of perceived personal control (Bandura, in press-b). The convenience of general-purpose measures of personality characteristics is thus gained at the cost of explanatory and predictive power.

The nature and regulative function of self-conceptions have traditionally been conceptualized in personality theory in terms of the self-concept (Rogers, 1959; Wylie, 1974). Such self theories are concerned, for the most part, with global self-images. A global self-conception does not do justice to the complexity of self-belief systems, which can vary substantially across different task domains, different levels of complexity within the same domain, and different contexts and situational circumstances. Social cognitive theory approaches the structure of self-belief systems in more refined, domain-linked ways.

Use of domain-tailored measures does not mean that there is no generality to perceived self-efficacy. If different classes of activities require similar functions and subskills one would expect some generality in judgments of personal efficacy. Even if different activity domains are not subserved by common subskills, some generality of perceived self-efficacy can occur if competencies are developed in dissimilar domains. Commonality of subskills and covariation

of development will yield some generality. One can derive degree of generality from multidomain measures, but one cannot extract the patterning of perceived personal efficacy from conglomerate omnibus ones.

A major current movement in psychology is away from vague, omnibus cognitive structures to more domain-linked competencies (Cantor & Kihlstrom, 1987). Even in the field of cognitive development, the bulwark of global structuralism (Piaget, 1947/1950) is being abandoned for more heterogeneous and multiform developmental mechanisms and cognitive competencies (Feldman, 1980; Flavell, 1978).

The affinity to global dispositional constructs and measures has also fostered an erroneous dichotomy that pervades the literature in the field of personality. This is the disjoined duality of process and structure. Social-cognitive conceptions of personality are often depicted as being solely process theories, whereas dispositional approaches are said to be concerned with personality structures. Social cognitive theory rejects the false separateness of process and structure (Bandura, in press-a). Personality structures are created by process operations, and it is difficult to conceive of a personality process that is disembodied from any underlying structure.

Self-regulation of moral conduct serves to illustrate the interdependence of process and structure (Bandura, in press-c). In social cognitive theory, conduct is regulated through moral standards that represent enduring cognitive structures for judging the moral status of conduct in situations containing many morally relevant decisional ingredients. It is via the cognitive rule structures that the self-regulatory constituent processes of self-monitoring, self-evaluation, and self-sanctions operate anticipatorily on conduct. In short, processes do not function in a vacuum without structural properties that provide the substance and direction for those processes. A social cognitive theory combining moral rule structures and self-regulative processes operating through them within a network of reciprocal influences is no less a structural theory of personality than, for example, the psychoanalytic approach in which a superego controls conduct.

The social cognitive theory of moral thought and action also illustrates the disavowal of the dualistic view of the person-society relation. Self-sanctions keep conduct in line with internal standards. But moral standards do no function as fixed internal regulators of conduct. Self-regulatory mechanisms do not operate unless they are activated, and there are many psychosocial processes by which self-sanctions can be disengaged from inhumane conduct. This is achieved by reconstruing detrimental conduct as serving moral purposes, obscuring causal agency, disregarding or misrepresenting the injurious effects of ones actions, and blaming and devaluating the recipients of maltreatment. Selective activation and disengagement of self-reactive control permit different types of conduct with the same moral standards under different constellations of social circumstances. Thus, the ongoing regulation of moral conduct is better explained in terms of dialectic processes than by socially disembodied individual differences in moral standards.

Meichenbaum's commentary contains several puzzling misconstruals of social cognitive theory that should not go uncorrected. There is nothing like serious inaccuracies in a commentary to stir an author to reach for the pen. Consider the role of perceived self-efficacy in human functioning. The book under discussion contains detailed conceptual and em-

pirical analyses of the causal function of self-efficacy beliefs and the different psychological processes through which they exert their effects on human action. These efficacy-activated events include cognitive, motivational, affective, and selection processes. Some of these processes are of interest in their own right rather than only as intervening influences of action. Diverse causal tests conducted with different modes of efficacy induction, varied populations, and all sorts of domains of functioning provide convergent support for the explanatory and predictive generality of the self-efficacy determinant. However, in social cognitive theory, perceived self-efficacy is only one of many determinants of human motivation and action. Entire chapters in *Social Foundations of Thought and Action* are devoted to the origins of other classes of determinants and the mechanisms through which they produce their effects.

To begin with, human action is partly regulated by knowledge structures that serve as guides for the construction of complex modes of behavior. Two chapters examine how these knowledge structures are acquired through observational learning, inferences from exploratory experiences, information conveyed by tuition, and innovative cognitive syntheses of preexisting knowledge. The transformational and generative operations by which cognitive models are translated into proficient action receive detailed analyses, as do the changes in multilevel regulation of skills as they are perfected.

Another chapter is devoted to the anticipative mechanism of forethought in the regulation of human motivation and action. Predictive knowledge of conditional relations between environmental events fosters foresightful adaptations. The ability to envision the likely outcomes of prospective actions is another way in which anticipative mechanisms contribute to human motivation and action. These outcome expectancies may take the form of external, vicarious, or self-generated consequences. Three lengthy chapters are devoted to how such outcome expectancies operate singly and in concert to influence the course of human action. Another chapter explains how cognized goals and internal standards rooted in value systems create self-incentives and guides for action through self-regulatory mechanisms.

Social cognitive theory clearly posits a multifaceted causal structure, rather than placing the entire explanatory burden on self-beliefs of efficacy. Indeed, the chapter on perceived self-efficacy cautions readers not to misinterpret commonality of mechanism as exclusivity of mechanism. Because people's beliefs about their capabilities touches most everything they do does not mean that nothing else affects their actions. Meichenbaum misinterprets my comments on this issue as a concession regarding the adequacy of the construct of self-efficacy. To acknowledge the multiple determinants of human motivation and action in no way diminishes the role of the self-efficacy determinant in causal processes. To compound the puzzling misconstrual, Meichenbaum then asks, "One wonders what other mechanisms Bandura has in mind." This is hardly a mysterious matter. As already noted, eight chapters of the book address, at considerable length, other determinants and the cognitive mechanisms through which they exert their effects. Moreover, it presents research explicitly showing that outcomes are multiply determined by perceived self-efficacy operating in concert with such factors as personal standards, affective self-reaction, and cognitive strategies (Bandura & Cervone,

1983, 1986; Locke, Frederick, Lee, & Bobko, 1984). Subsequent research has similarly analyzed how perceived self-efficacy operates in the causal structure in conjunction with other determinants emphasized in social cognitive theory (Bandura & Jourden, 1989; Bandura & Wood, 1989; Dzewaltowski, 1989; Dzewaltowski, Noble, & Shaw, 1989; Ozer & Bandura, 1990; Wood & Bandura, 1989b). The odd characterization of social cognitive theory as a one-factor theory has absolutely no foundation in fact.

In other comments regarding perceived self-efficacy, Meichenbaum pits self-efficacy as a determinant against the interviewing processes through which it effects change as though they were competing explanations. As noted earlier, a vast body of research, reviewed fully in the *Social Foundations* volume and elsewhere (Bandura, 1989, 1990), documents the diverse processes through which people's beliefs in their efficacy affect their functioning. Self-efficacy beliefs determine, among other things, whether people's thought patterns are self-aiding or self-impeding, the nature of their inferential judgments, the level of motivation they enlist and sustain in given endeavors, their vulnerability to stress and depression, and their choice of activities and environmental settings which shape developmental trajectories. Extension of self-efficacy theorizing and research to health functioning document the substantial impact of self-beliefs of coping efficacy on biological systems that mediate health and illness. These microanalytic studies of the biochemical effects of perceived self-efficacy include autonomic reactions (Bandura, Reese, & Adams, 1982), neurotransmitters and stress-related hormones (Bandura, Taylor, Williams, Mefford, & Barchas, 1985), endogenous opioids (Bandura, Cioffi, Taylor, & Brouillard, 1988; Bandura, O'Leary, Taylor, Gauthier, & Gossard, 1987), and various components of the immune system (Wiedenfeld et al., 1989). With regard to the sources of self-beliefs of efficacy, considerable progress has been made in our understanding of how efficacy-relevant information conveyed enactively, vicariously, persuasively, and physiologically is used to form self-efficacy beliefs.

In his discussion of research designed to facilitate post-coronary recovery through efficacy enhancement, Meichenbaum focuses on the trivial mechanics of recording an efficacy judgment and then pits perceived self-efficacy against some of the very processes through which it effects changes. Prior studies in this program of research had already demonstrated that the more patients' beliefs in their physical and cardiac efficacy were enhanced by treadmill attainments, the more they engaged in activities that help to strengthen cardiovascular capabilities. The particular study under discussion was founded on knowledge gained from these previous investigations on the processes through which enhanced self-beliefs of cardiac efficacy serve to facilitate psychological and physical recovery from a heart attack. Other lines of research had shown that the course of personal change is determined not only by a person's own self-efficacy beliefs but also by how significant others treat that person depending on their beliefs about his or her efficacy. Psychological recovery from a heart attack is clearly a social rather than solely an individual matter. Wives who believe their husbands have a robust heart are more likely to encourage them to resume an active life, whereas those who believe their husband's heart is impaired and vulnerable to further damage are likely to retard the recovery process by curtailing their activities. We, therefore, strengthened wives' beliefs in

their husbands' physical and cardiac capabilities. The stronger the patient's and wife's beliefs in his cardiac capabilities at the end of the brief intervention, the greater was the patient's long-term improvement in cardiovascular functioning. Meichenbaum poses the question of whether the explanation lies in ethological descriptions of social interactions rather than in people's efficacy beliefs, as though beliefs of cardiac vulnerability have no effect whatsoever on how postcoronary patients and their spouses live their lives.

Understanding of human functioning is not advanced by severing efficacy-activated processes from their efficacy sources or treating them as rival factors. This point can be further illustrated by research demonstrating the influential role of beliefs of self-efficacy in academic attainments. Gibson and Dembo (1984) devised an efficacy scale to measure teachers' beliefs in their capabilities to motivate and promote learning in students. In a microanalytic observational study, they found that teachers who have a high sense of instructional efficacy devote more classroom time directly to academic learning, provide students who have difficulty learning with the help they need to succeed, and praise their academic accomplishments. In contrast, teachers who have a low sense of instructional efficacy spend more time on non-academic pastimes, readily give up on students if they do not get quick results, and criticize them for their failures. Thus, teachers who believe strongly in their capability to promote learning create mastery experiences for their students, whereas those beset by self-doubts about their instructional efficacy construct classroom environments that are likely to undermine students' judgments of their capabilities and their cognitive development.

Instructional factors alter children's self-beliefs of efficacy (Schunk, 1984, 1989). Children's beliefs in their intellectual efficacy, in turn, affect their level of motivation, flexibility in the use of solution strategies, development of intrinsic interest in the subject matter, and level of academic performance (Bandura & Schunk, 1981; Collins, 1982; Schunk, 1984). Ashton and Webb (1986) documented the cumulative impact of different levels of teachers' perceived self-efficacy. At the individual level, teachers' beliefs concerning their own instructional efficacy predict students' level of mathematical and language achievement over the course of an academic year, with students' entering ability controlled.

The combined evidence from preceding studies shed some light on how teachers' perceived self-efficacy affects the quality of instructional transactions and how the resultant development of children's perceived self-efficacy influences the rate of academic progress at the individual level. Teachers operate collectively within an interactive social system rather than as isolates. Reciprocal social influences in a school can raise or lower teachers' beliefs in the efficacy of their school as a whole to accomplish significant academic progress. We are presently conducting research on the multiple social sources of collective school efficacy and its impact on level of school accomplishments using the school as the unit of analysis. In short, research on the efficacy determinants of psychosocial change has moved well beyond "ethological description" of social interactions to stringent tests of causal linkages operating within interpersonal networks.

Meichenbaum seems to take umbrage at the use of technical psychological terms, although it is unclear whether the distaste for technical terms is specific to social cognitive theory or applies equally to the theories he favors. I have no quarrel with people who try to present technical terms in

colloquial forms provided the meanings of the psychological constructs and processes are not thereby altered. Wordsmiths who sell their wares to the general public do so all the time. Unfortunately, all too often the process of simplification strips constructs of significant defining properties or invests them with the surplus meanings carried by the colloquialisms. Advances in a field are best achieved by well-defined constructs that fully reflect the phenomena of interest and are rooted in a theory that specifies their determinants, mediating processes, and multiple effects.

Meichenbaum is of the view that an integration of social cognitive and psychodynamic theories will provide the best glimpse of the human condition. But exactly what does the unification mean? How does one combine theories that rest on fundamentally different assumptions about the determinants and mechanisms of human motivation and action and retain any conceptual coherence? Psychological theories provide abstractions about human phenomena but the particular set of phenomena that happen to be singled out for attention by different theorists are not the patented possessions of the theories nor do the phenomena have to be permanently saddled with the interpretive baggage imposed on them by particular conceptual schemes. Important advances in the understanding of human behavior are often impeded when deficient theories appropriate significant phenomena. Progress is achieved when the phenomena are reconceptualized within a more fruitful theoretical framework. Witness the limited and impoverished yield of research spawned by the psychoanalytic theory of identification and the voluminous cumulative research stimulated by the social cognitive theory of the determinants, mechanisms, diverse effects, and operative power of psychological modeling (Bandura, 1969, 1986; Bronfenbrenner, 1958). A comprehensive theory of human functioning must, of course, encompass the factors that govern human thought, affect, and action, whatever Aristotle, Comte, Freud, Jung, Mead, Montesquieu, or one's grandmother may have had to say about some of them at one time or another. But the multiform factors must be integrated within a unified conceptual framework; otherwise one ends up with discordantly fragmented eclecticism.

The basic human phenomena have been charted by the ancient psychic mariners and are not new to any particular theory. The challenge is to provide conceptions of them that have explanatory, predictive, and operative power. Ecumenical appeals for unification of social cognitive and psychodynamic theories go unsupported by any empirical evidence for the superiority of the theoretical hybridization. Close empirical scrutiny has repeatedly shown that psychodynamic assessments are relatively poor predictors of human behavior (Dawes, Faust, & Meehl, 1989; Meehl, 1965; Wiggins, 1973). Indeed, actuarial systems combining a few psychosocial factors are typically superior to psychodynamic assessments in predicting how people will behave. Similarly, self-appraisal is usually a better predictor than psychodynamic assessments that supposedly measure critical determinants of people's behavior of which they are unaware (Shrauger & Osberg, 1982). Efforts at laboratory tests of some of the less loosely specified tenets of such theories have floundered in conceptual and methodological quagmires (Erwin, 1980; Eysenck & Wilson, 1973; Grünbaum, 1984). Psychodynamic approaches have been shown to be wanting not only in predictive power but also in their efficacy to alter human behavior.

I read with mingled amusement and astonishment Meich-

enbaum's ascription of the parentage for behavior theory to Freud. In the quoted passage that supposedly verifies the lineage, Freud says that while undergoing analysis clients should cope with their nemesis. Considering the high success achieved rapidly by mastery-oriented treatments without the psychoanalytic appendage (Bandura, 1988), there is every indication that the analysis is a protractively expensive irrelevancy to behavioral change. How long are we going to keep squeezing that same old orange and coming up dry? The burden of proof rests with the unificationists to demonstrate empirically that psychodynamic grafts produce a theory that has superior predictive and operative power. The rhetoric of faith can no longer substitute for evidence.

Note

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Self-Regulatory Mechanisms Governing the Impact of Social Comparison on Complex Decision Making

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This study tested the hypothesis that different patterns of social comparison would affect performance attainments in a simulated organization through their impact on mediating self-regulatory mechanisms. Ss served as organizational decision makers under prearranged comparative feedback that they performed as well as their comparators, consistently surpassed them, achieved growing mastery, or experienced progressive decline. Progressive mastery enhanced perceived self-efficacy, efficient analytic thinking, challenging goal setting, aidful affective self-reaction, and organizational performance. Relative decline undermined these self-regulatory factors and produced a growing deterioration of organizational performance. The similar and superior social-comparative patterns of influence had a supportive self-regulative and performance effect. Path analyses revealed that perceived self-efficacy, quality of analytic thinking, personal goal setting, and affective self-reactions operated as significant determinants of performance attainments.

Many of the theories that have been proposed over the years to explain human sociocognitive functioning have relied heavily on causal models favoring one-sided determinism. In such models of unidirectional causation, behavior is depicted as being shaped and regulated either by environmental influences or by internal dispositions. In the more recent, partially bidirectional models of causation, persons and situations affect each other but their influence on behavior flows unidirectionally. Social cognitive theory explains sociocognitive functioning in terms of triadic reciprocal causation (A. Bandura, 1986). In this model of reciprocal determinism, behavior, cognitive, and other personal factors and environmental events all operate as interacting determinants that influence each other bidirectionally. In analyzing the personal determinants in this interactional causal structure, social-cognitive theory accords a central role to cognitive self-regulative processes.

In this research, interactional causal structures are examined as they operate within the context of managerial decision making in a dynamic simulated environment. Each of the major interactants in the triadic causal structure—cognitive, behavioral, and environmental—functions as an important constituent of the transactional processes. The cognitive determinant is indexed by self-beliefs of efficacy, personal goal setting, self-evaluation, and quality of analytic thinking. The managerial choices that are executed constitute the behavioral determi-

nant. The properties of the organizational environment, the level of challenge it prescribes, and its responsiveness to managerial interventions represent the environmental determinant.

The mechanisms and outcomes of complex decision making do not lend themselves readily to experimental analysis in actual organizational settings. This is because the ongoing interaction between behavioral, cognitive, and environmental factors cannot be sufficiently controlled to elucidate causal processes. A simulated environment permits systematic variation of theoretically relevant factors and precise assessment of their impact on organizational performance and the psychological mechanisms through which they achieve their effects. The temporal dynamics of triadic reciprocity require the sequential measurement of interacting factors to isolate the effects of the constituent influences. The design of the simulated environment used in this research makes it possible to examine temporal interdependencies and cumulative effects of the major classes of variables postulated to operate in the composite causal structure (R. E. Wood & Bailey, 1985; R. E. Wood & Bandura, 1989a).

Decision-making research conducted within the framework of cognitive psychology has added substantially to the understanding of how judgmental operations affect decisional activities. However, much of the research on human decision making examines discrete judgments in static environments under nontaxing conditions (Beach, Barnes, & Christensen-Szalanski, 1986; Hogarth, 1981). By contrast, in naturalistic environments decisions must be made from a wide array of information within a continuing flow of activity under time constraints and with social and self-evaluative consequences. To complicate matters further, organizational decision making requires working through others and coordinating, monitoring, and managing collective efforts. Many of the decisional rules for effective management of dynamic environments must be learned through exploratory experiences while one is coping with ongoing organizational activities. Under these more com-

We are deeply indebted to Paul Shaw for his generous assistance with this research; to the Dean of Social Sciences, James Walsh; to Lee Jerrell, Director of MBA Programs; to Jim Hawkins, Frank Payne, and Allen Leventhal of the Department of Psychology; and to Steve Achtenhagen, Jerry Burstein, and Dirk Wassenaar of the Graduate Business Programs at San Jose State University for their help in arranging the facilities. We are also grateful to Robert Wood for his generous assistance with different aspects of this research.

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plex transactional conditions, self-regulative, affective, and motivational factors can exert substantial impact on the quality of decision making.

In social-cognitive theory (A. Bandura, 1986, 1988), self-regulation of motivation and sociocognitive functioning is governed by several self-regulatory mechanisms operating in concert. One of the mechanisms that occupies a central role in this regulatory process operates through beliefs of personal efficacy. Perceived self-efficacy is concerned with people's beliefs in their capabilities to mobilize the motivation, cognitive resources, and courses of action needed to exercise control over environmental events. Self-beliefs of efficacy have diverse psychological effects that can facilitate or impair complex decision making. They regulate level of motivation, both directly through mobilization and maintenance of effort and indirectly by their impact on goal setting (A. Bandura, 1988; A. Bandura & Cervone, 1983, 1986; Cervone & Peake, 1986). The stronger the perceived self-efficacy, the higher the goals that people set for themselves and the stronger their commitment to them (Locke & Latham, 1990; R. E. Wood & Bandura, 1989a).

Self-efficacy beliefs also influence attentional and cognitive processes in self-aiding or self-debilitating ways. People who have a strong sense of efficacy focus their attention on analyzing and figuring out solutions to problems, whereas those beset with self-doubts of their efficacy tend to turn their attention inwardly and become self-preoccupied with evaluative concerns when their efforts prove unsuccessful (A. Bandura, 1989). They dwell on their personal deficiencies and envision failure scenarios that produce adverse consequences. Such intrusive thinking activates disruptive stress reactions and undermines effective use of cognitive capabilities by diverting attention from how best to fulfill task demands to concerns over personal deficiencies and possible calamities (Lazarus & Folkman, 1984; Meichenbaum, 1977; Sarason, 1975).

The capacity to exercise self-influence by personal challenge provides a second self-regulatory mechanism of motivation and action. Motivation through pursuit of challenging standards has been the subject of extensive research on goal setting. Converging lines of evidence from laboratory and field studies involving heterogeneous domains of functioning reveal that explicit challenging goals enhance motivation and performance attainments (Locke & Latham, 1990; Mento, Steel, & Karren, 1987). However, the multifaceted nature and intricate linkage of managerial decisions to organizational performance introduces complexities in the relation between personal goals and group attainment. At the individual level, individuals can exercise direct control over their performances by regulating their attention and level of effort. In organizational environments, group goals must be socially mediated through the coordinated efforts of others. Sheer managerial effort alone does not ensure attainment of group goals. Moreover, systematic pursuit of operational subgoals for one segment of a social system at a time may contribute to eventual success but does not necessarily produce sizable gains in organizational performance in the short run (A. Bandura & Wood, 1989; R. E. Wood & Bandura, 1989b). Thus enhancement of performance by goal challenges is more complicated at the group than at the individual level.

Affective self-evaluation operates as a third factor in the self-regulation of motivation and action. People seek satisfaction

from fulfilling valued goals and are prompted to intensify their efforts by discontent with substandard performances. This form of self-regulation involves cognitive comparison processes that include both proactive and reactive elements. By making self-satisfaction conditional on matching adopted goals, people proactively give direction to their actions and create self-incentives to persist in their efforts until they accomplish what they seek. Perceived negative discrepancies between performance and a standard to which they commit themselves creates self-dissatisfaction that can also serve as an incentive for enhanced effort. Negative self-reactivity augments effort in routinized activities (A. Bandura & Cervone, 1983, 1986; Locke, Cartledge, & Knerr, 1970) but can be disruptive in activities that make heavy attentional and cognitive demands.

In organizational environments, decision makers must discover managerial rules that enable them to predict and exercise influence over the collective effort. Discernment of predictive rules requires effective cognitive processing of multidimensional information that contains ambiguities and uncertainties. Predictive factors are usually related probabilistically, rather than invariably, to future events, which leaves some degree of uncertainty. If too many factors are altered at once, it is difficult to gauge which ones are responsible for the observed results.

In the formal characteristics of the simulated organization used in this research, managers had to learn the form of the functions relating several motivational factors to aggregate outcomes. Some of the factors involved nonlinear and compound rules that were more difficult to learn than were linear ones (Brehmer, Hagafors, & Johansson, 1980). Moreover, the managers had to figure out the best way to integrate the set of rules and to apply them discernibly to each member of the group. To achieve all this, they had to generate hypotheses about functional relations for different motivational factors and to integrate them into a coherent managerial effort. People who had a strong sense of problem-solving efficacy were likely to exhibit more efficient analytic thinking than were those who were beset by self-doubts.

The way in which ability is construed can have powerful impact on the self-regulatory mechanisms governing motivation, action, and the cognitive processing of outcome information (M. M. Bandura & Dweck, 1989; Nicholls, 1984; R. E. Wood & Bandura, 1989b). People who view ability as an acquirable skill display stronger resiliency of self-efficacy, profit more from failure experiences, set higher personal challenges, and engage in more efficient analytic thinking than those who regard ability as a fixed entity reflecting one's basic cognitive capacities. Social comparison operates as a primary factor in the self-appraisal of capabilities (Festinger, 1954; Goethals & Darley, 1977; Suls & Miller, 1977). This is because most activities do not provide objective, nonsocial standards for gauging level of ability. People must therefore appraise their capabilities in relation to the performance attainments of others.

The research on self-appraisal of capability through social standards has centered mainly on why people engage in social comparison, whom they choose to compare themselves with, the role of performance and attribute similarity in the selection of social referents, and the self-evaluative consequences of such choices (Suls & Miller, 1977; Suls & Mullen, 1982; J. V. Wood, 1989). Results of these studies have helped to clarify some im-

portant aspects of comparative self-appraisal. However, the laboratory situations generally differ in several respects from how socially comparative influences operate under naturally occurring conditions. In the former case, people can choose from a set of social referents whose accomplishments they want to hear about to determine whether they prefer upward or downward comparisons. The comparative self-appraisal typically involves a single evaluative instance. In contrast, under ordinary conditions, people are continually confronted with comparative information with social consequences whether they seek it or not. Moreover, comparative evaluation is an ongoing process often involving changes in the level, rate, and direction of performance discrepancies. Comparative self-appraisal therefore entails interpreting the ability implications of changing patterns of comparative information over time. Moreover, full understanding of how social-comparative influences affect human functioning requires broadening this line of inquiry to their impact on ongoing performance and the mediating mechanisms through which they produce their performance effects.

Research on the mechanisms of modeling reveals that exposure to the attainments of others has significant impact on self-efficacy appraisals (A. Bandura, Reese, & Adams, 1982; Brown & Inouye, 1978; Kazdin, 1979; Schunk, 1986). Assumed similarity to the models strengthens the impact (Prince, 1984). Comparative information conveyed in the form of normative indexes affects self-efficacy appraisals in much the same way as does observing the attainments of similar others (Jacobs, Prentice-Dunn, & Rogers, 1984; Litt, 1988). Alterations in perceived self-efficacy, in turn, influence the level of goal setting, affective self-evaluation, and the quality of analytic thinking.

This experiment was designed to test hypotheses that different patterns of social comparison exert differential impact on achieved levels of organizational performance and that they do so through their effects on the mediating self-regulatory mechanisms described earlier. Subjects managed a simulated organization in which they had to match a set of employees to production subfunctions and had to use goals, instructive feedback, and social incentives in appropriate ways to achieve gains in organizational performance that were difficult to fulfill. They managed the group activity over a series of production trials under conditions of social comparison in which they either performed as well as a comparison group of decision makers, consistently surpassed them, achieved progressive mastery, or experienced a progressive decline relative to the attainments of their comparators. These particular social-comparative patterns were selected because they encompass the range of divergencies commonly encountered and they represent psychologically interesting disparities in accomplishments. At three points in the organizational simulation, subjects' perceived self-efficacy, goal setting, and evaluative self-reactions were assessed. The adequacy of their analytic strategies for discovering managerial rules and the level of organizational performance they achieved were also measured.

It was predicted that comparative progressive mastery would instill a rising sense of managerial self-efficacy that enhances the other self-regulatory factors and organizational performance. In contrast, a progressive relative decline in attainments would rapidly undermine effective self-regulation and performance. Performing as well as or better than one's comparators

would help to sustain self-regulatory guides and performance. The following self-regulatory causal structure was proposed as governing the level of organizational attainment. Perceived self-efficacy enhances organizational performance both directly and indirectly by its effects on personal goal setting, on affective self-reactions, and on use of analytic strategies. In the latter paths of influence, perceived self-efficacy is linked to adoption of challenging organizational goals, positive self-evaluative reactions, and systematic use of efficient analytic strategies to discover managerial rules. Goal setting is affected by level of prior attainments as well as by perceived self-efficacy. The stronger the perceived self-efficacy and the higher the prior accomplishments, the more challenging are the goals adopted for the organization. With regard to the paths of influence to self-evaluation, a strong sense of efficacy and high prior attainments activate positive self-evaluative reactions. High self-set organizational goals, positive affective self-reactions, and systematic analytic thinking, in turn, enhance the level of organizational performance.

Method

Subjects

The subjects were 40 male and 20 female volunteers from a graduate program in business studies. They ranged in age from 21 to 49 years, with an average age of 31 years. Eighty-eight percent of the subjects were employed full-time in various corporations, and 72% of them had had prior managerial experience. The subjects were randomly assigned, balanced for gender, to the four experimental conditions.

Simulated Organization

The study was presented to the subjects as part of a program of research designed to advance understanding of managerial decision making. They were told that they would serve as managers of a simulated organization modeled after an actual organization that had been observed over an extended period. To ensure that all participants received the same information, all the instructions were presented on their computer monitor. The orienting information described the simulation as one in which managers receive weekly orders for the production of furniture items, along with a roster of available employees. The manufacture of the items in each of the weekly orders required eight different production subfunctions, such as milling the timber, assembling the parts, staining and glazing the assembled frame, upholstering the furniture, and preparing the products for shipment. The subjects would manage the organizational unit for a total of 18 production orders, with each order representing a performance trial in the simulation. The orders included producing new units, repairing old ones, and refurbishing antiques.

The subjects' managerial task was to allocate eight employees selected from a 10-member roster to the different production subfunctions to complete the work assignment within an optimal period. They were told that by matching employees' particular interests and skills to production requirements, they could attain a higher level of organizational performance than if employees were poorly matched to subfunctions. To assist them in this decision task, subjects were given written descriptions of the effort and skill required for each of the eight production subfunctions and brief profiles of the characteristics of each member. This individuating profile information described their particular skills, experience, motivational level, preference for routine or challenging work assignments, and standards of work quality. Following is the profile description of one of the employees:

Jack is one of the firm's oldest employees. He has been a builder for most of his working life and has a wide range of woodworking skills. He has a distrust of 'those fancy new machines,' even though he is a competent lathe operator. Jack is usually happiest with non-technical, manual jobs. He is a perfectionist, with a fine eye for detail.

Both the production subfunctions and the employee attributes were selected on the basis of extensive observation of the actual manufacturing process to ensure that the simulation closely approximated the actual environment. Subjects were provided with the profile descriptions at the outset of the managerial task on their computer display monitor and on a sheet for referral at any time during the organizational decision making.

In addition to allocating employees to subfunctions, subjects were informed that they had to make a set of decisions on how to use the various motivational factors to optimize the group's performance. Specifically, they had to decide how to use goals, instructive feedback, and social incentives to enhance the accomplishments of each employee. For each of these motivational factors, subjects had a set of options representing the types of actions that managers might take in an actual organization. A mathematical model was used to calculate the hours taken to complete a production order on the basis of the adequacy of subjects' allocation of employees to subfunctions and their use of the three motivational factors. The group performance for each trial was reported to subjects as a percentage of a preset standard number of hours to complete each manufacturing order. This preset performance standard, which was based on information from a pretest of performance attainments on this task, was set at a level that was difficult to fulfill. The logic of the simulation model and the decision options available to subjects are described next. A more detailed explanation of the mathematics and logic of the model has been presented elsewhere (R. E. Wood & Bailey, 1985).

In performing the managerial role, subjects had to allocate the employees to the various subfunctions for each manufacturing order. They could reassign them if they judged that a particular member would be better suited for a different job assignment. After subjects allocated the employees to the different subfunctions for a given trial, they could then assign each employee a production goal from a set of options that included urging them to do their best or assigning them one of three specific goals set at, above, or below the established standard. A fifth option allowed them to set no production goal for an employee, if they judged that it would have a negative motivational effect. Goal assignments for employees, which were made at the beginning of each trial, influenced an employee's performance according to the calculations of the simulation model in the manner predicted by goal theory (Locke & Latham, 1990). Goals that present a moderate challenge lead to higher performance than do no goals or instructions to do one's best. However, repeated imposition of goals that exceed an employee's prior performance at a level that renders them unattainable has a negative effect on performance after two consecutive trials. Continued imposition of unattainable goals would eventually lead to their rejection and diminished motivation. To enhance the performance of their organizational unit, subjects had to learn the decision rule for setting the optimal level of challenge for each member.

Employees were provided instructive feedback and social incentives after the production for each order had been completed. The feedback and reward decisions, which influenced performance on the subsequent trial, modeled the temporal effects of such actions in actual organizational environments. For the feedback decision, subjects could give employees no feedback or select one of three options, which varied in the amount of direction given regarding procedures of production and analysis of difficulties. Instructive feedback had a positive effect on performance for employees who were performing below the established standard. When an employee performed above standard, the

continued use of high directive feedback on three or more trials was regarded as oversupervision that would have a negative effect on performance. Effective use of the feedback options to improve organizational performance required subjects to learn decision rules for optimal adjustment of level of instructive guidance to performance attainments.

For decisions regarding social incentives, the effects of the three options varied with the type of reward given (e.g., compliment, social recognition, note of commendation) and with the degree to which rewards were contingent on employees' performance attainments. Subjects also had the option of not making any laudatory comments regarding their employees' work. Social rewards had a positive effect on performance. However, in an organizational setting the impact of rewards on performance is affected by social-comparison processes as well. Therefore, the magnitude of the incentive effect for a given member depended on the ratio of rewards to attainments for that employee compared with the equivalent ratio for other employees. Subjects therefore had to learn a compound decision rule combining incentive and equity factors to create an equitable system of incentive motivation.

In sum, to optimize performance of the organization that the subjects were managing, they had to match employee attributes to subfunctions and to master a complex set of decision rules on how best to guide and motivate their supervisees. To discover the rules, they had to test options, cognitively process the outcome feedback information of their decisional actions, and continue to apply analytic strategies in ways that would reveal the governing rules. The subjects were informed that they would receive feedback on how well their group had performed at the end of each production order. They could use this information to adjust their decisions so as to improve their group's level of performance.

Simple task demands reduce the impact of social influences on self-regulative factors because successes come easily to all performers. However, complex organizational environments present difficult decisional demands that tend to activate motivational, affective, and other self-referent processes in a flow of activities. Complex tasks thus place heavy demands on effective use of self-regulative influences for competent functioning. Therefore, our experiment used a high level of organizational complexity (R. E. Wood, Bandura, & Bailey, 1990), in which subjects had to make 32 decisions per production trial with several trade-offs in allocations of employees to production subfunctions.

Social Comparison Conditions

Subjects were randomly assigned to one of four treatment conditions defined by the pattern of social-comparative information presented. After each production trial, subjects received, on their computer monitor, the performance score for their own organizational unit and the corresponding mean performance score supposedly attained by other master's of business administration (MBA) students managing the same simulated organization. The feedback of the subjects' performance attainments was veridical, but the comparative information on each production trial was preprogrammed to diverge from the subject's actual attainment in the magnitude and direction designated by the treatment conditions to which subjects had been assigned. This preset yoking procedure ensured that all subjects in a given treatment condition received the identical comparative pattern whatever their level of performance might be. To ensure that the subjects attended to the comparative information, they plotted on a graph their group's performance attainments in red and the attainments of the comparative group in blue at the end of each production trial. The subjects could thus see clearly the emerging pattern of their performance attainments relative to the comparative group of decision makers. The effects of the following four comparative patterns were investigated.

Similar capabilities. For subjects assigned to the similar condition, the performance attainments for the comparison group varied irregularly a few percentage points above and below the subject's attainments. This comparative pattern conveyed a level of decisional capability comparable with that of peers of similar status.

Superior capabilities. Subjects in this social comparison condition outperformed their counterparts at the outset and maintained the relative predominance throughout the decision-making series. This comparative feedback indicated a relatively high decisional capability.

Progressive mastery. In the information presented in this condition, the comparison group outperformed the subjects at the outset, but over the course of the production trials the subjects continued to close the gap and eventually surpassed their counterparts.

Progressive decline. Subjects began this comparative condition at about the same level as their managerial counterparts, who rapidly surpassed the subjects and widened their ascendant position as they continued to manage the organization. This relative decline suggested a faulty decisional capability that became more and more apparent over time.

Subjects performed the simulation at a computer and entered all their decisions on the computer keyboard. After subjects demonstrated that they understood how to use the computer keyboard, the experimenter left the room. On each trial, subjects received information about the production order for that week and the roster of available employees. After they made their decisions they received, on the computer screen, quantitative feedback on the organization's performance level and the attainments of the comparison group. During the simulation, a computer timer emitted a tone every 5 min. Subjects were informed that the timer was provided to help them pace their progress rather than to time their decision making. They performed the task over a 1-hr session.

After the final trial, subjects were given a full explanation of the nature and purpose of the study. They were also told that they had performed the organizational simulation in relation to a difficult performance standard.

All data were collected in the context of the simulation, which included a total of 18 trials. The scales for the different self-regulatory measures were presented on the monitor following Trials 6, 12, and 18. Subjects recorded their responses on the computer keyboard. The first assessment was conducted after the 6th trial so that subjects would have at least some experience with the simulation before being asked to judge their perceived efficacy and to set goals for themselves.

Mediating Self-Regulative Determinants

Perceived self-efficacy was recorded on a multi-item efficacy scale that described nine levels of production attainments, ranging from 30% better to 40% worse than standard production time. Subjects rated the strength of their perceived self-efficacy for getting the group that they were managing to perform at each of the levels described. The ratings were made in terms of a 10-interval scale ranging from 0 (*no confidence at all*) to 100 (*total confidence*). The strength of perceived self-efficacy was the sum of the confidence scores for the nine levels of organizational performance.

In assessing *self-set goals*, subjects recorded the level of organizational performance they were personally aiming for in the succeeding block of trials. They selected their personal goals from nine levels of possible organizational attainments ranging from 40% below to 30% above the preset level and a tenth option of *no particular goal*. They also rated their commitment to their goals by using a 9-point scale that ranged from 0 (*not at all committed*) to 9 (*very strongly committed*).

In measuring *self-evaluative reactions*, subjects rated on a 9-point scale how self-satisfied or self-dissatisfied they were with the group performance they achieved in the prior production order and their

affective reactions if they attained the same group performance level on the next production order (9 = *high self-dissatisfaction*; 5 = *neutral*; 1 = *high self-satisfaction*).

The adequacy of subjects' *analytic strategies* was derived from their decisions regarding job assignments and how they varied the motivational factors to discern the managerial rules across each block of trials. Changing more than one factor concurrently for a given employee is a deficient analytic strategy for testing hypotheses regarding the impact of motivational factors on performance because it confounds the contribution of factors to outcomes. Systematic analytic strategies require changing one factor at a time and evaluating the effects it produces. Eight systematic tests, one for each employee, could be made in each trial. The strategy score was the sum of the decisions across a block of trials in which subjects changed more than one factor (i.e., job allocation, goal level, instructive feedback, or social reward) for each person. The more factors the subjects changed concurrently for each individual, the more erratic was the analytic thinking.

Organizational Performance

Organizational performance was measured in terms of the total number of hours taken by the group of employees to complete each weekly order. The number of production hours for each trial was automatically calculated by the simulation model on the basis of the subjects' job allocations and selection of motivational factors (R. E. Wood & Bailey, 1985). The fewer the production hours, the better the managerial decision making by the subject. Levels of organizational performance attained by subjects were reported as percentages of the preset standard, with a higher score indicating better performance. Organizational performance scores were averaged across three blocks of six trials each.

Results

Impact of Social Comparison on Self-Regulatory Factors

The impact of the social comparative influence on self-regulatory factors was analyzed by a 3×4 analysis of variance (ANOVA) with social comparison as the between-subjects variable and phase of assessment as a repeated-measures variable. There were no gender differences on any of the measures, so the data for men and women were pooled. The differences between subsets of means were tested by the Newman-Keuls procedure. Note that the treatment conditions represent changing patterns rather than invariant comparative differences from the outset. Three of the four groups shifted in direction or magnitude of their comparative status over trials. Subjects in the progressive mastery and progressive decline conditions briefly passed through a crossover point of comparative similarity with their counterparts. The different treatment conditions were fully realized by the third trial block, so that was where the major treatment effects were expected to be manifest.

Perceived self-efficacy. Figure 1 presents the mean strength of perceived self-efficacy as a function of social comparison at each of the three phases of assessment. Analysis of these data shows the interaction effect between comparative conditions and phases to be highly significant, $F(6, 112) = 3.77, p < .002$. Results of the Newman-Keuls contrasts underscore the cumulative negative impact of unfavorable social comparison. Subjects in the similar and superior comparative conditions maintained their sense of efficacy across phases despite shortfalls in performance attainments. Those in the progressive mastery

condition displayed a sharp rise in perceived self-efficacy ($p < .05$), whereas those in the declining condition suffered a growing deterioration in their perceived self-efficacy ($p < .05$).

The groups did not differ in their perceived self-efficacy in the initial and middle phases, but by the third phase the decliners expressed a much lower sense of managerial efficacy than did their counterparts in the similar, superior, and progressive mastery conditions (all $p < .05$). Subjects in the former three conditions ended up performing as well as, or better than, their comparators and did not differ in their perceived self-efficacy.

Affective self-evaluation. Subjects' affective reactions to their prior performance attainment and their reactions if they were to achieve the same performance level in the next attempt were highly correlated, $r(58) = .84$, $p < .0001$. Therefore, the analyses were conducted on the mean of the two ratings. The changes in affective self-reactions are plotted in Figure 1.

The ANOVA yielded significant main effects for comparative conditions, $F(3, 56) = 4.59$, $p < .01$, and phases, $F(2, 112) = 25.89$, $p < .0001$. However, these main effects are qualified by a highly significant interaction between comparative conditions and phases, $F(6, 112) = 4.45$, $p < .001$. Affective self-evaluation fluctuated as groups shifted in their comparative status over trials. In the initial phase, subjects who matched or surpassed their comparators expressed a high level of self-satisfaction, whereas those who were outperformed by the comparison group were self-dissatisfied with their attainments. In the analysis of intergroup differences, the similar condition differed in self-satisfaction from both the progressive declining ($p < .05$) and mastery subjects ($p < .01$), who started out poorly. Subjects in the superior condition were also more self-satisfied than

their counterparts in the progressive mastery ($p < .01$) and declining ($p < .10$) conditions.

The organizational attainments of all subjects fell short of the difficult preset standard. It is not surprising that subjects in all conditions showed a rise in self-dissatisfaction in the second phase ($p < .01$) and did not differ in this regard. However, by the third phase, subjects in the superior and mastery conditions became much more positive in their self-reactions to their organizational accomplishments ($p < .01$). Both of these groups differed beyond the $p < .05$ level from decliners, who remained discontent with their performance. The self-reactions of subjects in the similar comparative condition fell at an intermediate level and did not differ significantly from those of the other groups.

Self-set goals. Exposure to social-comparative influence significantly affected the goals subjects set for their organization $F(3, 56) = 3.35$, $p < .025$. These effects remained similar across the three phases. Subjects who received comparative information suggesting progressive mastery set higher goals for the organization than did those in the other comparative conditions, which did not differ from each other. The progressive masterers set themselves the goal of bettering the standard time by about 5% ($M = 5.7$), whereas the other three groups set a goal that was about 5% longer ($M = 4.2$) than the standard time. Subjects were highly committed to fulfilling their personal goals ($M = 7.2$) and did not differ in this respect as a function of comparative conditions.

Analytic Strategies

Subjects who are erratic in their analytic thinking are likely to vary more factors concurrently in an effort to hit upon an effec-

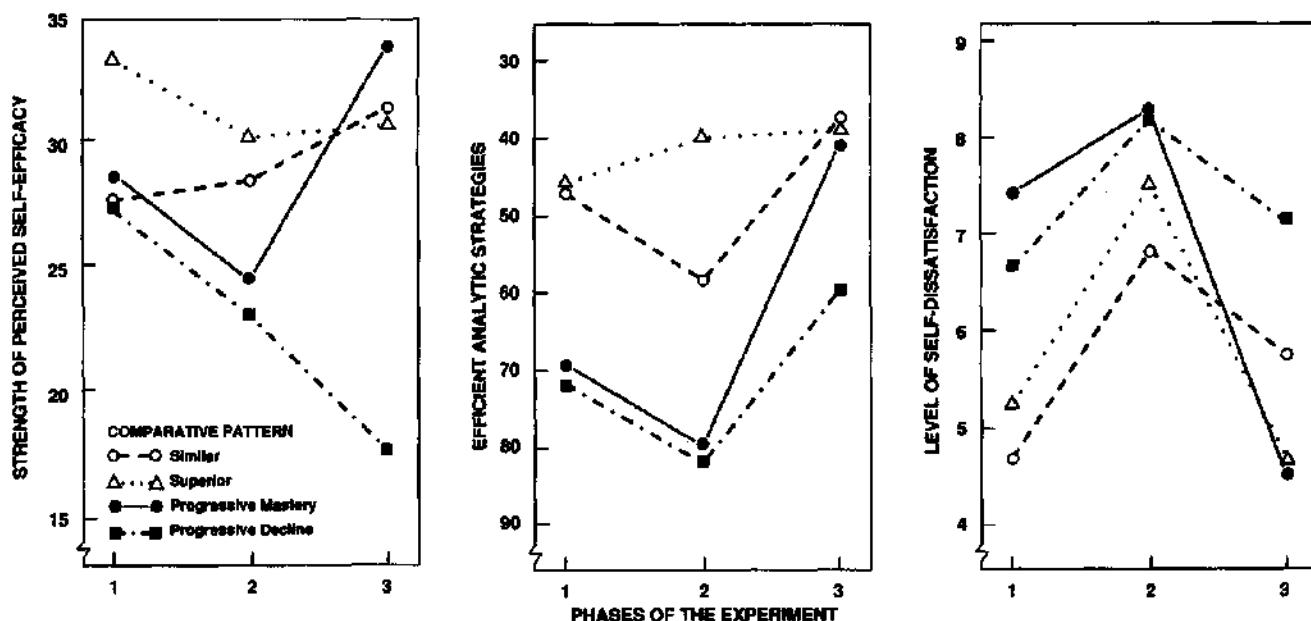


Figure 1. Changes in perceived self-efficacy, effective use of analytic strategies, and affective self-reactions across successive phases of the experiment under different patterns of social comparison. (Each phase includes six different production orders.)

tive arrangement than subjects who seek to discover predictive relations by thoughtful selective variation of factors. Significant main effects on quality of analytic thinking were obtained for comparative conditions, $F(3, 56) = 6.13, p < .001$, and for experimental phases, $F(6, 112) = 52.96, p < .0001$. These effects are also qualified by a highly significant interaction between comparative conditions and phases, $F(6, 112) = 3.17, p < .01$. This two-way interaction is shown in Figure 1.

Subjects in the superior comparative condition maintained a relatively efficient level of analytic thinking throughout the different phases of the experiment. Those in the similar and progressive mastery conditions were somewhat less systematic in their decisional strategies in the second phase ($p < .05$) but regained their analytic efficiency by the third phase ($p < .01$). Subjects who got off to a superior start according to the comparative feedback but declined in comparative status did not approach the inferential task efficiently at the outset and became even more erratic in the second phase ($p < .10$). Although they improved somewhat in the third phase ($p < .01$), they were still making multiple changes that would make it difficult to discern the optimal organizational rules.

In the intergroup contrasts, subjects in the similar and superior conditions were more efficient in their analytic thinking in the initial phase than those who were changing in their comparative status. Each of the former groups differed significantly from each of the latter groups beyond the $p < .01$ level of significance. The pattern of differences was essentially the same in the middle phase except that the similar subjects exhibited some deterioration in their analytic thinking. In the final phase, each of these three conditions, which fared well in relation to the comparative group, surpassed at the $p < .05$ level the progressive decliners, who continued to exhibit erratic thinking.

Organizational Performance

The changes in organizational attainments across phases of the experiment were highly significant, $F(2, 112) = 43.59, p < .0001$. The social-comparative influence had strong impact on level of organizational attainment, which increased in strength the longer the subjects managed the organization. This is shown in the highly significant two-way interaction between comparative conditions and phases, $F(6, 112) = 18.22, p < .0001$. This interaction is presented in Figure 2.

Subjects who received comparative feedback suggesting growing mastery surpassed the organizational attainments of their counterparts in the similar, superior, and declining conditions (all $p < .01$). The similar subjects were also marginally better in their organizational attainments than the decliners ($p < .10$).

Because an exceedingly difficult organizational performance standard was preset, subjects in all of the comparative conditions, except progressive mastery, suffered varying amounts of decline in organizational attainments over time. Results of the Newman-Keuls intragroup contrasts revealed that, for each of these three groups, the decline in organizational attainments from the first to the second phase and from the second to the third phase were significant at the $p < .01$ level. In contrast, subjects in the progressive mastery condition displayed an ini-

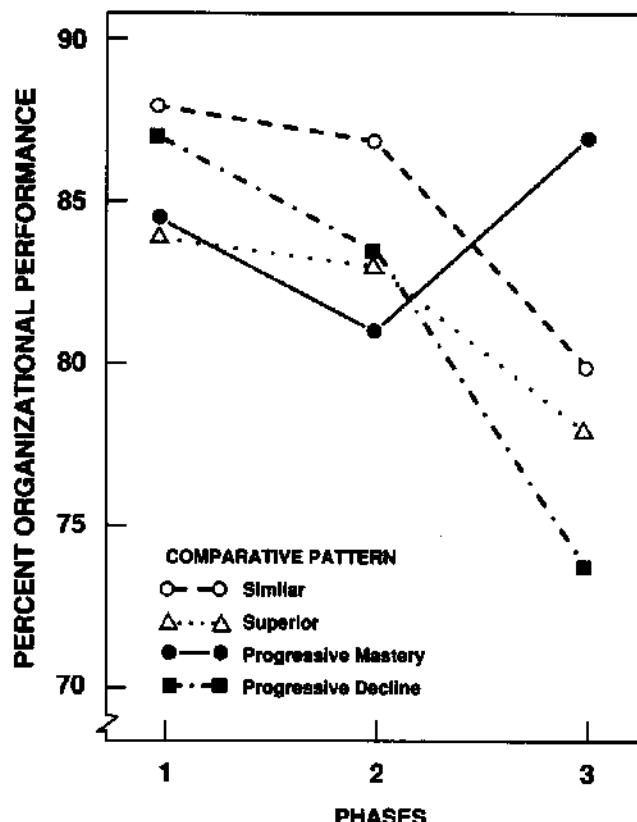


Figure 2. Level of organizational attainment achieved across successive phases by subjects who managed the simulated organization under different patterns of social comparison.

tial decline ($p < .05$) when they were clearly outperformed by their comparators, but they achieved substantial gains in organizational attainments ($p < .01$) when they were led to believe they were gaining on their comparators and eventually surpassed them.

Path Analysis

Path analyses were conducted to test the hypothesized causal ordering of self-regulatory factors. The structure of the causal model is presented in the introductory section of this article and receives support in the findings of prior research (A. Bandura & Wood, 1989; R. E. Wood & Bandura, 1989a). The temporal sequencing of variables by experimental variation of factors also helps to remove ambiguity concerning the direction of causality. The full set of structural equations representing the hypothesized causal relations were analyzed separately for the second and third trial blocks.

The standardized path coefficients that are significant beyond the .05 level are shown in Figure 3. The findings reveal that in the second phase perceived self-efficacy enhanced subsequent performance attainments both directly and indirectly through its effects on analytic thinking. Effective use of analytic strategies fostered performance attainments after prior determi-

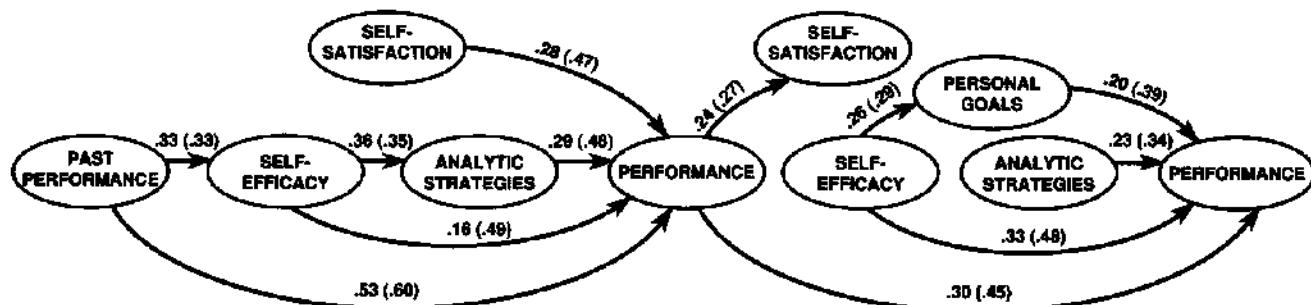


Figure 3. Path analysis of causal structures in the second and third phase of the experiment. (The initial numbers in the paths of influence are the significant standardized path coefficients, $p < .05$; the numbers in parentheses are the first-order correlations. The network of relations on the left half of the figure are for the second phase, and those on the right are those for the third phase.)

nants were controlled. Self-satisfaction also had a positive impact on performance attainments.

In the third phase, perceived self-efficacy and analytic strategies continued to operate as mediators of performance attainments. A strong sense of self-efficacy was accompanied by higher personal goals, which, in turn, made an independent contribution after prior performance and perceived self-efficacy were controlled. In both phases of the experiment, significant direct relations were found between perceived self-efficacy and organizational performance and between prior and subsequent organizational performance. Comparison across the two blocks of trials shows that, with increasing experience, prior performance makes a weaker contribution, and perceived self-efficacy accounts for a larger share of the variance in organizational performance attainments. The combined set of explanatory variables in the conceptual model accounts for a sizable share of variance in organizational attainments in both the second phase ($R^2 = .67$, $p < .0001$) and the third phase ($R^2 = .48$, $p < .0001$) of the study.

Discussion

The hypothesis that social comparative influences affect self-regulatory factors governing human motivation and performance accomplishments receives substantial support in the findings of this experiment. This is most strikingly revealed in the conditions involving contrasting changes in comparative status that are suggestive of progressive mastery or decline in managerial competence. The comparative decliners displayed a precipitous drop in their perceived self-efficacy, their analytic thinking remained erratic, and they were unremittingly self-critical of their performance attainments. By contrast, the comparative masterers experienced heightened perceived self-efficacy and substantially improved their use of efficient analytic strategies for ferreting out predictive rules of organizational management, and their affective self-reactions provided a dual source of motivation, namely, self-discontent with comparative substandard performances and a self-rewarding sense of satisfaction with their rising accomplishments.

The divergent patterns of self-regulatory influence were accompanied by corresponding divergent changes in performance attainments. Whereas the decliners exhibited a progres-

sive deterioration of performance, the masterers boosted their level of performance attainments as their comparative status ostensibly improved. Subjects' spontaneous comments on the postexperiment questionnaire provide further testimony to the differential impact of comparative appraisal on sociocognitive functioning. The comparative masterers were more likely to adopt the type of task-diagnostic focus that ensures success, as in the following example:

At first it was very discouraging. The other MBA students seemed much better at it. I kept trying more and more changes but then I tried a few experiments that seemed to work. Then I just kept making little changes until I caught up. I think the secret is making just a few small changes after the first big adjustments.

Those who experienced progressive decline in their comparative status were more prone to a self-referent focus on their inability to do their job and some despair over their repeated failure to reverse the downward slide. Perceived self-inefficacy to produce expected organizational outcomes also fosters attributions of blame, recalcitrance, and deficiencies to others (Ashton & Webb, 1986). Had the option to dismiss employees been available, the decliners would probably have depleted a sizable portion of their original personnel. As one of the subjects put it,

This was frustrating. I was beginning to think I was getting better at my job but maybe engineers are just a different breed of worker. If I could fire them and replace them . . . but it's hard to know what to do.

Because of the high organizational complexity and stringent preset standard, even subjects who operated proficiently might have closely approximated the standard but not fulfilled it. Thus, those who matched or surpassed their comparators still had to contend with persisting shortfalls in organizational performance. The self-regulatory patterns exhibited by the latter two groups indicate that favorable comparative appraisal helps to neutralize some of the potentially adverse effects of repeated failure. Despite unending shortfalls in performance attainments, the subjects maintained their sense of efficacy, continued to use efficient analytic strategies, and, although experiencing heightened discontent midway through the series, eventually derived self-satisfaction from being able to perform at least as well or better than similar others. The sociocognitive benefits

of advantageous social comparison under taxing conditions received additional support in the research of Brown and Inouye (1978).

Comparison of subjects who achieved superiority easily with those who had to struggle to gain mastery suggests that easy comparative triumphs support self-efficacy appraisal and analytic thinking but incur demotivating effects. The easy triumphers set lower goal challenges for themselves than did the masterers and were highly self-satisfied with declining performance attainments because they happened to surpass the performances of their comparators. Complacent self-assurance creates little incentive to expend the increased effort needed to attain high levels of performance.

The findings of this study lend further validity to the general thesis that the effects of particular performance outcomes are determined by their relational properties rather than by their absolute properties. However, most of the research demonstrating that the valence of performance outcomes is determined relationally has been concerned with temporal comparison with the outcomes that one has experienced in the past (Buchwald, 1960; Premack, 1965). Our study shows that the impact of performance outcomes is altered by social comparison as well and identifies mechanisms through which comparative influences produce their effects.

Subjects set their personal goal slightly below the preset standard and continued to aim for it with strong commitment even though their organizational attainments fell somewhat short of that level. This was true for all of the social-comparative conditions except for the progressive masterers, who sought to better the preset standard. Thus, a growing sense of mastery fostered high aspiration as well as beneficial self-efficacy, analytic thinking, and affective self-reactions. The significant impact of changing comparative status on affective self-reactions lends further support to the growing interest in the self-evaluative consequences of social comparison (Goethals & Darley, 1987).

As previously noted, affective self-reactions provide a dual source of incentive motivation: The anticipated self-satisfaction for personal accomplishment operates as a positive motivator, and discontent with deficient performance functions as a negative motivator. The findings of this experiment taken together with those of previous studies indicate that these two forms of self-motivators contribute differentially to performance accomplishments, depending on the complexity of the activity. On simpler tasks, in which success is attainable solely by increased level of effort, self-discontent with substandard attainments is the major regulator of performance accomplishments (A. Bandura & Cervone, 1983, 1986). In contrast, on complex tasks that make heavy attentional and cognitive demands, self-satisfaction with personal progress toward challenging standards provides a positive motivational orientation for performance accomplishments. Strong self-critical reactions can detract from the intricate task of generating and testing alternative organizational strategies. Indeed, the higher the subjects' self-discontent, the more difficulty they had adhering to a systematic exploratory strategy in the second phase, $r(58) = .36, p < .01$, and third phase, $r(58) = .26, p < .025$, of the organizational management. Cervone, Jiwani, and Wood (1990) reported a similar disruptive effect of self-devaluation on decisional processes. There are two plausible explanatory contenders for this rela-

tionship. One possibility is that high self-dissatisfaction diverts cognitive processing efforts from the task at hand to self-concerns. A second possibility is that failure on a complex multifaceted activity reduces faith in all of the strategies used, both good and faulty ones, and prompts a wholesale shift to suboptimal ones. Janis and Mann (1977) reported that people who experience self-doubt following failure of decisions tend to shift to suboptimal strategies. Affective self-reactions exerted their greatest influence in the early phases of the endeavor when sociocognitive functioning is most vulnerable to self-debilitating emotional reactions. High self-satisfaction also predicted subsequent organizational attainments, $r(58) = .31, p < .01$, but its contribution was no longer significant once the influence of the other determinants was controlled.

As previously noted, much of the current research on social comparison is concerned with how people weight different characteristics in comparing themselves with others and with the multiple functions that social comparison can serve (Taylor & Lobel, 1989; J. V. Wood, 1989). The mechanisms governing the translation of comparative self-appraisals into action have received relatively little attention. Our research broadens and extends this line of inquiry to the behavioral consequences of dynamic shifts in comparative status and to cognitive and affective mechanisms through which comparative influences exert their effects.

The results of the path analyses provide corroborating evidence that social-comparative influences affect performance partly through their impact on self-regulatory factors. Perceived self-efficacy, quality of analytic thinking, personal goal setting, and affective self-reaction operated as significant determinants of performance attainments. The path analysis served as a convenient device for structuring the pattern of relations in terms of the conceptual model guiding the research and the empirical findings from a series of prior studies. Although the sample size is relatively small, several factors add to the significance and generality of the findings. The self-regulatory factors were altered by variation of treatment conditions, and assessment of the self-regulatory factors preceded performance in the temporal relationship. Experimental variations and temporality removed some of the ambiguity concerning the source and direction of causality. Moreover, the causal structure revealed by the path analysis essentially replicated the structure obtained in a series of prior studies (A. Bandura & Wood, 1989; R. E. Wood & Bandura, 1989a). Evidence that the influence of prior performance diminishes with experience, whereas perceived self-efficacy exerts an increased impact on subsequent performance attainments, is also in accord with earlier findings (R. E. Wood & Bandura, 1989a). Replication of the paths of influence in the path analyses across different experiments involving markedly different experimental treatments attests to the generality of the mediating mechanisms.

In the early phase of organizational management, when the preset standard and the socially comparative standard were saliently introduced, personal goals were not a significant contributor to organizational performance. However, with further experience, subjects began to set organizational goals in terms of their perceived self-efficacy. The goals they set for themselves contributed independently to organizational accomplishments when the influence of other determinants was controlled.

The combined findings of a series of experiments (R. E. Wood & Bandura, 1989a) indicate that personal goals have weaker effects on organizational accomplishments than on individual accomplishments. Several factors may account for this differential impact. Personal goals operate as strong regulators of performance when people already possess the knowledge and means to exercise control, and they need only to intensify their efforts to obtain higher levels of performance. In dynamic organizational environments, people have to discover the best means of coordinating and orchestrating the efforts of others to achieve desired group outcomes. Systematic changes of organizational factors aid eventual discovery of functional rules for enhancing group performance without necessarily producing immediate improvements. Indeed, in early phases of organizational structuring, success is perhaps better achieved by linking goals to acquisition of a sound predictive model of organizational functioning than to achievement of quick performance results.

To complicate matters further, unlike the exercise of direct personal influence over one's own performance, socially mediated influence must operate through multifaceted, complex causal paths to produce organizational outcomes. The complexities of working through others create additional obstacles to transforming personal goals to group accomplishments.

Our findings reveal that social comparison can have both beneficial and detrimental effects. The adverse consequences are not easily avoidable in competitively structured systems because of the prevalence of forced social comparisons. Indeed, comparison with agemates is well entrenched even by the early years of development (Morris & Nemcek, 1982). Given that people are not about to forsake achievement pursuits and that cooperatively structured systems are hard to come by, it remains a challenge as to how to minimize the demoralizing effects of unfavorable social comparison. Construal of ability as an acquirable attribute, rather than an inherent fixed aptitude, and beliefs in controllability can help to sustain a sense of self-efficacy, motivation for self-development, and positive self-evaluation in the face of repeated failure and setbacks (A. Bandura & Wood, 1989; R. E. Wood & Bandura, 1989b). Placing greater weight on self-comparative standards and indicants of personal improvement can also lessen the detrimental effects of inimical social comparison (Frey & Ruble, 1990; Nicholls, 1990). A fruitful extension of research on social comparison would be to articulate the ways in which its demoralizing effects can be attenuated.

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Received April 19, 1990

Revision received August 17, 1990

Accepted August 21, 1990 ■

Correction to Hsee and Abelson

In the article "Velocity Relation: Satisfaction as a Function of the First Derivative of Outcome Over Time," by Christopher K. Hsee and Robert P. Abelson (*Journal of Personality and Social Psychology*, 1991, Vol. 60, No. 3, pp. 341-347), the note to Table 2 on page 345 is incorrect. Instead of greater numbers in the table indicating greater satisfaction, smaller numbers in the table indicate greater satisfaction.

Escaping Homelessness: The Influences of Self-Efficacy and Time Perspective on Coping With Homelessness¹

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This study explored whether self-efficacy and time perspective of homeless adults ($N = 82$) living in a shelter affected their coping strategies related to obtaining housing and employment. Participants with high self-efficacy searched more for housing and employment and stayed at the shelter for a shorter duration, whereas participants with low self-efficacy were more likely to request an extension of their stay at the shelter. Those high on future orientation had shorter durations of homelessness and were more likely to enroll in school and to report gaining positive benefits from their predicament, whereas those with a high present orientation had more avoidant coping strategies. Despite the predictive power of self-efficacy and future orientation of proactive search behaviors, there were no predictors of obtaining stable housing, which is a scarce resource in the area. However, a high present orientation predicted obtaining temporary housing. A present temporal perspective may be adaptive in finding short-term solutions to an unstable situation, such as homelessness. The role of time perspective in crisis situations is discussed, as well as the severe environmental constraints on the exercise of personal control over reality dictated by social, economic, and political forces.

One of the most sorrowful and challenging national problems is the plight of the homeless. In recent years, the number of homeless people has dramatically increased, with estimates reaching up to 3 million people (Youssef, 1988). Little systematic research has been conducted on the new homeless, composed mainly of young poor families, with many more women and minorities than the earlier generations of homeless (Bassuk & Lauriat, 1986; Rossi, 1989). The rise in

¹This study would not have been possible without the cooperation and assistance of the Redwood City Family Shelters staff and Diane Harkins. Acknowledgments to Anabel Aportela, Debbie Colina, Kelly Kowalchek, and Joanna Greenberg for their persistence and interviewing skills, to Ellen Levine for statistical advice, to Dr. Robert Levine for helpful comments on an earlier draft, and to Dr.'s Anne Fernald and Laura Carstensen for their invaluable support. This study was funded by a Stanford Undergraduate Research Grant.

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homelessness is due to recent structural and systemic changes, such as deinstitutionalization of state mental hospitals, reductions in entry-level jobs, corporate downsizing, increases in poverty, weakened family support systems, and decreased availability of low-income housing. Nevertheless, it is important to identify personal factors that may affect coping with homelessness and success in reentering mainstream society. The effects of homelessness on psychological (Goodman, Saxe, & Harvey, 1991) and physical health (Winkleby & White, 1992) are extremely damaging and long-lasting, and psychological research has an important role to play in expanding our understanding of the challenges faced by the homeless and the factors that enable people to escape homelessness. In fact, the APA Resolution on Homelessness (APA Council of Representatives, 1991) has called for more research on the psychological coping strategies of those in this new homeless state, as well as the various psychosocial costs of homelessness.

Research has identified personal risk factors for homelessness, such as problems of physical and mental health, substance abuse, and lack of social support (Rossi, 1989), but we know little about mediating factors that may limit episodes of homelessness. While it is difficult to disentangle the social, economic, and personal factors that contribute to becoming homeless, it is feasible and useful to identify factors that promote success in improving the situation *once one becomes homeless*. Personal appraisal of the stressor of homelessness and of one's resources will affect how people react to the predicament, and in turn should affect their ability to escape the condition of being homeless (Milburn & D'Ercole, 1991).

Homeless people vary in how they cope with homelessness and their uncertain futures. Some pursue activities toward regaining stable work and housing. Others respond with a sense of futility and despondency. One personal factor that engenders, motivates, and sustains functional coping under adversity is a sense of personal efficacy to produce desired results by one's actions (Bandura, 1997). Efficacy beliefs affect how people think, motivate themselves, and make decisions. Diverse lines of research verify that efficacy beliefs contribute to well-being and personal accomplishments across diverse spheres of life (Bandura, 1997; Maddux, 1995).

Many homeless people also lack stable employment. Research on the role of perceived self-efficacy in gaining reemployment is therefore of special relevance. Two studies of unemployed men found that self-efficacy was the best predictor of success in gaining reemployment (Clifford, 1989; Kanfer & Hulin, 1985). Programs based on guided mastery that build or restore a sense of efficacy in laid-off workers increase job search efforts and the likelihood of re-employment (Eden & Aviram, 1993; Vinokur, van Ryn, Gramlich, & Price, 1991). In mediational analyses, the effects of mastery training on job-search behavior are entirely mediated through changes in perceived self-efficacy (Vinokur et al., 1991). Thus, among

homeless people, high self-efficacy may also sustain motivation of search behaviors that secure stable housing, in addition to employment.

One's outcome expectations, motivation, and task-related performance may also be greatly affected by another cognitive schema—that of time perspective (Lewin, 1951). Time perspective is the individual's construal of the flow of personal experiences into the temporal phases of past, present, or future. Gonzalez and Zimbardo (1985) have shown that one's cognitive schema of time may become biased, structuring life in predominantly present- or future-oriented directions (they did not measure past orientation).

Both perceived self-efficacy and time perspective play fundamental roles in motivating behavior. Motivation is determined in large part by cognitive representations of future states—by expected outcomes and by cognized future goals (Bandura, 1997). Efficacy beliefs about the amount of personal control one can exert over events determines the outcomes they expect to produce and the goals they set for themselves, both of which serve as sources of motivation. In addition, social cognitive theorists have long acknowledged the role of future orientation in motivational processes (Bandura, 1991; Karniol & Ross, 1996; Nuttin, 1985). Those who are more future oriented have a greater ability to set goals and to formulate plans for their attainment, while also enlisting greater functional motivation to achieve their plans (Zaleski, 1994). Indeed, both future orientation and perceived self-efficacy are necessary conditions for developing a realistic sense of achievement motivation.

Time perspective has been shown to be related to a broad domain of outcomes (Zimbardo & Boyd, 1997). For example, future orientation is related to high academic achievement (Karniol & Ross, 1996; Strathman, Gleicher, Boninger, & Edwards, 1994; Wolf & Savickas, 1985; Zaleski, 1994), vocational maturity, career decision making (Savickas, Silling, & Schwartz, 1984), delay of gratification (Mischel, 1974; Mischel et al., 1989), and higher socioeconomic status (SES; Lamm, Sanmill, & Trimmsdorf, 1976). In contrast, present orientation is related to higher rates of unplanned pregnancies (Mindrick & Shapiro, 1989; Oskamp, Mindrick, Berger, & Motta, 1978), juvenile delinquency (Landau, 1976), and lower SES (LeShan, 1952; Nurmi, 1991). In addition, high-risk behaviors such as risky driving, substance use and abuse, aggression, and thrill-seeking (Keough, Zimbardo, & Boyd, *in press*; Zimbardo, Keough, & Boyd, 1997) are also more characteristic of highly present-oriented individuals.

Homeless people tend to fall at the lower end of the socioeconomic spectrum which, as noted, is usually associated with a present orientation. However, immersion in the daily battle for survival, facing deprivation of basic needs such as shelter, could also induce a situationally based present orientation, regardless of one's dispositional temporal orientation. Thus, present orientation can be both a cause and a consequence of homelessness. Biased time perspectives, in contrast

to a balanced temporal orientation, are influenced by many factors—sociocultural, religious, educational, family, and personal experiences—as well as by crises, such as becoming homeless. Regardless of its origins, our concern here is to understand how overly focusing one's subjective time sense on the present or future impacts on current decisions, actions, and outcomes. The present study explores the roles of perceived self-efficacy and time perspective in predicting the success of currently homeless people in securing housing and in finding employment.

For a homeless person with limited resources, finding a job and affordable housing in a region where demand far outstrips availability is a formidable challenge. It requires a resilient sense of efficacy to withstand the likely repeated failures of one's efforts. It also requires planning ahead to ensure that one has the resources and strategies to succeed in that pursuit. Our primary goal was to test the role of perceived self-efficacy and future orientation in escaping from homelessness. We assessed the activities that homeless families engaged in during their stay at a temporary shelter and their success in securing employment and stable housing upon their departure. We predicted that both self-efficacy and a future orientation would lead to search activities, less avoidant coping, reduced vulnerability to despondency, and increased likelihood of finding stable work and housing.

Our secondary goal was to assess the relationship between self-efficacy time perspective. *Self-efficacy* can be thought of as one's perceived competence to reach a goal, and *time perspective* can be thought of as one's goal orientation. In this way, self-efficacy can shape time perspective. People who believe they can play a part in bringing about desired changes and thus see a stronger contingency between their actions with future consequences show stronger commitments to the pursuit of their desired futures (Bandura, 1997; Locke & Latham, 1990). In contrast, those who distrust their ability to influence the course of events have little incentive to look to the future to set distant goals for themselves. They are more likely to adopt a fatalistic present-oriented outlook in their everyday lives. We thus predicted that a high sense of personal efficacy would be accompanied by a high future orientation and a low present orientation.

Method

Participants and Setting

The participants were 82 homeless adults residing at one of four family shelters. All residents of the shelters were invited by the staff to participate in a confidential study on homelessness for which they would receive a small payment. Data were obtained from all residents over a 6-month period, except from 2 people who declined participation.

The four temporary family shelters were located in the northern California Bay area, where there is great demand for, but severe lack of, low-cost housing. The eligibility requirements of the shelters included having at least one child, following shelter rules (which forbade alcohol, drugs, or visitors on the premises), and attending weekly house meetings to discuss common living issues. The shelters provided private furnished rooms for each family. Each shelter allowed families to stay for a fixed period of either 1, 2, or 3 months for a minimal monthly fee.

Procedure

Five trained interviewers, two of whom were bilingual (Spanish and English), administered the self-efficacy and time-perspective scales, and a survey of background information to participants at the beginning of the participants' stay at the shelter (with prior approval from each shelter's administration). The measures were translated into Spanish for native Spanish speakers. Participants received \$10 total for completing both surveys (the initial and follow-up surveys). The interviewers contacted the participants, explained to them the voluntary nature of the study, assured them of the confidentiality of the study, and informed them that the study was unaffiliated with the shelter. Before participants permanently left the shelter, they completed a follow-up Check-Out Questionnaire, labeled only with their identification numbers. This form assessed where they were going and their plans. If they left before an interviewer could receive the questionnaire from them, the participants left their forms in a sealed confidential box at the shelter. Except for a few cases, their stated housing destinations were confirmed independently by the staff at the shelter.

Measures

The assessments consisted of an initial battery, including a background socio-demographic questionnaire, time perspective inventory scales measuring perceived self-efficacy to find housing and employment, and a follow-up check-out questionnaire completed before leaving the shelter.

Background Questionnaire

This questionnaire was adapted in part from one devised by Winkleby and White (1992) to assess history of homelessness, such as date of first episode of homelessness, number of episodes, length of current episode, and reasons for current episode. The questionnaire also assessed basic sociodemographic information, such as age, race, level of education, marital status, and employment history.

Time Perspective

Time perspective was measured by the Zimbardo Time Perspective Inventory (ZTPI; Gonzalez & Zimbardo, 1985), modified slightly by substituting simpler and more concrete words to facilitate comprehension for people with limited education. The scale consists of 32 items that assess whether one is predominantly future, present, or past oriented. The statements depict social situations or attitudes viewed through different time perspectives. For example, a future-oriented statement is, "I believe a person's day should be planned ahead each morning" and a present-oriented statement is, "I think it is useless to plan too far ahead because things rarely come out the way you planned anyway." Participants rated how much they agreed with each statement on a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The measure has been shown to have high external validity, and satisfactory test-retest, and internal reliability (Zimbardo & Boyd, 1999; Zimbardo et al., 1997).

Perceived Self-Efficacy Questionnaire

The measures of perceived self-efficacy assessed participants' beliefs that they can carry out the activities necessary to obtain housing and employment, and also expectations for success within specified time periods. The scales contain 20 items, 10 items each for assessing housing efficacy and job efficacy. The items were developed after extensive discussions with many homeless shelter residents about obstacles faced in their attempts to obtain employment and housing. The residents who participated in scale development had left the shelter months before the data-collection phase began, and were not included in the formal study. Participants rated on a 9-point scale the strength of their belief that they can construct a résumé, impress employers and rental agents, get others to help them, and find a job and housing within the time frames of 1 month, several months, and 1 year.

Follow-Up Check-Out Questionnaire

This questionnaire consists of 17 items regarding progress participants were making toward securing housing and employment. Fourteen questions asked participants to rate on a 5-point scale from 1 (*none of my time*) to 5 (*all my time*) how much time they spent engaged in specific activities. The activities were various domestic activities, calling potential rental agents and employers, watching television, being depressed, passing time away, working, and looking for housing or employment. The last page included open-ended questions asking the participants to describe any changes they had made while at the shelter, whether they got a job or housing, what type of housing they will have when they leave, and

the nature of their future plans. Their recorded answers were coded into the relevant categories.

Overview of Statistical Analyses

Factor analyses were conducted to create internally consistent, independent subscales of self-efficacy and time perspective. Correlations were performed to assess relationships between perceived self-efficacy and time perspective, history of homelessness and employment, and amount of time spent searching for housing and employment. All significance tests reported are two-tailed, unless otherwise indicated. One-tailed p tests were used in testing the directional hypotheses. ANOVAs assessed whether people with different housing outcomes had different initial levels of self-efficacy and time perspective. Finally, multiple regressions were performed to assess the contributions of self-efficacy and time orientation while controlling for baseline variables in determining housing outcome and length of shelter stay.

Results

Demographics of Sample

We were surprised by the relatively high educational level of this homeless sample; two thirds had graduated from high school, and one third had some college education. Five percent had graduated from college. The ethnic distribution was 37% Hispanic, 31% African American, 22% White, and 7% Asian and American Indian (2 participants did not report ethnicity). There were 52 women and 30 men who completed the initial assessment. Women outnumbered men because most of the families at the shelter were headed by single women. There were no gender differences on any of the measures at the initial assessment, except that men reported having higher job efficacy ($M = 6.8, SD = 1.2$ vs. $M = 6.1, SD = 1.7, p < .05$) and housing efficacy ($M = 6.4, SD = 1.4$ vs. $M = 5.6, SD = 1.7, p < .04$). At the follow-up, women reported spending more time depressed than did men ($M = 2.5, SD = 1.2$ vs. $M = 1.5, SD = 0.67, p < .001$).

With regard to employment, 26% were presently employed. The majority (87%) reported that they were looking for a job or for a better job than their current job, and 14% were looking for highly skilled jobs. Over half had held a job for at least 5 years. Sixty-six percent had worked within the last year. Seventy-six percent reported that this was their first episode of homelessness. This was clearly a sample comprised predominantly of the "new homeless," the majority being recently dislodged, employable, relatively educated, of minority status, and female. The most important reasons cited for homelessness were loss of a job (21%); eviction from home (26%); decreases in finances (23%); separation from

or loss of a loved one (8%); emotional distress (4%); and injury, disability, or health problems (4%).

Factor Analysis of Self-Efficacy Measures

A varimax rotation produced two interpretable factors which replicated the conceptually driven subscales—perceived self-efficacy to find housing and to find a job. Although three items loaded equally well on both factors ("How much can you personally do to convince a potential rental agent or manager that you will be good tenants?"; "How much can you do to find out about where available housing is, besides looking in the newspaper?"; and "How confident are you that you can find a job in 1 year?"), they were assigned to the conceptually relevant factors. Note, however, that the two factors are not entirely independent. The alpha reliability coefficients were .87 for housing self-efficacy and .84 for employment self-efficacy.

Measures of self-efficacy for housing and for employment were computed for each subject based on factor loadings, using a unit weighting method. The mean self-efficacy scores were just above midrange (*some confidence*) for obtaining a job ($M = 6.3$, $SD = 1.6$) and efficacy for obtaining housing ($M = 5.8$, $SD = 1.6$).

Factor Analysis of ZTPI

Although the ZTPI has been validated on other samples, it had not yet been administered to homeless samples. Therefore, an exploratory factor analysis was performed on the 32 items to see if they formed the dual-factor structure of time perspective typically observed—including present and future orientations. A varimax rotated principal components method was chosen because it tends to be more replicable. A low cutoff point of above .30 on factor loadings was chosen because the factors were expected to share little overlapping variance.

The varimax rotation produced two interpretable factors. Similar to previous ZTPI analyses, Factor 1 was Future Orientation, and Factor 2 was a combination of primarily present with some past orientation (Table 1), which was labeled Present Orientation. All items that were expected to load highly on the Future Orientation factor did so, with some minor exceptions. Item #33, "Hard work is the key to improvement," loaded higher but negatively on present orientation. Therefore, it was reverse coded and included in the present orientation scale. Item #10, ordinarily a present-oriented item, "I try to live one day at a time" did not load on either factor. It is likely that being homeless forces people of all time orientations to live one day at a time. The high mean on this item of 3.5 ($SD = 1.4$) supports this interpretation. On average, the sample agreed with this present-oriented statement much more than with the other present-oriented

Table 1

Pattern Weights for Two Varimax Rotated Principal Components of Time Perspective

Items	F1	F2	<i>h</i> ²
Future perspective (Factor 1), Cronbach's $\alpha = .84$			
1. I believe a person's day should be planned ahead each morning.	81	-4	.66
2. Doing necessary work comes before having fun with friends or family.	62	-37	.53
3. Thinking about the future is pleasant to me.	62	-5	.39
4. When I want to get something done, I first set short-term goals to reach this big future goal.	59	-11	.36
5. I worry if things aren't done on time.	58	21	.38
6. I am able to resist temptation when I know there is an important task or some job to be done.	56	-7	.32
7. I believe it is important to save money for emergencies.	55	-41	.47
8. I complete my work on time by making steady progress.	55	-8	.30
9. I keep working at a difficult, uninteresting task if it will help me get ahead in life.	54	12	.31
10. At the start of the day, I generally make lists of things to do.	51	5	.26
11. I try to be realistic about what the future holds for me.	50	-25	.31
12. I put off small pleasures that I know I can have right now if they get in the way of bigger benefits that I might be able to get in the future.	49	-17	.27
13. I have fantasies about a better life ahead of me.	43	-8	.19
14. Hard work and discipline are the keys to improving my life.	40	-43	.34
Present/past perspective (Factor 2), Cronbach's $\alpha = .79$			
1. I find myself daydreaming a lot about better times in my past. (past)	-11	70	.51
2. I do things impulsively, making decisions on the spur of the moment, without always worrying about the consequences.	-17	65	.45
3. I don't do things that will be good for me if they don't feel good now.	7	59	.35

(table continues)

Table 1 (Continued)

Items	F1	F2	h^2
Present/past perspective (Factor 2), continued			
4. I enjoy stories about how things used to be in the "good old days." (past)	22	55	.34
5. I take risks to put a little more excitement into my life.	6	52	.28
6. I often think about how it might have been to live in an earlier time. (past)	23	50	.31
7. It doesn't make sense to worry about the future since fate determines that whatever will be is going to happen anyway.	-34	44	.31
8. I feel that it's more important to enjoy what you are doing than to get some required job done on time.	-29	43	.27
9. I prefer old and familiar people, experiences, and ideas instead of the new and changing. (past)	0	42	.18
10. I believe that to be successful you must be lucky.	-20	41	.21
11. It's fun to gamble on the lottery, or make small bets when I have spare money.	-27	35	.20
12. I think that it's useless to plan too far ahead because things hardly ever come out the way you planned, anyway.	-13	34	.13
Items that did not load onto either scale			
I try to live one day at a time.	22	7	.05
It gives me pleasure to think about the past.	5	23	.05
The past has too many unpleasant memories, so I prefer not to think about it.	-4	16	.03
I make better what is happening today rather than be concerned about what will happen later on.	13	16	.04
If I had the money, I would invest a substantial amount of my income in insurance.	33	37	.25
	Factor 1	Factor 2	Total
Eigenvalue	5.2	4.0	9.2
% variance accounted for	15.3	12.5	28.8

Note. F1 = Factor 1 = Future orientation (14 items). F2 = Factor 2 = Present/past orientation (8 present and 4 past-oriented items). h^2 = communality.

statements, which had a composite mean of only 2.6 ($SD = 0.68$). Five items that usually load on the present factor did not load highly enough to be included in the subscale, and one item ("If I had the money, I would invest a substantial amount of my income in insurance"), was excluded because it loaded highly on both factors.

The factor analysis results were used to create factor scores. The reliability of the highly loading items on each factor was satisfactory for both the future scale ($\alpha = .84$) and the present scale ($\alpha = .79$). When the mean time orientation of the homeless participants was compared to that of 15 other samples, reported in Keough et al. (in press), the homeless sample was similar in present orientation to most samples, but higher in future orientation, which was unexpected.

Housing Outcomes

For 6 participants, their destination upon leaving the shelter could not be determined 1 subject moved away, and the others left the shelter unexpectedly. They were not included in the analyses of housing outcomes. Twenty-seven participants left the shelter before filling out the Check-Out Questionnaire. Therefore, no data on how they spent their time at the shelter was available. However, the shelter staff tried to keep close ties with, and good records of, their residents' progress in obtaining housing, so we were able to obtain data on their new housing situations and the duration of their stay at the shelter. Overall, 38% obtained stable housing (renting an apartment or house), and 19% obtained new transitional housing (transferring to a new shelter, staying with a friend, sharing housing in a transitional program). Twenty-six percent did not know where they would go as of the day before they left the shelter; 13% were asked to leave the shelter for breaking shelter rules, law violations, or were imprisoned; and 4% planned to move to a motel. A "no housing" category was created, consisting of the latter three groups.

Patterns of Interrelationships

Table 2 presents the relationships between the different measures of time perspective and self-efficacy. As expected, future orientation was negatively related to present orientation. People with high self-efficacy were more future oriented and less present oriented. High efficacy to gain employment was related to high efficacy to secure housing.

Future orientation was positively related to level of education, and to duration of time employed in current or most recently held job (Table 3). Future orientation was unrelated to number of episodes of homelessness and time since first episode, but was negatively related to length of *current* episode. The more future

Table 2

Pearson Correlations Between Time Perspective and Self-Efficacy

	Future orientation	Present orientation	Job efficacy	Housing efficacy
Future orientation	—	-.30**	.22*	.24*
Present orientation	—	—	-.20*	-.14
Job efficacy	—	—	—	.47**

* $p < .05$. ** $p < .01$.

Table 3

Correlations Between Time Perspective, Self-Efficacy, and Baseline Variables

Baseline variables	Future orientation	Present orientation	Job efficacy	Housing efficacy
Level of education ($n = 82$)	.28**	-.21*	.15	.12
Duration of episode of homelessness ($n = 82$)	-.26**	.08	-.13	-.00
Duration of last job ($n = 62$)	.27*	.03	.28*	.14

* $p < .05$. ** $p < .01$.

oriented the person, the shorter the duration of her or his current episode of homelessness. Although it is impossible to determine whether homelessness reduced future orientation, inspection of the means shows a linear trend of decreasing future orientation with longer durations of homelessness. At the extremes, those who had been homeless for less than 1 month had the highest future orientation ($M = 4.0$, $SD = 0.55$, $n = 4$), whereas those who had been homeless for more than 1 year had the lowest future orientation ($M = 2.6$, $SD = 0.36$, $n = 3$). Future orientation was also marginally related to a shorter length of stay at the shelter.

It was predicted that potentially productive search behaviors and less avoidant or nonproductive coping behaviors (e.g., passing time and watching TV) would be positively related to self-efficacy and future orientation, but negatively related to present orientation. As predicted, participants who had a higher sense of efficacy at baseline spent more time searching for housing and

Table 4

Correlations Between Time Perspective, Self-Efficacy, and Outcome Variables

Behavioral outcomes (<i>n</i> = 48 for all variables, except for duration at shelter, <i>n</i> = 82)	Future orientation	Present orientation	Job efficacy	House efficacy
Duration of shelter stay	-.18†	.08	-.27*	-.13
Time spent working	.17	-.31*	.27*	.13
Time spent eating	.04	.28*	-.02	.08
Time spent watching TV	-.41**	.28*	-.08	.08
Time spent passing time	-.38**	.25*	-.23†	-.23†
Time searching for housing	.15	.22†	.05	.28*
Time searching for a job	.09	-.20†	.21†	.25*
Time spent depressed	-.23†	.05	-.08	-.09

†*p* < .10. **p* < .05. ***p* < .01 (one-tailed tests).

employment, passed less time away, and had a shorter shelter residency (Table 4). Future orientation was related to less time spent watching television and passing time. Present orientation was related to less time spent working and more passing time, eating, and watching television.

Relationships of Time Perspective and Self-Efficacy to Housing Outcomes

Housing outcomes were categorized into three groups—stable, temporary, and no housing (see Housing Outcomes section for definition of groups). Those who stayed in a motel were categorized separately because it was a more transient housing option than the other temporary housing arrangements, while at the same time it was a more definite future plan than not knowing where they will go after leaving the shelter.

Differences between the dichotomous housing outcomes of any housing versus no housing were tested as a function of self-efficacy, time perspective, and education. Only one variable was found to be significantly different. Those who did not obtain housing reported spending more time depressed while at the shelter ($M = 2.6$, $SD = 1.2$ vs. $M = 1.9$, $SD = 0.90$, $p < .03$). Again, it is not possible to identify the causal sequence of these variables. To compare staying in a motel versus all other housing arrangements, Student's *t* tests were performed. Although there were only 3 participants in the "motel" category, there were significant differences—those who planned to stay in a motel had significantly

Table 5

Time Perspective, Self-Efficacy, Education, Length of Shelter Stay, and Depression for Each Type of Housing Outcome

Means for independent variables	Stable housing <i>n</i> = 29 (38%)	Temporary housing <i>n</i> = 15 (19%)	<i>M</i> (<i>SD</i>)	<i>p</i> for ANOVA <i>F</i> (2, 73)	No housing <i>n</i> = 30 (43%)
	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)			<i>n</i> = 30 (43%)
Future	3.8 (7.2)	3.7 (0.8)	3.9 (0.6)	<i>ns</i>	
Present	2.4 (0.6)	3.1 _a (0.7)	2.4 (0.7)	<.005	
Housing efficacy	6.1 (1.6)	5.8 (1.3)	6.0 (1.6)	<i>ns</i>	
Job efficacy	6.6 (1.3)	6.3 (1.1)	6.6 (1.8)	<i>ns</i>	
Years of education	10.1 (1.1)	9.9 (3.5)	9.2 (2.5)	<i>ns</i>	
Number of days at shelter	62.0 (29.0)	73.0 (34.0)	90.0 _a (48.0)	<.02	
Number of days past allowed stay	7.2 (17.0)	15.0 (24.0)	35.0 _a (57.0)	<.03	
Time spent depressed	1.7 _a (0.87)	2.7 (0.82)	2.6 (1.3)	<.02	

Note. Means with subscript letters are significantly different than the other two means.

lower self-efficacy for housing ($M = 3.5$, $SD = 0.83$ vs. $M = 5.9$, $SD = 1.5$, $p < .03$), lower self-efficacy for employment ($M = 3.4$, $SD = 0.95$ vs. $M = 6.5$, $SD = 1.3$, $p < .02$) and a marginally lower future orientation ($M = 2.6$, $SD = 0.64$ vs. $M = 3.8$, $SD = 0.70$, $p < .07$).

ANOVAs were used to test for differences between the three levels of housing—stable housing, transitional housing, and no housing. An unexpected result emerged, as shown in Table 5. Those in transitional housing were more present oriented than were those in stable housing and no housing. Those in the no housing group stayed at the shelter for the longest duration, both in total number of days and in number of days past the preset deadline (Table 5).

A logistic regression was performed to see which, if any, baseline or independent variables predicted type of housing obtained, while controlling the other baseline factors. Dichotomous variables of one of the three housing types versus all others were created. Predictor variables were level of education, number of

children, future and present orientation, and job and housing efficacy. Replicating the ANOVA results, the only predictor of obtaining temporary housing was having a high present orientation, $\chi^2 = 7.1, p < .01$. There were no predictors of any other type of housing arrangement.

Forward multiple regression analyses were then performed on the continuous variable of duration of shelter stay, with the same predictor variables as used previously (education, number of children, time perspective, and self-efficacy). As might be expected, higher education and higher job efficacy predicted a shorter shelter stay, $F(6, 78) = 5.2, p < .001, R^2 = .25$. A similar regression analysis was performed on number of days stayed overtime (by subtracting days of permitted stay from the total number of days). Again, high education and efficacy predicted shorter duration of days stayed overtime. Similarly, a *t* test showed that those who asked for a formal extension to stay at the shelter longer had significantly lower initial housing efficacy ($M = 4.4, SD = 1.2$ vs. $M = 5.9, SD = 0.2, p < .05$).

Future Plans

Future plans after leaving the shelter were assessed from the open-ended comments from the check-out questionnaire. The most frequent plans included starting school, gaining a positive attitude from their shelter experience, saving money, and hoping for better luck. Those who had already enrolled in an educational/vocational program ($n = 4$) by the end of their stay had a significantly higher initial future orientation than did the other participants ($M = 4.1, SD = 0.3$ vs. $M = 3.7, SD = .7, p < .04$), even though they had similar levels of education. However, participants who stated that they merely *planned* to go back to school did not differ in self-efficacy or time orientation from those who did not state such a plan.

Shelter residents who reported benefits ($n = 9$), mostly that they gained a more positive outlook after staying in the shelter, such as "I became more independent," "I became more positive about the future," and "I learned a lot," were also significantly more future oriented than were the other participants ($M = 4.2, SD = 0.6$ vs. $M = 3.7, SD = 0.7, p < .04$).

Those who spontaneously reported that they were able to save money while at the shelter ($n = 5$) were significantly less present oriented ($M = 2.1, SD = 0.3$ vs. $M = 2.6, SD = 0.7, p < .02$), and reported spending less time depressed ($M = 1.5, SD = 0.6$ vs. $M = 2.3, SD = 1.2, p < .05$) than did other participants. Finally, those who spontaneously reported that they hoped for better luck ($n = 9$), such as to "win the lottery," "get rich," or "be successful," had a marginally lower future orientation than did the other participants ($M = 3.2, SD = 0.8$ vs. $M = 3.8, SD = 0.7, p < .07$).

Discussion

The results of this study clearly suggest that a strong sense of self-efficacy enables one to carry out the complex set of behaviors that theoretically should help attenuate homelessness. Those with higher perceived self-efficacy spent more time searching for both housing and employment, stayed at the shelter for a shorter duration, and were less inclined to pass their time away unproductively while at the shelter. In contrast, those with low self-efficacy were more likely to seek extensions to stay longer at the shelter. It appears that one's efficacy beliefs upon entering a homeless shelter can help predict some of the coping behaviors enacted while at the shelter. We therefore propose that a brief assessment of self-efficacy beliefs at the time of entry to a homeless shelter can help to identify those who need extra guidance and support to restore some self-assurance and bolster their search skills to increase their prospects of finding stable housing and employment.

The findings on time perspective, some predicted and some surprising, paint a more complicated picture. The following patterns emerged from our survey data. Future orientation was associated with positive outcomes of enrollment in an educational or vocational program; learning valuable lessons from the experience of being homeless; and less depression, passing time, and watching television. However, future orientation was unrelated to search behaviors. In contrast, those more presently oriented tended to spend more time watching television, passing time, and eating, and less time working. They were less likely to save money and hoped for luck or chance to free them from their predicament. These behaviors are not the constructive means that typically lead one to achieve goals.

Although strong self-efficacy and a future orientation predicted proactive coping behaviors, their efforts did not secure stable housing. Further, despite the negative correlates of a present orientation, the main predictor of obtaining transitional or temporary housing was being highly present oriented. This finding is clearly contrary to our expectation that a future orientation would be more adaptive, and thus demands further discussion.

There are several possible explanations for this apparently discrepant finding. Overwhelmingly, research has demonstrated benefits of being future oriented, but this has been according to middle-class standards, within a stable predictable environment. The optimal time perspective depends upon the demands of the situation and its tasks and reward structure. A present orientation is necessary in times of acute crisis. When it came close to the last days of guaranteed shelter, and to a reality that threatened survival, a present orientation may have helped people to focus on the immediate next steps to be taken to ensure temporary shelter. On the other hand, highly future-oriented people who lacked the flexibility to switch to a present-focused time frame may have continued looking for longer term solutions, such as low-cost rentals, which are a very limited resource.

We can further speculate that highly future-oriented people may also have been less flexible in adjusting their standards of acceptable housing arrangements, and more willing to forgo temporary solutions in search of more lasting ones, whereas the more present-oriented people may have settled for less desirable temporary housing. Although the latter appear to postpone rather than solve the housing dilemma, it is hard to judge what decisions and behaviors are most adaptive for people under such constraints.

Time perspective may itself be influenced by personal crises. In stressful situations, it may be highly aversive to dwell on the present and emotionally adaptive to look to a brighter future. For example, a strong future orientation or belief in a better future has been found among prison inmates (Megargee, Cooper, Frohwirth, & Levine, 1970) and among Holocaust survivors and children of survivors (Carmil & Breznitz, 1991). In the present study, those who had been homeless the longest seemed to have given up the hope of having a brighter future. It should be recalled, however, that as a group, our homeless sample had a high future orientation. Such an orientation, in combination with a sense of personal efficacy, may have helped to protect their mood under difficult circumstances. Studies have shown that depression is negatively related to future orientation and positively related to present orientation (e.g., Keough et al., *in press*). Similarly, in our study, the more future-oriented people were less depressed while at the shelter. Depression, in turn, was the only variable (*inversely*) related to finding stable housing. Thus, higher future orientation may in some respects be adaptive and stress-buffering in such negative situations.

We can conclude that for adults living in shelters, a future orientation may be most conducive to mental health and active coping behaviors, but a predominant present orientation is beneficial for finding immediate but unstable housing solutions. The profile that seems most adaptive and successful for shelter residents would be to adopt a mixed balance of both high future and present orientation, with the self-efficacy to sustain their efforts. The future orientation would help one to focus on constructive actions and foster more optimistic attitudes and less depressive hopelessness over their stressful life circumstances, but alone could lead to unrealistic expectations or demands that are exceedingly difficult to meet. Having the flexibility to be concurrently present-focused could temper the excesses of a future focus by redirecting attention onto what is realistically possible in the immediate situation (i.e., on the next step to take). This type of dual force is in accord with the prescription by social cognitive theory for optimal self-motivation by goal setting (Bandura, 1996). Distal goals provide the directions for one's pursuits, and proximal goals provide the guides and motivators for what one must do in the here and now to get there.

Street people may be more present oriented than our sheltered families, because of their differing needs (La Gory, Ritchey, & Mullis, 1990). People living on the street may be forced to focus exclusively on the present. Wallace

(1986) found that homeless men were present oriented because of the urgency of daily survival and the cyclical schedules of nightly shelters, soup kitchens, and welfare checks. The newly homeless soon abandoned their conventional future orientations to adapt to the harsh reality of meeting their immediate survival needs. Wallace thus concluded that street people cannot look ahead to the future until their basic needs are met.

Taken together, Wallace's research and the current study suggest that a high present orientation can be a double-edged sword for homeless people. It helps them to survive the anxiety, struggles, and strains of making it through each day, and in some cases it leads to staying in other temporary housing arrangements. However, it does not provide the foundation for motivating the complex, adaptive self-regulated behavioral repertoires involved in setting goals and developing strategies to achieve long-term stable housing.

The prospective nature of this study is one of its strengths. However, the loss of some data on how time was spent at the shelter due to attrition and from the people dismissed from the shelter for violations may have removed the most dysfunctional individuals from our sample, thereby biasing our results on coping behavior to some extent.

Depression during the stay was measured retrospectively. Thus, the finding that those who did not find stable housing spent more time depressed must be interpreted cautiously. We cannot determine whether depression impaired their ability to find housing, or whether people who did not find housing reported greater depression.

Similarly, we cannot determine the direction of causality in the relationship between future orientation with homelessness. Did adversity foster a present orientation, or did a lack of future orientation contribute to their homelessness? Most likely, these influences are bidirectional. A low future orientation could serve as a risk factor for homelessness, possibly through not motivating safety-net behaviors, such as saving money. Longitudinal studies are needed to examine the causal direction of the relationship between time perspective and homelessness. For example, studies that follow people at high risk of homelessness, or that follow homeless people who reenter mainstream society and continually assess their time perspective, may shed light on the relationship between residential instability and recurrent crises with time perspective. Alternatively, a cross-sectional study that compares the time perspective of those at risk for homelessness, those currently homeless and formerly homeless could address this question.

Additional clarification of the operation of time perspective as a cognitive style influencing attitudes and behaviors of homeless people can be gained by using the newly revised, expanded ZTPI measure (Zimbardo & Boyd, 1997). The revised ZTPI distinguishes factorially between future orientation and two different subclasses of present orientation—hedonistic and fatalistic. The scales also

separate a positive past from a negative past orientation. Future investigations should further our understanding of how one's temporal perspective varies along these dimensions among those living in a culture of poverty—those at risk of homelessness, homeless sheltered families, and homeless street people. Policy recommendations may benefit from combining the approaches of individual differences, cognitive-social processes, and systems analyses. Institutionalized strategies to alter the detrimental situations and high-risk lifestyles of people may depend on tailoring both psycho-educational public service and clinical information to their dominant time perspective so that they are personally relevant, learned, and later acted upon in the most efficacious manner.

This study examined the power of self-efficacy and time perspective in predicting how individuals cope with homelessness and joblessness. Both time perspective and self-efficacy were related to proactive behaviors and constructive plans, as found among nonhomeless samples.

Disconcertingly, no attitudes nor behavior were related to obtaining stable shelter. Specifically, although high self-efficacy predicted active search behaviors, these behaviors did not lead to secure housing. Thus, "escaping homelessness," for the many people so situated, may go beyond personal control and involve many other powerful structural factors, such as political and economic climates. These findings underscore that homelessness and unemployment are not just personal problems, but social problems demanding social remedies. The continuing escalation in disparity of wealth, corporate downsizing, and female-headed families in poverty, without increases in low-income housing, is likely to further exacerbate the epidemic of homelessness. Given the environmental constraints, the exercise of collective efficacy oriented toward social solutions may have greater impact on the problem. For example, it is conceivable that with some help and empowerment, people who are homeless can have a hand in pressuring the social system to address the problem through the exercise of organized collective efficacy (Bandura, 1997; Fawcett, Seekins, Whang, Muiu, & Balcazar, 1984). Nevertheless, it is clear that a structural solution for homelessness will necessarily involve changes at both the social and individual levels—increases in emergency shelters, transitional and low-income housing, service delivery, and job retraining (McChesney, 1990).

To help ameliorate the current tragedy of homelessness at a psychological level, our results stress the importance of service delivery: developing interventions that prevent or reduce depression and increase self-efficacy. Increasing self-efficacy may promote a more future-oriented outlook, since the two constructs are positively related. It may still be necessary to teach the cognitive skills involved in future orientation, as well as inflexible short-term, goal-setting. Given our findings on the limitations of personal control over one's life when homeless, psychologists need to work in concert with economists and politicians to develop new short-term tactics and long-term strategies for eliminating such

human suffering. The psychological demoralization of homelessness must be countered through innovative social interventions if we are to help homeless people improve the stability of their lives, rather than let them become entrenched in the daily survival of homelessness, which for too many is the vicious cycle of hopelessness and despondency.

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The Changing Face of Psychology at the Dawning of a Globalization Era

Honorary President's Address — Allocution du Président honoraire

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Abstract

Societies today are undergoing drastic social, informational, and technological changes. The revolutionary advances in electronic technologies and globalization are transforming the nature, reach, speed, and loci of human influence. These rapidly evolving realities place increasing demands on the exercise of personal and collective agency to shape personal destinies and the national life of societies. There is growing unease about progressive divestiture of different aspects of psychology to biology and subpersonal cognitive science. It is feared that as we give away more and more psychology to disciplines lower on the food chain, there will be no core psychological discipline left. Contrary to divestitive oracles, psychology is the integrative discipline best suited to advance understanding of human adaptation and change. It is the discipline that uniquely encompasses the complex interplay between intrapersonal, biological, interpersonal, and sociostructural determinants of human functioning. With the growing primacy of human agency in virtually all spheres of life, the field of psychology should be articulating a broad vision of human beings not a reductive fragmentary one.

The present address analyzes human adaptation and change from an agentic perspective and documents the growing primacy of personal and collective agency in this era of globalization. The capacity to exercise some measure of control over the nature and quality of one's life is the essence of humanness. Human agency is characterized by a number of core features. These include intentionality for shaping future plans and courses of action, temporal extension of agency through forethought, self-regulation of motivation, affect, and action through self-influence, and self-reflectiveness concerning one's functioning and the meaning

and purpose of one's life (Bandura, 1999a, 2001). These core features of self-directedness enable humans to play a part in their own development, adaptation, and self-renewal.

PARADIGM SHIFTS IN PSYCHOLOGICAL THEORIZING

In its brief history, psychology has undergone wrenching paradigm shifts. The current theoretical ferment will determine the very nature of our discipline, not only the paradigms that subserve it. Over the years, the core metaphors of our theories have changed but the theories grant humans little, if any, agentic capabilities.

Much of the early psychological theorizing was founded on behaviouristic principles. It embraced an input-output model linked by an internal conduit that makes behaviour possible but exerts no influence of its own. Human behaviour was shaped and controlled automatically and mechanically by environmental stimuli. This line of theorizing was put out of vogue by the advent of the computer. It likened the mind to a linear computational system operating through a central processor. This model filled the internal conduit with a lot of representational and computational operations created by smart and inventive thinkers.

The linear model was, in turn, supplanted by more dynamically organized computational models that perform multiple operations simultaneously and interactively to mimic better how the human brain works. Sensory organs deliver up information to a neural network acting as the mental machinery. The network does the construing, planning, motivating, and regulating nonconsciously. Although the mindless organism became a more cognitive one, it was still devoid of consciousness and agentic capabilities. It is not people, but their subpersonal parts that are orchestrating the courses of action. The personal level involves phenomenal consciousness and the purposive use of information and self-regulative means to make desired things happen.

Consciousness is the very substance of mental life. It not only makes life personally manageable but worth living. A functional consciousness involves intentional accessing, and deliberative use of semantic and pragmatic information to manage life events. There have been some attempts to reduce consciousness to a by-product of activities at a subpersonal level. In these reductive accounts of consciousness, there is no experiencing person conceiving of ends and acting purpose-

fully to attain them. Without a phenomenal and functional consciousness, people are essentially higher-level automatons undergoing actions devoid of any subjectivity, deliberative self-guidance, and reflective self-reactiveness. Nor does this being have a phenomenal life or personal identity derived from how one lives one's life and reflects upon it.

PHYSICALISTIC THEORY OF HUMAN AGENCY

People have the power to influence what they do and to make things happen. They are not just onlooking hosts of brain mechanisms orchestrated by environmental events. The sensory, motor, and cerebral systems are tools people use to accomplish things that give meaning, direction, and satisfaction to their lives.

Research on brain development is providing new insights on the social construction of the neural and functional structure of the human brain (Diamond, 1988; Kolb & Whinshaw, 1998). It is not just exposure to stimulation, but agentic action in exploring, manipulating, and influencing the environment that counts. By regulating their own motivation and activities, people produce the experiences that form the functional neurobiological substrate of symbolic, psychomotor, social, and other skills.

Social cognitive theory subscribes to a model of emergent interactive agency (Bandura, 1986, 1999a). Thoughts are not disembodied immaterial entities that exist apart from neural events. Thought processes are emergent brain activities that exert determinative influence. The human mind is generative, creative, and proactive, not just reactive. The dignified burial of the dualistic Descartes, forces us to address the formidable explanatory challenge for a physicalistic theory of human agency and a nondualistic cognitivism. How do people operate as producers of thoughts that structure and regulate actions? How do people intentionally recruit the functional circuitry of forethought, proaction, intention, aspiration, self-appraisal, and self-reflection? Sperry (1993) has argued cogently that cognitive agents regulate their actions by cognitive downward causation, as well as undergo upward activation by sensory stimulation.

BIOLOGICAL REDUCTIONISM

There is growing unease about progressive divestiture of different aspects of psychology to biology and subpersonal cognitive science. Biological determinants of human behaviour are being widely heralded, and psychosocial dynamics are being downgraded for neurodynamics. It is feared that as we give away more and more psychology to disciplines lower down on the food chain, there will be no core psychological discipline left. Disciplinary fragmentation, dispersion, and absorp-

tion in neuroscience, we are told, may be our discipline's destiny.

We are currently witnessing a lively debate on this matter. In a piece in the *APS Observer*, James McGough questioned the integrity of psychology as a core discipline. He likened it to Zoology on the way to obsolescence through divestiture to multidisciplinary programs structured around a common interest. In contrast, Donchin advocated a disciplinary structure in which the multifaceted aspects of psychology are explored within a unified psychological discipline with participatory ties to interdisciplinary programs of shared interest. Kiesler documented instances in which our psychological discipline is being split and dispersed by intradisciplinary squabbles and power struggles, rather than by conceptual imperative.

Contrary to the proclamations of the divestive oracles, psychology is the one discipline that uniquely encompasses the complex interplay between intrapersonal, biological, interpersonal, and sociostructural determinants of human functioning. Psychology is best suited to advance understanding of the integrated biopsychosocial nature of humans, and how they manage and shape the everyday world around them. It is ironic that an integrative core discipline, that deals with the whole person acting in, and on environments, should consider fractionating, and farming out subpersonal parts to other disciplines. The field of psychology should be articulating a broad vision of human beings not a reductive fragmentary one.

The divestive line of thinking is fueled by conceptual reductionism, nature-nurture analytic dualism, and one-sided evolutionism. Mental events are brain activities, but physicality does not imply reduction of psychology to biology. Knowing how the biological machinery works, tells one little about how to orchestrate that machinery for diverse purposes. To use an analogy, the "psychosocial software" is not reducible to the "biological hardware." Each is governed by its own set of principles that must be studied in its own right.

Much of psychology is concerned with discovering principles about how to structure environments to promote psychosocial changes. This exogenous subject matter does not have a counterpart in neurobiological theory. Psychological laws are, therefore, not derivable from it. For example, knowledge of the locality, and brain circuitry subserving learning can say little about how best to devise conditions of learning in terms of level of abstractness, novelty, and challenge; how to provide incentives to get people to attend to, process, and organize relevant information; in what modes to present information; and whether learning is better achieved independently, cooperatively or competitively.

The optimal conditions must be specified by psychological principles. There is little at the neuronal level that can tell us how to develop efficacious parents, teachers, executives, or social reformers.

ONE-SIDED EVOLUTIONISM

The biologizing of psychology, which has become highly fashionable, is also being promoted by adoption of one-sided evolutionism. Not to be outdone, the geneticization of human behaviour is being promoted more fervently by psychological evolutionists than by biological evolutionists as documented elsewhere (Bussey & Bandura, 1999). Social cognitive theory acknowledges the influential role played by biological endowments but rejects one-sided evolutionism in which evolved biology shapes behaviour, but the selection pressures of social and technological innovations on biological evolution get ignored.

Evolved structures and biological potentialities can serve diverse purposes. Therefore, ancestral origin dictates neither current social function, nor a singular sociostructural arrangement. For example, tall individuals have the potential to become successful basketball players. But tallness does not ordain basketball pursuits. I seriously doubt that the genetic makeup of the Nazi Germans, who committed unprecedented barbarity, differs from the genetic makeup of peaceful Swiss residing in the German canton of Switzerland. People possess the biological potentiality for aggression, but the answer to the cultural variation in aggressiveness lies more in ideology than in biology.

The rapid transformation of warring societies into peaceful ones underscores the power of nurture over nature. The Swiss used to be the main suppliers of mercenary fighters, but they transformed into a pacific society and have remained so. For ages, the Vikings plundered other nations. After a prolonged war with Russia, the populous rose up and forced a constitutional change that prohibited kings from starting wars (Moerk, 1995). This political act promptly transformed a fighting society into a peaceable one.

In Gould's (1987) insightful analysis, the major explanatory battle is not between nature and nurture as commonly framed, but whether nature operates as a determinist or as a potentialist. He marshals considerable evidence that biology has culture on a "loose leash," Whereas Wilson (1998) argues that biology has culture on a "tight leash." Biological determinists emphasize the rule of nature, inherent constraints, and limitations. Biological potentialists give greater weight to the rule of distributed opportunities, privileges, and power. They emphasize human possibilities. As Dobzhansky (1972) puts it succinctly, the human species has been selected

for learnability and plasticity of behaviour adaptive to remarkably diverse habitats, not for behavioural fixedness. The rapid pace of social change gives testimony that biology, indeed, permits a range of possibilities.

HUMAN AGENCY IN THE COEVOLUTION PROCESS

The specialized neurophysiological systems shaped by evolutionary pressures provide the capacity for the very agentic characteristics that are distinctly human. People are not just reactive products of selection pressures. They are prime players in the human coevolution process, creating new types of environments at a dizzying pace. Other species are heavily innately programmed for stereotypic survival in a particular habitat. In contrast, through agentic action, people devise ways of adapting flexibly to remarkably diverse geographic, climatic, and social environments; figure out ways to circumvent physical and environmental constraints; redesign and construct environments to their liking; create styles of behaviour that enable them to realize desired outcomes, and pass on the effective ones to others by social modeling and other experiential modes of influence. Through contraceptive ingenuity that disjoined sex from procreation, humans have outwitted and taken control over their evolved reproductive system. They are developing reproductive technologies to separate sex from fertilization (Levy, 2000).

Through agentic genetic engineering, humans are becoming major agents of their own evolution, for better or for worse. Humans have created biotechnologies to replace defective genes and to change the genetic make-up of plants and animals. In a budding biotechnology that is forging ahead in ways that bypass evolutionary genetic processes, we are now cloning clones and exploring methods that could alter the genetic codes of humans. As people devise more powerful biotechnologies to fashion their nature, the psychosocial side of coevolution is gaining ascendancy.

We face the prospect of more direct social construction of human nature through genetic design of human beings for desired properties. What is technologically possible eventually gets applied. As previously noted, genetic factors provide only potentialities not the finished psychosocial attributes. These are the products of prolonged nurturing of potentialities. However, there is no shortage of individuals with the resources and belief in genetic determinism to underwrite attempts at genetic engineering of human nature. The values to which we subscribe and the social systems we devise to oversee the uses to which our powerful technologies are put will play a vital role in what we become and how we shape our destiny.

GROWING PRIMACY OF HUMAN AGENCY

Societies today are undergoing drastic social, informational, and technological changes. The revolutionary advances in electronic technologies and globalization are transforming the nature, reach, speed, and loci of human influence. These rapidly evolving realities present new adaptational demands and vastly expand opportunities for people to exercise control over their self-development and how they live their lives. But the benefits come with new challenges and vulnerabilities. Wrenching changes that dislocate and restructure lives are not new in history. What is new, is the boundless scope and accelerated pace of human transactions, and the growing globalization of human interconnectedness.

Life in the cyberworld transcends time, place, distance, and national borders. People now have instantaneous communicative access worldwide via a system that no one can control. It is transforming how people communicate, educate, relate to each other, and conduct their business and daily affairs. These new realities place increasing demands on human agency to shape personal destinies and the national life of societies. Consider some examples of how these novel realities are placing a premium on self-management and self-renewal.

EDUCATIONAL SELF-REGULATION

Information technologies will be transforming educational systems. Students can now exercise greater personal control over their own learning. In the past, their educational development was heavily dependent on the quality of the schools in which they were enrolled. Students now have the best libraries, museums, and multimedia instruction at their fingertips through the global Internet for educating themselves, regardless of where they may reside.

We are entering a new era in which the construction of knowledge will rely increasingly on electronic inquiry. Before long, most information will be available only in electronic form. Knowing how to process and evaluate this avalanche of information is vital for knowledge construction and cognitive functioning (Debowski, Wood, & Bandura, 2000).

Electronic media do more than just expand access to vast bodies of information. They also serve as a convenient vehicle for building social networks for creating shared knowledge through collaborative learning. Through interactive electronic networking, people link together in dispersed locales, exchange information, share new ideas, and work collaboratively on projects.

Information technologies are a tool, not a panacea for intellectual development. Internet tutors can do little if students cannot motivate themselves to take advantage of what these systems have to offer. Students must develop

skills in regulating the motivational, emotional, and social determinants of their intellectual functioning, as well as the cognitive aspects. Efficacious self-regulators gain knowledge, skills, and intrinsic interests in intellectual matters. Weak self-regulators do not achieve much progress in self-development. Given the influential role of psychological factors in whether and how educational technologies are used, one must guard against placing excessive hope in the technology itself. Learners need live mentors to help build their self-regulatory efficacy, cultivate their aspirations, and to find meaning and direction in their intellectual pursuits. They need to learn how to filter the avalanche of information, and how to convert reliable information into knowledge and wisdom. The content of early schooling is perishable and long forgotten. But the valuational and self-regulatory capabilities endure as personal resources for continued self-development.

OCCUPATIONAL SELF-REGULATION

A major part of people's daily life is spent in occupational activities. These pursuits do more than provide income for one's livelihood. They serve as a major source of personal identity, self-evaluation, and social connectedness. Self-regulation is becoming a key factor in occupational life as well. In the past, employees learned a given trade and performed it much the same way during their lifetime in the same organization. In the modern workplace, information-based technologies are now operating automated production and service systems that were formerly done manually. This historic transition from the industrial to the information era calls for advanced cognitive and self-regulatory competencies.

Much of the world of work is now being structured so that employees assume operational control in flexible self-managed teams. With the fast pace of change, knowledge and technical skills are quickly outmoded unless they are updated to fit the new technologies. Employees have to take charge of their self-development for a variety of positions and careers over the full course of the worklife (Bandura, 1997).

Efficacious adaptability has become a premium at the organizational level as well. Organizations must be continuously innovative to survive and prosper in the rapidly changing global marketplace. They face the paradox of preparing for change at the height of success. Many fall victim to the inertia of success. They get locked into the technologies and products that produced their success, and fail to change fast enough to the technologies and marketplaces of the future.

HEALTH SELF-REGULATION

In recent years, there has been a major change in the

conception of health from a disease model to a health model. Health promotion should begin with goals not means. If health is the goal, biomedical interventions are not the only means to it. Human health is heavily dependent on lifestyle habits and environmental conditions. By exercising control over health habits, people can live longer, healthier, and slow the process of aging. To stay healthy, exercise, don't smoke, reduce the amount of dietary fat, keep blood pressure down, and develop effective ways of coping with stressors. These habits provide the elixir of health. If the huge health benefits of these lifestyle habits were put into a pill, it would be declared a spectacular breakthrough in the field of medicine.

Fuchs' comprehensive analysis of health care systems shows that, beyond basic medical care, adding more care does not make people healthier (Fuchs, 1974; Kolata, 2000). Medical care cannot substitute for healthful habits and environmental conditions. It is mainly self-care that keeps people healthy. New health self-management systems structured around self-regulatory principles are reducing major health risks, retarding the rate of biological aging, and enhancing health (Bandura, 1997). This type of model for health promotion combines the high individualization of the clinical approach, with the large-scale applicability of the public health approach. Linking the interactive aspects of the self-management model to the Internet can vastly expand its availability for preventive and health promotive guidance to people wherever they may live.

BROADENING THE SCOPE OF CROSS-CULTURAL ANALYSES

Life in the cyberworld also calls for major changes in the study of cultural influences on human adaptation and change. Cultures are no longer insular nor monolithic. Transnational interdependencies and global market forces are restructuring national economies and shaping the political and social life of societies. Advanced telecommunications technologies are disseminating ideas, values, and styles of behaviour transnationally at an unprecedented rate. The symbolic environment feeding off communication satellites is altering national cultures and homogenizing collective consciousness. Mass migrations are changing cultural landscapes.

These new realities call for broadening the scope of cross-cultural analyses beyond the focus on the social forces operating within given societies. The issues of interest centre on how national orientations interact with global forces to shape the nature of cultural life. With growing multiethnicity of societies, bicultural efficacy to navigate successfully demands of both one's ethnic subculture and that of the larger society gains importance.

INTERNET TECHNOLOGY IN SOCIOPOLITICAL CHANGE

The Internet technology is changing social and political processes. It provides vast opportunities to participate directly in sociopolitical matters of concern and a ready vehicle for mobilizing grass-roots activity to promote desired changes in social practices and policies. The Internet is swift, wide-reaching, and free of institutional controls. Political contests are shifting to the cyberworld, where political pronouncements and partisan critiques are circulated instantly. The unfettered, pluralistic nature of the Internet is also changing the locus of power of the news media. The cyberworld contains a multiplicity of voices. Online journalistic enterprises, serving diverse ideologies and vested interests, may eventually supplant oldline broadcast networks as the main purveyors of sociopolitical information.

There is much utopian talk of electronic democratization and the liberalizing power of the Internet. Here too, one must guard against excessive hope for a technological remedy for problems of political strife and representative governance. The Internet technology distributes the capacity to communicate readily throughout society and across national borders, but it does not determine what gets communicated.

The online journalistic debut at the recent political conventions in the United States was hardly an exemplification of emancipation from the oldline broadcast gatekeepers. There was low public participation in the Web sites and much of the online political discourse was rather sterile. In the chatrooms of everyday life, some of the discourse is edifying and enabling, but much of it is banal, misinformed, contentious, and even hateful. In short, more communication does not necessarily mean more enlightening discourse for human betterment.

Ready access will not necessarily enlist active participation unless people see that the communications technologies help them to achieve desired outcomes. A strong sense of personal and collective efficacy determines whether people make their voices heard in cyberworld politicing, and the extent to which they play an active part in bringing about meaningful changes in their lives (Bandura, 1997; Newhagen, 1994a,b).

The social benefits of electronic technologies do not come without costs. The computerized technologies have several properties that magnify their dangerousness if put to detrimental use. They are readily available to anyone, portable, easily implementable via a global network that recognizes no international borders; they can produce widespread devastating effects and are very difficult to control. Because anybody can get into the act and nobody is in charge, Internet freelancers can use this unfettered vehicle for detrimental purposes. Societal vulnerabilities are further enormously magnified because virtually all of the systems on which people depend in

their everyday life are interdependently run by computer network systems. These can be easily knocked out, as witnessed by the computer student who wreaked havoc world-wide by crippling e-mail systems costing billions of dollars. Smart hackers can do much more serious damage. Cybercrime and cyberterrorism enacted through the Internet is another dark side of the cyberworld that will increasingly command psychological attention.

In addition to creating far-reaching vulnerabilities, electronic technologies are eroding privacy in unprecedented ways. Based on Internet transactions and browsing, financial and medical status, and other details of peoples' personal lives can be monitored, recorded, profiled, archived, and shared with, or sold to, third parties for marketing purposes or other misuses. For the most part, people are blissfully unaware that computers preserve records, computer tracking systems can find the users and resurrect their online activities. Rosen (2000) makes the interesting point that the most disquieting consequences of the erosion of privacy is that people will be viewed in terms of distorted personal identities constructed from fragmentary, decontextualized online behaviour.

Undetectable surveillance programs that are cheap and easily available, can secretly record whatever people have in their computers and transmit the information remotely. Such technologies provide ready means for even more pervasive intrusions into human privacy. If people are to preserve some measure of privacy and dignity they will have to reinstate control over the use of information about personal online behaviour through technological, social, and legislative remedies. Online behaviour differs from face-to-face behaviour (Kiesler, 1997). Anonymity and pseudonymity in interchanges in the cyberworld remove communication constraints and expand participation in activities. But concealment can also bring out the worst in people by shielding them from any social consequences for pernicious attacks on others (Froomkin, 1999).

Electronic technologies are also eroding the boundaries between worklife and homelife. With wireless communication systems that respect neither time nor place, the demands of worklife increasingly intrude on familial, social, and recreational life. People are now wired to their workplace regardless of where they are. These electronic technologies create new challenges to striking a balance between the competing priorities of life.

AGENTIC MANAGEMENT OF FORTUITY

There is much that people do designedly to exercise some control over their self-development and life circumstances. But there is a lot of fortuity in the courses lives take. Indeed, some of the most important determi-

nants of life paths occur through the most trivial of circumstances (Bandura, 1982, 1998; Krantz, 1998). People are often inaugurated into new developmental trajectories, marital partnerships, occupational careers, or untoward life paths through fortuitous circumstances. A book editor enters a lecture hall as it was rapidly filling up, for a talk on the "Psychology of Chance Encounters and Life Paths." He seizes an empty chair near the entrance. Some months later, he marries the woman he happened to sit next to. With only a momentary change in entry, seating constellations would have altered, and their lives would have taken quite different courses. A marital partnership was formed fortuitously at a talk devoted to fortuitous determinants of life paths!

Fortuity does not mean uncontrollability of its effects. There are ways people can capitalize on the fortuitous character of life. They can make chance happen by pursuing an active life that multiplies the fortuitous encounters they will experience. Chance favours the inquisitive and venturesome who go places, do things, and explore new activities (Austin, 1978). People also make chance work for them by cultivating their interests, self-affirming beliefs, and competencies. These personal resources enable them to make the most of opportunities that arise unexpectedly from time to time. Pasteur put it well when he noted that, "Chance favors only the prepared mind." Self-development gives people a greater hand in shaping their destiny in the life paths they travel. These various proactive activities illustrate the agentic management of fortuity. By these inventive means, people exert some control over the odds in the fitness game.

OVERPREDICTION OF PSYCHOPATHOLOGY

Our discipline is infected with a virulent negativity virus that manifests itself in diverse forms.¹ Our theories grossly overpredict psychopathology. This is because they favour a reactive risk model rather than a proactive mastery model. Families in our inner cities are living under dismal conditions of poverty, physical decay, social disorganization, and inadequate human services. These environments provide few prosocial opportunities but many antisocial ones.

Our theories would lead one to expect that most of

¹ Following this address, Professor Warren Eaton, an attendee at the conference, gave further graphic testimony to the pervasive psychopathologizing bias of our discipline. A newspaper reporter asked him for background psychological information on "brothers" for an article on this subject. His Psychlit computer search for research on "brothers" over the past decade produced a rich assortment of psychopathologies such as delinquency, drug use, sibling incest, attention deficit disorder, sexual deviance, fraternal jealousy, sexual abuse, hyperactivity, alcoholism, and sibling violence, just to mention a few of the brotherly aberrations. But our field had virtually nothing positive to say about brotherhood!

the children living in these impoverished, risky environments would be heavily involved in crime, addicted to drugs or too psychically impaired for a normal life. In fact, most of the children make it through the developmental hazards. In adulthood, most support themselves through legitimate jobs, form partnerships, and stay clear of criminal activities.

Families achieve these results through self-sacrifice and perseverant effort that promote their children's development and to protect them from dangerous neighbourhood activities (Furstenberg, Eccles, Elder, Cook, & Sameroff, 1999). They carve out functional subcommunities through active involvement in church and other social organizations. These affiliations link their children to positive models, constructive activities, supportive social networks, and values and social norms that parents hold dear. The social ties compensate for meager neighbourhood resources. By exercising their sense of efficacy, the parents do not let their dismal environment defeat them.

RESILIENCE: REACTIVE RISK MODELS VS. PROACTIVE MASTERY MODELS

We are more heavily invested in intricate theories of failure than in theories of success. Risk factors command our attention. Enablement factors, which equip people with the skills and resilient self-beliefs to exert control over their lives, receive little notice. When enabling factors are considered, as in resilience, they are depicted in static, epidemiological terms as protective factors. Protectiveness shields individuals from harsh realities or weakens their negative impact. In contrast, enablement equips people with the personal resources to select and create successful life courses.

Studies have examined the developmental trajectories of children burdened with extremely disordered home lives (Werner & Smith, 1992). They grow up in families plagued with chronic poverty, discord, physical abuse, divorce, parental alcoholism, criminality, or serious mental disorders. Remarkably, a goodly number of the children surmount such enormous hardships and develop into efficacious, caring, and productive adults. Their personal triumphs have given us a better sense of some of the determinants of extraordinary resilience.

A crucial factor is the development of a stable social bond to a competent, caring adult. Such caregivers offer emotional support and guidance. They promote meaningful values and standards. They model constructive styles of coping and create opportunities for mastery experiences. Enabling caretaking builds trust, competencies, and a sense of personal efficacy. Physical attractiveness and a sociable temperament help to draw nurturing caretaking. As children develop positive attributes, they

become more engaging to others and attract support from them. Supportive teachers are often important enabling influences in the lives of children who surmount severe adversities. Social connectedness to a variety of other caring persons outside the family provides further continuing guidance and opportunities for self-development. Intellectual competencies also help to promote successful development under adversity.

The children's heroic life stories support an agentic, rather than a protective view of resilience. The children play a proactive role in selecting and constructing beneficial social environments that shape their life courses. They operate out of a sense of efficacy that they can exercise some control over their lives. Theories of resilience should be recast in proactive agentic terms, rather than in epidemiologic terms of protective factors buffering the negative effects of adversity.

NONAGENTIC DIATHESIS-STRESS MODEL

The difference between an agentic and a reactive conception of human adaptation also applies to the diathesis-stress model of psychopathology. In this model, external stressors act upon personal vulnerabilities to produce emotional and behavioural disorders. This model is often combined with epidemiological risk-buffer models. Protective factors are posited as buffers to stressors.

This theory is heavily cast in reactive terms devoid of agentic functions. The only thing the person contributes to the adaptation process is personal vulnerabilities. In fact, people do not simply undergo happenings in which environments act upon their personal endowments. Through the exercise of self-regulatory influence they have a hand in which environments they get into (Bandura, 1997). They create supportive environments for themselves by seeking out beneficial social networks. They do things that help them to manage the stressors in their lives, and develop the coping capabilities for transforming threatening environments into benign ones.

CONQUERING SUBSTANCE ABUSE

Because of selective inattention to successes, our theories similarly over-predict the inability to overcome difficult problems, such as substance abuse. We build theories for why people are powerless to change addictive behaviour. In the case of smoking, which is one of the most addictive substances, it is said to be intractable because it is compelled by biochemical and psychological dependencies. Each puff sends a reinforcing nicotine shot to the brain. Prolonged use is said to create a relapsing brain disease. Once addicted, aversive withdrawal reactions drive the users to heavy continual use of the substance.

A brief period of abstinence eradicates the physiological withdrawal reactions. A major explanatory challenge is resumption of drug use after biological withdrawal reactions are long gone to serve as motivators. Environmental cueing was proposed as the driving mechanism. Exposure to situations that have been associated with drug use presumably induce physiological craving for the substance. Negative affect was also invoked as a precipitating motivator that drives people to seek relief in the substance (Piasecki, Kenford, Smith, Fiore, & Baker, 1997).

The problem with these motivational explanations is that they predict vastly more than has ever been observed. Over 40 million people in the United States have quit smoking on their own. Where was their brain disease? How did the smokers cure the disease on their own? Superimposed on the 40 million self-quitters, the dismal relapse curves that populate our journals are but a tiny ripple in the vast sea of successes.

As for the affective motivators, the 40 million ex-smokers were not insulated from the situations where they smoked or from smokers around them. Everyday life is strewn with episodes of negative affect. The 40 million self-quitters are not leading lives free of negative affectivity. They manage to maintain abstinence despite bouts of negative affect. Both the cueing and emotive explanations require a self-regulatory component to explain successful self-management under situational and affective instigators.

In other dysfunctions, negative affect precipitates problem behaviour in those of low efficacy, but infrequently in those of high efficacy (Love, Ollendick, Johnson, & Schlezinger, 1985; Schneider, O'Leary, & Agras, 1987). Overcoming nicotine dependence is a tortuous process, often involving periods of torment and repeated relapses. But those who can persevere in the face of repeated failures eventually succeed.

The same is true for alcohol and narcotic dependence. Robins (1974) reported a remarkably high remission for heroin addiction among Vietnam veterans without the benefit of treatment. In other studies, successful quitters sever ties with drug-using friends. They build new lives for themselves with meaningful alternative social networks (Granfield & Cloud, 1996). Vaillant (1995) has shown that a large share of alcoholics eventually quit drinking without treatment, assistance from self-help groups, or radical environmental change. Such successes testify to the human capacity for self-regulation.

Granfield and Cloud (1996) put it well when they characterized the conspicuous inattention to successful self-changers in substance abuse as, "The elephant that no one sees." The massive elephant in our midst can tell us a lot about the mechanisms of successful self-change

and how to enable people to overcome substance abuse.

Full understanding of self-regulatory mechanisms requires examination of successful self-changers as well as the intractable ones. Naturalistic studies of self-directed change show that successful self-regulators are highly skilled in enlisting the component subfunctions of self-regulation (Perri, 1985).

PROSOCIAL FOUNDATION OF DEVELOPMENTAL TRAJECTORIES

Over the years, much theorizing and research have been devoted to the adverse effects of early proneness to aggression on subsequent academic development and interpersonal relationships. Aggressiveness can detract from self-development by undermining academic pursuits and creating socially alienating conditions. The relationship between discordant behaviour and academic deficiency has been extensively documented (Dishon, 1990; Hinshaw, 1992; Patterson, Capaldi, & Bank, 1991; Rutter, 1979).

Prosocialness, as reflected in cooperativeness, helpfulness, sharing, and empathicness can help to promote interpersonal relationships conducive to social and academic development. Moreover, a prosocial orientation can curb aggression both directly and by engaging moral self-sanctions for harmful conduct (Bandura, 1999b). Despite the many potential benefits of prosocialness on children's developmental trajectories, it has received comparatively little attention.

The relative impact of early prosocialness and aggressiveness on children's later social ties and academic achievement has been tested longitudinally (Caprara, Barbaranelli, Pastorrelli, Bandura, & Zembardo, 2000). Prosocialness has a strong positive impact on later academic achievement and peer acceptance, but early aggressiveness has no significant effect on either sphere of functioning. Such findings underscore the value of investing resources to develop and promote children's prosocialness. Doing so enhances the learning atmosphere, facilitates academic success, and enabling social-support networks. Prosocial orientations, in turn, can contribute to more positive communal norms and promote beneficial modeling and social practices that together can help reduce aggression in our communities.

DUAL NATURE OF MORAL AGENCY

Our theories about the exercise of moral agency also tell only half the story. They neglect the positive side of moral functioning. Conceptions of moral agency focus heavily on the power to refrain from detrimental conduct by the exercise of self-sanctions. We study moral control in children by observing their power to refrain from transgressing under high enticement (Kochanska, Murray, Jaques, Koenig, & Vandegesek, 1996; Sears,

Rau, & Alpert, 1965). We study moral control in adults by their ability to refrain from injurious conduct under conditions of high provocation or situational demands. Milgram's (1974) classic studies on obedient aggression illustrate the refrain side of morality.

Milgram's research is widely cited as evidence of how easy it is to bring out the worst in people. What is rarely noted is the equally striking evidence that people refuse to behave cruelly, even under unrelenting authoritarian demands, if the situation is humanized and they can see the suffering they cause. Our own research on mechanisms of moral disengagement shows that, even under high provocation, people cannot behave punitively toward humanized individuals (Bandura, Underwood, & Fromson, 1975).

The emphasis on obedient aggression is understandable given the prevalence of people's inhumanities to one another. But the power of humanization to counteract cruel conduct is also of considerable importance. Human interdependence and a vested interest in each other's welfare instill a sense of community. The affirmation of common humanity can bring out the best in others.

The positive side of human agency centres on the proactive power to behave humanely, rather than just the power to refrain from behaving inhumanely (Bandura, 1999b). The My Lai massacre graphically illustrates the dual aspects of moral agency. An American platoon, led by Lt. Calley, massacred 500 Vietnamese women, children, and elderly men. Numerous insightful analyses have documented how moral self-sanctions were disengaged from the brutal conduct (Kelman & Hamilton, 1989).

A ceremony, 30 years in coming, was recently held at the Vietnam Veteran's Memorial, honouring extraordinary heroism of prosocial morality (Zganjar, 1998). The moral courage that was honoured testifies to proactive morality through the remarkable power of humanization. Thompson, a young helicopter pilot, swooped down over the village of My Lai on a search and destroy mission as the massacre was occurring. He spotted an injured girl, marked the spot with a smoke signal and radioed for help. Much to his horror, he saw a soldier flip her over and spray her with a round of fire. Upon seeing the human carnage in an irrigation ditch, and soldiers firing into the bodies, he realized that he was in the midst of a massacre.

He was moved to moral action by the sight of a terrified woman with a baby in her arms and a frightened child clinging to her leg. As he explained his sense of common humanity, "These people were looking at me for help, and there is no way I could turn my back on them." He told a platoon officer to help him remove the remaining villagers. The officer replied, "The only help

they'll get is a hand grenade." Thompson moved his helicopter in the line of fire, and commanded his gunner to fire on his approaching countrymen if they tried to harm the villagers. He radioed the accompanying gunships for help and together they airlifted the remaining dozen villagers to safety.

He flew back to the irrigation ditch where they found and rescued a 2-year-old boy still clinging to his dead mother. Thompson described his empathetic human linkage: "I had a son at home about the same age."

Social psychology often emphasizes the power of the situation over the individual. In this case of proactive moral courage, the individual triumphs as a moral agent over compelling situational forces. Such moral heroism is most strikingly documented in rescuers who risked their lives, often over prolonged periods fraught with extreme danger to save from the Holocaust persecuted Jews with whom they had no prior acquaintance and had nothing material or social to gain by doing so (Oliner & Oliner, 1988; Stein, 1988).

CONCEPTIONS OF HEALTH

Human health is another domain in which we often tell only half the story, mainly the negative half. For years our conception of health was grounded in a biomedical disease model rather than a health model. It emphasized curative and disease preventive approaches rather than health enhancement. It is just as meaningful to speak of levels of vitality and healthfulness as of debility and infirmity.

As previously noted, the quality of health is heavily influenced by lifestyle habits (Bandura, 1997; Fuchs, 1974). With increased life expectancy, minor dysfunctions have more time to develop into chronic diseases. National efforts to control escalating health costs have focused heavily on reducing, rationing, and limiting access to medical services on the supply side. But they do little to reduce the demand for medical services by enabling people to stay healthy through self-management of health-promoting habits. Demand will overwhelm supply. Social cognitive theory works on the demand side. Our knowledge of self-regulatory mechanisms provides the means to promote health as well as to reduce risk factors for various diseases (Bandura, 1997; Holman & Lorig, 1992). The mounting demand for health care will force societies to change the balance of efforts from disease care to health promotion.

CONTROLLABILITY AND STRESS EFFECTS

Stress has been implicated as an important contributor to physical dysfunctions. Controllability is a key organizing principle regarding the stress effects. Exposure to stressors with controlling efficacy has no adverse physiological effects. But exposure to the same stressors

without controlling efficacy activates biological reactions that impair immune function.

Most of these findings are based on studies with animals experiencing uncontrollable physical stressors. There is a problem in extrapolating across species and from physical to psychological stressors. The important stressors with which humans have to cope are psychological ones. It is the belief of uncontrollability that is the stressful reality. In the animal studies, they either exercise complete control over stressors or none at all.

Most human stress is activated while developing competencies for managing environmental demands. Stress experienced while acquiring coping efficacy can have different effects than stress aroused in aversive situations with no prospect of gaining self-protective control. There are substantial evolutionary benefits to experiencing enhanced immunocompetence during the development of coping capabilities. Given the prevalence of stressors in everyday life, if they only impaired immune function we would be bedridden most of the time or done in.

Stress aroused while gaining coping efficacy through mastery over threats can boost the immune system (Wiedenfeld et al., 1990). The few studies that have examined the immune effects of positive emotions, show that antibody levels to orally ingested antigens are higher on pleasant days (Stone et al., 1994). We are heavily preoccupied with the physically debilitating effects of stressors. Self-efficacy theory also acknowledges the physiologically strengthening effects of mastery over stressors. The benign neglect of the positive side of emotional life limits our understanding of the psychosocial contributors to health. Studies reviewed by Dienstbier (1989) demonstrate that successful coping with taxing situations is, indeed, physiologically toughening.

PSYCHOSOCIAL SPILLOVER OF DUAL ROLES

According to the prevailing theories of human stress, it arises when perceived task demands exceed perceived coping capabilities. But there is another demand-capability relation that is largely ignored even though it is an important stressor. People experience emotional strain when they are trapped in activities that permit them little opportunity to make full use of their talents. Whether overload or underload is stressful is largely determined by perceived efficacy. Matsui and Onglatco (1992) found that women employees who have a low sense of efficacy are stressed by heavy work demands and responsibilities. In contrast, those of high perceived efficacy are frustrated and stressed by blocked opportunities to make full use of their talents.

The neglected underload stressor highlights the prevailing negative bias in research on the effects of

multiple role demands on women in dual career families. The family has been undergoing major structural changes that are altering women's roles. A sharp drop in birthrate and increased longevity creates the need for purposive pursuits for women that provide satisfaction and meaning to their lives over the expanded lifespan (Astin, 1984). They are seeking fulfillment in career pursuits as well as in their family life. These changes pose new challenges on how to strike a balance between family and occupational demands.

The effects of combining dual roles are typically framed negatively in terms of interrole conflicts breeding family distress and discord. There are countless studies on the negative spillover of job pressures on family life. But few on how job satisfaction enhances the quality of family life. Ozer's (1995) research shows that women's sense of efficacy in managing dual roles contributes to personal well-being and better health. We need to be studying the positive spillover on family life of fulfilling career pursuits.

PSYCHOPATHOLOGIZING OF OPTIMISM

Human well-being and accomplishments require an optimistic and resilient sense of efficacy (Bandura, 1997). This is because the normative daily realities are strewn with difficulties, frustrations, conflicts, impediments, failures, setbacks, inequities, and adversities. It requires a resilient sense of efficacy to override such dissuading condition. The functional belief system in difficult pursuits combines realism about tough odds but optimism that one can beat those odds through self-development and perseverant effort. Resilient self-efficacy provides the needed staying power. The people who are successful, innovative, sociable, nonanxious, nondespondent, and tenacious social reformers take an optimistic view that they can bring about valued changes.

In much of the psychological literature, optimistic self-appraisal is treated as a cognitive failing requiring correction. One can easily produce cautious self-appraisal. Simply punish optimism (Oettgen, 1995). In activities where the margins of error are narrow and missteps can produce costly or injurious consequences, personal well-being is best served by highly accurate self-appraisal. It is a different matter when difficult accomplishments can produce substantial personal or social benefits and the personal costs involve time, effort, and expendable resources. Individuals have to decide for themselves whether to invest their efforts and resources in ventures that are difficult to fulfill, and how much hardship they are willing to endure in pursuit of a desired future. Remedial reductions of optimism come at the cost of undermining aspiration, innovation, and human accomplishments in endeavours presenting tough odds.

When people are asked about their regrets in life, for the most part they regret the actions not taken rather than the actions taken (Hatiangadi, Medvee, & Gilovich, 1995). They regret the educational opportunities forsaken, the careers not pursued that would have brought satisfaction and self-fulfillment, the risks not taken, and the relationships not cultivated or shortchanged. We study extensively the risks of overconfidence, but ignore the pervasive self-limiting cost of under-confidence. The risk-averse bias reflects the conservative orientation of our theorizing and research on human development and functioning.

CONCLUDING REMARKS

Humans have an unparalleled capacity to become many things. The qualities they cultivate and the life paths that become open to them are partly determined by the societal systems to which their development is entrusted. Social systems that cultivate competencies, instill a robust sense of efficacy, create equitable opportunity structures, provide aidful resources, and allow room for self-direction increase the chances that people will realize what they wish to become.

To sum up, the psychological franchise is a burgeoning enterprise worthy of acclamation rather than a disjoined candidate for divestiture or foreclosure. We will keep recoupling the subpersonal brain to a sentient, agentic being. As an integrative core discipline, we will continue to create knowledge to advance human understanding and betterment.

This article was presented as an address as Honorary President of the Canadian Psychological Association at the annual meeting of the CPA in Ottawa, June 30, 2000.

Preparation of this article and some of the cited research were supported by grants from the Grant Foundation, the Spencer Foundation, and the Jacobs Foundation. Some sections of this article include revised, updated, and expanded material from *Self-Efficacy: The Exercise of Control* (Bandura, 1997), Social cognitive theory of personality (Bandura, 1999) in *Handbook of Personality* (2nd ed.), Social cognitive theory: An agentive perspective (Bandura, 2001), in *Annual Review of Psychology* (Vol. 52), and Growing primacy of human agency in adaptation and change in the electronic era (Bandura, 2000).

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Résumé

Aujourd’hui, les sociétés subissent des changements so-

ciaux, informationnels et technologiques radicaux. Les progrès révolutionnaires dans les technologies électroniques et la mondialisation transforment la nature, la portée, la vitesse et le lieu de l’influence humaine. Ces réalités qui évoluent rapidement imposent des demandes croissantes dans l’exercice de gestions personnelle et collective visant à façonner les destinés personnelles et la vie des sociétés à l’échelle des nations. Il y a un malaise grandissant quant au dessaisissement de différents aspects de la psychologie au profit de la biologie et de la science cognitive sous-personnelle. On craint qu’à mesure qu’on dévole de plus en plus d’aspects de la psychologie à des disciplines connexes en amont, il ne restera plus grand chose de la discipline centrale proprement dite. Contrairement à ce que prêchent les oracles du dessaisissement, la psychologie demeure une discipline intégrée, la mieux placée pour faire progresser la compréhension de l’adaptation et des changements humains. Il s’agit plutôt d’une discipline qui cerne de façon exemplaire l’entrecroisement complexe des déterminants intrapersonnels, biologiques, interpersonnels et sociostructurels du fonctionnement humain. Avec la primauté grandissante de la gestion humaine dans toutes les sphères de la vie, le domaine de la psychologie devrait articuler une vision plus large des être humains et non pas une qui soit réductionniste et fragmentaire.

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Sociocognitive Self-Regulatory Mechanisms Governing Transgressive Behavior

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This longitudinal research examined a structural model of the self-regulatory mechanisms governing transgressive conduct. Perceived academic and self-regulatory efficacy concurrently and longitudinally deterred transgressiveness both directly and by fostering prosocialness and adherence to moral self-sanctions for harmful conduct. The impact of perceived social self-efficacy was mediated through prosocialness. Moral disengagement and prosocialness affected transgressiveness through the mediating influence of irascible affectivity and hostile rumination. Ruminative affectivity, in turn, both concurrently and longitudinally affected transgressiveness. Moral disengagement also contributed independently to variance in transgressiveness over time. This pattern of relations was obtained after controlling for prior transgressiveness. The structural model was replicated across gender and provided a better fit to the data than did several alternative models.

Social cognitive theory analyzes human self-development, adaptation, and change from an agentic perspective (Bandura, 1999b, 2001). The capacity to exercise some measure of control over one's thought processes, motivation, affect, and action operates through mechanisms of personal agency. Diverse lines of research have documented the prominent role that self-regulatory mechanisms play in the development and pursuit of socially valued life courses (Bandura, 1995, 1997; Caprara & Cervone, 2000; Cervone & Shoda, 1999; Schunk & Zimmerman, 1994; Zimmerman, 1989). The longitudinal research presented in this article extends this line of inquiry to self-regulatory mechanisms governing transgressive forms of behavior.

Among the mechanisms of human agency, none is more focal or pervasive than beliefs of personal efficacy. In social cognitive

theory, the self-efficacy belief system is the foundation of human motivation, well-being, and personal accomplishments. Unless people believe that they can bring about desired outcomes and forestall undesired ones by their actions, they have little incentive to act or to persevere in the face of difficulties and adversities. Whatever other factors may operate as guides and motivators, they are rooted in the core belief that one has the power to influence one's own functioning and life circumstances.

Perceived self-efficacy plays a pivotal role in causal structures because it affects courses of actions not only directly but also through its impact on cognitive, motivational, and affective determinants. Such beliefs influence whether people think productively, self-debilitatingly, pessimistically, or optimistically; how well they motivate themselves and persevere in the face of adversities; their vulnerability to stress and depression; and the life choices they make (Bandura, 1995, 1997; Maddux, 1995; Schwarzer, 1992). These diverse effects identify the multiple pathways through which a strong sense of efficacy oriented toward positive self-development can affect transgressive behavior. It does so, in large part, by promoting prosocialness, curtailing the propensity to disengage moral self-sanctions from socially alienating and harmful conduct, and countering ruminative and vengeful affectivity (Bandura, Barbaranelli, Caprara, & Pastorelli, 1996a; Bandura, Pastorelli, Barbaranelli, & Caprara, 1999). That a resilient sense of personal efficacy is a vital personal resource has been amply documented by meta-analyses of findings from diverse spheres of functioning by heterogeneous populations in a variety of environmental conditions (Holden, 1991; Holden, Moncher, Schinke, & Barker, 1990; Multon, Brown, & Lent, 1991; Stajkovic & Luthans, 1998).

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The research reported in this article was supported by grants from the Grant Foundation, the Spencer Foundation, and the Jacobs Foundation. This article was prepared while Claudio Barbaranelli was a visiting scholar at Stanford University on a grant from the Fulbright Exchange Program.

We thank Kay Bussey for her helpful comments on an earlier version of this article.

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A growing body of evidence shows that efficacy beliefs are linked to domains of functioning rather than conforming to an undifferentiated trait (Bandura, 1997). In the present study, we examined the role of three major domains of perceived personal efficacy that have been verified cross-culturally (Pastorelli et al., in press) and shown to be predictive of developmental outcomes (Bandura, 1997). These domains include academic, social, and self-regulatory efficacy to resist peer pressure for transgressive activities. However, social cognitive theory identifies several processes that can produce some covariation even across distinct activity domains. One such process involves metacognitive self-regulation. Proficient performance is partly guided by higher order self-regulatory skills, which include generic skills for evaluating task demands, constructing alternative options, setting proximal goals to guide one's efforts, and creating self-incentives to sustain engagement in taxing activities and to manage stress and debilitating intrusive thinking. Such generalizable self-regulatory skills enable people to improve their performance in a variety of activities (Meichenbaum & Asarnow, 1979; Zimmerman, 1989). Generic metastrategies learned in one realm of activity tend to be used in other activity domains (Bandura, Jeffery, & Gajdos, 1975).

A second process that can promote cross-domain covariations concerns beliefs in one's learning efficacy. Perceived learning capability affects how people approach the mastery of new challenges. Having achieved success in a particular activity domain can create a more general sense of efficacy to learn in other life situations. To the extent that people consider their self-regulatory capabilities and learning efficacy in their self-appraisals, they will exhibit at least some generality in their sense of personal efficacy across different activities.

Codevelopment across diverse domains can also give rise to covariation when the development of competencies in different spheres are promoted together. For example, students are likely to develop comparably high perceived self-efficacy in language and mathematics in superior schools but relatively low perceived self-efficacy in these diverse subjects in ineffective schools, which do not promote much in the way of academic competencies in any subject matter. Adoption of particular lifestyles also clusters activity domains for codevelopment. Thus, students who are academically oriented are likely to pursue a supportive constellation of extracurricular activities, cultivate prosocial relationships, and shun involvement in delinquent pursuits (Donovan & Jessor, 1985; Elliott, 1993). Thus, although self-efficacy beliefs are multifaceted rather than undifferentiated, some interdomain covariance is expected.

The self-regulatory mechanisms through which moral agency is exercised are of special relevance to the self-management of transgressive behavior. In social cognitive theory (Bandura, 1999a), moral agency has dual aspects—*inhibitive* and *proactive*. The inhibitive form of morality is expressed in the power to refrain from behaving inhumanely. The proactive form of morality is expressed in the power to behave humanely. After individuals adopt personal standards, their negative self-sanctions for actions that violate their standards and their positive self-reactions for conduct faithful to their moral standards serve as the regulatory influences (Bandura, 1991). These self-reactive influences serve as the motivational and cognitive regulators of moral conduct.

Personal standards do not function as invariant internal regulators of conduct, however. Self-sanctions do not impinge on con-

duct unless they are activated, and there are numerous sociocognitive maneuvers by which moral self-reactions can be selectively disengaged from detrimental conduct. In the conception of moral agency, social cognitive theory specifies eight mechanisms of moral disengagement that operate at different points in the control of behavior by moral self-sanctions (Bandura, 1991, 1999a). They center on the construal of injurious conduct itself, the sense of personal agency for the actions taken, the representation of the injurious effects that flow from actions, and the characterization of the recipients of maltreatment.

One set of disengagement practices operates on the cognitive construal of the conduct itself. Through *moral justification*, detrimental conduct is made personally and socially acceptable by portraying it as serving socially worthy or moral purposes (Kelman & Hamilton, 1989; Rapoport & Alexander, 1982; Reich, 1990; Sanford & Comstock, 1971). Language shapes the thoughts on which actions are based. Sanitizing *euphemisms and convoluted language* is widely used to make harmful conduct look respectable or benign (Bollinger, 1982; Diener, Dineen, Endresen, Beaman, & Fraser, 1975; Lutz, 1987). How behavior is viewed is also colored by what it is compared with. Through advantageous *exonerative comparison*, detrimental conduct can lose its repugnancy or even appear benevolent by contrasting it with more flagrant inhumanities (Bandura, 1991).

Moral control operates most strongly when people regard themselves as contributors to harmful outcomes. The second set of disengagement mechanisms operates by obscuring, minimizing, or disclaiming the agentive role in the harm that one causes. This disengagement is achieved by *displacement* and *diffusion of responsibility* (Bandura, Underwood, & Fromson, 1975; Diener, 1977; Milgram, 1974; Zimbardo, 1995). Further ways of weakening moral control operate by *misrepresenting the harm* caused by one's conduct (Klass, 1978). As long as the harmful effects are ignored, minimized, distorted, or disbelieved, there is little reason for self-sanctions to be activated.

The final set of disengagement mechanisms operates on the recipients of detrimental acts. *Ascription of blame* to the victims for their plight or to compelling circumstances can serve self-exonerative purposes (Crick & Dodge, 1994; Darley, Klosson, & Zanna, 1978; Ferguson & Rule, 1983; Weiner, 1986). The strength of moral self-sanctions also depends partly on how perpetrators view those whom they maltreat. To perceive another person as human activates, through perceived similarity, empathic reactions that counteract cruelty (Bandura, 1992). However, self-censure for cruel conduct can be disengaged by *dehumanization* that strips people of human qualities or invests them with demonic or bestial qualities (Bandura, Underwood, et al., 1975; Haritos-Fatouros, 1988; Keen, 1986).

A substantial body of evidence has demonstrated the disinhibitory power of moral disengagement. The moral disengagement is shown in the perpetration of large-scale inhumanities (Andrus, 1969; Bandura, 1990; Kelman & Hamilton, 1989; Rapoport & Alexander, 1982; Reich, 1990) and social punitiveness in laboratory conditions conducive to disengagement of moral self-sanctions (Bandura, Underwood, et al., 1975; Diener, 1977; Milgram, 1974; Tilker, 1970; Zimbardo, 1969). Research in which proneness to moral disengagement is assessed verifies some of the processes through which it is presumed to operate. To justify and disown responsibility for the harm done to others and to dehumanize

ize and blame them for their maltreatment are not conducive to prosocial relationships. Effective moral disengagement also frees one from the restraints of self-censure experienced as anticipative guilt for detrimental conduct. Self-exoneration for wrongdoing fosters a self-righteousness that not only justifies one's conduct but also breeds inimical rumination. Indeed, high moral disengagers experience low guilt over injurious conduct, are less prosocial, and are more prone to vengeful rumination (Bandura, Barbaranelli, Caprara, & Pastorelli, 1996a).

Prosocialness operates as another influential factor in the posited causal structure. In recent years, a conceptual shift has been witnessed from the prevailing focus on the impact of negative risk factors on developmental trajectories toward the influential role of positive enablement factors in shaping the directions that lives take. Prosocialness, as reflected in cooperativeness, helpfulness, sharing, and empathicness, is one such factor that helps to promote advantageous self-development (Bandura et al., 1996b; Caprara, Barbaranelli, Pastorelli, Bandura, & Zimbardo, 2000; Eisenberg & Fabes, 1998; Patterson, Reid, & Dishion, 1992; Wentzel, 1991). A prosocial orientation also deters aggressive conduct by fostering social networks conducive to harmonious relationships and empathic and vicarious emotional arousal over the suffering of others (Bandura, 1992; Feshbach & Feshbach, 1986; Miller & Eisenberg, 1988).

An agentic perspective assigns a prominent role to self-generated emotional arousal and affect regulation in the self-management of socioemotional life (Bandura, 1997, 1999b). Situationally induced anger arousal has been shown to increase the likelihood and intensity of injurious behavior (Berkowitz, 1993; Zillmann, 1983). People live extensively in a psychic environment that is largely of their own making. The instigators to detrimental conduct often involve problems of thought. Anger arousal dissipates with time, but it can be repeatedly regenerated by cognitive self-arousal (Bandura, 1973). Many people are quick to rouse themselves into angered states by ruminating over perceived insults, inequities, and indignities. Anger arousal often fuels retali-

ative schemes. Hostile ruminative affectivity not only distorts thinking but also predisposes people to untoward conduct, especially if combined with infirm capability for affect self-regulation. The behavioral effects of ruminative affectivity have been corroborated experimentally in simulated conditions in which participants can inflict shocks of varying intensity on provocateurs. Individuals who have a low threshold for anger arousal and are prone to hostile rumination behave more punitively than those who are slower to anger and disinclined to dwell on grievances and possible retaliations (Caprara, Coluzzi, Mazzotti, Renzi, & Zelli, 1985; Caprara, Renzi, Alcini, D'Imperio, & Travaglia, 1983; Caprara, Renzi, Amolini, D'Imperio, & Travaglia, 1984; Caprara et al., 1986).

The conceptual analysis presented thus far has examined how particular sociocognitive determinants separately foster or deter detrimental conduct and the supportive empirical evidence for their contributory role. In the present study, we examined how these various self-regulatory determinants operate in concert within an integrative causal structure in governing transgressive behavior. Transgressiveness encompassed varied detrimental conduct, including interpersonal breaches by lying, cheating, and stealing; destructiveness; verbal and physical assaults; and substance abuse. We proximally and longitudinally analyzed the paths of influence.

Figure 1 summarizes schematically the direct and mediated links in the posited structural model. Perceived self-efficacy to regulate one's academic activities and to ward off peer pressure to engage in detrimental activities both directly and meditatively affects transgressive behavior by supporting prosocialness, adherence to moral self-sanctions, and low proneness to vindictive rumination. In addition, perceived social efficacy affects transgressive conduct through the mediated effects of prosocialness.

We posited the following structural relations among the mediating factors. Children who exhibited high prosocialness, as manifested in helping, sharing, and empathicness, would refrain from ruminative vengefulness toward others. Those who strongly ad-

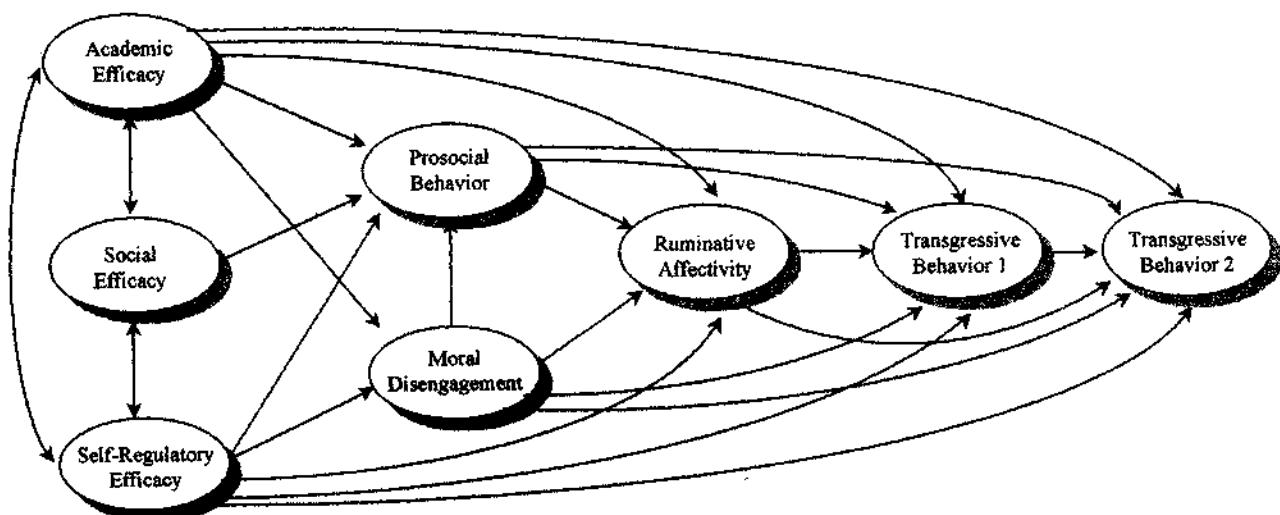


Figure 1. Posited causal structure through which perceived self-efficacy and moral disengagement operate in concert with other sociocognitive factors to concurrently and longitudinally affect transgressive conduct.

hered to moral self-sanctions against hurting others would be more likely than high moral disengagers to act prosocially in their interpersonal relationships and to exhibit a low propensity for irascible affectivity and hostile rumination. Low ruminative affectivity, in turn, would reduce the likelihood of transgressive behavior. Prosocialness and moral disengagement would concurrently and longitudinally affect transgressive behavior both directly as well as mediationally through ruminative affectivity.

Method

Participants

The participants in this longitudinal study were 564 children tested initially at 11 years of age with staggered annual starts for two separate cohorts. There were 304 boys and 260 girls. We selected the participants from two schools in a residential community located near Rome, Italy. For each cohort, the sociocognitive factors and transgressiveness assessed in the sixth grade served as predictors of level of involvement in transgressive activities in the eighth grade.

Adaptation in the adolescent phase was selected for study because it is an especially important period in the life course when adolescents have to concurrently manage major biological, educational, and social role transitions (Eccles & Midgley, 1989; Furstenberg, Eccles, Elder, Cook, & Sameroff, 1999; Gruber, Brooks-Gunn, & Petersen, 1996). It is also a period of experimentation with risky activities and substance use (Elliott, 1993; Jessor, 1986).

The community from which the participants were selected represents a microcosm of the larger society, containing families of skilled workers, farmers, professionals, and local merchants and their service staffs. Fifteen percent were in professional or managerial ranks, 38% were merchants or operators of other types of businesses, 16% were skilled workers, 30% were unskilled workers, and 1% were retired. The socioeconomic diversity of the sample adds to the generalizability of the findings.

This community adheres to a stringent consent procedure for the conduct of research in the schools. Each research proposal must be approved by a school council composed of parent and teacher representatives as well as student representatives at the junior high and high school levels. In addition, parents must give consent, and children are free to decline to take part if they so choose. The study was structured to the parents and the children as a project designed to gain a better understanding of child development. Informed consent was obtained from 100% of the families, with 91% of the sample reassessed in the follow-up phase of the study. The low attrition was due chiefly to relocation from the area or absence from school at the time of the assessment. The latter children did not differ significantly from their counterparts on any of the variables in the initial assessment. The data regarding the variables of theoretical interest were collected in the children's classrooms by two female experimenters. The various sociocognitive measures were administered over a period of several days at each phase of the study.

Perceived Self-Efficacy

Children's beliefs in their efficacy were measured by 37 items representing seven domains of functioning (Bandura, 1990; Bandura et al., 1996b). For each item, children used a 5-point response format to rate the strength of their belief in their capability to execute the designated activities.

Perceived academic self-efficacy measured the children's belief in their capabilities to master different areas of course work. The subjects included mathematics, science, reading and writing language skills, and social studies. A second set of scales measured children's perceived self-efficacy for regulating their own learning activities (Zimmerman, Bandura, & Martinez-Pons, 1992). These scales assessed children's efficacy to arrange

environments conducive to learning, to plan and organize their academic activities, to use cognitive strategies to enhance understanding and memory of the material being taught, to seek pertinent information and get teachers and peers to help them with academic problems when needed, to motivate themselves to do their schoolwork, to get themselves to complete scholastic assignments within set deadlines, and to pursue academic activities when there are other interesting things to do. The item "How well can you get teachers to help you when you get stuck on schoolwork?" measured perceived self-efficacy to enlist enabling social resources. The item "How well can you study when there are other interesting things to do?" measured children's perceived efficacy to motivate themselves for academic pursuits in the face of competing attractions.

A third set of scales assessed efficacy for leisure and extracurricular activities involving mainly group extracurricular activities. A fourth set of scales assessed children's self-regulatory efficacy to resist peer pressure to engage in high-risk activities involving the use of alcohol and drugs and transgressive behavior that could get them into trouble. For example, the following item assessed perceived self-regulatory efficacy to rebuff pressures exerted by peers to drink alcoholic beverages: "How well can you resist peer pressure to drink beer, wine, or liquor?"

Perceived social self-efficacy measured children's beliefs in their capabilities to form and maintain social relationships, work cooperatively with others, and manage different types of interpersonal conflicts. Self-assertive efficacy measured children's beliefs in their capabilities to voice their opinions when they differ from those held by others, to stand up to mistreatment or harassment, and to refuse unreasonable requests. "How well can you express your opinions when other classmates disagree with you?" is a sample item assessing perceived self-assertive efficacy. Perceived self-efficacy to meet others' expectations assessed children's beliefs in their capabilities to fulfill what their parents, teachers, and peers expect of them and to live up to what they expect of themselves. "How well can you live up to what your parents expect of you?" typifies items in the perceived efficacy domain to fulfill social expectations.

A principal-components factor analysis revealed a three-factor structure. The first factor, Perceived Academic Self-Efficacy, included high loadings on 19 items measuring perceived capability to manage one's own learning; to master academic subjects; and to fulfill personal, parental, and teachers' academic expectations. Perceived Social Self-Efficacy constituted the second factor. The 13 items loading on this factor included perceived capability for peer relationships, for self-assertiveness, and for leisure-time social activities. The third factor, Perceived Self-Regulatory Efficacy, was represented by 5 items measuring perceived capability to resist peer pressure to engage in high-risk activities. These three factors constituted 16.2%, 8.2%, and 5.4% of the variance, respectively.

The triadic factor structure of these multidimensional efficacy scales has been replicated cross-nationally with Italian, Hungarian, and Polish children (Pastorelli et al., in press). The predictive validity of these different forms of perceived self-efficacy is supported by findings of prior studies (Bandura et al., 1996b; Bandura, Barbaranelli, Caprara, & Pastorelli, in press; Zimmerman et al., 1992).

The reliability of the factors of perceived self-efficacy was assessed by the squared multiple correlations of factor scores. Coefficients of .70 or higher are indicators of stable factors (Tabachnik & Fidell, 1989). The estimated reliabilities were .90 for Perceived Academic Self-Efficacy, .80 for Perceived Social Self-Efficacy, and .83 for Perceived Self-Regulatory Efficacy.

Prosocial Behavior

Children rated their prosocialness on a 10-item scale that assessed their degree of helpfulness, sharing, consoling, kindness, and cooperativeness (Caprara & Pastorelli, 1993). "I try to help others" and "I try to make sad people happier" are sample items. To avoid a possible response bias, we also included several control items in this scale. The internal consistency

reliability was .77. The factor structure and the concurrent validity of this measure have been corroborated in studies relating children's self-ratings to level of prosocialness as rated by parents', teachers', and peers' sociometric nominations (Caprara & Pastorelli, 1993).

Ruminative Affectivity

The affective contributors to transgressive behavior were measured by a latent variable labeled *ruminative affectivity* comprising two facets—rumination self-arousal and irascibility. Rumination self-arousal assessed with 15 items the level of preoccupation with personal grievances and hostile and retaliative ideation. For example, the items "When I am outraged, the more I think about it the angrier I feel" and "Sometimes I can't sleep because of a wrong done to me" assessed ruminative self-arousal of anger. The irascibility measure, comprising 14 items, measured proneness to negative affectivity in terms of ready anger arousal in social transactions and high testiness even to slight provocations. "It takes very little for things to bug me" is a sample item. This latent variable, previously called "aggression proneness," was labeled *ruminative affectivity* so as to be more descriptive of its dual affective components. The alpha reliability coefficients were .86 for hostile rumination and .83 for irascible affectivity. As we noted earlier, the predictive validity of these measures has been verified experimentally. The high factor loadings of .76 and .63 for the boys and the girls, respectively, showed it to be a well-defined latent construct.

Moral Disengagement

Each of the eight mechanisms of moral disengagement was measured by four subsets of items (Bandura et al., 1996a). They tapped readiness to construe injurious conduct as serving righteous purposes, masquerading censurable activities by palliative language or rendering them benign by advantageous comparison, disowning responsibility for harmful effects by displacement or diffusion of responsibility, minimizing the harmful effects of one's detrimental conduct, devaluing those who are maltreated, and attributing blame to them. To cite some examples, "If people are careless where they leave things it is their own fault if they get stolen" was one of the items measuring attribution of blame to the victims. The item "Kids cannot be blamed for misbehaving if their friends pressured them to do it" measured displacement of responsibility. "Some people deserve to be treated like animals" measured proclivity for dehumanization.

The scale items encompassed diverse forms of detrimental conduct in a variety of contextual conditions and in different types of social relationships. The detrimental activities involved physically injurious and destructive conduct, verbal abuse, deception, and theft. The social contexts encompassed educational, familial, community, and peer relations. For each of the 32 items, children rated the strength of their endorsement or

repudiation of moral exonerations of detrimental conduct. Their responses were scored on a 5-point scale ranging from 1 (*strongly agree*) to 5 (*strongly disagree*) for the various disengagement practices. High scores signify a high level of moral disengagement, and low scores signify a high level of moral engagement. Factor analysis of the items revealed a one-factor structure with all items loading on the principal factor. Therefore, we summed responses to the items to form a composite measure of moral disengagement. The alpha reliability coefficient for this measure was .86.

Transgressive Behavior

Transgressive behavior was measured initially and 2 years later by the Delinquency subscale of the Child Behavior Checklist developed by Achenbach and Edelbrock (1978). Both the reliability and the predictive validity of this measure of transgressive behavior are well established (Achenbach, McConaughay, & Howell, 1987). The subscale, comprising 22 items for boys and 19 items for girls, covers a wide range of transgressive behaviors, including physical and verbal aggression, theft, cheating, lying, destructiveness, truancy, and use of alcohol and drugs. The participants recorded whether they engaged in such antisocial activities and, if they did, whether they did so only occasionally or often. The reliability coefficients were .73 for girls and .85 for boys at the initial assessment and .82 for female adolescents and .87 for male adolescents at the second assessment.

Results

Prior to conducting the analyses, we examined the data for univariate and multivariate outlying cases by using the procedure devised by Tabachnick and Fidell (1989). Two participants with extreme standard scores on transgressive behavior were detected and eliminated from subsequent analyses. Table 1 presents the means and standard deviations for the various sociocognitive factors and the matrix of correlations between them and transgressive behavior at both time periods.

One-way analyses of variance of gender variations revealed significant differences on all of the assessed variables except perceived social efficacy. Compared with girls, boys expressed lower academic self-efficacy, $F(1, 562) = 9.58, p < .01$, and lower self-regulatory efficacy, $F(1, 562) = 13.73, p < .001$; were less prosocial, $F(1, 562) = 29.68, p < .0001$; were more prone to disengage moral self-sanctions for harmful conduct, $F(1, 562) = 9.09, p < .01$; were more prone to ruminative self-arousal, $F(1, 562) = 9.91, p < .01$, and irascible affectivity, $F(1, 562) = 7.35, p < .01$; and engaged more heavily in transgressive activities in both the initial phase, $F(1, 562) = 69.50, p < .0001$, and the

Table 1
Means, Standard Deviations, and Correlation Matrix for the Various Sociocognitive Self-Regulatory Factors and Transgressive Behavior Assessed Concurrently and Longitudinally

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9
1. Academic efficacy	3.89	0.64	—	.43***	.25***	.41***	-.23***	-.18***	-.11*	-.45***	-.31***
2. Social efficacy	4.22	0.57		—	.22***	.31***	-.03	-.07	-.01	-.16***	-.06
3. Self-regulatory efficacy	4.12	0.82			—	.12**	-.18**	-.02	-.05	-.28***	-.27***
4. Prosocial behavior	24.34	3.60				—	-.19***	-.17***	-.14***	-.25***	-.22***
5. Moral disengagement	93.35	20.52					—	.32***	.31***	.33***	.31***
6. Irascibility	59.96	14.24						—	.49***	.36***	.27***
7. Hostile rumination	64.16	18.02							—	.28***	.22***
8. Transgressive behavior 1	6.77	5.69								—	.52***
9. Transgressive behavior 2	6.22	5.67									—

* $p < .05$. ** $p < .01$. *** $p < .001$.

longitudinal phase of the study, $F(1, 562) = 65.43, p < .0001$. In a Gender \times Time multivariate analysis of transgressive behavior, neither the main effect of time nor the Gender \times Time interaction was significant.

Paths of Influence

We tested the posited causal structure on the covariance matrices by using the EQS program (Bentler, 1995). Level of engagement in transgressive behavior at the longitudinal time point was the distal outcome variable. We analyzed the structural model by using the multiple-groups model approach, which estimated simultaneously the same pattern of relationships among variables in the two samples of boys and girls. Equivalence is evaluated by constraints that impose identical estimates for the model's parameters (Byrne, 1994; Scott-Lennox & Scott-Lennox, 1995). In EQS, the plausibility of these equality constraints is examined by the Lagrange Multipliers test (Bentler, 1995).

Figure 2 presents the results of the path analysis using Time 1 predictors of Time 2 transgressive conduct. In accord with the posited structural model, perceived academic self-efficacy was concurrently and distally linked to low engagement in transgressive behavior both directly and through the mediation of prosocialness and strong adherence to moral self-sanctions. Similarly, a high sense of efficacy to withstand peer pressure for transgressive activities curbed engagement in transgressive behavior at the initial and the longitudinal phase both directly and by supporting moral engagement. As we further hypothesized, the desistive impact of perceived social self-efficacy on transgressive behavior was mediated through enhancement of prosocialness.

Most of the posited structural links among the mediating factors were verified. Children with a strong prosocial orientation refrained from moral disengagement. Low prosocialness and facile moral disengagement were accompanied by hostile ruminative

affectivity, which, in turn, contributed both concurrently and longitudinally to variance in transgressive behavior.

The main departure from the posited conceptual model was that perceived academic and self-regulatory efficacy were mediational rather than directly linked to ruminative affectivity through prosocialness and moral disengagement. The effect of prosocialness on transgressive behavior was also mediated through ruminative affectivity. Moral disengagement contributed to concurrent transgressiveness through ruminative affectivity but operated independently on distal transgressive behavior. The analysis revealed no omitted paths of influence from those specified in the structural model. The posited causal structure was fully replicated across gender, although moral disengagement contributed more heavily to aggression proneness in boys than in girls, and prosocialness operated as the counteractor of ruminative affectivity in girls.

The trimmed model provided an excellent fit to the empirical data as shown by all the different goodness-of-fit indexes considered. These tests yielded a nonsignificant $\chi^2(53, N = 564) = 55.36, p = .39$; a nonnormed fit index of .99; a comparative fit index of .99; and a root-mean-square error of approximation of .009 (.00, .029). The model accounted for 36% of the variance in Time 1 transgressiveness for both boys and girls, 27% of the variance in Time 2 transgressiveness for boys, and 26% of the variance in Time 2 transgressiveness for girls.

Alternative Models

A number of alternative causal models were also tested. In one model, prior transgressiveness was assigned causal primacy affecting subsequent transgressiveness directly and through its impact on perceived self-efficacy, prosocialness, moral disengagement, and ruminative affectivity. The second model conferred causal primacy on ruminative affectivity, which contributed to distal

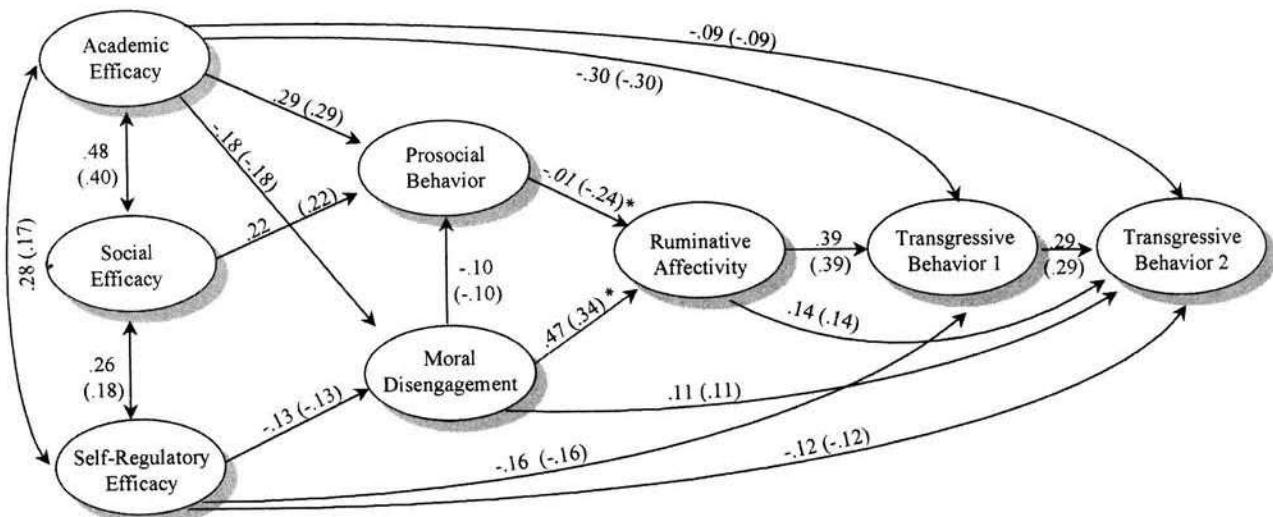


Figure 2. Path analysis of the patterns of influence through which perceived self-efficacy and moral disengagement affect transgressive conduct. The first path coefficient on each of the structural links is for boys; the second coefficient in parentheses is for girls. All of the path coefficients are significant at the $p \leq .05$ level, except that boys' prosocial behavior was unrelated to ruminative affectivity. This nonsignificant path coefficient is in italic type. The coefficients with an asterisk on the paths differ significantly between boys and girls.

transgressiveness directly and through its influence on the mediating factors described above. In a third model, moral disengagement was the causally primary factor operating on distal transgressiveness independently and through the mediating factors.

In each case, the alternative causal models provided a poorer fit to the empirical data than did the posited structural model. All of the chi-square tests were significant, and these alternative models fared less well on the other indexes of goodness of fit. Further tests of the aforementioned alternative models, but with reversed direction of causation in which prosocialness curbed moral disengagement, similarly provided a poorer fit to the data.

Discussion

The findings of the present study lend considerable support for the posited paths of influence through which self-regulatory factors contribute to level of transgressiveness. With a few exceptions, not only were the links in the postulated structural model empirically verified, but the model provided a better fit to the empirical data than did several plausible alternative models.

Male adolescents, who were more heavily engaged than female adolescents in transgressive activities, differed on self-regulatory factors assigned a prominent role in social cognitive theory in the self-management of transgressive conduct. The male adolescents had lower perceived academic and self-regulatory efficacy, were more prone to disengage moral self-sanctions from detrimental conduct, were quicker to rouse themselves to anger through hostile rumination, and were less prosocially oriented. These differences in self-regulatory influence add to the growing body of evidence that sociocognitive factors account for a major share of the variance in gender differences in detrimental conduct (Bettencourt & Kernahan, 1997; Bettencourt & Miller, 1996; Bussey & Bandura, 1999; Eagly & Steffen, 1986; Hyde, 1984; Perry, Perry, & Boldizar, 1990). Although male and female participants differed in level of self-regulatory determinants, the posited causal structure was essentially replicated across gender.

Perceived academic and self-regulatory factors concurrently and longitudinally curtailed transgressiveness both directly and by fostering prosocialness and adherence to moral self-sanctions for harmful conduct. As we hypothesized, the impact of perceived social self-efficacy was mediated through prosocialness. Adolescents who related prosocially to others and who eschewed moral disengagement were disinclined to engage in angering and retaliative rumination. Ruminative affectivity was both concurrently and longitudinally linked to transgressive conduct. Disengagement of moral self-sanctions also contributed independently to subsequent transgressiveness.

Prior research has shown that the various facets of perceived self-efficacy and moral disengagement operate as influential contributors to academic achievement (Bandura et al., 1996b). Evidence that these factors also operate influentially in transgressive conduct adds to the explanatory and predictive generality of sociocognitive theory.

Only two paths in the structural model differed by gender. Moral disengagement was accompanied by ruminative affectivity for both boys and girls, but the link was stronger for boys. The magnitude of difference may reflect the lower level and lesser variance on both factors for the girls. Prosocialness was linked to low ruminative affectivity for girls but not for boys. Differential

associational networks may account for this gender difference. Peer groups are not homogeneous. Adolescents who are irascible and hostile ruminative may behave prosocially with like-minded aggressive peers to whom they gravitate. In contrast, for adolescents who repudiate harmful conduct, their prosocialness is likely to create little occasion both cognitively and through amicable affiliations for anger arousal and vindictive ideation.

A second possible interpretation is in terms of the affective quality of peer relationships. Girls are more likely than boys to engage their peers in discussions of their negative feelings toward others (Buhrmester, 1990; Sharabany, Gershoni, & Hofman, 1981; Tannen, 1990). Talking things out may weaken the intensity of troublesome experiences, permit corrections of misconstruals, and suggest socially reparative actions. Ruminative hostility is likely to flourish in the absence of ameliorative social feedback. Gender differences in the various facets of prosocialness in the present study are in accord with the latter interpretation. Boys and girls do not differ in the sociability facets, but girls are substantially more consoling, sharing, helpful, and affectionately demonstrative. Compatible associativity and emotional supportiveness may, of course, operate as complementary rather than competing factors in gender differences in how prosocialness is linked to ruminative affectivity. Prosocialness would thus have differential effects on ruminative affectivity depending on the types of peers with whom one associates and their level of emotional disclosure.

Several of the hypothesized paths in the structural model were not verified. Perceived academic and self-regulatory efficacy affected ruminative affectivity through their positive impact on prosocialness and curtailment of moral disengagement rather than directly. Apparently, the more proximally germane empathic and moral cognitive processes had determinative priority. Prosocialness mediational but not directly affected transgressiveness by lessening ruminative affectivity and readiness to disengage moral self-sanctions. The nature of the affiliative linkages discussed above may account for the absence of a residual direct link to transgressiveness. Transgressive adolescents may be prosocial with peers who are antisocially oriented (Cairns & Cairns, 1991; Claes & Simard, 1992; Elliott, Huizinga, & Ageton, 1985), as are nondeviant adolescents whose peer associates are disinclined to engage in serious wrongdoing. Seriously antisocial individuals may not be especially empathic and caring toward anyone (Marcus, 1996), but adjudicated delinquents fall at the extreme of unstable social connectedness.

The old adage that birds of a feather flock together professes the significance of differential peer bonding. Beliefs of personal efficacy affect social relationships. For example, adolescents with a high sense of self-regulatory efficacy communicate openly with their parents about predicaments they face outside the home and enlist their parents' guidance and support in managing peer pressures to engage in detrimental activities (Caprara et al., 1998). The role of sociocognitive influences in the selection and structuring of peer relationships and whether those social ties promote deviancy or prosocialness clearly warrant study.

Moral disengagement affected transgressiveness through its influence on ruminative affectivity in the short run, but directly in the long run. This pattern of linkage suggests that as cognitive modes of moral disengagement get routinized, they no longer need to operate through self-arousing affective states. A similar regulatory shift over time is observed in other forms of adaptation, such

as avoidant lifestyles, in which emotional arousal initially plays a facilitative role, but as the behavior becomes habitualized, it is performed independently of emotional arousal (Bandura, 1986). In the perpetration of large-scale inhumanities through collective moral disengagement, pernicious conduct gets routinized to the point where it is carried out with unexcited efficiency (Andrus, 1969; Bandura, 1991; Kelman, 1973).

The participants rated the extent to which they engaged in transgressive activities and used alcohol and drugs. In the transition to junior high school, their socioeducational realities become more diverse. They have multiple teachers who are a less reliable evaluative source because their observations are largely limited to behavior in the particular course that they teach. Moreover, they have little firsthand accessibility to transgressive activities and substance use, which occur mainly outside the school. The grouping of classmates also varies across the different academic course arrangements. However, data from the elementary school period, in which social arrangements are more uniform, revealed significant congruence of ratings of aggressive and transgressive conduct across sources and methods. The children's self-ratings correlated .51 with parental ratings, .24 with teachers' ratings, and .37 with peers' sociometric ratings. The high correlation with ratings by parents, who have the highest accessibility to their children's behavior, speaks most strongly to the reliability of participants' self-ratings. The findings of other studies attest to the generalizability of particular paths of influence in the structural model. In a national longitudinal study in Korea, children who had a low sense of academic and self-regulatory efficacy and were facile to moral disengagement showed a high propensity for antisocial conduct (Kwak & Bandura, 1997). Elliott and Rhinehart (1995) found that proclivity to moral disengagement predicted both felony and misdemeanor assaults and thefts regardless of age, sex, race, religious affiliation, and social class.

Research on the effects of situational provocation has added substantially to our understanding of the conditions in which induced anger arousal is likely to spur aggressive actions (Berkowitz, 1993; Rule & Nesdale, 1976; Zillmann, 1988). Cognitions have been shown to operate as significant mediators of situational incitements (Baumgardner, 1990; Crick & Dodge, 1994; Ferguson & Rule, 1983). Their contribution to aggression enhancement has been studied primarily in terms of the cognitive labeling of emotional states in theories of emotion and in terms of ascriptions of causality and blame for detrimental conduct in attribution theory. Social cognitive theory of aggression broadens the cognitive contribution by adding the self-activation function of cognition (Bandura, 1973, 1986).

The findings of the present study underscore the influential role of cognitive self-arousal in fostering detrimental conduct. Prone-ness to angering and retaliative rumination was positively linked to transgressiveness both concurrently and over time. It also played a mediating role in the impact of prosocialness and moral disengagement on transgressive behavior.

As we previously noted, situationally induced anger dissipates over time. If provocation produced only transitory arousal, it would be of little importance. What gives enduring significance to past angering experiences is that they create proneness for affective rearousal on future occasions. Several rearousal mechanisms have been proposed as explanatory contenders. One explanation is that, through associative coupling, situational cues alone become

conditioned activators (Berkowitz, 1993). Situational reminders of maddening experiences can certainly rouse one to anger. Whether the situationally cued linkage is initially cognitively mediated but then becomes thoughtless through routinized rearousal, is always cognitively mediated, or is thoughtless from the outset and remains so thereafter is open to speculation and empirical verification. In social cognitive theory (Bandura, 1999b), efficient functioning requires a dual-process mix of routinized action patterns under lower sensorimotor control and mindful activity regulated cognitively.

Affect arousal is often construed in terms of a state-trait distinction reflecting situational and dispositional activation. Social cognitive theory treats personal dispositions, such as proneness to ruminative affectivity, as dynamic self-arousal processes (Bandura, 1999b). The nature and locus of the events that set off perturbing thought processes may differ currently and on future occasions. But the self-arousal mechanism is similarly involved at different time points regardless of whether self-arousal is situationally prompted and experienced as a current state or later cognitively activated by remembrances of past indignities. Experimental investigations and field studies of thought sampling of self-arousal linked to contextual circumstances, accompanying trains of thought, and adaptive actions can add to our understanding of how negative affectivity contributes to detrimental conduct.

Everyday life is strewn with experiences that generate negative affect. People do not act naively on anger and vengeful thoughts. If every angering experience or vindictive thought triggered aggressive acts, individuals would be endlessly embroiled in serious social and legal troubles. Adaptiveness requires self-management of affective states through exercise of self-regulatory capabilities. There is a major difference between possessing self-regulatory skills and unwaveringly applying them in the face of stiff peer pressure for transgressive activities and maddening provocation. The findings of the present study verify the influential role of perceived self-regulatory efficacy in the management of peer transgressive pressures.

Self-efficacy theory is currently being extended to the self-regulation of affective states. The self-management of affect takes several forms (Bandura, 1997). People influence their emotional states by whether they construe events in affect-laden or more benign ways (Crick & Dodge, 1994; Lazarus & Folkman, 1984). The second mode of self-arousal operates through the trains of thoughts that people conjure up and dwell on (Bandura, 1973; Wegner & Pennebaker, 1993). People can also moderate by palliative means their affective states once they arise without altering their determinants.

Self-management of affect does not rely solely on cognitive means, however. People exert control over their emotional well-being by the environments that they select and create through their styles of behavior (Bandura, 1999b). For example, aggressive individuals manage to create by their actions hostile environments, whereas amicable individuals generate harmonious social milieus (Raush, 1965). Another form of affect regulation by behavioral means is concerned with whether people give vent to their emotions or restrain their expression (Gross, 1998).

Self-efficacy to manage one's emotional life is concerned with perceived capability to regulate both positive and negative emotions through construal, cognitive, palliative, and behavioral means (Bandura, 1997). Preliminary research in other domains of func-

tioning has revealed that emotional self-regulatory efficacy contributes to variance in depression and prosocial behavior independently of perceived social efficacy (Caprara et al., 1999). Because we have clarified the contributory role of several aspects of perceived personal efficacy in the present study, an appropriate next phase for research is to evaluate the unique contribution of perceived self-efficacy for affect regulation in the causal structure of transgressive behavior.

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Received April 11, 2000

Revision received July 31, 2000

Accepted August 2, 2000 ■

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Role of Affective Self-Regulatory Efficacy in Diverse Spheres of Psychosocial Functioning

Albert Bandura, Gian Vittorio Caprara, Claudio Barbaranelli, Maria Garbino, and Concetta Pastorelli

This prospective study with 464 older adolescents (14 to 19 years at Time 1; 16 to 21 years at Time 2) tested the structural paths of influence through which perceived self-efficacy for affect regulation operates in concert with perceived behavioral efficacy in governing diverse spheres of psychosocial functioning. Self-efficacy to regulate positive and negative affect is accompanied by high efficacy to manage one's academic development, to resist social pressures for antisocial activities, and to engage oneself with empathy in others' emotional experiences. Perceived self-efficacy for affect regulation essentially operated mediational through the latter behavioral forms of self-efficacy rather than directly on prosocial behavior, delinquent conduct, and depression. Perceived empathic self-efficacy functioned as a generalized contributor to psychosocial functioning. It was accompanied by prosocial behavior and low involvement in delinquency but increased vulnerability to depression in adolescent females.

The capacity for self-regulation is one of the core features of human agency in social cognitive theory (Bandura, 1999a, 2001). Perceived self-efficacy plays a pivotal role in this process of self-management because it affects actions not only directly but also through its impact on cognitive, motivational, decisional, and affective determinants. Beliefs of personal efficacy influence what self-regulative standards people adopt, whether they think in an enabling or debilitating manner, how much effort they invest in selected endeavors, how they persevere in the face of difficulties, how resilient they are to adversity, how vulnerable they are to stress and depression, and what types of choices they make at important decisional points that set the course of life paths.

A growing body of research has documented the contributing role of self-efficacy beliefs in self-development, adaptation, and change at different phases of the life course (Bandura, 1995, 1997). Children's beliefs in their efficacy contribute uniquely to variance in developmental outcomes

within the complex interplay of socioeconomic, familial, educational, and peer influences (Bandura, Barbaranelli, Caprara, & Pastorelli, 1996b, 2001). Self-efficacy beliefs are developed and strengthened by mastery experiences, social modeling, and persuasive forms of social influences. Diverse intervention programs attest to the efficacy-enhancing impact of these modes of influence (Bandura, 1997; Schunk, 1989). In cross-cultural studies, the functional role of efficacy beliefs and the processes through which they operate are replicated in both individualist and collectivist cultural systems (Bandura, 2002). The present study extended this line of research to the role of affective self-regulatory efficacy in the management of the transitional stressors of adolescence.

Adolescence is an especially taxing transitional phase that presents a host of new challenges (Bandura, 1997; Eccles & Midgley, 1989; Furstenbeerg, Eccles, Elder, Cook, & Sameroff, 1999; Gruber, Brooks-Gunn, & Peterson, 1996). Adolescents have to manage major biological, educational, and social role transitions concurrently. Learning how to deal with puberty changes, differently structured school environments and enlarged peer networks, and emotionally invested partnerships and sexuality become important. With growing independence, adolescents commonly experiment with risky activities, some of which may take antisocial forms. Gender differences in depression begin to emerge in adolescence, with girls exhibiting higher vulnerability to depression. This is also a time when older

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The research reported in this article was supported by grants from the Grant Foundation, the Spencer Foundation, and the Jacobs Foundation. We thank Laura Carstensen and James Gross for their helpful comments on an earlier version of this article.

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adolescents have to cope with the demands of emerging adulthood. How well adolescents develop and exercise their personal efficacy during this formative period can play a key role in setting the course their life paths take (Bandura, 1997).

For years psychological theorizing and research have centered on how the mind works in processing, representing, organizing, and retrieving information. To the extent that emotions were addressed, they were usually treated as consequences of actuating events rather than as determinants of psychosocial functioning. A comprehensive theory must also address the role played by affect regulation in human self-development and change. More recent lines of research have clarified the impact of affect regulation on attentional, cognitive, and motivational processes, and how failures in affect regulation give rise to emotional and psychosocial dysfunctions (Bower, 1992; Carstensen, 1992; Gross & Munoz, 1995; Larsen, 2000; Nolen-Hoeksema, 1991). Affect is often the basis of social ties and their durability that influences the course of lives (Bandura, 1986). Other studies have examined the development of emotional competence as reflected in the ability to discern emotions, to understand the social consequences of one's emotionally expressive behavior, and to manage one's emotional states (Mayer & Salovey, 1997; Saarni, 1999).

Different conceptual models have been proposed concerning the underlying structure of affective experiences (Russel & Carroll, 1999; Watson & Tellegen, 1985). Common among these models is an evaluative dimension representing positive and negative affect. The regulation of affect has important intrapersonal, communicative, and behavioral functional value (Bandura, 1986; Caprara, 2002; Larsen, 2000). Therefore, the perceived self-efficacy to manage these basic affective states was assigned a pivotal role in the posited causal structure tested in the present study.

It is one thing to possess self-regulatory skills but another to be able to adhere to them in taxing and perturbing situations. A resilient sense of efficacy is needed to overrule emotional and psychosocial subverters of self-regulative efforts (Bandura, 1997; Zimmerman, Bandura, & Martinez-Pons, 1992). The present research, therefore, sought to clarify the structural paths of influence through which perceived self-efficacy for affect regulation operates in concert with perceived self-efficacy for behavioral regulation in governing diverse forms of adaptation encompassing affective, prosocial, and transgressive spheres of functioning. This program of research broadens and extends developmentally the analysis

of perceived self-efficacy to the regulation of one's affective life and its impact on psychosocial functioning. It is conducted within the social functional perspective of social cognitive theory of emotion (Bandura, 1986, 1992).

In the interpersonal transactions of everyday life, socioculturally constructed expressive rules specify the conditions under which certain types of emotional displays are normative and others are deviant (Thoits, 1989). Expressions of positive and negative affect generally have different social effects. Everyday life is strewn with situational provocations and stressors that generate negative affect. Negative affect is a natural part of everyday life requiring effective self-management through self-regulatory capabilities. Unrestrained venting of anger, disparaging others, and voicing jealousy would get one endlessly embroiled in social, if not legal, troubles. If fear automatically triggered immobility or avoidance behavior, personal development and accomplishments would be severely constrained because most significant pursuits involve some risks and evaluative consequences that are fear arousing.

Unlike the often discordant and divisive effects of negative affect, positive affect promotes social connectedness and bonding. Expression of affection, liking, and joyfulness cultivates personal attractiveness. By fostering affiliative relationships, positive affect can enhance cognitive functioning, help buffer the perturbing effects of aversive experiences, and facilitate adaptive coping (Folkman & Moskowitz, 2000; Fredrickson, 1998; Isen, 1987). Enabling supportive relationships enhances a sense of personal efficacy that, in turn, influences the quality of affective and behavioral functioning. Indeed, mediational analyses show that social support produces beneficial outcomes only to the extent that it enhances perceived coping self-efficacy (Bandura, 2002).

Affective states are often depicted as operating directly on psychosocial functioning, with negative affect producing adverse effects and positive affect producing beneficial effects. Adaptive functioning requires discriminative regulation of affect. People differ widely in how well they manage the emotional experiences of everyday life. A growing body of evidence indicates that perceived self-regulatory efficacy is an important factor in the variable behavioral effects of negative affect. For example, negative affect precipitates binge eating often in bulimics of low perceived self-regulatory efficacy, but infrequently in those of high perceived self-regulatory efficacy (Love, Ollendick, Johnson, & Schlezinger, 1985; Schneider, O'Leary, & Agras, 1987). In coping with threats, individuals of high

perceived self-efficacy perform intimidating activities successfully despite anxiety arousal (Bandura, 1997; Pajares & Valiante, 1997; Williams, 1995).

The mediating role of perceived self-efficacy is also evident in the self-management of depression. Observational studies of interactions of clinically depressed mothers with their infants revealed that mothers' beliefs in their parenting self-efficacy predict how competently they perform caretaking activities after controlling for social and marital support and severity of depression (Teti & Gelfand, 1991). The findings from these diverse lines of research underscore the influence of self-efficacy in regulating the impact of affect.

To test the generality of the self-efficacy theory of affect regulation, diverse psychosocial outcomes were selected for study. They included prosocial behavior and antisocial conduct as behavioral effects, and depression as an emotional aspect of life. Figure 1 summarizes schematically the direct and mediated paths of influence in the posited structural model. The subsequent discussion provides the conceptual rationale for each structural path.

The first segment of the posited model specifies the impact of perceived efficacy to regulate affect on beliefs in ones' capabilities to manage academic

demands, transgressive peer pressures, and empathic feelings. Although perceived self-efficacy to regulate affective states can influence the latter domains of functioning directly, for reasons already given, most of its impact was hypothesized to be mediated through more behaviorally oriented efficacy beliefs.

Affective states have a widely generalized impact on judgments of personal efficacy. Experimentally induced negative affect diminishes perceived self-efficacy across different spheres of functioning, whereas positive affect enhances perceived self-efficacy (Kavanagh & Bower, 1985). The more intense the induced affect, the greater is its impact on self-efficacy beliefs (Forgas, Bower, & Moylan, 1990; Salovey & Birnbaum, 1989). The higher the affect-based sense of personal efficacy, the stronger is the engagement in activities (Bandura, 1997; Kavanagh, 1983). It was, therefore, predicted that perceived self-efficacy to manage positive affect would foster perceived academic, social self-regulatory, and empathic efficacy. By contrast, a weak sense of efficacy to manage negative affect would undermine the behaviorally oriented efficacy beliefs.

The second segment of the posited structural model specified the functional relations of behaviorally oriented efficacy beliefs to the different spheres

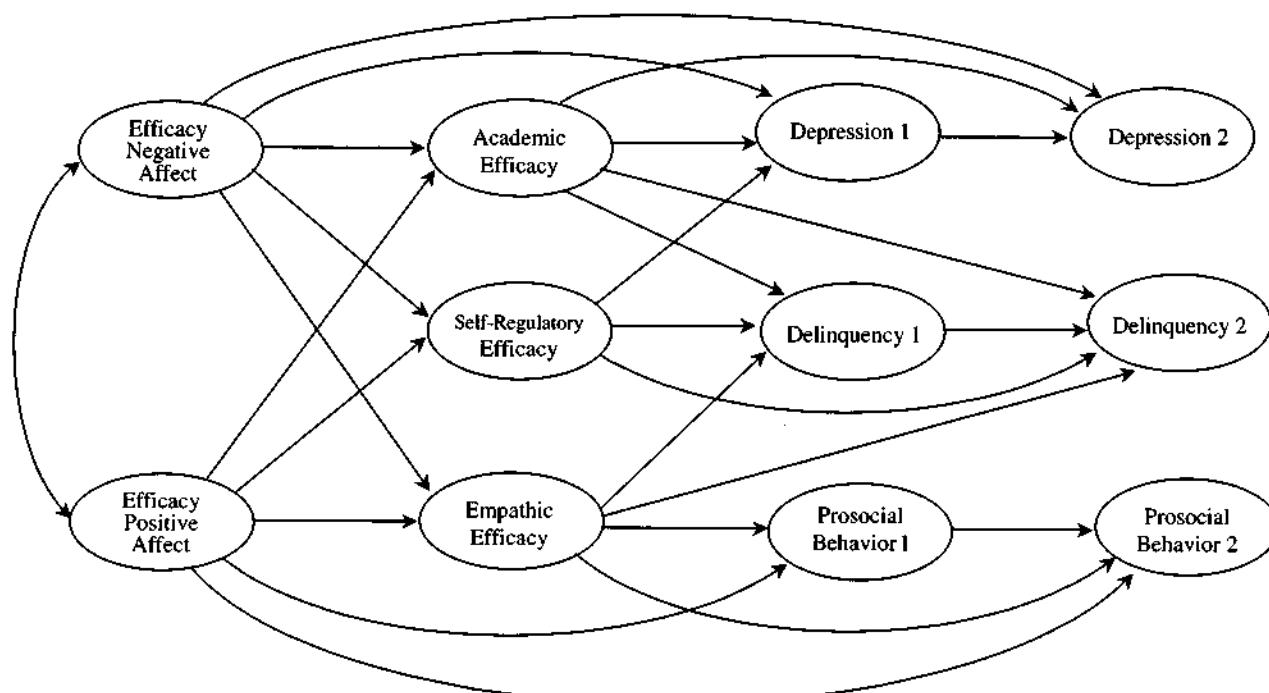


Figure 1. Posited causal structure through which perceived self-efficacy for affect regulation operating in concert with action-oriented efficacy beliefs influence depression, delinquent conduct, and prosocial behavior.

of psychosocial functioning. Perceived academic, social self-regulatory, and empathic efficacy were hypothesized to affect depression, delinquent conduct, and prosocialness both concurrently and prospectively. Perceived academic self-efficacy plays a mitigating role in depression and transgression. A secure sense of academic self-efficacy reduces vulnerability to depression by promoting academic attainments and altering the construal and management of failure (Bandura, Pastorelli, Barbaranelli, & Caprara, 1999). For individuals of high efficacy, failures, setbacks, and obstacles are viewed as surmountable and, therefore, spark redoubled effort rather than discouragement and despondency (Bandura, 1991). For individuals of low efficacy, failure undermines motivation and breeds despondency.

Difficulties in the academic sphere often result in disengagement from academic activities and gravitation to peers who favor transgressive pursuits (Dishion, 1990; Hinshaw, 1992; Jessor, Donovan, & Costa, 1991; Patterson, Capaldi, & Bank, 1991). It is students' beliefs in their academic capabilities rather than their actual academic performances that tend to shape the course of their developmental trajectories (Bandura, Barbaranelli, Caprara, & Pastorelli, 2001). With regard to antisocial proclivities, a low sense of academic efficacy increases risk by involvement in transgressive activities and substance use (Bandura et al., 1996a; Bandura, Barbaranelli, Caprara, Pastorelli, & Regalia, 2001).

As low sense of efficacy to ward off peer pressure to pursue detrimental activities creates vulnerability to troublesome social influences. Individuals who feel at a loss to manage the predicaments they get caught in readily give in to inducements for antisocial forms of conduct (Bandura et al., 1996b; Bandura, Barbaranelli, Caprara, Pastorelli, et al., 2001). Perceived self-regulatory inefficacy predicts transgressive behavior after controlling for prior level of transgressive behavior and quality of familial relationships (Caprara, Regalia, & Bandura, 2002).

People's efficacy for being empathetic was also hypothesized to play an influential role in their social and emotional lives. Empathic self-efficacy is not simply a reactive process of cognitive perspective taking but rather an active self-involvement in the emotional life of others (Bandura, 1986). Interpersonal experiences during formative years, in which people experience joys and suffer pain in a correlational way, create the foundation for empathic responsiveness to the plight of others (Bandura, 1992, in press; McHugo, Smith, & Lanzetta, 1982). Conversely, discordant emotional experiences, as

when coactors' joyful triumphs spell sorrowful loses for oneself and coactors' sorrow spells joy for oneself, create counterempathic responsiveness (Englis, Vaughan, & Lanzetta, 1982; Lanzetta & Englis, 1989). Empathic responsiveness fosters prosocial behavior (Hoffman, 2001; Mussen & Eisenberg, 2001; Staub, 1971). Perceived self-efficacy for empathic response can also deter delinquent conduct by activating vicarious distress over the suffering of others and fostering social networks conducive to harmonious relationships (Bandura, 1992, 1999b; Feshbach & Feshbach, 1986; Miller & Eisenberg, 1988).

To summarize the posited structural model, perceived self-efficacy to regulate positive and negative affect influences depression, delinquent conduct, and prosocial behavior both directly and mediational by their impact on perceived academic self-efficacy, resistive self-regulatory efficacy, and empathic self-efficacy. The inclusion of diverse spheres of perceived self-efficacy and multiple developmental outcomes within the same design permitted tests of cross-domain functional relations.

Method

Participants

The participants were 464 older adolescents, 213 males and 251 females, ranging in age from 14 to 19 years, with a mean age of 16 years at Time 1, and ranging in age from 16 to 21 with a mean age of 18 years at Time 2, 2 years later. To avoid potential selection biases, all the students who were originally in the 4th and 5th grades in one of two large elementary schools serving a community located near Rome were the source of the participants when they were enrolled in the middle school at the Time 1 assessment. All of the families consented to have their children participate in the research. The project included a staggered, multiple cohort design with three cohorts assessed at two time points. At the time of the second measurement, 95% of the participants were enrolled in several high schools serving the community. The remaining participants had left school and were employed in the community.

The participants varied widely in socioeconomic background drawn from a community that represents a microcosm of the larger society. It contained families of skilled workers, farmers, professionals, and local merchants and their service staffs. Eighteen percent were in professional or managerial ranks, 40% were merchants or employees in various

types of businesses, 17% were skilled workers, 18% were unskilled workers, 5% were retired, and 2% were unemployed. The community comprises a homogenous Italian population. The families live together in the community rather than being segregated by residence and schools based on socioeconomic status. The socioeconomic diversity of the sample and high residential integration adds to the generalizability of the findings.

This community adheres to a stringent consent procedure for research conducted in the schools. A research proposal must gain approval from a school council composed of parent and teacher representatives at the junior and high school levels. In addition, parents must give consent and children are free to decline to take part. Informed consent was obtained from 100% of the families, with 88% of the sample reassessed at Time 2. The attrition was mainly due to relocation from the area or absence from school at the time of the assessments. In ANOVA, the latter children did not differ significantly from their counterparts on any of the variables in the initial assessment, nor did the groups differ in the covariance matrices as tested by the Box M test for homogeneity of covariance matrices.

The study was explained to parents and adolescents as a project designed to gain better understanding of adolescent development. Participants were administered the sets of scales measuring the variables of theoretical interest by three female researchers during specially scheduled sessions in a school. The set of five self-efficacy predictors was measured at Time 1, and the three psychosocial domains of functioning were measured at both Time 1 and Time 2.

Participants' beliefs in their personal efficacy were measured for five domains of functioning. For the items in the different sets of efficacy scales, participants rated the strength of their belief in their capability to execute the designated activities, using a 5-point response format ranging from 1 (*perceived incapability*) to 5 (*complete self-assurance in one's capability*).

Affective Self-Regulatory Efficacy

Affective self-regulatory efficacy was measured by 14 items concerning perceived capability to manage one's emotional life. These included perceived efficacy to discern one's emotional states, understand one's feelings toward others, and manage the expression of positive and negative affect.

Perceived self-efficacy to manage positive affect was measured by five items in terms of perceived

capability to express liking and affection toward others, to get oneself to express enthusiasm and enjoyment, and to feel satisfaction with personal accomplishments. The item "I can show liking for a person toward whom I am attracted" assessed perceived efficacy to express fondness.

Perceived self-efficacy to regulate negative affect was assessed by nine items in terms of perceived capability to manage negative affect in the face of anxiety-arousing threats, anger provocation, rejection, and disrespect, and to control worrisome ruminations when things go wrong. Other items of affective self-management measured perceived efficacy to calm oneself in taxing situations and to recover quickly one's emotional well-being after suffering perturbing experiences. "I can calm myself in stressful situations" is a sample item.

Perceived Academic Self-Efficacy

Participants' beliefs in their efficacy to direct their academic activities included high loading on 15 items measuring perceived efficacy to master different academic areas of coursework; to fulfill personal, parents', and teachers' academic expectations; and to regulate their own learning activities. The items concerned with self-directed learning assessed children's efficacy to arrange environments conducive to learning, to plan and to organize their academic activities, to use cognitive strategies to enhance understanding and memory of the material being taught, to seek pertinent information and get teachers and peers to help them with academic problems when needed, to motivate themselves to do their schoolwork, to get themselves to complete scholastic assignments within set deadlines, and to pursue academic activities when there are other interesting things to do. The item "How well can you get teachers to help you when you get stuck on schoolwork?" measured perceived self-efficacy to enlist enabling social resources. The item "How well can you study when there are other interesting things to do?" measured children's perceived efficacy to motivate themselves for academic pursuits in the face of competing attractions.

Resistive Self-Regulatory Efficacy

Perceived resistive self-regulatory efficacy centered on adolescents' beliefs in their efficacy to ward off social inducements for transgressive conduct. This perceived capability was assessed by 10 items, which measured perceived efficacy to resist peer pressure to engage in high-risk activities involving

the use of alcohol and drugs, sexual activity, theft of property, and various other types of transgressive activities that can get them into serious trouble. For example, the following item assessed perceived self-regulatory efficacy to rebuff pressures exerted by peers to use drugs: "How well can you resist using drugs even if your friends push you to use them?"

The factor structures of the academic and resistive self-regulatory efficacy scales have been replicated cross-nationally with Italian, Hungarian, and Polish children (Pastorelli et al., 2001). The predictive validity of these forms of perceived self-efficacy has been verified in prior studies both cross-sectionally (Bandura et al., 1996a, 1996b; Caprara et al., 1998) and prospectively (Bandura, Barbaranelli, Caprara, & Pastorelli 2001; Bandura, Barbaranelli, Caprara, Pastorelli et al., 2001; Bandura et al., 1999; Caprara 2001; Caprara et al., 2002; Zimmerman et al., 1992).

Empathic Self-Efficacy

Perceived empathic self-efficacy was measured by 12 items in terms of perceived capability to sense another person's feelings and need for emotional support, to discern coactors' emotional expressions, to experience emotions from another person's perspective, to respond empathetically to others' distress and misfortune, and to be sensitive to how one's actions affect others' feelings. The sample item "I can experience how a person in trouble feels" assessed perceived empathic capability for empathic distress.

To investigate the dimensionality of the sets of self-efficacy items, a principal factor analysis with Oblimin rotation was performed. Only items loading .40 or higher were considered for inclusion in a factor. The actual item loadings in the factors ranged from .45 to .78. The results revealed a five-factor structure corresponding to the posited five domains of self-efficacy functioning, each representing a single factor. The percentage of the total variance explained by these different self-efficacy scales was 11% for empathic efficacy, 11% for academic efficacy, 9% for resistive self-regulatory efficacy, 9% for efficacy to regulate negative emotions, and 5% to manage positive emotions.

The alpha reliability coefficients for the self-efficacy factor scales were uniformly high. The coefficients were .88 for regulating negative affect, .82 for managing positive affect, .89 for empathic efficacy, .88 for academic efficacy, and .86 for resistive self-regulatory efficacy.

Depression

Participants rated their level of depression on the 20-item scale developed by Radloff (1977). The validity of this measure has been corroborated (Radloff, 1977; Weissman, Sholomskas, Pottenger, Prushoff, & Locke, 1977). The items measure the features that characterize depression, such as despondency, hopelessness, loss of appetite and interest in pleasurable activities, sleep disturbance, crying bouts, loss of initiative, and self-deprecation. Participants rated how often over the past week they experienced these aspects of depression using a 5-point response format. The alpha reliability coefficients were .88 for Time 1 assessment and .89 for Time 2 assessment.

Prosocial Behavior

Participants rated on a 5-point response format their prosocial behavior on a 24-item scale that assessed their degree of helpfulness, sharing, consoling, supportiveness, and cooperativeness. "I try to help others" and "I try to console people who are sad" are sample items. This scale is an expanded version of the measure of prosocial behavior developed by Caprara and Pastorelli (1993) for younger children. The concurrent validity of this measure has been corroborated in studies relating children's self-ratings of prosocial behavior with their level of prosocial behavior as rated by their parents', teachers', and peers' sociometric nominations (Caprara & Pastorelli, 1993). Factor analysis of the adolescent version revealed a single factor structure. The reliability coefficients were .94 for Time 1 assessment and .95 for Time 2 assessment.

Delinquent Behavior

Delinquent behavior was measured initially and 2 years later by the Achenbach (1991) Delinquency scale. Both the reliability and predictive validity of this measure of delinquent behavior are well established (Achenbach, Howell, McConaughy, & Stanger, 1995a; Achenbach & McConaughy, 1996). The scale, comprising 11 items, assesses a wide range of transgressive behaviors including aggression, theft, cheating, lying, destructiveness, truancy, and use of alcohol and drugs. Participants recorded whether they engaged in such antisocial activities and, if they did, whether they did so only occasionally or often. The reliability coefficient was .86 at the Time 1 assessment and .74 at the Time 2 assessment.

Results

Before conducting the analyses, we examined the data for univariate and multivariate outlying cases using the procedure devised by Tabachnick and Fidell (1989). Five participants, 2 males and 3 females, were detected as outliers and eliminated from subsequent analyses. Table 1 presents the means and variances for the variables. It also includes the matrix of relations among the forms of perceived self-efficacy and the three domains of psychosocial functioning: depression, delinquent conduct, and prosocial behavior. None of the variables presented problems of normality, with skewness ranging from -.70 to .99 and kurtosis ranging from -.41 to .90.

ANOVAs of gender variations revealed significant differences on all of the assessed variables. The degrees of freedom for all of the *F* values are 1 and 462. Females had a stronger sense of academic efficacy ($F = 27.64, p < .001$) and resistive self-regulatory efficacy ($F = 72.64, p < .001$). They also showed stronger empathic efficacy ($F = 6.69, p < .01$) and efficacy to express positive affect ($F = 7.88, p < .01$) but weaker efficacy to manage negative affect ($F = 14.03, p < .001$). Girls were also more depressed than boys at both Time 1 ($F = 34.72, p < .001$) and Time 2 ($F = 29.53, p < .001$). However, they were more prosocially oriented at both Time 1 ($F = 59.41, p < .001$) and Time 2 ($F = 33.75, p < .001$), and less prone to delinquent behavior at Time 1 ($F = 53.15, p < .001$) and Time 2 ($F = 69.96, p < .001$).

Pattern of Influences

We tested the posited structural model on the covariance matrix with the EQS program (Bentler, 1995). Participants' forms of perceived self-efficacy at Time 1 served as predictors of depression, delinquent conduct, and prosocial behavior both concurrently (Time 1) and 2 years later (Time 2). Because of gender differences, we analyzed the structural model by using the multiple-groups model approach, which estimated simultaneously the same pattern of relationships among variables in the two samples of males and females. In this approach, equivalence among samples is evaluated by constraints that impose identical estimates for the model's parameters (Byrne, 1994; Scott-Lennox & Scott-Lennox, 1995). In EQS, the plausibility of these equality constraints is examined by the Lagrange multipliers (LM) test (Bentler, 1995). For each of the constraints specified, the LM test provides evidence that the constraint applies to the populations involved. In the present study the equality constraints were imposed on path coefficients across the gender groups.

Figure 2 presents the results of the path analysis using the multifaceted self-efficacy predictors of depression, delinquent conduct, and prosocial behavior, both concurrently and prospectively. The figure includes all of the path coefficients that are significant beyond the .05 level.

Perceived self-efficacy to regulate positive and negative affect are both accompanied by high perceived academic self-efficacy, resistive self-regu-

Table 1

Means, Standard Deviations, and Correlational Matrix for the Affect Regulation and Action-Oriented Forms of Perceived Self-Efficacy, and Depression, Delinquent Conduct and Prosocial Behavior Measured Concurrently (1) and Longitudinally (2), $N = 459$

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9	10	11	
1. Academic efficacy	3.71	.58	—	.58***	.40***	.30***	.37***	—	.27***	-.49***	.33***	-.14**	-.38***	.28***
2. Regulative efficacy	4.07	.70	—	—	.28***	.24***	.36***	—	.17***	-.57***	.31***	-.07	-.52***	.23***
3. Empathetic efficacy	3.72	.58	—	—	.44***	.66***	.19***	—	.24***	.51***	—	.10*	-.27***	.41***
4. Efficacy in managing negative emotions	3.19	.67	—	—	—	.36***	-.44***	—	.24***	.21***	—	.33***	-.18***	.11*
5. Efficacy in expressing positive emotions	4.13	.61	—	—	—	—	—	—	.18***	—	.38***	—	.13**	-.28***
6. Depression (1)	30.50	8.57	—	—	—	—	—	—	.27***	—	.57***	—	.15**	.02
7. Delinquency (1)	6.20	5.66	—	—	—	—	—	—	.26***	—	.18***	—	.58***	-.15**
8. Prosocial behavior (1)	85.32	14.76	—	—	—	—	—	—	—	—	.03	—	.25***	.66***
9. Depression (2)	33.00	9.22	—	—	—	—	—	—	—	—	—	—	.26***	.00
10. Delinquency (2)	5.94	5.61	—	—	—	—	—	—	—	—	—	—	—	.22***
11. Prosocial behavior (2)	86.48	13.96	—	—	—	—	—	—	—	—	—	—	—	—

* $p < .05$. ** $p < .01$. *** $p < .001$.

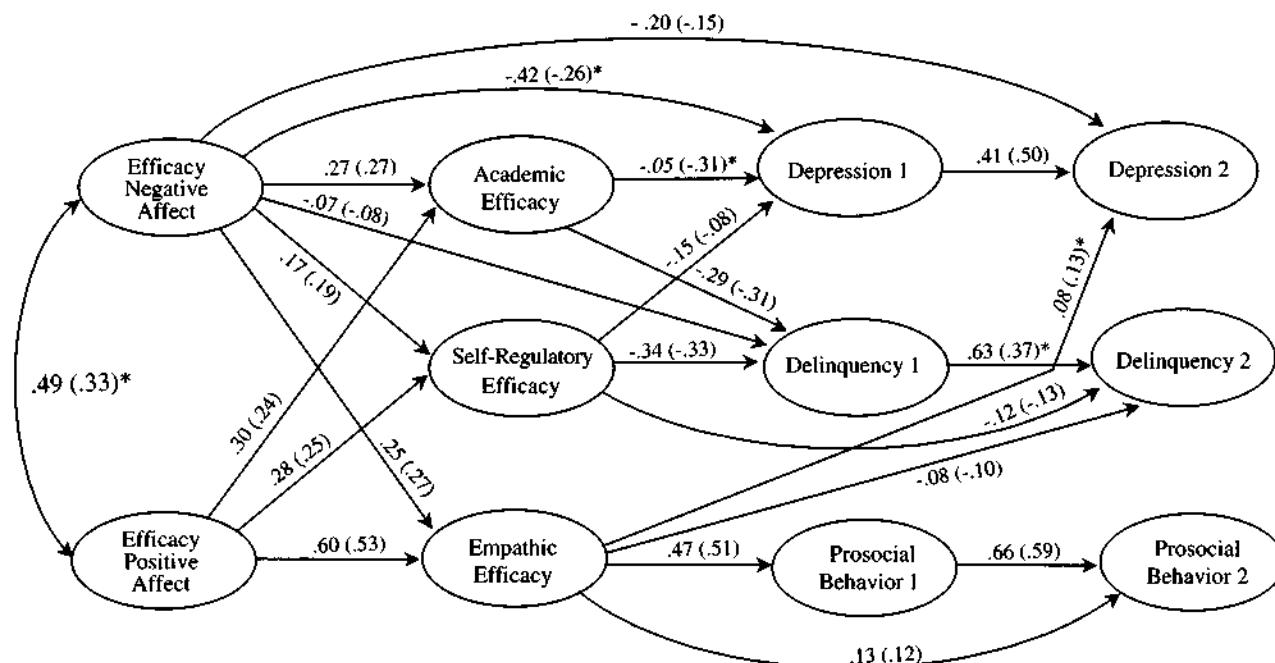


Figure 2. Path analysis of the pattern of influences through which perceived self-efficacy to regulate positive and negative emotions acting in concert with academic, behavioral self-regulatory, and empathic efficacy affect depression, delinquent conduct, and prosocial behavior concurrently and longitudinally. The first path coefficient on each of the structural links is for males; the second coefficient in brackets is for females. All the path coefficients are significant beyond the $p < .05$ level except that, for males, empathic self-efficacy is unrelated to delinquent conduct and depression. These two nonsignificant path coefficients are printed in italic type. The coefficients with an asterisk on the paths differ significantly across gender.

latory efficacy, and empathic self-efficacy. Perceived self-efficacy to manage positive affect contributed more strongly to variance in each of the latter spheres of perceived efficacy.

A strong sense of efficacy to regulate negative affect is accompanied by low proneness to depression concurrently and distally both directly and medially through academic self-efficacy and empathic self-efficacy. Perceived self-efficacy to regulate negative affect is also accompanied by concurrent delinquent conduct directly and through academic self-efficacy, and by distal delinquency medially through perceived self-efficacy to resist peer pressure for transgressive conduct. The relation between perceived self-efficacy to regulate negative affect to concurrent and distal prosocial behavior is entirely mediated through perceived empathic self-efficacy.

Perceived self-efficacy to manage positive affect also contributes to variance in the three domains of functioning, but only through its impact on the more action-oriented forms of perceived efficacy. Its mediated link to depression is through its impact on perceived academic self-efficacy, to delinquent conduct through perceived self-efficacy to resist peer

pressure for delinquent conduct, and to prosocial behavior through empathic self-efficacy.

Perceived academic, resistive self-regulatory, and empathic efficacy contribute differentially to depression, delinquent conduct, and prosocial behavior with some interesting gender differences. Perceived academic self-efficacy was accompanied by low concurrent engagement in delinquent activities and low depression in females but not in males. Adolescents of high perceived resistive self-regulatory efficacy exhibited low involvement in delinquent activities both concurrently and distally. Perceived empathic self-efficacy contributed to prosocial behavior in males and females both concurrently and distally. High perceived empathic self-efficacy is associated prospectively with proneness to depression in adolescent females but not in males. A strong sense of empathic self-efficacy also predicts low engagement in delinquent conduct in the longer term.

Depression, delinquent conduct, and prosocial behavior showed moderate stability over time, but more so for depression in females and delinquency in males, with a similar level of stability across gender for prosocial behavior. The different forms of

perceived self-efficacy made unique contributions to variance in the latter spheres of functioning after controlling for the prior levels of these outcomes.

The refined model, which includes the significant nonspecified relation between empathic self-efficacy and depression, provided an excellent fit to the empirical data as shown by different goodness-of-fit indexes. These tests yielded a nonsignificant chi square, $\chi^2(80, N = 459) = 98.41$, a non-normed fit index (NNFI) of .99, a comparative fit index (CFI) of .99, and a root mean square error of approximation (RMSEA) of .023. For the CFI and NNFI indexes, the closer the value is to 1 the better is the model fit. For the RMSEA index, the closer the value is to 0, the better is the fit of the conceptual model to the empirical data.

The model accounted for 27% and 30% of the variance in depression for females at Time 1 and Time 2, respectively, and 26% and 26% of the variance for males at the two time points. The model accounted for 34% and 54% of the variance at Times 1 and 2 delinquent conduct in males, and 35% and 23% of the variance in Times 1 and 2 delinquent conduct in females. For prosocial behavior, the model explained 23% and 53% of the variance for males at Times 1 and 2, and 26% and 43% of the variance for females at Times 1 and 2.

Alternative Models

Although the refined model provided an excellent fit to the empirical data, alternative plausible models were also tested. One alternative model presumes that quality of psychosocial functioning shapes efficacy beliefs. It reverses the direction of causation with Time 1 depression, delinquent conduct, and prosocial behavior influencing efficacy beliefs at Time 1 and the three modes of functioning at Time 2. This trimmed model, which includes only the paths found to be significant, provided a much poorer fit to the data. It yielded a significant chi square, $\chi^2(90, N = 459) = 233.61, p < .001$, and fared less well on the other goodness-of-fit indexes, with NNFI = .90, CFI = .93, and RMSEA = .059.

A second plausible model conferred causal primacy to perceived academic, resistive self-regulatory, and empathic efficacy. In this structural model the latter behaviorally oriented efficacy beliefs affect the three spheres of functioning both directly and indirectly through their impact on positive and negative affect self-regulatory efficacy. This trimmed structural model provided a better fit to the data on the indexes than the model assigning causal primacy to prior behavior as the predominant

factor, with a significant chi square, $\chi^2(90, N = 459) = 134.88, p < .001$, NNFI = .97, CFI = .98, and RMSEA = .033.

The Akaike information (AIC) index is particularly well suited for comparing the adequacy of non-nested models fitted to the same correlational matrix. The lower the AIC index, the better is the goodness of fit. In this comparison, the AIC index confirmed a better fit for the posited causal structure (-45) than the model conferring causal primacy to the more behaviorally oriented forms of perceived self-efficacy (-29). The model reversing the causal ordering by making prior prosocial behavior, delinquent behavior, and depression the primary causal factors (54) provided the poorest fit to the empirical data.

Discussion

The findings of this research provide a good empirical fit to the structural model specifying how perceived affective self-regulatory efficacy operates in concert with action-oriented perceived self-efficacy in governing adaptation in diverse spheres of functioning. There is a notable pattern of gender differences in self-appraisals of efficacy. Compared with adolescent males, females manifest a stronger sense of efficacy to manage academic activities, to rebuff peer pressure for transgressive behavior, to experience empathy for another's feelings and experiences, and to express positive affectively in their interpersonal relationships. However, adolescent females doubt their efficacy to manage negative affective states. These differential patterns of perceived self-efficacy are accompanied by different styles of adaptation. Compared with males, females are more prosocial in their behavior, less prone to delinquent conduct, and more prone to depression.

Although efficacy beliefs differed as a function of gender, the causal structures were essentially the same for both groups. In accord with prediction, a strong sense of efficacy to manage one's positive and negative emotional life contributes to perceived self-efficacy to take charge of one's academic activities, to ward off peer pressures for transgressive behavior, and to feel empathy for the experiences of others.

Theorizing and research on human affect is heavily oriented toward the detrimental psychosocial effects of disregulation of negative emotional states. The recent years have witnessed a shift in our discipline toward the contribution of positive factors to human self-development, adaptation, and change (Bandura, 2001; Seligman & Csikszentmihalyi, 2000).

In the present research, perceived self-efficacy to express positive affect in interpersonal transactions is generally a stronger contributor to beliefs that one can manage academic, transgressive, and empathic aspects of one's life than is perceived self-efficacy to regulate negative affect.

Except for the direct effect of perceived self-efficacy to regulate negative affect on depression, affective self-regulatory efficacy was related to the domains of functioning indirectly through its impact on behaviorally oriented aspects of perceived self-efficacy. In the mediated paths of influence, perceived capability to manage positive and negative affect is associated with low engagement in delinquent activities concurrently and lessened proneness to depression in girls through its impact on academic self-efficacy. These enabling and protective developmental benefits of perceived academic self-efficacy replicate functional relations obtained at younger ages (Bandura et al., 1996b; Bandura, Barbaranelli, Caprara, Patorelli, et al., 2001; Bandura et al., 1999). This evidence adds to the generalizability of the functional properties of this belief system. Similarly, the impact of perceived efficacy to manage positive and negative affect on delinquency and prosocial behavior is entirely mediated through perceived empathic and behavioral self-regulatory efficacy.

Perceived self-efficacy to rebuff peer pressures for transgressive behavior is accompanied by low proneness to depression concurrently and low delinquent conduct both concurrently and longitudinally. When examined within the context of familial relationships, perceived self-regulatory efficacy deters involvement in delinquent activities after controlling for both prior delinquent conduct and quality of parental communication (Caprara et al., 2002). Adolescents who are assured in their efficacy to manage peer pressure stay clear of delinquent activities and freely discuss with their parents the predicaments they face outside the home.

Perceived empathic self-efficacy functioned as a significant mediator in each of the forms of adaptation. Adolescents with a high sense of efficacy to involve themselves in the emotional lives of others were more prosocial in their relationships and refrained from delinquent conduct. These findings are in accord with prediction. Research comparing the early familial management practices of adjudicated delinquents with those of prosocial adolescents in the same milieu shed some light on the development of empathic self-efficacy and its role as a restrainer of aggression (Bandura & Walters, 1959). In their early socialization practices, parents of sons who adopted aggressive styles of behavior relied

heavily on fear-based control. They sought to discourage their sons' aggressive conduct by emphasizing the external punishment it would bring on them. In contrast, the parents of prosocial sons cultivated empathic-based control. They portrayed the consequences of aggressive conduct in terms of the injury and suffering it brings to others. In handling problems of misconduct, parental socialization practices that direct attention to the suffering inflicted on others foster development of empathic perspective taking and prosocial behavior (Bandura & Walters, 1959; Hoffman, 2001; Mussen & Eisenberg, 2001).

The structural analysis revealed an interesting nonspecified relation between perceived empathic self-efficacy and longer term depression. This was true for adolescent females but not for males. Empathic self-efficacy in females increases vulnerability to depression over time. To the extent that many of the experiences involve perturbing aspects, personalizing the distresses of others can take an emotional toll on empathizers. It is widely assumed that empathic arousal motivates prosocial behavior to reduce one's own vicarious distress. However, it is not uncommon for people to avoid empathic distress by disengaging themselves psychologically and physically from the suffering of others (Bandura, 1999b, *in press*; Bandura & Rosenthal, 1966).

In social cognitive theory (Bandura, 1999b) being empathetic can serve a proactive intrapersonal and prosocial function as well. People form self-conceptions embodying self-evaluative standards of social obligation. They act in accordance with their personal standards to preserve their self-respect. A vulnerability based on being empathetic presents the challenge of how to moderate the personalization of other people's distress and suffering to minimize impairing personal anguish without becoming emotionally indifferent to the plight of others (Maslach, 1982).

The question remains of how much of the gender difference in empathic efficacy is the product of evolutionary endowment, differential socialization, sociostructural role prescription, or dynamic interaction among these factors. Males and females do not differ in their ability to recognize affect in others, but females generally display stronger vicarious arousal (Hoffman, 1977). Personal distress over another's adverse experiences, as indexed by autonomic arousal, predicts proneness to helpfulness in girls but not in boys (Fabes, Eisenberg, & Eisenbud, 1993). For the socialization of emotion, males are traditionally socialized to be instrumental and emotionally stoic, and females are socialized to be

emotionally expressive and nurturing responsive. Differences in the socialization of emotion can create differential proclivity for empathic arousal. The findings of research conducted within the framework of sociological theory (Thoits, 1989) and social cognitive theory (Bandura, 1986; Bussey & Bandura, 1999) document the social construction of affect and its expressive display. Systematic research into gender differences in frequency and intensity of affective experiences and expressive display styles shed light on the notion that affective interpersonal commonality may be a contributing factor.

Knowledge of the mechanisms governing empathic response provides another possible explanation for gender difference in capability for vicarious self-arousal. Evidence indicates that personalizing the emotional experiences of others is more vicariously arousing than simply viewing events from their perspective. Thus, for example, observers react more emotionally to the sight of a person in pain if they imagine how they themselves would feel under the circumstances than if they imagine how the other person might feel (Stotland, 1969). Studies of the development of empathic understanding corroborate the importance of personalization (Hughes, Tingle, & Sawin, 1981). Young children who focus on their own emotional reactions to the plight of others gain better understanding of others' emotions than if they focus on how others might feel.

The ability to visualize oneself undergoing the experiences to which others are being subjected seems to be a critical factor in the empathic process (Bandura, 1986; Stotland, 1969). The imaginal self-arousal is facilitated by revivifying similar experiences. The emotional expressions of others serve as retrieval cues for observers to reactivate similar emotions that they have experienced. If females have more emotional experiences to draw on, they will exhibit stronger empathic responsiveness. Given that females are more prone to depression than males (Culbertson, 1997; Nolen-Hoeksema, 1990), they are likely to have greater commonality of despondency for revivification. To further complicate affect regulation, females tend to have a lower sense of efficacy to manage negative affect than do males. The combined effect of higher vicarious emotional activation and a low sense of efficacy to manage negative affect increases personal vulnerability to others' emotional distress.

As this and other studies reveal, compared with males, females are more involved prosocially in relationships as expressed in being helpful, sharing, consoling, and cooperative (Bandura, Barbaranelli, Caprara, Patorelli, et al., 2001). High concern for the

welfare of others provides many occasions for dejection over their sorrowful predicaments. Gender differences in the management of despondency is still another process by which empathic efficacy may increase vulnerability to depression. Males tend to work their way out of a despondent mood by immersing themselves in activities, whereas females are more inclined to dwell on their despondency, which sustains or exacerbates it (Nolen-Hoeksema, 1990).

Although the predictive relations were studied prospectively, self-report data present certain limitations. Note, however, that self-beliefs are subjective phenomena that are necessarily accessible through self-report. Some of the developmental outcomes, especially prosocial behavior and delinquent conduct, are socially measurable behavioral phenomena, but many delinquent activities remain hidden from the public. In prior research, prosocial behavior and antisocial conduct were assessed by multiple methods (self-report, sociometric ratings, behavior observations) and by multiple sources (self, peer, teachers, parents). Self-reports of prosocial behavior and transgressive conduct correlated with assessments by these diverse methods and sources (Bandura et al., 1996b; Caprara & Pastorelli, 1993). These findings lend support to the reliability of self-reports of behavioral patterns.

Conceptions of the impact of positive and negative affect on human functioning are often framed in terms of direct effects. Positive affect promotes beneficial outcomes; negative affect breeds dysfunctional outcomes. However, the variability of behavioral effects requires further theoretical specification. Theories of affect regulation focus on factors that may mediate the relation between affect and behavioral outcomes (Gross, 1998; Larsen, 2000). As previously noted, beliefs in personal efficacy to regulate positive and negative affective states operate in concert with action-oriented efficacy beliefs on diverse forms of adaptation both concurrently and longitudinally.

Although control is more central to negative affect and expression is more central to positive affect in socializing emotion, effective social functioning requires discriminative regulation of expressions of affect. There are times and circumstances when expression of negative affect, such as indignation over unjust practices, has positive functional value and indiscriminate displays of positive affect are socially out of place.

The obtained structural pattern of influences verifies that complex human adaptations are governed by multiple forms of perceived efficacy

involving self-management of cognitive, motivational, and affective aspects of functioning operating in concert. The verified codetermining patterns of self-regulatory efficacy in the structural model vary for different forms of adaptation. The patterned multicausality further underscores the dynamic interplay of efficacy beliefs in the regulation of socioemotional functioning. Of particular interest are relations reflecting dynamic processes such as perceived empathic self-efficacy increasing vulnerability to depression but curtailing socially injurious aggression. Such findings underscore the explanatory and predictive value of a multifaceted, self-system perspective on personal dispositions. Multi-faceted causality requires multidimensional assessment and structural analysis to disentangle direct and mediated paths of influence.

Emotional experiences are heavily embedded in interpersonal transactions. In maneuvering through emotionally arousing situations, people have to take charge of their inner emotional life and regulate their expressive behavior and strategically manage their modes of adaptation. Those who believe they can exercise some measure of control over their emotional life are more successful in their self-regulatory efforts than individuals who believe they are at the mercy of their emotional states (Bandura, 1997, 1999a; Sanderson, Rapee, & Barlow, 1989). Research has also shown that perceived self-regulatory efficacy mediates the effects of affective states on health and addictive behavior. The findings of the present research further corroborate the mediational function of different configurations of perceived action-oriented efficacy in diverse spheres of functioning. Explanatory and predictive generalizability affords theoretical utility.

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Chapter 3

Selective Exercise of Moral Agency

Albert Bandura

In a recent book titled *Everybody Does It!*, Gabor (1995) documents the pervasiveness of disengagement of moral self-sanctions from harmful conduct by people of all statuses in all walks of life. A full understanding of human morality must explain not only how people come to behave morally but also how they selectively disengage moral self-sanctions in the transactions of their everyday lives.

In the development of a moral self, individuals adopt standards of right and wrong that serve as guides and deterrents for conduct. In this self-regulatory process, people monitor their conduct and the conditions under which it occurs, judge it in relation to their moral standards and perceived circumstances, and regulate their actions by the consequences they apply to themselves. They do things that give them satisfaction and a sense of self-worth, and they refrain from behaving in ways that violate their moral standards because such conduct will bring self-condemnation. Thus, moral agency is exercised through the constraint of negative self-sanctions for conduct that violates one's moral standards and the support of positive self-sanctions for conduct faithful to personal moral standards. In the face of situational inducements to behave in inhumane ways, people can choose to behave otherwise by exerting self-influence. Self-sanctions keep conduct in line with internal standards. Moral conduct is motivated and regulated through the ongoing exercise of evaluative self-influence.

Dual Nature of Moral Agency

The exercise of moral agency has dual aspects, *inhibitive* and *proactive* (Bandura, 1999). The inhibitive form is manifested in the power to refrain from behaving inhumanely, and the proactive form is expressed in the power to behave humanely. In the latter form of morality, people do good things as well as refrain from doing bad things. This chapter examines how an individual can shift rapidly from a moral disengager to a moral engager through the transformative power of humanization.

Social psychology emphasizes the power of environmental forces over individuals. In the case of proactive moral courage, individuals triumph as moral agents over compelling environmental pressures to behave otherwise. Such moral heroism is most tellingly documented in Holocaust rescuers who saved persecuted Jews from the death camps at great risks to themselves and their families with a heavy burden of extended protective care. The rescuers had no prior acquaintance with those they sheltered and had nothing material or social to gain by doing so. Such moral commitments involve courageous humanness amid overwhelming evil.

Humanization can rouse empathic sentiments and a strong sense of social obligation. This enlists self-evaluative reactions that motivate humane actions on others' behalf at sacrifice of one's self-interest or even at one's own peril (Oliner & Oliner, 1988). The rescuers viewed their behavior as a human duty rather than as extraordinary acts of heroism. After the protective relationship was established, the development of social bonds heightened the force of empathic concern and moral obligation.

Researchers extensively analyze the inhibitive form of morality. Adults are studied for their power to refrain from behaving injuriously under conditions highly conducive to inhumane conduct, and children are studied for the power to resist instigation to transgressive conduct. But the proactive form of morality, in which people behave humanely, often at personal costs, receives relatively little attention.

Mechanisms of Moral Disengagement

The acquisition of moral standards is only half the story in the exercise of moral agency. Moral standards, whether characterized as conscience or moral principles, do not function as unceasing internal regulators of conduct. Self-regulatory mechanisms do not operate unless they are activated. Many psychosocial maneuvers can be used to disengage moral self-sanctions from inhumane conduct. Selective activation and disengagement of self-sanctions permits different types of conduct by persons

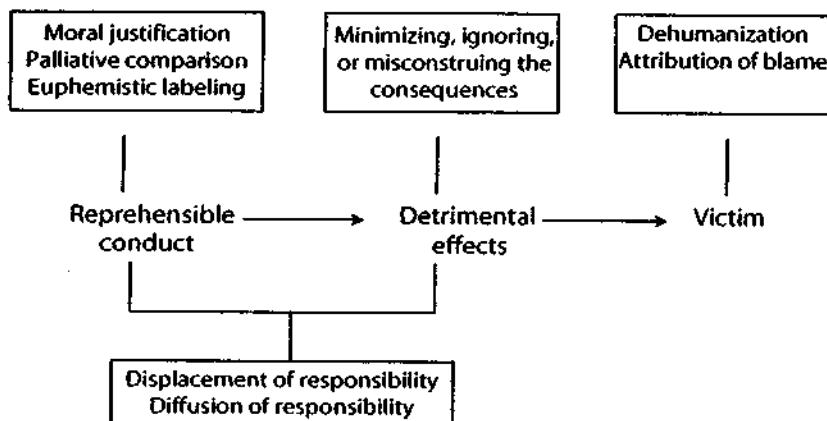


Figure 3.1. Mechanisms through which moral self-sanctions are selectively disengaged from detrimental conduct at different points in the self-regulatory process (Bandura, 1986).

with the same moral standards. Indeed, large-scale inhumanities are typically perpetrated by people who, in other areas of their lives, can be quite considerate and compassionate. They can even be ruthless and humane simultaneously toward different individuals. This selectivity of moral engagement is strikingly illustrated by Amon Goeth, a Nazi labor commandant. While dictating a letter replete with empathy and compassion for his ailing father, he sees a captive on the grounds who he thinks is not working hard enough. He takes out his revolver and callously shoots the captive. The commandant is both overcome with compassion and is savagely cruel at the same time.

Figure 3.1 shows the points in the process of moral control at which moral self-censure can be disengaged from reprehensible conduct. The disengagement may center on sanctifying harmful conduct by moral justification, exonerating social comparison, and sanitizing language. It may focus on obscuring personal agency by diffusion and displacement of responsibility so that perpetrators do not hold themselves accountable for the harm they cause. It may involve minimizing, distorting, or even disputing the harm that flows from detrimental actions. And the disengagement may include dehumanizing, demonizing, and blaming the victims of the maltreatment.

Selective engagement and disengagement of moral self-sanctions is central to a full understanding of moral conduct. The present analysis addresses this focal aspect of the moral self within the conceptual framework of social cognitive theory (Bandura, 1991). The sections that follow analyze how each of these types of moral disengagement function in the

perpetration of inhumanities, how the mechanisms of moral disengagement operate developmentally, and how knowledge of the selective exercise of moral agency provides guides on nurturing morality.

Moral Justification

One set of disengagement practices operates by changing the meaning of injurious behavior. People do not usually engage in harmful conduct until they have justified, to themselves, the morality of their actions. In this process of moral justification, worthy ends are used to sanctify pernicious means. People can then act on a moral imperative and preserve a favorable view of themselves as moral agents while inflicting harm on others.

Rapid radical shifts in destructive behavior through moral justification are most strikingly revealed in military pursuits. The conversion of socialized people into dedicated fighters is achieved not by altering their personality structures, aggressive drives, or moral standards. Rather, it is accomplished by cognitively redefining the morality of killing so that it can be done free from self-censure. Through moral justification of violent means, people see themselves as fighting ruthless oppressors, protecting their cherished values, preserving world peace, saving humanity from subjugation, or honoring their country's commitments. Moral justifications sanctify the violent means. Killing becomes an act of heroism. Voltaire put it well when he said, "Those who can make you believe absurdities, can make you commit atrocities."

Over the centuries, much destructive conduct has been perpetrated by ordinary, decent people in the name of righteous ideologies, religious principles, and nationalistic imperatives. The politicization of religion has produced a long bloody history of holy terror. Pope Urban (who launched the Crusades), Osama bin Laden (who mounted a jihad), Rabin's assassin, and the Presbyterian minister who shot a doctor and his assistant at an abortion clinic all saw themselves as serving a holy imperative. In holy terror, perpetrators twist theology and see themselves as courageously doing God's will. Adversaries sanctify their militant actions but condemn those of their antagonists as barbarity masquerading under a mask of outrageous moral reasoning. Each side feels morally superior to the other.

Euphemistic Labeling

Language shapes thought patterns on which people base their behavior. Activities can take on different appearances, depending on what they are called. Euphemistic language is widely used to make harmful conduct

respectable and to reduce personal responsibility for it. Euphemizing is an injurious weapon. People behave much more cruelly when assaultive actions are given sanitized labels than when they are called aggression.

Different varieties of language of nonresponsibility exist. One form relies on sanitizing language. Through the power of sanitized language, even killing a human being loses much of its repugnancy. Soldiers "waste" people rather than kill them. Bombing missions are described as "servicing the target," in the likeness of a public utility. The attacks become "clean, surgical strikes," arousing imagery of curative activities. The civilians the bombs kill are linguistically converted to "collateral damage."

Sanitizing euphemisms are also used extensively in unpleasant activities that people do from time to time. In the language of some government agencies, people are not fired; rather, they are given a "career alternative enhancement" as though they were receiving a promotion. Proposals are not rejected; they are "selected down." In the Watergate hearings, lies became "a different version of the facts." An "involuntary conversion of a 727" is a plain old airplane crash. The television industry produces and markets some of the most brutal forms of human cruelty under the sanitized labels of "action and adventure" programming. The nuclear power industry has created its own specialized set of euphemisms for the injurious effects of nuclear mishaps. An explosion is an "energetic disassembly," and a reactor accident is a "normal aberration."

The agentless passive voice serves as another self-exonerative tool. It creates the appearance that reprehensible acts are the work of nameless forces rather than people. It is as though people are moved mechanically but are not really the agents of their own acts. Even inanimate objects are sometimes turned into agents. Here is a driver explaining to police how he managed to demolish a telephone pole: "The telephone pole was approaching. I was attempting to swerve out of its way, when it struck my front end."

The specialized jargon of a legitimate enterprise is also misused to lend respectability to illegitimate enterprises. In the vocabulary of the Watergate transgressions, criminal conspiracy became a "game plan," and the conspirators were "team players," like the best of sportsmen. The conspirators elevated word corruption to new heights in the service of criminal conduct.

Advantageous Comparison

How behavior is viewed is colored by what it is compared against. By exploiting the contrast principle, reprehensible acts can be made righteous. Terrorists see their behavior as acts of selfless martyrdom by comparing

them with widespread cruelties inflicted on the people with whom they identify (Bandura, 2003). The more flagrant the contrasting inhumanities, the more likely it is that one's own destructive conduct will appear benevolent. Expedient historical comparison also serves self-exonerating purposes. Apologists for the lawlessness of political figures they support point to transgressions by rival administrations as vindications. Adapters of violent means for social change are quick to point out that democracies, such as those of France and the United States, were gained through violence against oppressive rule.

Exonerating comparison relies heavily on moral justification by utilitarian standards. The task of making violence morally acceptable from a utilitarian perspective is facilitated by two sets of judgments. First, nonviolent options are judged to be ineffective to achieve desired changes. This removes them from consideration. Second, utilitarian analyses affirm that injurious actions will prevent more human suffering than they cause.

The utilitarian calculus is quite slippery in specific applications, however. The future contains many uncertainties, and human judgment is subject to a lot of biases. As a result, calculations of long-term human costs and benefits are often suspect. There is much subjectivity in estimating the gravity of potential threats. Judgment of gravity justifies choice of aggressive options, but preference for aggressive options often biases judgment of gravity.

Sanctifying pernicious conduct through moral justifications, sanitizing language, and favorable comparisons is the most effective set of psychological mechanisms for disengaging moral self-sanctions. Investing harmful conduct with high moral purpose not only eliminates self-censure but also engages self-approval in the service of destructive exploits. What was once morally condemnable becomes a source of self-valuation. Functionaries work hard to become proficient in the destructive means and take pride in their accomplishments.

Displacement of Responsibility

Moral control operates most strongly when people acknowledge that they are contributors to harmful outcomes. The second set of disengagement practices operates by obscuring or minimizing the agentive role in the harm one causes. People behave in ways they normally repudiate if a legitimate authority accepts responsibility for the effects of their injurious conduct (Milgram, 1974). Under displaced responsibility, they view their actions as stemming from the dictates of authorities rather than being personally responsible for them. Because they are not the actual agents of their actions, they are spared self-condemning reactions.

Self-exemption from gross inhumanities by displacement of responsibility is most gruesomely revealed in socially sanctioned mass executions. Nazi prison commandants and their staffs divested themselves of personal responsibility for their unprecedented inhumanities. They claimed they were simply carrying out orders.

In the sanctioning of pernicious conduct in contemporary life, responsibility is rarely assumed openly. Only obtuse authorities would leave themselves accusable of authorizing destructive acts. They usually invite and support harmful conduct in insidious ways by surreptitious sanctioning systems for personal and social protection. Sanctioning by indirection shields them from social condemnation in case things go awry. It also enables them to protect against loss of self-respect for authorizing human cruelty that leaves blood on their hands.

Authorities often act in ways that keep them intentionally uninformed. They do not search for evidence of wrongdoing. Obvious questions that would reveal incriminating information remain unasked, so that officials do not find out what they do not want to know. Implicit agreements and insulating social arrangements are created that leave the higher echelons free from blame.

When harmful practices are publicized, they are officially dismissed as merely isolated incidents arising from misunderstanding of what had been authorized. Efforts are made to limit any blame to subordinates, who are portrayed as misguided or overzealous. Investigators who look for incriminating records of authorization display naiveté about the insidious ways that pernicious practices are sanctioned and carried out. One finds arrangements of nonresponsibility rather than traces of smoking guns.

But obedient functionaries do not cast off all responsibility for their behavior as if they were mindless extensions of others. If they disowned all responsibility, they would be quite unreliable, performing their duties only when commanded to do so. It requires a strong sense of responsibility to be a good functionary. One must, therefore, distinguish between two levels of responsibility—a strong sense of duty to one's superiors and accountability for the effects of one's actions. The best functionaries are those who honor their obligations to authorities but feel no personal responsibility for the harm they cause.

Diffusion of Responsibility

The exercise of moral control is also weakened when personal agency is obscured by diffusing responsibility for detrimental behavior. Kelman and Hamilton (1989) document the different ways that personal agency gets obscured by social diffusion of responsibility. Responsibility can be

diffused by division of labor in which the subdivided tasks seem harmless in themselves. People shift their attention from the meaning of what they are doing to the details of their specific jobs.

Group decision making is another common practice that enables otherwise considerate people to behave inhumanely. Napoleon noted that "collective crimes incriminate no one." When everyone is responsible, no one really feels responsible. Collective action, which provides anonymity, is yet another expedient for weakening moral control. Any harm done by a group can always be attributed largely to the behavior of others. People act more cruelly under group responsibility than when they hold themselves personally accountable for their actions.

Disregard or Distortion of Consequences

To be able to perpetrate inhumanities requires more than absolving personal responsibility. Other ways of weakening moral control operate by minimizing, disregarding, or even disputing the harmful effects of one's action. When people pursue activities that harm others, they avoid facing the harm they cause, or they minimize it. If minimization does not work, the evidence of harm can be discredited. As long as the harmful results of one's conduct are ignored, minimized, or disbelieved, there is little reason for self-censure to be activated.

It is easier to harm others when their suffering is not visible and when destructive actions are physically and temporally remote from their injurious effects. Death technologies have become highly lethal and depersonalized. We are now in the era of faceless electronic warfare, in which mass destruction is delivered remotely with deadly accuracy by computer- and laser-controlled systems.

When people can see and hear the suffering they cause, vicariously aroused distress and self-censure serve as self-restrainers. In studies of obedient aggression, people are less compliant to the injurious commands of authorities as the victims' pain becomes more evident and personalized. Even a high sense of personal responsibility for the effects of one's actions is a weak restrainer of injurious conduct when aggressors do not see the harm they inflict on their victims.

Most social systems involve hierarchical chains of command in which superiors formulate plans and intermediaries transmit them to functionaries, who then carry them out. The further removed individuals are from the destructive end results, the weaker the restraining power of injurious effects. Disengagement of moral control is easiest for the intermediaries in a hierarchical system—they neither bear responsibility for the decisions nor do they carry them out and face the harm being inflicted.

Attribution of Blame

Blaming one's adversaries or circumstances is another expedient that serves self-exonerating purposes. People view themselves as faultless victims driven to injurious conduct by forcible provocation. Violent conduct becomes a justifiable defensive reaction to belligerent provocations. Victims get blamed for bringing suffering on themselves. Self-exoneration is also achievable by viewing one's harmful conduct as forced by compelling circumstances rather than as a personal decision. By fixing the blame on others or on compelling circumstances, not only are one's injurious actions excusable, but one can even feel self-righteous in the process.

Justified abuse can have more devastating human consequences than acknowledged cruelty. Mistreatment that is not clothed in righteousness makes the perpetrator rather than the victim blameworthy. But when victims are convincingly blamed for their plight, they may eventually come to believe the degrading characterizations of themselves. Exonerated inhumanity is, thus, more likely to instill self-contempt in victims than inhumanity that does not attempt to justify itself. Seeing victims suffer maltreatment for which they are held partially responsible leads observers to derogate them. The devaluation and indignation aroused by ascribed culpability provide further moral justification for even greater maltreatment.

Dehumanization

The final set of disengagement practices operates on the recipients of detrimental acts. The strength of moral self-censure depends on how the perpetrators regard the people they mistreat. To perceive another as human activates empathetic reactions through a sense of common humanity. The joys and suffering of those with whom one identifies are more vicariously arousing than are those of strangers or those divested of human qualities. It is difficult to mistreat humanized persons without risking personal distress and self-condemnation.

Self-censure for cruel conduct can be disengaged or blunted by stripping people of human qualities. After they are dehumanized, they are no longer viewed as persons with feelings, hopes, and concerns but as subhuman objects. They are portrayed as mindless "savages," "gooks," and other despicable wretches. If dispossessing one's foes of humanness does not weaken self-censure, it can be eliminated by attributing demonic or bestial qualities to them. They become "satanic fiends," "degenerates," and other bestial creatures. It is easier to brutalize people when they are viewed as low animal forms. During wartime, nations often cast their enemies in the most dehumanized, demonic, and bestial images to make it easier to kill them.

In studies of the perniciousness of dehumanization, people who are given punitive power treat dehumanized individuals more ruthlessly than those who have been invested with human qualities. Combining diffused responsibility with dehumanization greatly escalates the level of punitiveness. By contrast, personalizing responsibility and humanizing others together has a powerful self-restraining effect.

The findings from research on moral disengagement are in accord with the historical chronicle of human atrocities: It requires conducive social conditions rather than monstrous people to produce atrocious deeds. Given appropriate social conditions, decent, ordinary people can do extraordinarily cruel things.

It should be noted that moral disengagement involves social machinations, not just personal, intrapsychic ones. In moral justification, for example, people may be misled by those they trust into believing that injurious means will prevent more harm than they cause. The perils and benefits that are socially declared may be exaggerated or simply pious rhetoric masking less honorable purposes. Cultural prejudices shape which human beings get grouped and dehumanized as well as the types of depraved attributes ascribed to them. Social systems are structured in ways that make it easy for functionaries to absolve themselves of responsibility for the effects of their actions. Media modes and content can be institutionally managed in ways that keep people uninformed or misinformed about the harm caused by the collective action. In short, moral disengagement is a product of the interplay of both personal and social maneuvers.

Many conditions of contemporary life are conducive to impersonalization and dehumanization. Bureaucratization, automation, urbanization, and high mobility lead people to relate to each other in anonymous, impersonal ways. Strangers can be more easily dehumanized than can acquaintances. In addition, social and political practices that divide people into ingroup and outgroup members create human estrangement that fosters dehumanization. Perpetrators group, divide, devalue, and dehumanize those they disfavor.

Conjoint experiences play a central role in creating not only empathetic responsiveness but counter-empathy as well (Bandura, 1992). Past congruent experiences in which a model's pleasure signals reward for oneself and a model's distress signals personal pain heighten observers' empathetic reactions to the model's emotional expression alone. Observers who have undergone discordant experiences (e.g., the model's joy brings suffering to oneself) respond indifferently or counter-empathetically to the model's joy and suffering. Vicarious activation relies heavily on a cognitive conveyance. Thus, when observers are merely led to expect cooperative interactions, the joy and distress of a cooperative model elicit

corresponding reactions from observers. By contrast, displays of joy by an alleged competitive model distress observers, and displays of distress calm them.

Similarly, observers respond empathically to the emotional experiences of models simply depicted as in-group members and counter-empathetically to those portrayed as outgroup members, in the absence of having shared any experiences with them. If a sense of mutuality has been created, so that the joys and distresses of an outgroup member foretell similar experiences for the observers, correlative outcomes transform disempathy to empathy. The findings of these experimental studies underscore the centrality of a sense of common humanity in human empathy.

Human transactions are increasingly conducted in the cyberworld. The electronic technologies that subserve these functions provide a ready vehicle for moral disengagement. Online behavior differs from face-to-face behavior. Anonymity and pseudonymity in interchanges in the cyberworld remove communication restraints and beget freer expressions of personal views. The cyberworld self is clearly less restrained. Concealment and depersonalization can bring out the worst in people by removing personal and social sanctions for pernicious conduct.

Certain characteristics of electronic technologies increase enlistment of the various forms of moral disengagement. Transgressive acts can be performed in privacy and anonymity toward depersonalized or faceless victims located thousands of miles away. Unlike breaking into offices to steal files, which is difficult to execute and escape detection, one can steal files electronically with little effort without apparent tracks, and the theft leaves the owner's property still in place. The moral disconnect makes it easy to behave transgressively.

The Internet is a highly decentralized system that defies regulation. Because anyone can get into the act and nobody is in charge, Internet users can use this unfettered vehicle for destructive purposes. Several unique features of electronic information technologies make them perilous if used for harmful purposes: They are readily accessible, portable, easily implementable remotely by pushbutton, connected worldwide for far-reaching consequence, and exceedingly difficult to control. Societal vulnerabilities are enormously magnified because virtually all of the systems on which people depend in their everyday lives are interdependently run by computer network systems. These can be easily knocked out, as shown by the computer student in the Philippines who wreaked havoc worldwide by crippling e-mail systems, costing billions of dollars. Smart hackers can do much more serious damage. Cybercrime and cyberterrorism, enacted through the Internet, is a dark side of the cyberworld that will increasingly command societal attention.

Power of Humanization

Psychological research tends to emphasize how easy it is to bring out the worst in people through dehumanization and other self-exonerating means. The sensational negative findings receive the greatest attention. For example, Milgram's (1974) research on obedient aggression is widely cited as evidence that good people can be talked into performing cruel deeds. What is rarely noted, however, is the equally striking evidence that most people refuse to behave cruelly, even with strong authoritarian commands, toward humanized others, and when they have to inflict pain directly rather than remotely (Bandura, 1999).

The emphasis on obedient aggression is understandable considering the prevalence of people's inhumanities toward one another. But the power of humanization to counteract cruel conduct also has important social implications. The affirmation of common humanity can bring out the best in others. The paramount role of humanization in the nurturing of morality is analyzed later in this chapter in greater detail.

Developmental Changes in Moral Disengagement

We are beginning to gain some understanding into children's development of moral disengagement and the processes through which it shapes their life courses. In studying moral disengagement developmentally, the various mechanisms are assessed in terms of the concrete forms they take in childhood. Thus, for example, children's moral justifications absolve fighting and lying as a social obligation to protect their friends and to preserve the respect of their peer group or family. In displacement of responsibility, children should not be blamed for transgressions if they were pressured by others or bad circumstances. In diffusion of responsibility, a given child should not be faulted for the trouble a group causes if decisions are made and carried out collectively. In minimization and distortion of consequences, physical provocation, lies, insults, and teasing among children do not really do any harm or are just ways of joking and showing interest in them. Advantageous comparisons absolve thefts, assaults, and property destruction through contrast with much worse offenses in the society at large. Maltreatments are sanitized euphemistically as simply providing "a lesson." In attribution of blame, victims bring maltreatment on themselves by their carelessness and untoward behavior. In dehumanization, some people must be treated roughly because they lack the usual sensitivities or deserve to be treated like animals.

Children learn at an early age how to disengage self-censure from transgressive conduct. Although the various disengagement mechanisms operate in concert in the self-regulatory process, they vary somewhat in the degree to which children enlist them. Construing injurious behavior as serving a worthy purpose, disowning responsibility for harmful effects by fixing the blame on others, and devaluing those who are maltreated are the most widely used modes of self-exoneration. Masquerading censorable activities in palliative language or rendering them benign by favorable comparison with worse conduct, both of which require dexterous cognitive skills, are used less often. Gender differences in moral disengagement do not exist in the earlier years, but before long, boys become more facile moral disengagers than do girls.

Moral development has typically been studied in terms of abstract principles of morality. Adolescents who differ in delinquent conduct do not differ in abstract moral values; almost everyone is virtuous in the abstract. However, the differences lie in the ease of moral disengagement under the conditionals of life. Facile moral disengagers display higher levels of violence than those who bring moral self-reactions to bear on their conduct. This is true regardless of age, gender, race, ethnicity, socioeconomic level, or religious affiliation.

Moral disengagement contributes to social discordance in ways likely to lead down dissocial paths. High moral disengagers experience low guilt over injurious conduct and are less prosocial. They dwell on vengeful rumination and are quick to resort to aggression and transgressive conduct.

Promotion of Humaneness Through Moral Engagement

The preceding analyses document how disengagement of moral self-sanctions from conduct enables otherwise considerate people to do cruel things. The investment of common humanity at each locus of moral self-regulation tends to foster humaneness. In the exercise of proactive morality, people act in the name of humane principles when social circumstances dictate expedient, transgressive, and detrimental conduct. They disavow use of worthy social ends to justify destructive means, are willing to sacrifice their well-being rather than accede to unjust social practices, take personal responsibility for the consequences of their actions, remain sensitive to the suffering of others, and see human commonalities rather than distance themselves from others or divest others of human qualities.

The transformative power of humanization is graphically illustrated in the midst of a military massacre (Zganjar, 1998). An American platoon, led by Lt. William Calley, had massacred 500 Vietnamese women, children,

and elderly men. Detailed analyses of this massacre have documented how moral self-sanctions were disengaged from the brutal collective conduct (Kelman & Hamilton, 1989). A ceremony, 30 years later, was held at the Vietnam Veteran's Memorial honoring the extraordinary heroism of prosocial morality. Hugh Thompson, a young helicopter pilot, had swooped down over the village of My Lai on a search-and-destroy mission as the massacre was occurring. He spotted an injured girl, marked the spot with a smoke signal, and radioed for help. Much to his horror, he saw a soldier flip her over and spray her with a round of fire. Upon seeing the human carnage in an irrigation ditch and soldiers firing into the bodies, he realized that he was in the midst of a massacre.

He was moved to moral action by the sight of a terrified woman with a baby in her arms and a frightened child clinging to her leg. He explained his sense of common humanity: "These people were looking at me for help and there is no way I could turn my back on them." He told a platoon officer to help him remove the remaining villagers. The officer replied, "The only help they'll get, is a hand grenade." Thompson moved his helicopter in the line of fire and commanded his gunner to fire on his approaching countrymen if they tried to harm the family. He radioed the accompanying gunships for help, and together they airlifted the remaining dozen villagers to safety. He flew back to the irrigation ditch, where they found and rescued a 2-year-old boy still clinging to his dead mother. Thompson described his empathetic human linkage: "I had a son at home about the same age."

The transforming effect of perceiving common humanity is further illustrated in a daughter's mission of vengeance (Blumenfeld, 2002). Her father, a New York rabbi, was shot and wounded in Jerusalem by Omar Khatib, a Palestinian militant. Twelve years later, the daughter set out to gain revenge by forcing Khatib to confront his victim's humanity. In the course of exchanging letters under a concealed identity with the jailed gunman, the parental victim, militant gunman, and filial avenger were humanized in the process. In a dramatic courtroom parole hearing, the daughter identified herself to Khatib as she pleaded for his release from prison, vowing he would never hurt anyone again. He wrote to her father, likening his daughter to "the mirror that made me see your face as a human person deserved to be admired and respected." In this case, hatred that breeds escalative cycles of violence instead turned into mutual compassion. At the national level, Nelson Mandela singularly displaced hatred of apartheid with reconciliation by affirming people's common humanity.

Research comparing the early familial management practices of adjudicated delinquents with those of prosocial adolescents in the same milieu sheds some light on the development of empathy and its role as a restrainer of aggression (Bandura & Walters, 1959). In their early socialization

practices, parents of sons who adopted aggressive styles of behavior relied heavily on fear-based control. They sought to discourage their sons' aggressive conduct by emphasizing the external punishment it would bring upon them. In contrast, the parents of prosocial sons cultivated empathic-based control, portraying the consequences of aggressive conduct in terms of the injury and suffering it brings to others. In handling problems of misconduct, parental socialization practices that direct attention to the suffering inflicted on others foster development of empathic perspective taking and prosocial behavior (Bandura & Walters, 1959; Hoffman, 2001; Mussen & Eisenberg, 2001). A sense of empathic self-efficacy to involve oneself in the plight of others both promotes prosocialness in the form of helpfulness, sharing, consoling, and supportiveness and curbs socially injurious forms of conduct (Bandura, Caprara, Barbaranelli, Gerbino, & Pastorelli, 2003).

Moral disengagement nullifies behavioral control by self-sanctions. Morality can be nurtured by restoring humanity to conduct so that people live in accordance with their moral standards. McAlister and his colleagues fostered moral reengagement against resort to violent means by peer modeling of prosocial solutions to conflicts and exposure to communications that unmasked the various self-exonerative maneuvers (McAlister, 2001; McAlister, Ama, Barroso, Peters, & Kelder, 2000). Whereas moral engagement reduced support of violent means, boosting self-exonerative vindications raised endorsement of violent means.

Interplay of Personal and Social Influences

The self-regulation of morality is not entirely an intrapsychic matter. People do not operate as autonomous moral agents, impervious to the social realities in which they are enmeshed. Morality is socially grounded. Social cognitive theory adopts an interactionist perspective to morality. In this view, moral actions are the product of the reciprocal interplay of cognitive, affective, and social influences.

After self-regulatory capabilities are developed, behavior usually produces two sets of consequences: self-evaluative reactions and external outcomes. These effects may operate as complementary or opposing influences on behavior (Bandura, 1986). Self-regulation of moral conduct creates the fewest strains when social influences are compatible with self-evaluative ones. This condition exists when socially rewardable conduct is a source of self-satisfaction and self-pride and socially punishable conduct brings self-censure. Behavior is also highly susceptible to external influences in the absence of countervailing internal standards. People with a

weak commitment to personal standards tailor their behavior to fit whatever the situation seems to call for or is most expedient.

People commonly experience conflicts of outcomes when they are rewarded socially or materially for behavior they personally devalue. When self-devaluative consequences outweigh the force of external rewards, the rewards have little sway. There is no more devastating consequence than self-contempt. But if the allure of rewards outweighs self-censure, the result can be cheerless compliance. However, as already noted, people are skilled at reconciling perturbing disparities between personal standards and conduct by selectively disengaging their moral standards.

Another type of conflict of outcomes arises when individuals are punished for activities they value highly. Principled dissenters and nonconformists often find themselves in such predicaments. The relative strength of self-approval and external censure determine whether the courses of action will be pursued or abandoned. However, some individuals' sense of self-worth is so strongly invested in certain convictions that they submit to prolonged maltreatment rather than accede to what they regard as unjust or immoral. It is common for people to endure hardships for unyielding adherence to ideological and moral principles.

Collective Moral Disengagement at the Social Systems Level

Selective moral disengagement operates at a social systems level, not just individually (Bandura, 1973; 1999). For example, it requires a lot of collective disengagement of moral concerns to operate a tobacco industry whose products kill about 450,000 people annually and requires continuous recruitment of youngsters to pick up the smoking habit. Those who trade in merchandising deadly wares depend heavily on the moral disengagement of a large network of otherwise considerate people. For years, the tobacco industry disputed the view that nicotine is addictive and that smoking is a major contributor to lung cancer.

The vast supporting cast contributing to the promotion of this deadly product includes talented chemists who discovered ammonia as a means to increase the nicotine "kick" by speeding the body's absorption of nicotine; inventive biotech researchers who genetically engineered a tobacco seed that doubles the addictive nicotine content of tobacco plants; creative advertisers who target young people with merchandising and advertising schemes depicting smoking as a sign of youthful hipness, modernity, freedom, and women's liberation; ingenious officials in a subsidiary of a major tobacco company who engage in an elaborate international cigarette smuggling operation to evade excise taxes; popular movie actors who agree to

smoke in their movies for a hefty fee; legislators with bountiful tobacco campaign contributions who have exempted nicotine from drug legislation even though it is the most addictive substance and who have passed preemption laws that block states from regulating tobacco products and their advertising; U.S. trade representatives who have threatened sanctions against countries that erect barriers against the importation of U.S. cigarettes; and even a U.S. president who fired his head of the Department of Health, Education and Welfare for refusing to back off on the regulation of tobacco products.

The gun industry provides another example of moral disengagement in the business arena. With the shrinkage of rural populations, guns are used mainly by urban people to hunt people rather than deer. As sales for low-caliber guns stagnated, the gun industry shifted its production to weapons of increasing lethality (Diaz, 1999). The new generation of pistols is faster firing semiautomatic weapons with larger magazines to hold more bullets of higher caliber that magnify their killing power. To protect themselves against being outgunned, the police, in turn, are switching from revolvers to semiautomatic pistols using more lethal ammunition in a deadly escalation.

An executive of a shooting trade organization justifies the production change through advantageous comparison with normal business practices that trivialize the lethality of the product: "Just like the fashion industry, the firearms industry likes to encourage new products to get people to buy its products." Through social justification, he invests the more deadly weapons with worthy self-protective purposes: "If the gun has more stopping power, it is a more effective weapon." Another exonerative device absolves the gun industry of responsibility for the criminal use of the lethal semiautomatic pistols they design and market: "We design weapons, not for the bad guys, but for the good guys. If criminals happen to get their hands on a gun, it is not the manufacturer's fault. The problem is, you can't design a product and ensure who is going to get it." A lawsuit for negligent marketing and distribution practices won by New York City against gun manufacturers charged that they oversupply stores in Southern states with lax gun laws, knowing that the weapons will be bought and resold to juveniles and criminals in cities with tough gun laws.

The television industry markets some of the most brutal forms of human cruelty under the sanitized labels of "action and adventure" programming. Heavy exposure to televised violence has at least four different effects on viewers: It teaches aggressive styles of conduct; weakens restraints over aggressive behavior because the productions legitimize, glamorize, and trivialize human violence; desensitizes and habituates viewers to human cruelty; and shapes viewers' images of reality, making them more

distrustful of others and more fearful of being victims of crime. Network memos presented at congressional hearings and interviews with media personnel document the heavy use of moral disengagement in the commercialization of violence (Baldwin & Lewis, 1972).

High moral purposes are assigned to the taking of human life, in the likeness of a national character-building service. "The government wants kids to think that there are values worth fighting for, and that's basically what the leads on our show are doing." "If people who break the society's code resist the law, we have to use violence to suppress them. In doing so, we are in the mainstream of American morality." Modeling violent solutions to problems allegedly builds character and affirms society's legal imperative.

Producers often excuse commercialization of violence by contrasting it with outrageous inhumanities, as though one form of human cruelty exonerates other forms. Why pick on television, the scapegoat disclaimer goes, when societies fight wars? "To examine violence where the end result is a dead body on television glosses over the point. This evades the culpability of a whole society that permits wars."

Another variant in the comparative exoneration is to sanctify brutalizing excesses on television by pointing to revered masterpieces containing some violent episodes. "There is violence in *Oedipus*, *Hamlet*, and it permeates the Bible." But gratuitous televised violence ain't Shakespeare. Here are some examples of television practices masquerading behind Hamlet's cloak: "I wish we could come up with a different device than running the man down with the car as we have done this now in three different shows. I like the idea of the sadism, but I hope we can come up with another approach for it." "Last week you killed three men; what are you going to do this week?" When the television programs are exported to other countries, much of the gratuitous violence is deleted. But we overdose our own children on it.

Producers of violent fare are quick to displace responsibility for violent events to other sources. "Television and motion pictures are fall guys for a sick society." "Are kids from unstable environments triggered by television violence? Their not having parents is a more serious problem." Producers disclaim using gratuitous violence by attributing evident excesses to the characters they create. Ruthless individuals, or even peaceful folks, confronted with mortal jeopardy demand acts of violence. One of the more candid scriptwriters discounted the asserted dramatic requirement for violence as analogous to saying, "I never put cotton in a wagon that's not prepared for cotton—but I never use anything but a cotton wagon."

Personal responsibility for gratuitous violence is also obscured by diffusing responsibilities for the product. Rewriters alter writers' scripts, directors fill in the details of the scenarios, and editors shape how the filmed

events are depicted by what they select from the lengthy footage. Diffusion of the production process reduces a sense of personal responsibility for the final product.

Another way of escaping self-censure is to misrepresent, deny, or ignore harmful effects. Modeling violent solutions is purported to serve a public therapeutic function of draining viewers' aggressive drives (e.g., "Violence is a catharsis for kids." "Exposure to properly presented conflict that results in violence acts as a therapeutic release for anger and self-hatred"). The claimed catharsis effect has long been discredited empirically. Although producers tout the refuted therapeutic effects, they contend that adverse effects of televised violence can never be clearly demonstrated. "Nobody has been able to make a definitive statement about the effects of televised violence."

Viewers are divested of human sensitivities or invested with base qualities that justify serving them gory offerings (e.g., "Man's mind is connected to his stomach, his groin, and his fists. It doesn't float five feet above his body. Violence, therefore, cannot be eradicated." "Not as much action as some, but sufficient to keep the average bloodthirsty viewer fairly happy"). The prevalence of violent content is attributed to the aggressive nature and desire of its viewers.

In fact, there is no relationship between the level of program violence and the Nielson index of program popularity. Situational comedies and variety shows are the big draws. The answer to the prevalence of violent scenarios on TV lies in production costs and other structural factors, not in a human craving for cruelty.

Whenever a violent event occurs that stirs the public, the television networks run a predictable scenario: They assemble the cast of spokespersons for the major suspected sources of violence. The spokespersons promptly divert attention from their possible contributory influence by invoking and repudiating a single-cause theory of violent conduct that no one really pro-pounds. They portray themselves as convenient scapegoats and shift the blame to other contributors. They proclaim that it is not the easy access to automatic weapons that is at fault, but lax enforcement of existing gun laws. It is not television or interactive media that promote assaultive styles of conduct, but detached or deficient parenting that is to blame. It is not parental failings, but a cultural moral decay spawned by secular humanists and an entertainment industry that glamorizes, trains, and rewards proficient assaultiveness.

These self-exonerative sermonettes also provide opportunities for political operatives and social advocates to lobby for their pet remedies—prayer in the schools, school vouchers, boosting self-esteem, and enlarging law enforcement and prison systems. Because no one is singularly at fault, they are all absolved of blame with diversionary damage control.

The television networks would do well to stop restaging the blame game. Instead, they should confront the various contributors to violence as to what they are willing to do in the enterprises they run to reduce violence in our society.

I have analyzed elsewhere the moral disengagement of international weapons merchants who merchandize deathly wares and the latest in terrorist technology (Bandura, 1999). The merchandising of terrorism is not accomplished by a few unsavory individuals. Rather, it requires a worldwide network of reputable, high-level members of society who contribute to the deathly enterprise by insulating fractionation of the operations and displacement and diffusion of responsibility. One group manufactures the tools of destruction. Others amass the arsenals for legitimate sale. Others operate storage centers for them. Others procure export and import licenses to move the deathly wares among different countries. Others obtain spurious end-user certificates that get the weaponry to embargoed nations through circuitous routes. And still others ship the lethal wares. Intermediaries and banks handle the money. The cogs in this worldwide network include weapons manufacturers; former government officials with political ties; ex-diplomatic, -military and -intelligence officers who provide valuable diplomatic skills and contacts; weapons merchants; and shippers and bankers operating legitimate businesses. By fragmenting and dispersing subfunctions of the enterprise, the various contributors see themselves as decent, legitimate practitioners of their trades rather than as parties to deathly operations.

Edmund Burke's aphorism that "the only thing necessary for the triumph of evil is for good men to do nothing," needs a companion adage: The triumph of evil requires a lot of good people doing a bit of it in a morally disengaged way with indifference to the human suffering they collectively cause. Given the many psychological devices for disengaging moral self-sanctions, societies cannot rely solely on individuals, however righteous their standards. Humane life requires, in addition to ethical personal standards, effective safeguards built into social systems that uphold compassionate behavior and curb human cruelty. Regardless of whether inhumane practices are executed institutionally, organizationally, or individually, it should be made difficult for people to remove humanity from their conduct.

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Assessment of Filial, Parental, Marital, and Collective Family Efficacy Beliefs

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Keywords: Self-efficacy, collective efficacy, family, scales

Summary: This study examines the psychometric properties of four scales designed to assess efficacy beliefs that family members hold about their role as spouse, parent, and child, as well as about the functioning of family as a holistic system. The sample includes about 600 parents and about 1000 adolescents. Psychometric properties of the scales are examined by means of exploratory and confirmatory factor analyses as well as internal coherence coefficients. Validity was examined by means of correlations with indicators of open communication, parental monitoring, aggressive management of conflict, and family satisfaction. Confirmatory factor analysis corroborates the internal reliability of the scales and their distinctiveness. Although correlated, efficacy beliefs that family members hold regarding their capacity to meet the different roles within the family and involved in the functioning of family as a whole system are not reducible to a single dimension. The family efficacy scales provide theoretically rooted tools for studying family processes and functioning as they occur under naturalistic conditions and as a result of therapeutic interventions.

People do not undertake activities that they feel are beyond their capabilities, nor are they inclined to pursue ambitious goals, or to persevere in the face of difficulties, unless they believe they can produce the desired results by their own actions. The more assured they are in their capabilities to manage environmental demands, the more likely they are to take advantage of opportunities, to develop their talents, and to realize desired accomplishments. A vast body of literature verifies the pervasive influence of self-efficacy beliefs across diverse domains of human functioning, including academic, health, organizational, athletic, and sociopolitical spheres (see Bandura, 1997).

In social cognitive theory (Bandura, 2001), efficacy beliefs are the foundations of human agency. Self-efficacy beliefs attest to the propensity of persons to reflect on themselves and to regulate their conduct in accordance with their personal goals and standards. Thus, efficacy beliefs reflect what people have learned from past experience

and provide an indication of the course of action they are inclined to take to achieve desired goals. Self-efficacy beliefs are domain-linked knowledge structures that vary across spheres of functioning rather than a global trait.

Beliefs in one's personal efficacy may not be sufficient alone to ensure the achievement of desired goals. Many outcomes are achievable only by people pooling their knowledge and resources, and working together. Under conditions in which outcomes require interdependent effort, as is true in most social systems, success depends on perceived collective efficacy. Thus, social cognitive theory extends the conception of human agency to collective efficacy. People's shared beliefs in their collective power to produce desired results is a key ingredient of collective agency in social cognitive theory (Bandura, 1997, 2000, 2001).

Perceived collective efficacy affects "the sense of mission and purpose of a system, the strength of common

commitment to what it seeks to achieve, how well its members work together to produce results, and the group's resiliency in the face of difficulties" (Bandura, 1997, p. 469). Findings from diverse lines of inquiry attest to the influence of perceived collective efficacy on group motivational investment and achievements in educational, athletic, socio-political, and organizational settings (Bandura, 1993, 1997; Caprara, Borgogni, Barbaranelli, & Rubinacci, 1999; Earley, 1994; Fernandez-Ballesteros, Diez-Nicolas, Caprara, Barbaranelli, & Bandura, 2002; Hodges & Carron, 1992; Jex & Bliese, 1999; Prussia & Kinicki, 1996; Zaccaro, Blair, Peterson, & Zazanis, 1995). The evidence from two meta-analyses is consistent in showing that perceived collective efficacy contributes to group functioning (Stajkovic & Lee, 2003).

The family is a social system that exerts an ongoing influence on human development. Throughout the course of life people face a variety of demands and challenges as part of a family system consisting of multiple interlocking relationships. The different roles of spouse, parent, and child carry different opportunities, constraints, and reciprocal obligations. Each role represents an aspect of life where self-efficacy beliefs for managing effectively the role requirements may prove critical for individuals' and family functioning. It is unlikely that people feel equally efficacious as child, spouse, and parent at different phases of the family life cycle. Being an efficacious spouse rests upon the capacity to deal with different challenges and obligations than being an efficacious parent, and efficacious parenting with infants calls for different capabilities than those needed to manage relationships with adolescents.

Research on self-efficacy beliefs related to various family roles is relatively sparse, despite the growing evidence for the influence that self-efficacy beliefs exert on family functioning (Bandura, 1997). Most research has focused on parents' beliefs in their efficacy to foster the development of their children. Perceived parental efficacy affects child development both directly and as a mediator of other important determinants such as socioeconomic status, poverty, social support, quality of marital relationship, parental affective states such as depression, and children's characteristics such as temperament and physical health (Ardelt & Eccles, 2001; Bandura, 1997; Coleman & Karraker, 1998, 2000; Cutrona & Troutman, 1986; Elder, Eccles, Ardet, & Lord, 1995; Teti & Gelband, 1991; Teti, O'Connell, & Reiner, 1996; Whitbeck, Simons, Conger, Wickrama, Ackley, & Elder, 1997).

Much less is known about the influence that marital and filial efficacy beliefs exert on family functioning and

how the interactive family dynamics contribute to the efficacy of the family as a whole to manage its circumstances. To fill this gap we developed a set of efficacy scales to assess marital, parental, filial, and collective family efficacy beliefs. This scale development is part of a longitudinal project aimed at identifying the personal and social determinants of social adaptation and well-being from childhood, through adolescence, to adulthood (Caprara, Regalia, & Scabini, 2001).

This study presents the set of familial efficacy scales, and their psychometric properties. Because the various family roles involve differing demands and challenges we hypothesized that child, parental, and marital efficacy would represent distinct factors. Interactions among group members create emergent group properties (Bandura, 2000). We, therefore, expected *perceived collective efficacy* to represent a distinct factor as well. However, because of the interdependent nature of family functioning (Bussey & Bandura, 1999; Halverson & Wampler, 1997; Maccoby, 1998; Parke, & Kellam, 1994; Parke & Buriel, 1997; Scabini, 1995) we hypothesized some degree of positive relations among the various family efficacy scales. Finally, we hypothesized positive correlation of these scales with indicators of family adjustment (such as family satisfaction, open communication, and effective monitoring) and negative correlations with indicators of family maladjustment (such as aggressive management of conflict).

Methods

Participants

The participants were drawn from Genzano, a residential community near Rome, and from Milan and its surroundings. The former sample is part of a longitudinal project*; the latter sample was expressly recruited for the present study.

Both samples are of similar sociodemographic characteristics. They include families of skilled workers, professionals, merchants, and service staff. In the Genzano sample 16% were in professional or managerial ranks, 38% were merchants or employees in various types of businesses, 15% were skilled workers, 21% were unskilled workers, 8% were retired, and 2% were unemployed. In the Milan sample 18% were in professional or managerial ranks, 40% were merchants or employees in various types of businesses, 14% were skilled workers, 18% were unskilled workers, 9% were retired, and 1%

* As part of the longitudinal study we primarily asked the child/adolescent's caretaker (the person having primary responsibility for the son/daughter within the household) to participate; but we also asked if the other partner was willing to participate.

were unemployed. There is no significant difference in the sample socioeconomic composition.

Both samples included complete families, mother-children and father-children dyads, and single family members.* The number of complete families was 220, of mother-children dyads was 121, of father-child dyads was 17, of single adolescents was 626, of mothers was 36, and of fathers was 22.

The Genzano sample include 92 complete families, 64 mother-child dyads, 12 father-child dyads, 10 fathers, 16 mothers, and 574 adolescents who filled out the instruments. The total number of subjects included 181 mothers and 115 fathers, with mean ages of 44 and 49 years, respectively. The adolescents were 384 girls and 358 boys with ages ranging from 14 to 20 years, and a mean age of 17 years. The participation rates were 70.4% for mothers, 43.2% for fathers, and 85% for adolescents.

The Milano sample included 128 complete families, 57 mother-child dyads, 5 father-child dyads, 12 fathers, 26 mothers, and 52 adolescents who filled out the instruments. The total number of the subjects include 196 mothers and 144 fathers, with mean ages of 46 and 50 years, respectively, and 121 girls and 121 boys ranging in age from 13–20 years, with a mean age of 16 years. The participation rates were 85% for mothers, 70% for fathers, and 98% for adolescents.

Considering together the two samples, there were 341 mother-child dyads (170 mother-son dyads and 171 mother-daughter dyads) and 237 father-child dyads (116 father-son dyads and 121 father-daughter dyads). All participants were identified by public and private secondary schools, contacted by phone, and invited to participate in the study. For both samples adolescents were administered the measures of interest by female experimenters during scheduled sessions in the schools in groups of about 30 participants. For both samples parents were administered the measures of interest at their home by a member of the research staff.

Measures

Perceived Filial Self-Efficacy

Adolescents' perceived filial self-efficacy was measured by 20 items assessing belief in their capabilities to discuss with their parents personal problems even under difficult circumstances, express positive feelings and manage negative emotional reactions toward them, get parents to see their side on contentious issues, man-

age stress arising from marital conflicts, and to influence constructively parental attitudes and social practices. The construction of the scale was guided by knowledge concerning competencies that are likely to foster a good relationship with parents: the capacity to maintain open communication with parents, to manage different and conflictive situations, and to voice one's own opinion (Brennen, 1999; Demo & Acock, 1996; Noller, 1995; Scabini, 1995; Smetana, 1996). The same response format was used for each of the family efficacy scales. For each item, participants rated their perceived efficacy to manage given family relationships. The items comprising the final version of this scale and of other family efficacy scales are presented in the Appendix.

Perceived Parental Self-Efficacy

Mothers' and fathers' perceived parental efficacy was measured by 15 items assessing beliefs about their capability to maintain open communication with their children, support their children's efforts to gain self-reliance and manage new challenges, achieve consensus on personal responsibilities, handle firmly violations of rules and commitments, prevent disagreements from escalating into open conflicts, and make time for enjoyable activities with their children. Research highlighting the importance of parental support and monitoring in adolescents' individuation process provided the guidelines for constructing the items (Scabini, 1995; Scabini & Cigoli, 2000). Evidence indicates that an effective parenting style combines a balance of affective closeness and disciplinary firmness toward children (Steinberg, 2001). The more parents are able to provide adolescents with support and affect while encouraging their autonomy and independence, the more they provide guidance and control over risky behaviors while respecting their children's privacy and encouraging personal responsibility, the more their children are emotionally and socially equipped to face the challenges that pave the way to adulthood (Barnes, Reifman, Farrell, & Dintcheff, 2000; Fisher & Feldman, 1998; Scabini, Lanz, & Marta, 1999).

Perceived Marital Self-Efficacy

Spouses' perceived marital efficacy was measured by 15 items assessing belief in their capabilities to communicate openly and confide in each other, share feelings,

* The distinction among "complete families," "mother-children" and "father-children" dyads, and "single family members" is mainly of a descriptive nature and refers only to how many people in the family filled out the questionnaire. This distinction does not refer to the presence in the family of only one parent: In fact all families in the study were "complete" families in the sense that both parents were living in the family.

aspirations, and worries, provide each other with emotional support, cope jointly with marital problems, work through disagreements over child rearing, and share common activities and social relations. In constructing the scale and selecting the items, we focused on the major tasks couples must face to maintain a satisfactory relationship, as well as on the challenges and negotiations that parents of adolescents have to manage. With adolescents in the home, a couple's intimacy can be strained, marital disagreements and conflicts can be exacerbated, and mutual commitment and concerted action can be difficult to realize, especially in the face of the competing demands of children, relatives, and the community at large (Olson, et al., 1989). Thus, the guiding criteria in constructing the items concerned spouses' efficacy to nurture feelings of mutual trust and loyalty, provide effective mutual support, avoid having disagreements turn into hostility, improve adequate communication, promote and use dyadic coping strategies to face daily stresses and to operate in concert toward the achievement of common goals, including child management and surveillance (Bodenmann, 1997; Gottman, 1994; Scabini & Cigoli, 2000). For each item, participants rated their of efficacy to manage the relationship with her/his spouse.

Perceived Collective Family Self-Efficacy

Participants' perceived collective family efficacy was measured by 20 items assessing beliefs in the family's efficacy to operate as a whole system in accomplishing tasks necessary for family functioning. The previously mentioned perceived family efficacy scales measured perceived capabilities to operate at the dyadic level (i.e., parent-child and husband-wife). Collective family efficacy focuses on the perceived operative capabilities of the family as a whole. The family is construed as a social system comprising interlocking relationships, operating interactively. The holistic efficacy appraisal captures the coordination, interaction, and the dynamics of social systems operating collectively (Minuchin, 1985; Walsh, 1993). In generating the various items we focused on the family's capability to: manage daily routine operations, achieve consensus in decision-making and planning, cope together with adversities, promote reciprocal commitment, provide emotional support in difficult times and in stressful situations, enjoy each other and relax together in spite of multiple obligations, and keep good relations with the community at large.

Following the recommendations of Bandura (1997), all scales used a 7-point response format, from 1 = *Not well at all*, to 7 = *Very well*. All items were developed in the Italian language. The Appendix presents the original Italian version as well as the English translation.

Family Satisfaction

The adolescents' and parents' satisfaction with their family life was measured by a scale developed by Olson and Wilson (1982). This 14-item instrument assessed the major dimension of Olson's Circumplex Model of family functioning: Adaptability and Cohesion. For each item participants rated (on a 5-point scale) how well they were satisfied with different aspects of family life, including the amount of time they spent together, the way the family made decisions and handled family problems, carried out mutual responsibilities, and the sense of fairness in family relations. Examples of items are: "How satisfied are you with how close you feel to the rest of the family? How satisfied are you with the way you talk together to solve family problems?" Following Olson and Wilson's recommendation, the total score were used as an index of global satisfaction with family functioning. The α coefficients for the scale were .85 for adolescents, .84 for mothers, and .81 for fathers.

Parent-Adolescent Communication

Parent-adolescent communication was measured by a scale developed by Barnes and Olson (1982), in which participants respond to 20 items on a 5-point scale, ranging from 1 = *strongly agree* to 5 = *strongly disagree*. The scale is divided into two subscales measuring two dimensions: Openness and Problems. The first subscale, Openness, focuses on the free-flowing exchange of information, both factual and emotional, as well as on the perception of the lack of constraint and the degree of understanding and satisfaction experienced in the interaction. Examples of items from this subscale include: "My father/mother/child is always a good listener. When I ask questions, I get honest answers from my father/mother/child." The second subscale, Problems, focuses on the negative aspects of communication such as the hesitancy to share, or selectivity and caution in what is shared, and negative styles of interaction. Examples of items measuring the existence of problems in communication are: "There are topics I avoid discussing with my father/mother/child. I don't think I can tell my father/mother/child how I really feel about some things." Adolescents were requested to assess communication with their mothers and fathers separately.

In adolescent samples, the α coefficient of the scale was .83 for open communication with both the mother and the father, and .73 for problematic communication with the mother and .76 for problematic communication with the father. In parent samples, the α coefficient of the scale was .86 for open communication with children for both mothers and fathers, and .78 for problematic communication with children for mothers and .70 for problematic communication with children for fathers.

Parental Monitoring

The extent to which adolescents informed their parents about their activities and relationships outside the home was assessed by a 7-item scale developed by Capaldi and Patterson (1989). Two versions were used, one for adolescents and one for parent. For each item participants rated on a 5-point scale how often they kept their parents informed about their activities outside the home. "Do you inform your parents about activities you are doing or intend to do? Can your parents track you down if they need you?" The α coefficients for the scale were .84, .75, and .80, for adolescents, fathers, and mothers, respectively.

Aggressive Management of Conflict Between Parents and Children

The degree to which serious disagreements between children and parents were managed in aggressive or hostile ways was measured by "The Parent-Adolescent Disagreement Scale" developed by Honess, Charman, Zani, Cicognani, Xerri, Jackson, and Bosma (1997). For each of six items, adolescents and parents rated on a 4-point scale, ranging from 1 = *not at all* to 4 = *very well*, the extent to which the statements described behaviors occurring during disagreements about important issues in his or her life. Examples of items are: "I say or do something to hurt her/his feelings," and "I get really angry and hit out." The α coefficient for the scale was .86 for aggressive management of conflict with father, .87 for aggressive management of conflict with mother, and .80 for aggressive management of conflict with children.

Results

To assess the psychometric properties of each of the efficacy scales, the items were subjected to a principal components analysis with Oblimin rotation. Oblimin rotation is a procedure normally used when factors are expected to correlate and not to be orthogonal (Gorsuch, 1983). Items that failed to load .40 or higher were deleted, and a second principal components analysis, with Oblimin rotation, was performed. We then tested the degree of congruence of the factor patterns across the parental and adolescent respondents using the coefficient devised by Tucker (1951). The α reliability coefficients were also computed for the efficacy scales.

Factor Structure of Perceived Filial Self-Efficacy Scales

A first principal components analysis with subsequent Oblimin rotation was conducted on the 40 items combin-

ing the perceived filial and collective family efficacy scales. The items were analyzed together to examine the emergence of two hypothesized factors corresponding to perceived filial efficacy and holistic family efficacy. Four items of the perceived filial self-efficacy scale, which presented a loading less than .4, were eliminated. A second principal components analysis with Oblimin rotation was performed on the remaining 36 items, resulting in a two-factor solution, that accounted for 53% of the variance for boys, and 56% of the variance for girls (see Table 1).

The obtained factor pattern identifies two factors, corresponding to our hypotheses. The correspondence of the factor patterns for boys and girls was evidenced by high congruence coefficients, $\Phi = .99$ for both factors. Both scales showed high internal consistency. The Cronbach's α coefficient for the filial scale was .92 for boys and .93 for girls. The Cronbach's α coefficient for the collective family scale was .96 for boys and .97 for girls.

Factor Structure of Parental and Marital Perceived Efficacy Scales

A first principal components analysis with subsequent Oblimin rotation was conducted separately for mothers and fathers on the 50 items combining the items from perceived parental, marital, and collective family efficacy scales. The six items that presented a loading less than .4, were deleted, three from the marital scale and three from the parental efficacy scale. A second principal components analysis with Oblimin rotation was performed on the remaining 44 items, resulting in a three-factor solution that accounted for 61% of the variance for fathers, and 58% of the variance for mothers (see Table 2).

The correspondence among factor patterns obtained from the samples of mothers and fathers was evidenced by high congruence coefficients: $\Phi = .99$, .98, and .96 for the first, second, and third factors respectively. All three scales showed high internal consistency: Cronbach's α for the parental scale was .92 for mothers and .94 for fathers, Cronbach's α for marital scale was .94 for both mothers and fathers, and Cronbach's α for collective family efficacy scale was .96 for both mothers and fathers.

Gender Differences

Table 3 presents the means and the standard deviations for the different scales. The family members reported a moderate level of perceived efficacy to manage their family relationships. One-way ANOVAS revealed no significant differences between boys and girls. Fathers

Table 1. Factor structure of adolescents' perceived filial self-efficacy.

Item	Factor 1		Factor 2	
	Eigenvalue = 15.6 Boys	Eigenvalue = 17.13 Girls	Eigenvalue = 3.21 Boys	Eigenvalue = 3.12 Girls
PFCE 1	.50	.64	.17	.12
PFCE 2	.67	.78	.09	.03
PFCE 3	.73	.72	.04	.12
PFCE 4	.73	.75	.02	.06
PFCE 5	.72	.73	.02	.03
PFCE 6	.76	.81	.06	.01
PFCE 7	.81	.88	-.02	-.06
PFCE 8	.87	.89	-.09	-.04
PFCE 9	.80	.78	-.01	.04
PFCE 10	.80	.78	-.03	-.02
PFCE 11	.82	.83	-.01	.02
PFCE 12	.81	.82	.04	.01
PFCE 13	.78	.74	.01	.06
PFCE 14	.63	.67	.01	-.05
PFCE 15	.65	.71	-.02	-.06
PFCE 16	.72	.75	.03	.00
PFCE 17	.75	.80	.03	-.04
PFCE 18	.78	.80	-.05	-.00
PFCE 19	.76	.76	-.01	-.00
PFCE 20	.62	.65	.01	.01
PFSE 1	.03	.06	.58	.67
PFSE 2	.06	-.00	.68	.76
PFSE 3	-.04	-.10	.70	.74
PFSE 4	.02	-.02	.62	.73
PFSE 5	-.02	-.00	.74	.76
PFSE 6	-.16	-.07	.81	.78
PFSE 7	.04	.02	.70	.73
PFSE 8	.05	.00	.71	.75
PFSE 9	.07	-.00	.64	.66
PFSE 10	.14	.15	.54	.57
PFSE 11	.13	.25	.63	.50
PFSE 12	.05	.12	.69	.67
PFSE 13	-.11	.02	.66	.60
PFSE 14	.00	-.05	.64	.69
PFSE 15	.09	.28	.69	.51
PFSE 16	.05	.02	.52	.60

Note. PFCE = perceived family collective efficacy; PFSE = perceived filial self-efficacy.

reported a lower sense of parental efficacy than did mothers ($F(1, 635) = 9.14, p < .001$).

Interrelations Among Efficacy Scales

The scales measuring the different aspects of familial efficacy resulted in substantial correlations. In particular, considering adolescents' reports, perceived filial efficacy and perceived collective family efficacy showed a correlation of .64 for boys, and of .68 for girls. Considering parents' reports, perceived parental efficacy correlated .65 (for fathers) and .54 (for mothers) with perceived marital efficacy, and .75 (for fathers) and .60 (for mothers) with perceived collective family efficacy; fi-

nally, perceived marital efficacy correlated .69 (for fathers) and .68 (for mothers) with perceived collective family efficacy. All these correlations were statistically significant and attest to a substantial overlap among the different aspects of familial efficacy.

To further investigate this overlap, the hypothesis that perceived parental, marital, filial, and collective family efficacy scales are correlated but assess independent constructs was examined by means of confirmatory factor analyses using the EQS program (Bentler, 1995). Three models were tested separately for adolescents, fathers, and mothers:

- 1) *Unique factor model:* In this model, factor loadings and error variances are estimated when the corre-

Table 2. Factor structure of perceived parental, marital, and collective efficacy scales.

		Factor 1 Eigenvalue = 19.1 Mother	Factor 1 Eigenvalue = 21.63 Father	Factor 2 Eigenvalue = 3.44 Mother	Factor 2 Eigenvalue = 3.00 Father	Factor 3 Eigenvalue = 2.99 Mother	Factor 3 Eigenvalue = 3.40 Father
PFCE	1	.59	.65	.08	.03	.06	.08
PFCE	2	.79	.64	.03	.09	-.00	.08
PFCE	3	.74	.68	.04	.00	.03	.13
PFCE	4	.54	.57	.27	.27	.00	.02
PFCE	5	.68	.61	-.10	-.08	.17	.19
PFCE	6	.71	.65	.05	.10	.08	.14
PFCE	7	.64	.67	.16	.08	.10	.14
PFCE	8	.66	.71	.09	.04	.11	.11
PFCE	9	.73	.87	.09	.03	.00	.10
PFCE	10	.70	.83	.03	.01	.11	.07
PFCE	11	.74	.77	.11	.08	.01	.04
PFCE	12	.73	.80	.14	.15	-.04	.11
PFCE	13	.82	.69	-.01	-.04	-.03	.08
PFCE	14	.61	.67	.01	-.05	.09	.15
PFCE	15	.72	.75	.04	.12	-.12	.19
PFCE	16	.74	.64	-.00	.16	-.03	.01
PFCE	17	.81	.76	-.08	.01	-.01	.04
PFCE	18	.83	.79	-.12	-.06	.06	.10
PFCE	19	.81	.76	-.07	-.08	-.08	.05
PFCE	20	.55	.41	-.00	-.15	-.00	.28
PMSE	1	-.04	.08	.79	.82	-.03	.18
PMSE	2	.01	.02	.78	.68	-.10	.07
PMSE	3	.00	-.12	.83	.91	-.00	.07
PMSE	4	-.04	-.06	.63	.55	.01	.28
PMSE	5	-.03	-.06	.77	.74	.04	.16
PMSE	6	-.03	.06	.79	.70	.13	.13
PMSE	7	.01	.14	.75	.71	.06	.06
PMSE	8	.06	.09	.77	.72	.03	.11
PMSE	9	.02	.22	.77	.73	.06	.09
PMSE	10	.06	.04	.74	.70	.03	.10
PMSE	11	.23	.05	.58	.68	-.04	.05
PMSE	12	.17	.13	.63	.61	.06	.15
PPSE	1	.01	.09	.02	.05	.64	.67
PPSE	2	.12	.19	.12	.06	.56	.58
PPSE	3	.03	.10	.08	.09	.65	.65
PPSE	4	.09	.20	.11	.10	.63	.58
PPSE	5	-.06	-.02	.00	.14	.82	.71
PPSE	6	-.02	-.03	-.03	.08	.84	.77
PPSE	7	.03	.03	-.01	.00	.68	.61
PPSE	8	-.03	.06	-.08	.04	.88	.81
PPSE	9	-.01	-.01	.14	.19	.52	.59
PPSE	10	-.05	.01	-.05	.01	.81	.76
PPSE	11	.10	.04	-.02	.11	.72	.74
PPSE	12	.11	.28	.03	.06	.68	.55

PFCE = perceived family collective efficacy; PMSE = perceived marital self-efficacy; PPSE = perceived parental self-efficacy.

tions between factors are fixed at 1. The model hypothesizes that the family self-efficacy scales are the expression of one latent factor.

2) *Orthogonal model:* In this model, factor loadings and error variances are estimated when the correlations between factors are fixed at 0. The model hypothesizes that the family self-efficacy scales are independent.

3) *Oblique model:* In this model, factor loadings and error variances are estimated and the correlations between factors are estimated. The model hypothesizes that the family self-efficacy scales are interrelated but not the expression of one latent factor.

For the adolescent participants, we tested the models us-

Table 3. Means and standard deviations for perceived filial, parental, marital, and collective family efficacy scales.

	Adolescents	N	Mean	SD
Perceived filial self-efficacy	Males	479	4.12	1.04
	Females	505	4.00	1.11
Perceived collective family efficacy	Males	479	4.83	1.03
	Females	505	4.80	1.12
<i>Parents</i>				
Perceived marital self-efficacy	Fathers	259	5.17	1.02
	Mothers	377	5.08	1.04
Perceived parental self-efficacy	Fathers	259	4.64	1.03
	Mothers	377	4.90	.90
Perceived collective family efficacy	Fathers	259	4.79	.94
	Mothers	377	4.72	.92

Table 4. Fit indices for confirmatory factor analyses^a.

Models	χ^2	df	RMSEA	NNFI	CFI
<i>Mother sample (N = 377)</i>					
A. Unique factor	3238.354	902	.08	.81	.82
B. Orthogonal model	3585.711	902	.09	.78	.79
C. Oblique model	3163.354	899	.08	.81	.82
<i>Father sample (N = 259)</i>					
A. Unique factor	2533.735	902	.07	.82	.83
B. Orthogonal model	3585.711	902	.09	.78	.79
C. Oblique model	2518.908	899	.07	.83	.82
<i>Adolescents sample (N = 984)</i>					
A. Unique factor	3773.783	1256	.046	.88	.88
B. Orthogonal model	4224.488	1256	.050	.86	.86
C. Oblique model	3731.966	1255	.046	.88	.88

^aAll the models yield a significant χ^2 at the $p < .001$ level; RMSEA = Root mean square error of approximation; NNFI = Nonnormed fit index; CFI = Comparative fit index.

ing the multiple groups model approach, which simultaneously estimated the same pattern of relationships among variables for the samples of boys and girls.

Models' goodness of fit was evaluated by means of the χ^2 statistic (Joreskog & Sorbom, 1984), the comparative fit index and nonnormed fit index (CFI and NNFI; Bentler, 1990), and the Root mean square error of approximation (RMSEA; Bentler, 1995). Because the oblique model is nested into the orthogonal and the unique factor model, χ^2 differences (χ^2_{diff}) tests were performed to compare these nested models directly (Byrne, 1994).

Table 4 shows the different fit indices of the tested models in the parent and adolescent samples. As can be seen, all models obtained a significant χ^2 , as well as not quite adequate CFI, NNFI, and RMSEA values. This result is likely due to, first, the large sample size, and second, to the order of the covariance matrices analyzed (in fact, we have a 36×36 covariance matrix in the case of adolescents' scales, and a 44×44 matrix in the case of

parents' scales). However, the focus of this CFA was not on single model testing but on comparison of the models by means of χ^2 difference tests comparing nested models: These tests show that the oblique model fits the data better than either the unique factor model or the orthogonal model for both adolescents and parents, although none of the models present fully adequate fit indexes for the reasons given above. These results indicate that the scales are interrelated but they are not the expression of a single latent variable.

Relations Between Parents' and Adolescents' Family Efficacy Beliefs

The correlations between adolescents' perceived filial and collective family efficacy beliefs and their parents' perceived marital, parental, and collective family efficacy beliefs were computed separately for the 341 mother-

Table 5. Correlation between parents' and adolescents' family self-efficacy beliefs.

	Parents' self-efficacy beliefs											
	Mother-adolescents						Father-adolescents					
	Parental		Marital		Collective Family		Parental		Marital		Collective Family	
	Mother-boys	Mother-girls	Mother-boys	Mother-girls	Mother-boys	Mother-girls	Father-boys	Father-girls	Father-boys	Father-girls	Father-boys	Father-girls
Adolescent Self-Efficacy Beliefs												
Filial	.22**	.22**	.13	.28**	.16*	.28**	.41**	.34**	.50**	.34**	.46**	.36**
Collective Family	.28**	.26**	.19*	.34**	.26**	.32**	.34**	.30**	.32**	.32**	.41**	.30**

* $p < .05$; ** $p < .01$. Mothers-boys $N = 170$; Mothers-girls $N = 171$; Father-boys $N = 118$; Father-girls $N = 119$.**Table 6.** Correlation between parents and adolescents family perceived self-efficacy scales and family functioning variables.

Family functioning variables	Parents' perceived self-efficacy scales					
	PPSE		PMSE		PFCE	
	Mothers ($N = 366$)	Fathers ($N = 253$)	Mothers ($N = 366$)	Fathers ($N = 253$)	Mothers ($N = 366$)	Fathers ($N = 253$)
Family satisfaction	.46**	.60**	.66**	.63**	.64**	.72**
Open communication with offspring	.56**	.67**	.46**	.49**	.51**	.56**
Problems in communication with offspring	-.12	-.27**	-.13	-.35**	-.19*	-.39**
Monitoring	-.41**	-.35**	-.21**	-.56**	-.23**	-.45**
Aggressive style of conflict with offspring	-.20**	-.35**	-.23**	-.28**	-.26**	-.38**
Adolescents' perceived self-efficacy scales						
	PFSE		PFCSE			
	Males ($N = 473$)	Females ($N = 499$)	Males ($N = 473$)	Females ($N = 499$)		
Family satisfaction	.57**	.69**	.60**	.70**		
Open communication with mother	.62**	.64**	.57**	.54**		
Open communication with father	.60**	.66**	.54**	.61**		
Problems in communication with mother	-.28**	-.54**	-.24**	-.39**		
Problems in communication with father	-.31**	-.50**	-.25**	-.40**		
Monitoring	-.39**	-.48**	-.39**	-.35**		
Aggressive style of conflict with mother	-.38**	-.47**	-.29**	-.36**		
Aggressive style of conflict with father	-.34**	-.43**	-.31**	-.36**		

Note. PPSE = perceived parental self-efficacy; PMSE = perceived marital self-efficacy; PFCE = perceived family collective efficacy; PFSE = perceived filial self-efficacy; PFCSE = perceived family collective self-efficacy. * $p < .05$; ** $p < .01$.

child dyads and the 237 father-child dyads. The results are presented in Table 5. Correlation coefficients range from low to moderately high congruence, with same sex dyads generally being more highly related than opposite sex dyads.

Relationships of Parents' and Adolescents' Family Efficacy Beliefs With Variables Related to Family Functioning

Table 6 shows the correlation matrix between parents' and children's efficacy beliefs and the selected variables related to family functioning. The similar pattern of results for both parents and children attests to the role of

efficacy beliefs in contributing to positive family functioning. While efficacy beliefs are positively correlated with family satisfaction, open communication, and effective monitoring, and negatively correlated with aggressive management of conflict, it is likely that all these variables influence each other and operate in concert, with efficacy beliefs promoting other family variables as well as being sustained by them.

For adolescents, both perceived filial self-efficacy and perceived collective family efficacy were significantly related to the family functioning variables, as shown by the pattern of positive correlations between efficacy beliefs and dimensions of positive family functioning (i.e., family satisfaction, open communication with parents, and family satisfaction), and the negative correlations

between efficacy beliefs and dimensions of poor family functioning (i.e., problematic communication with parents, aggressive style of conflict, and lack of parental monitoring). With regard to the latter, for females, family efficacy beliefs were more highly negatively correlated with communication problems and aggressive conflicts with parents than for males. In general, the positive correlations are higher than the negative correlations.

Parents demonstrated a similar pattern of correlations, with family efficacy beliefs showing higher positive correlations with satisfaction, open communication, and effective monitoring than negative correlations with communication problems and aggressive management of conflict. However, in this case, family efficacy beliefs were more highly negatively correlated with communication problems and aggressive management of conflict for fathers than for mothers.

Discussion

Over the years much theorizing and research has centered on the family as a systems of relationships, functioning both internally and with extra-familial systems such as society at large (Belsky, Rovine, & Fish, 1989; Boss, Doherty, La Rossa, Schumm, & Steinmetz, 1993; Olson & De Frain, 2000; Scabini, 1995). To our knowledge, this is the first study that takes simultaneously into account filial, parental, marital, and collective family efficacy beliefs, and sets the premises to investigate their relationships.

Confirmatory factor analyses supported the conclusion that the scales, designed to assess filial, parental, marital, and collective efficacy beliefs, while correlated, assess different constructs. Collective efficacy beliefs likely depend upon the beliefs that family members hold about their capacity to meet their roles within the family, but are not reducible to a mere aggregate of these beliefs.

Adolescents', parents', and spouses' efficacy beliefs and their collective family efficacy beliefs are important indicators of family functioning as demonstrated by their significant correlations with other indicators of family functioning whose validity have been well-established, such as family satisfaction, open communication, parental monitoring, and management of conflict. The more confident adolescents are in their filial and collective family efficacy, the more likely they are to be satisfied with their family life, to report open communication with their parents, to comply with their monitoring, and to avoid having disagreements turn into hostility and aggression. Similarly, the more confident mothers and fathers are in their parental and marital efficacy, as well as in their collective family efficacy, the more likely they

are to be satisfied with their family life, the more likely they are to report engaging in open and frank communication with their children, and effectively monitoring their activities, and avoiding having disagreements escalate into hostility and aggression. In this regard, gender is also noteworthy, as correlations between efficacy beliefs and family functioning are generally higher among girls than among boys, and among fathers than among mothers, either when adolescents' filial and collective family efficacy beliefs or parents' parental and collective family efficacy beliefs are taken into account.

Viewing the family as a system consisting of multiple interlocking relationships indicates that the effectiveness in carrying out one family role can't be completely independent from effectiveness in performing other roles one may play within the family. Thus, being an efficacious spouse more likely affects the capacity to be an efficacious parent (Grych & Fincham, 2001). Similarly children's efficacy to manage their relationships with their parents more likely affects parents' efficacy to accomplish their role as parents and spouses. This interdependence is supported by the positive relations obtained among the various dyadic forms of efficacy and collective family efficacy beliefs.

A fundamental criticism to this research that may be raised is that we used only self-reports and did not include any external criterion for evaluating the validity of the scales. However, family efficacy scales can be "triangulated" to indicate common beliefs from different actors in the family.

Moreover, although self-reports introduce several response biases (such as social desirability) that claim researcher attention, results of previous research reveal that adolescents' perceived filial efficacy beliefs predict their prosocial and antisocial conduct independently of family variables like communication and styles of familial conflict (Regalia, Pastorelli, Barbaranelli, & Gerbino, 2001), and are among the most important predictors of satisfaction with life (Caprara, Delle Fratte, & Steca, 2002). Future research should clarify the extent to which filial, parental, marital, and collective efficacy beliefs, operating in concert with or independently from one another, promote the well-being of various family members and their functioning.

The efficacy scales we have developed also serve as tools for examining how the various forms of perceived family efficacy exert influence on social systems such as educational and community activities. These scales also provide the means for studying changes in family processes and functioning through family-oriented modes of treatment. Social cognitive theory (Bandura, 1997) provides guides on how to promote the sense of mastery that is needed to function successfully within the family as children, parents, and spouses.

Acknowledgment

This study was partially supported by grants from the Spencer Foundation and Grant Foundation to Albert Bandura, and from the Ministero dell'Università e della Ricerca Scientifica e Tecnologica (Cofin 1998) and Istituto Superiore di Sanità to Gian Vittorio Caprara.

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Appendix

Perceived Filial Self-Efficacy Scale

Nel rapporto con i tuoi genitori quanto sei capace di:

1. Mantenere il dialogo con tuo padre o tua madre quando il vostro rapporto è molto teso
2. Parlare con i tuoi genitori dei tuoi problemi personali
3. Gestire le intrusioni dei tuoi genitori nella tua vita privata senza irritazione e risentimento
4. Evitare che le divergenze di opinione con i tuoi genitori degenerino in litigi
5. Parlare con i tuoi genitori dei sentimenti che nutri nei loro confronti
6. Far sì che i tuoi genitori comprendano il tuo punto di vista su un determinato argomento quando è molto distante dal loro

7. Esprimere apertamente la tua riconoscenza per gli sforzi fatti dai tuoi genitori nei tuoi confronti
8. Esprimere il tuo dissenso senza irritazione e astio
9. Far sì che i tuoi genitori prestino attenzione ai tuoi bisogni, quando sono assorbiti dai loro problemi
10. Coinvolgere i tuoi genitori nelle principali decisioni relative al tuo futuro
11. Tenere conto delle raccomandazioni dei tuoi genitori quando contrastano con le tue opinioni e preferenze
12. Ammettere di avere torto in una discussione e rivedere le tue posizioni
13. Accettare le critiche dei tuoi genitori senza sentirti offeso
14. Rafforzare la stima e la fiducia che i tuoi genitori ripongono in te

15. Far sì che i tuoi genitori abbiano piena fiducia nel tuo giudizio e nel tuo senso di responsabilità
16. Evitare di irritarti quando i tuoi genitori non rispondono alle tue richieste di attenzione

Perceived Parental Self-Efficacy Scale

Nel rapporto con suo figlio/a quanto è capace di:

1. Aiutare suo figlio/a a gestire i problemi che deve affrontare con gli altri
2. Sostenere la fiducia che suo figlio/a ha in se stesso quando ha la netta sensazione di non farcela da solo/a
3. Offrire aiuto a suo figlio/a anche quando è riluttante a chiederlo
4. Essere vicino a suo figlio/a anche quando ha motivo di essere seriamente preoccupato/a per questioni personali, familiari o professionali
5. Mantenere una posizione ferma quando suo figlio/a viola le regole o non osserva gli impegni presi
6. Esercitare una guida su suo/a figlio/a senza intromettersi nella sua vita privata
7. Far sì che suo figlio abbandoni amici indesiderabili
8. Fare in modo che suo figlio/a le confidi i suoi timori e le sue preoccupazioni
9. Accettare le critiche di suo figlio/a senza sentirsi offeso/a
10. Far sì che suo figlio/a le parli anche di cose molto personali
11. Parlare con suo figlio/a del vostro rapporto e dei vostri sentimenti reciproci
12. Fare in modo che suo figlio/a si dia mete realistiche e aiutarlo/a a perseguitarle

Perceived Marital Self-Efficacy Scale

Nel rapporto col suo coniuge quanto è capace di:

1. Trovare tempo per parlare di voi, delle vostre preoccupazioni, delle vostre aspirazioni, delle cose da fare insieme
2. Evitare che i disaccordi degenerino in insulti e aperta ostilità
3. Rispettare le convinzioni personali del suo coniuge anche quando divergono profondamente dalle sue
4. Affrontare insieme le difficoltà, evitando di rimproverarsi reciprocamente
5. Accettare le critiche senza sentirsi colpito ed offeso
6. Ottenere il sostegno del suo coniuge quando ha seri problemi personali
7. Far sentire il suo coniuge importante e degno di rispetto

8. Affrontare di comune accordo i vari problemi educativi e scolastici dei vostri figli
9. Coinvolgere il suo coniuge nelle principali decisioni connesse alla gestione della famiglia
10. Sostenere concretamente il suo coniuge quando i figli oppongono resistenza
11. Preservare la riservatezza e l'indipendenza del suo rapporto coniugale
12. Sostenere il suo coniuge nel gestire i conflitti con i genitori

Perceived Collective Family Efficacy Scale

Quanto la sua famiglia (lei e i suoi familiari insieme) è capace di:

1. Progettare e realizzare momenti di svago insieme nonostante il premere di altri impegni
2. Trovare un accordo su decisioni che richiedono a tutti un qualche sacrificio
3. Risolvere i conflitti quando alcuni ritengono di non essere stati trattati in modo corretto
4. Evitare che i disaccordi reciproci degenerino in ostilità
5. Far sì che tutti si facciano carico dalla gestione della casa
6. Assicurare il supporto reciproco nelle situazioni stressanti
7. Riprendersi rapidamente dalle disavventure
8. Fornire sostegno a ciascuno per raggiungere le proprie mete
9. Far sì che ci si aiuti reciprocamente nei problemi di lavoro
10. Far sì che gli interessi specifici di ciascuno siano rispettati da tutti gli altri
11. Far sì che ciascuno si assuma pienamente le sue responsabilità
12. Aumentare la fiducia reciproca
13. Saper quale scelte fare nei momenti critici della vita
14. Far buon uso delle risorse che la società mette a disposizione della famiglia
15. Mantenere stretti legami con parenti e amici
16. Festeggiare le ricorrenze familiari anche in tempi difficili
17. Collaborare con il sistema scolastico per migliorare l'educazione
18. Mantenere salda la fiducia in se stessa durante le disavventure
19. Dare il giusto riconoscimento alle esigenze di indipendenza di ognuno
20. Rappresentare un esempio positivo per tutta la comunità

Perceived Filial Self-Efficacy Scale

1	2	3	4	5	6	7
Not well at all		Not too well		Pretty well		Very well

In relations with your parents: **How well can you:**

1. Talk with your parents even when your relationship with them is tense
2. Talk with your parent about your personal problems
3. Handle your parent's intrusions into your privacy without getting irritated about it
4. Prevent differences of opinions with your parents from turning into arguments
5. Talk with your parent about your feelings toward them
6. Get your parents to understand your point of view on matters when it differs from theirs
7. Express your gratitude to your parents for their efforts on your behalf
8. Express your disagreement with your parents without getting angry
9. Get your parents to pay attention to your needs even when they are preoccupied with their own problems
10. Involve your parents in important decisions about your future
11. Take into account your parents' suggestions when they differ from your preferences
12. Admit when you are wrong and change your opinion
13. Accept your parent's criticism of you without feeling offended
14. Increase your parent's trust and appreciation for you
15. Get your parents to trust your judgment and responsibilities
16. Avoid irritation when your parents don't pay attention to you

Perceived Parental Self-Efficacy Scale

1	2	3	4	5	6	7
Not well at all		Not too well		Pretty well		Very well

In relations with your son/daughter: **How well can you:**

1. Help your son/daughter manage problems that he/she has with others
2. Support your son's/daughter's self-reliance when he/she feels unable to handle the demands

3. Offer your son/daughter help even when he/she does not ask for it
4. Attend to your son/daughter when you are worried about personal, family or work matters
5. Handle firmly instances when your son/daughter breaks rules and commitments
6. Offer guidance without intruding on his/her privacy
7. Get your son/daughter to give up friends you do not care for
8. Get your son/daughter to confide in you about his/her worries
9. Accept your son's/daughter's criticism of you without being offended
10. Get your son/daughter to talk to you about highly personal matters
11. Talk to your son/daughter about your relationship and feelings for each other
12. Get your son/daughter to set realistic goals and help him/her to achieve them

Perceived Marital Self-Efficacy Scale

1	2	3	4	5	6	7
Not well at all		Not too well		Pretty well		Very well

In your relationship with your wife/husband: **How well can you:**

1. Set aside time to talk together about things that worry you
2. Prevent disagreements from turning into angry exchanges
3. Respect your spouse's views on matters even though you disagree with them
4. Deal with problems together without blaming each other
5. Accept criticism without feeling offended
6. Get the support of your spouse when you have personal problems
7. Make your spouse feel important and respected
8. Get your spouse to agree on how to deal with problems with your children and their schooling
9. Get your spouse involved in important decision about how to run the family
10. Support your spouse when the children ignore what they are asked to do
11. Protect the privacy of your marital relationship
12. Support your spouse in handling conflicts with parents

Perceived Collective Family Efficacy Scale

1	2	3	4	5	6	7
Not well at all		Not too well		Pretty well		Very well

How well, working together as a whole, can your family:

1. Set aside leisure time with your family when other things press for attention
2. Agree to decisions that require some sacrifice of personal interests
3. Resolve conflicts when family members feel they are not being treated fairly
4. Prevent family disagreements from turning into heated arguments
5. Get family members to share household responsibilities

6. Support each other in times of stress
7. Bounce back quickly from adverse experiences
8. Help each other to achieve their personal goals
9. Help each other with work demands
10. Build respect for each other's particular interests
11. Get family members to carry out their responsibilities when they neglect them
12. Build trust in each other
13. Figure out what choices to make when the family faces important decisions
14. Find community resources and make good use of them for the family
15. Get the family to keep close ties to their larger family
16. Celebrate family traditions even in difficult times
17. Serve as a positive example for the community
18. Remain confident during difficult times
19. Accept each member's need for independence
20. Cooperate with schools to improve their educational practices

FACTORS DETERMINING VICARIOUS EXTINCTION OF AVOIDANCE BEHAVIOR THROUGH SYMBOLIC MODELING

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The present study was primarily designed to test the hypothesis that magnitude of vicarious extinction is partly governed by the diversity of aversive modeling stimuli which are neutralized, and by observers' susceptibility to emotional arousal. 1 group of children, who were markedly fearful of dogs, observed a graduated series of films in which a model displayed progressively more intimate interactions with a single dog. A 2nd group of children was exposed to a similar set of graded films depicting a variety of models interacting non-anxiously with numerous dogs varying in size and fearsomeness, while a control group was shown movies containing no animals. Both the single-modeling and multiple-modeling treatments effected significant reductions in children's avoidance behavior, but only the multiple-modeling treatment weakened their fears sufficiently to enable them to perform potentially threatening interactions with dogs. Emotional proneness and degree of vicarious extinction were found to be unrelated in the single-model condition and negatively correlated for children who received the more powerful multiple-modeling treatment.

It has been shown in a previous experiment (Bandura, Grusec, & Menlove, 1967) that avoidance behavior can be extinguished through observation of modeled approach responses without any adverse consequences accruing to the performing model. The basic mechanism underlying this phenomenon was assumed to involve vicarious extinction of mediating arousal reactions which motivate and exercise discriminative control over instrumental avoidance responsivity. The present study investigated variables that might be expected to facilitate vicarious extinction of conditioned emotionality by symbolic modeling procedures that lend themselves readily to psychotherapeutic applications.

The magnitude of vicarious extinction effects is likely to be determined, in part, by the number of modeling stimulus elements which are neutralized. That is, exposure to modeling displays depicting nonreinforced approach behavior by diverse models toward variant forms of the feared object should produce relatively thorough extinction of arousal reactions, and hence, extensive reduc-

tion in avoidance behavior. On the other hand, observers whose emotional responsiveness is extinguished to a restricted set of aversive modeling elements are apt to achieve weaker disinhibitory effects.

Under conditions where a series of aversive modeling stimuli is presented only once, certain observer characteristics might influence the extent to which emotional responses undergo extinction. Observers who are highly susceptible to emotional arousal would be inclined to respond to fear-provoking modeling stimuli with pronounced arousal reactions and might, therefore, show relatively strong resistance to vicarious extinction. In accord with evidence that high-anxious subjects do, in fact, show a slower rate of *direct* extinction than those who are relatively nonanxious (Spence & Farber, 1953), emotional proneness would be expected to serve as an additional determinant of the degree to which avoidance behavior is reduced through modeling procedures.

The above propositions were tested in an experiment involving vicarious extinction of avoidance behavior toward dogs. The modeling stimuli were presented in pictorial form because a secondary purpose of this program of research is to assess the therapeutic efficacy of symbolic modeling techniques. One group of children observed a graduated series

¹ This research was supported by Public Health Research Grant M-5162 from the National Institute of Mental Health.

The authors are grateful to Gail Brugler and Vonda Porter for their generous assistance in the conduct of this research.

of films in which a fearless peer model exhibited progressively more intimate interactions with a dog. A second group of children was exposed to a similar sequence of graded modeling behavior, except that the films depicted a variety of models interacting positively with numerous dogs varying in size and fearsomeness. Children assigned to a control group were shown movies that contained no canine characters.

Evidence that deviant behavior can be modified by a particular method is of limited therapeutic significance unless it can be demonstrated that established response patterns generalize to stimuli beyond those encountered in treatment, and that induced changes endure after the therapeutic conditions have been discontinued. Therefore children were readministered tests for avoidance behavior toward different dogs following completion of the treatment program and again a month later. As a further test of the therapeutic efficacy of symbolic modeling, control children were administered the multiple-modeling treatment following completion of the main experiment.

It was predicted that both modeling approaches would reduce children's avoidance behavior, but that the diversified modeling procedure would achieve greater extinction effects. It was also hypothesized that low emotional proneness would favor relatively extensive vicarious extinction.

METHOD

Subjects

Thirty-two girls and 16 boys, varying in age from 3 to 5 years, participated in the experiment.

Pretreatment Measurement of Avoidance Behavior

All children enrolled in the Stanford Nursery School were administered a standardized test of avoidance behavior to identify those who were markedly fearful of dogs.

The test of strength of avoidance, which was identical to the one employed in an earlier experiment of vicarious extinction (Bandura et al., 1967), consisted of a graded series of 14 performance tasks in which the children were required to engage in increasingly intimate interactions with a dog. A female experimenter brought the children individually to the test room, where a brown cocker spaniel

was confined in a playpen. In the initial set of tasks the children were asked, in the following order, to walk up to the playpen and look down at the dog, to touch her fur, and to pet her. Following the measurement of avoidance behavior to the dog in the protective enclosure, the children were requested to open a gate and remove the dog from the playpen, to walk the dog on a leash to a rug located at the end of the room, to remove the leash, and to turn the dog over and scratch her stomach. In subsequent items the children were asked to remain alone in the room with the animal and to feed her dog biscuits. The final and most difficult set of tasks required the children to climb into the playpen with the dog and, after having locked the gate, to pet her, scratch her stomach, and to remain alone in the room with the dog under the confining fear-arousing conditions.

The strength of the children's avoidance tendencies was reflected not only in the approach responses that they were able to perform, but also in the extent to which they could engage in the required behavior and the degree of vacillation, reluctance, and fearfulness that preceded and accompanied each approach response. Therefore, as in the previous study, children were credited 2 points if they fully executed a given task either spontaneously or willingly, and 1 point when they performed it minimally with considerable hesitancy and reluctance. Thus, for example, children who promptly stroked the dog's fur repeatedly when requested to do so received 2 points, whereas subjects who held back but then touched the dog's fur briefly obtained 1 point. In the item requiring the children to remain alone in the room with the dog, they received 2 points if they approached the animal and played with her, and 1 point if they were willing to remain in the room but avoided any contact with the dog. Similarly, in the feeding task children were credited 2 points if they fed the dog by hand, but a single point if they tossed the biscuits on the floor and thereby avoided contact with the animal. The maximum approach score that a child could obtain was 28 points.

Children were grouped into two levels of avoidance behavior and assigned on a stratified random basis to one of three treatment conditions. Although identical test procedures were employed, the children selected for the present experiment displayed considerably more severe phobic behavior than subjects in the first study, with approximately 70% receiving scores of only 7 points or lower.

Appraisal of Susceptibility to Emotional Arousal

In order to establish whether emotional proneness of observers is a significant determinant of vicarious extinction, mothers rated their children's fears on a questionnaire comprising 42 items, each represented by a five-interval scale describing increasing degrees of fearfulness. The items in this inventory were equally divided into the following three general

categories: animal fears, interpersonal fears (e.g., physical aggression, peer rejection, separation, authority figures), and fear of inanimate objects or events (e.g., darkness, thunder, heights, unfamiliar places). In addition, the mothers were interviewed regarding the extent of their children's anxiety responsiveness, specific traumatic episodes that might have contributed to fearfulness of dogs, parental and sibling modeling of dog avoidance and apprehension, and the methods that the parents had employed in attempts to modify their children's avoidance behavior. The mothers of 14 dauntless children who, in the preliminary behavioral assessment, eagerly performed all the tasks in the avoidance test were also administered both the fear inventory and the interview to provide a basis for evaluating antecedent factors and the scope and magnitude of anxiety reactions exhibited by dogphobic children.

Treatment Conditions

In all treatment conditions children were shown a total of eight different 3-minute movies, two per day on 4 alternate days. Each session was attended by a group of three or four children who were seated facing a large screen in a semidarkened room. At periodic intervals during the movies the experimenter made simple descriptive comments about the events depicted on the screen in order to sustain a high level of attending behavior in the children.

Subjects who participated in the *single-model* condition observed a fearless 5-year-old male model display progressively bolder approach responses toward the cocker spaniel. The fear-arousing properties of the modeled displays were gradually increased from session to session by varying simultaneously the physical restraints on the dog and the directness and intimacy of the modeled approach responses (see Figure 3).

In the initial interaction sequences, for example, the model's behavior was limited to looking at the dog in the playpen and occasional petting. Subsequent movies showed the venturesome model walking the dog on the leash, grooming her, holding her in his arms, and serving her canine gourmet snacks. The feeding routines began with relatively nonthreatening amusing scenes in which the dog drank milk from a baby bottle and munched on a jumbo sucker held steadfastly by the model; later sequences depicted the dog vaulting toward hamburger patties and frankfurters that the model dangled in his hand. In the terminal set of movies the model climbed into the playpen with the dog where he petted her, fed her doggie bon bons and, as a finale, rested his head on his canine companion during a brief siesta in the overcrowded playpen. These modeled approach performances were interspersed with attention-sustaining segments in which the model attired both the dog and himself in colorful festive hats and oversized "Beatle" wigs.

Children assigned to the *multiple-model* condition observed, in addition to portions of each of the

filmed sequences described above, several different girls and boys of varying ages interacting positively with sundry dogs ranging from diminutive breeds to larger specimens. The size and fearsomeness of this canine aggregation were progressively increased from small dogs that were nonthreatening in appearance to the more massive varieties. The films in the two modeling treatments were of equal length.

Children in the *control* condition were shown movies of Disneyland and Marineland for equivalent periods of time. This group provided a control for any direct extinction of avoidance behavior resulting from repeated behavioral assessments, as well as disinhibitory effects of extensive contact with amicable experimenters and increased familiarity with the person conducting the avoidance tests.

Posttreatment Measurement of Avoidance Behavior

On the day following completion of the treatment series, children were readministered the avoidance test consisting of the graded sequence of dog interaction tasks. In order to determine the generality of vicarious-extinction effects, half the children in each of the three conditions were tested initially with the experimental animal and then with an unfamiliar dog; the remaining children were presented with the two dogs in the reverse order. The testing sessions were separated by an interval of approximately 1 hour so as to minimize any transfer of emotional reactions provoked by one animal to the other.

The unfamiliar animal was a white mongrel, predominantly terrier, and of approximately the same size and activity level as the cocker spaniel. Both dogs elicited virtually identical approach responses from children tested in a separate study (Bandura et al., 1967) to evaluate the relative fearsomeness of the two animals.

Follow-Up Appraisal

A follow-up measurement of avoidance behavior was conducted approximately 1 month after the posttreatment assessment in order to determine the stability of modeling-induced changes. The children's responses were tested with the same performance tasks toward both animals, presented in the identical order.

After the experiment was completed, children who had participated in the modeling treatment were told that, while most dogs are friendly, before petting an unfamiliar dog they should ask the owner. This precautionary instruction was intended to forestall indiscriminate approach behavior toward strange dogs which might have unfriendly dispositions.

Assessment Procedure

The same female experimenter administered the pretreatment, posttreatment, and follow-up avoid-

ance tests. To obviate any possible bias, the experimenter was furnished only minimal information about the study and had no knowledge of the conditions to which the children were assigned. The treatment and assessment phases of the study were further separated by the use of different rooms for each activity.

In order to provide an estimate of interrater reliability, 25% of the behavioral tests, randomly selected from pretreatment, posttreatment, and follow-up phases of the project, were scored simultaneously but independently by another rater who observed the test sessions through a one-way mirror from an adjoining observation room. The two raters were in perfect agreement on 95% of the specific approach responses that were scored.

During the administration of each test item, the animals' activity was rated as either passive, moderately active, or vigorous, since the dogs' behavior may have some influence on the degree of avoidance exhibited by the children. These data disclosed that the dogs did not differ in their behavior either across experimental phases or between treatment conditions.

Treated Controls

At the conclusion of the main experiment the efficacy of the symbolic modeling procedure was subjected to a further test based on an intrasubject design. Of the 16 children in the control group, 4 had left the San Francisco Bay area, but 12 were still enrolled in the nursery school. These children were shown the series of multiple-modeling films, after which they were administered the avoidance test with both animals.

RESULTS

Because the distributions of scores departed substantially from normality, and markedly so in the control group, the significances of differences were evaluated by nonparametric techniques.

Mann-Whitney *U* tests performed on approach scores for the total sample, and separately for each treatment condition at each phase of the experiment, disclosed no significant sex differences, and no effects due to the order in which the test animals were presented. Similarly, results of the Wilcoxon test reveal that children exhibited equivalent amounts of approach behavior toward the two dogs, indicating extensive generalization of vicarious extinction effects. The data were therefore pooled with respect to test order, dogs, and sex for evaluating the relative efficacy of the symbolic modeling treatments.

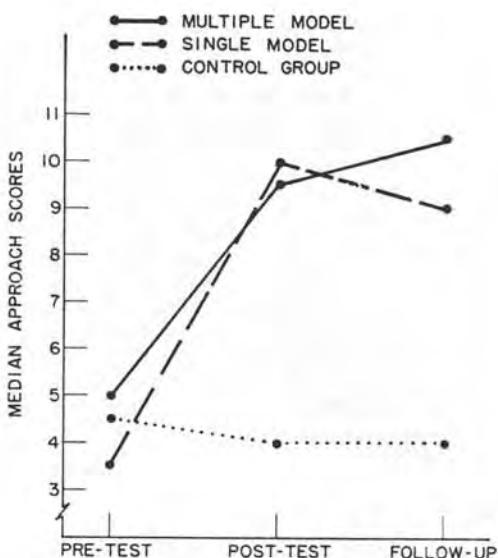


FIG. 1. Median approach scores obtained by children in each of three conditions at different phases of the experiment.

Within-Group Changes in Approach Behavior

The approach scores obtained by children in each of the three conditions at different phases of the experiment are shown graphically in Figure 1. A Friedman two-way analysis of variance disclosed a highly significant phases effect ($\chi^2_r = 15.79; p < .001$). Separate comparisons of these scores for each condition by the Wilcoxon test indicate that the sizable phases effect is entirely due to the behavioral modifications produced by symbolic modeling. Control children showed no changes in their dog approach behavior during either posttreatment or follow-up assessments relative to their pretherapy behavior. By contrast, children in the single-modeling condition displayed significant increases in approach behavior after the completion of treatment ($T = 22; p < .01$), and 1 month later ($T = 9; p < .005$). Subjects who had observed the multiple modeling likewise achieved substantial gains as measured in posttreatment ($T = 13; p < .005$) and follow-up ($T = 6.5; p < .005$) phases of the project.

It is interesting to note that, whereas children in the single-modeling condition main-

tained their gains at the level achieved after treatment, those who had the benefit of multiple modeling became even bolder toward dogs in the follow-up period compared to their posttreatment behavior ($T = 10$; $p < .02$, two-tailed test).

Differences Between Conditions

The obtained differences between treatment conditions were not of statistically significant magnitude in the posttherapy assessment, although multiple-modeling subjects differed from the controls just short of the .05 significance level ($U = 87.5$).

A Kruskal-Wallis one-way analysis of variance computed on change scores between pretherapy and follow-up performances yielded a significant treatment effect ($H = 5.01$; $p < .05$). Comparisons between pairs of conditions, evaluated by the Mann-Whitney U test, showed that children who received the single-modeling ($U = 80.5$; $p < .05$) and the multiple-modeling ($U = 76$; $.025 < p < .05$) treatments achieved greater increases in approach behavior than did the controls. The two modeling conditions, however, did not differ from each other with respect to total approach scores.

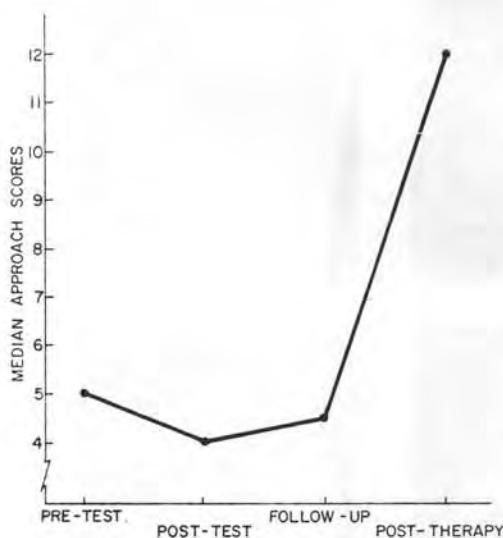


FIG. 2. Median approach behavior displayed toward dogs by control children during three test periods and after they had received the multiple-modeling treatment.

Treated Controls

The approach scores obtained by control children in three pretherapy assessments and after they had participated in the multiple-modeling treatment are shown in Figure 2.

A Friedman two-way analysis of variance performed on these scores yielded a highly significant treatment effect ($\chi^2_r = 13.42$; $p < .01$). Wilcoxon tests computed between scores at different phases of the study revealed that the children's avoidance behavior remained unchanged throughout the control period. However, after exposure to multiple modeling of fearless behavior toward dogs, control children displayed a sharp increase in approach responses compared to their performance in the initial appraisal ($T = 3$; $p < .005$), the posttest ($T = 3$; $p < .005$), and the follow-up ($T = 0$; $p < .005$) assessments. The increased boldness of one of the control children who had been subsequently treated is portrayed in Figure 3. The top frames show the model's dauntless behavior; the lower frames depict the girl's fearless interaction with the animals, both of which she boldly corralled into the playpen after the formal test.

Terminal Performances

The percentage of children in each condition who were able to perform the terminal approach task (i.e., remain confined with the dog in the playpen) is shown in Figure 4. Although the groups did not differ in this regard immediately after treatment, in the subsequent follow-up assessment twice as many children in the multiple-model condition completed the terminal task as did subjects in the other two groups ($\chi^2 = 2.73$; $p < .05$), which did not differ from each other.

The efficacy of the multiple-modeling treatment is further reflected in the substantial increase in terminal performances by treated controls from 17% in the follow-up phase to 50% after exposure to diversified symbolic modeling (Figure 4). Comparison of the incidence of terminal performances by children presented with the single-modeling display and all subjects who witnessed the

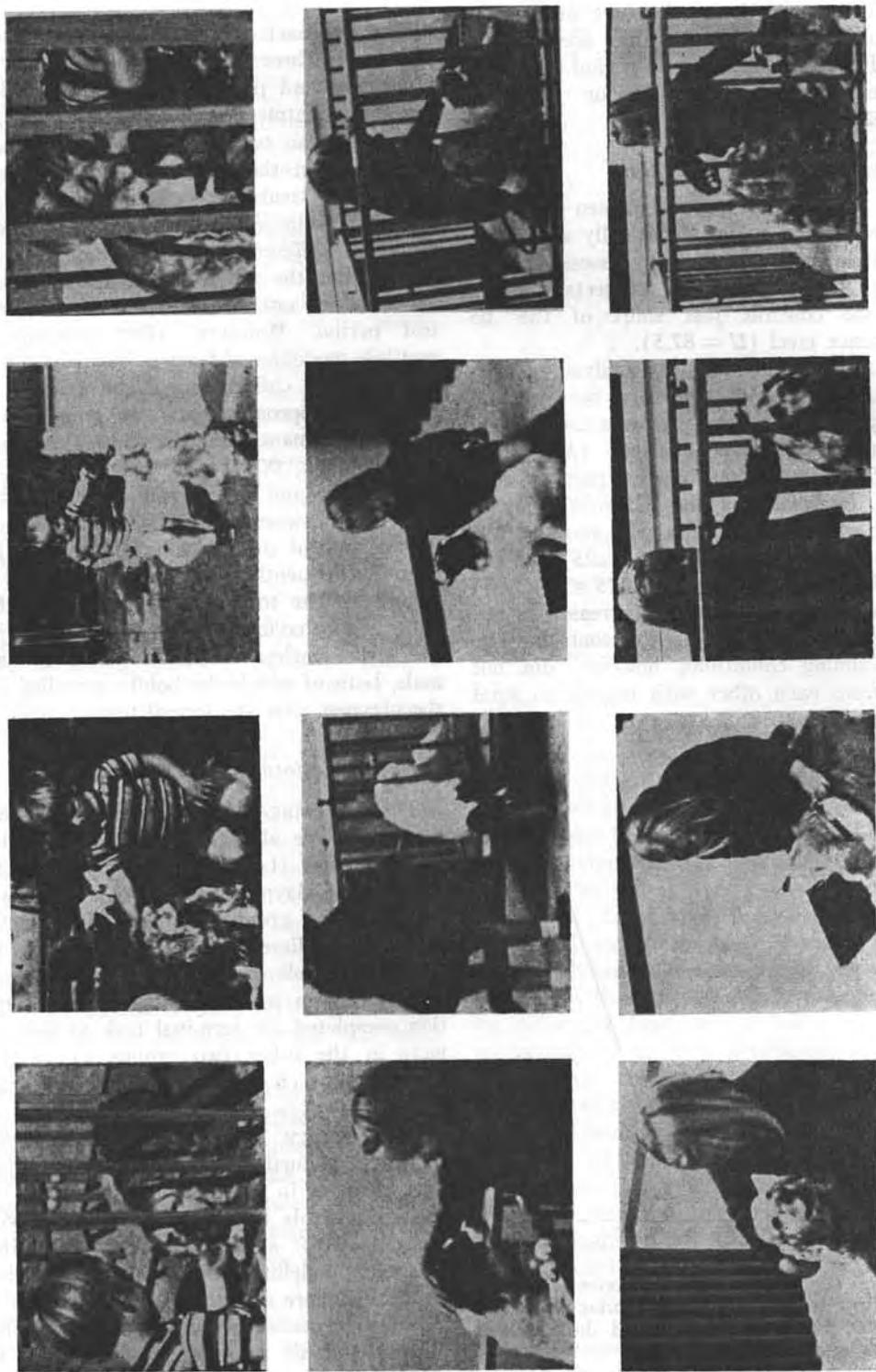


FIG. 3. Photographs of a child who was apprehensive about dogs engaging in fearless interactions with dogs after exposure to the series of therapeutic films.

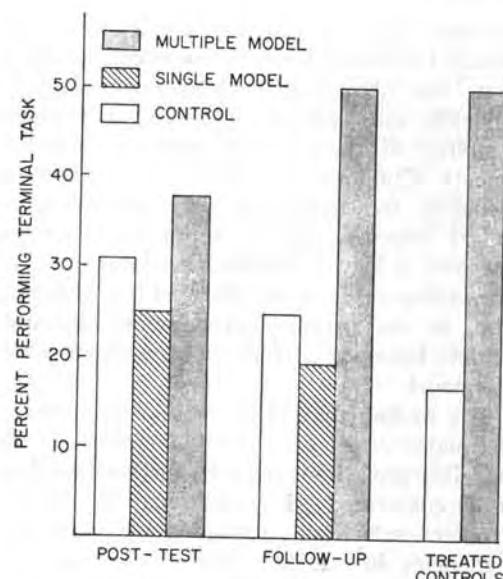


FIG. 4. Percentage of children in each treatment condition who achieved terminal approach behavior after treatment and 1 month later. (The rectangles on the right represent terminal performances by treated controls in the follow-up phase and following the multiple-modeling treatment.)

multiple modeling shows the latter form of treatment to be superior ($\chi^2 = 2.98$; $p < .05$) for completely eliminating dog avoidance behavior.

TABLE 1

DEGREE OF RELATIONSHIP BETWEEN DIFFERENT INDEXES OF EMOTIONAL PRONENESS AND VICARIOUS EXTINCTION

Emotionality variables	Post-treatment change	Follow-up change
Single-modeling condition		
Total fears (inventory)	.09	.04
Animal	-.20	.06
Interpersonal	.04	-.09
Inanimate objects	.28	-.01
Total fears (interview)	.33	.41
Pretherapy avoidance behavior	.11	.18
Multiple-modeling condition		
Total fears (inventory)	-.61***	-.41*
Animal	-.30	-.21
Interpersonal	-.55**	-.26
Inanimate objects	-.58**	-.47**
Total fears (interview)	-.64***	-.48**
Pretherapy avoidance behavior	.37	.36

* $.05 < p < .10$.

** $p \leq .05$.

*** $p < .01$.

Vicarious Extinction as a Function of Emotional Proneness

The rank-correlation coefficients between the various measures of avoidance behavior and emotional proneness are given in Table 1.

Severity of the children's avoidance behavior was unrelated to the degree to which they benefited from the modeling treatments; nor were the indexes of emotional proneness significant predictors of vicarious extinction for children who received the single-modeling treatment. On the other hand, in the multiple-modeling condition, which produced the more thorough extinction effects, susceptibility to emotional arousal was inversely related to degree of behavioral improvement. It is interesting to note, however, that emotional responsiveness to potentially threatening interpersonal and inanimate events, rather than severity of animal fears, proved to be the better predictive measures.

Antecedents of Dog-Avoidance Behavior

According to the questionnaire data the dog-phobic children have approximately twice as many animal fears ($t = 2.63$), which tend to be of greater intensity ($t = 1.99$), than children who displayed completely fearless behavior toward the test dog during the initial assessment. These two groups of children did not differ, however, with respect to their anxiety reactions to interpersonal and inanimate threats.

There is some evidence to suggest that parental modeling of fearful behavior is a significant contributory factor to children's fearfulness. Only one parent in the bold group reported any trepidation about dogs, whereas in 17 of the families of avoidant children one or both parents displayed such fears ($\chi^2 = 2.94$; $p < .05$). The data yielded no differences concerning peer modeling of dog-avoidance behavior and, although the incidence of specific traumatic episodes involving dogs was somewhat higher for fearful (35%) than bold children (21%), the groups did not differ significantly in this regard.

Perhaps the most interesting finding in the interview data is that the majority of parents (56%) made no attempts to overcome their children's fears. Those who periodically tried

remedial measures favored either explanations and verbal reassurances (12%), enforced contact with dogs (19%), or modeling of fearlessness (14%). However, the extinction and modeling endeavors rarely involved carefully graded presentations of threatening stimuli without which these techniques are not only likely to be ineffective, but may actually exacerbate anxiety reactions. A not uncommon domestic modeling scene is one in which a parent is busily petting a dog that is jumping about while simultaneously pressuring the child, who is clinging fearfully, to touch the bounding animal. By contrast, the present experiment, in addition to utilizing the principle of gradualism to reduce possible arousal of anxiety, involved concentrated exposures to modeling displays under protected observation conditions, and extensive variation of model characteristics, intimacy of approach behavior, and aversive properties of the feared object. Had the modeling sequences been presented in a widely dispersed and haphazard fashion and restricted to the more reserved petting responses by adults (whom the children are likely to discriminate as better able to protect themselves), the vicarious extinction outcomes might have been relatively weak and unpredictable.

DISCUSSION

The therapeutic effects of symbolic modeling appear sufficiently promising to warrant further development of this treatment approach. Highly fearful children who observed approach behavior modeled without any adverse consequences to the performer subsequently displayed stable reductions in avoidance behavior. Moreover, the extinction effects transferred beyond the stimulus objects encountered in treatment.

The vicarious extinction outcomes produced by the single symbolic model in this study appear to be somewhat weaker than earlier results with a subgroup of equally avoidant children who viewed live demonstrations of essentially the same approach responses by the same model. Although the single-modeling treatment effected reductions in children's avoidance responses, it did not sufficiently weaken their fears to enable them

to carry out the threatening terminal approach behavior. There is evidence, however, that the diminished efficacy of symbolic modeling cues can be offset by a broader sampling of models and aversive stimulus objects. Children who received the diverse modeling treatment not only showed continued improvement in approach behavior, but also achieved terminal performances at rates comparable to equally avoidant children who, in the previous experiment, observed fearless behavior performed by a single real-life model.

The finding that high emotional proneness attenuates vicarious extinction indicates that modeling procedures must be further modified or supplemented with additional techniques to effect substantial reduction of avoidance tendencies in subjects who display a generalized pattern of anxiety. Such persons are unlikely to experience marked decrements in emotional responsiveness on the basis of a single exposure to a graded series of modeling situations. In a current adaptation of symbolic modeling for the treatment of phobias in adults, three factors have, therefore, been incorporated to further increase the therapeutic power of this method. First, clients are taught to induce and maintain anxiety-inhibiting relaxation throughout the period of exposure. Second, the rate of presentation of modeling stimuli is controlled by the client. Thus, if a particular modeling situation proves to be emotion-provoking the client reviews the threatening scene repeatedly until it is completely neutralized before proceeding to the next item in the graduated sequence. A self-regulated modeling treatment should permit greater control over extinction outcomes. Finally, clients who fail to attain terminal behavior are administered a powerful live-modeling-guided-participation form of treatment in which, after observing the most fear-provoking behavior repeatedly modeled without any adverse consequences, clients are aided through demonstration to perform progressively more threatening responses toward actual feared objects.

The phenomenon of vicarious extinction not only has important clinical implications, but it also raises interesting theoretical questions concerning possible mediational mecha-

nisms governing the process of extinction itself. It is evident from results of both the present and the earlier study that performance of an overt response is not essential for its extinction. These findings question the generality of theoretical conceptualizations of extinction that rely heavily upon cognitive or physiological effects assumed to result from repeated evocation of effortful responses without reinforcement.

Both nonresponse extinction paradigms and explanations of vicarious effects (Bandura, 1965) are compatible with the dual-process theory of avoidance behavior. According to this view stimuli acquire, through their temporal conjunction with aversive experiences, the capacity to produce arousal reactions which have both central and autonomic components. It is further assumed that instrumental avoidance responses become partly conditioned to arousal-correlated stimuli. Suggestive evidence that arousal mediators may exercise discriminative control over avoidance behavior is provided by Solomon and Turner (1962). Animals first learned to make an avoidance response to a light stimulus. They were then skeletally immobilized by curare, and shock was paired with one tone while a contrasting tone was never associated with aversive stimulation. In subsequent tests the animals displayed the same degree of avoidance in response to the negatively valenced tone and the light, both of which evoked common arousal reactions, whereas avoidance responses rarely occurred to the neutral tone. Rescorla and Solomon (1967) provide additional evidence that classically conditioned effects exert mediating control over instrumentally learned behavior. The transfer is primarily achieved through central mechanisms rather than at the autonomic system level as is commonly assumed. If conditioned arousal reactions are extinguished, both the motivation and internal controlling stimuli for avoidance responses are thus removed. It has been shown in a previous experiment (Bandura & Rosenthal, 1966) that conditioned emotional reactivity can be extinguished on a vicarious basis by having observers witness a model encounter aversive stimuli without experiencing any adverse consequences. A systematic

test of this mediational theory of vicarious extinction would require simultaneous recording of autonomic and evoked electroencephalographic correlates of observational inputs involving modeled approach behavior toward feared objects.

Results of studies designed to extinguish naturally created avoidance behavior have bearing on another important issue in learning theory. Recent investigations of symbolic control of classical conditioning phenomena (Chatterjee & Eriksen, 1962; Fuhrer & Baer, 1965; Grings, 1965) demonstrate that only subjects who recognize the contingency between conditioned and unconditioned stimuli display autonomic conditioning. Moreover, subjects who are informed that the conditioned stimulus will no longer be accompanied by aversive stimulation show a prompt and virtually complete loss of emotional responses without experiencing any nonreinforced presentations of the conditioned stimulus.

The above findings provide strong support for the view that emotional conditioning and extinction, rather than representing a simple process in which external stimuli are directly and automatically connected to overt responses, are mediated through symbolic activities. However, precipitous extinction of laboratory-induced fears through informational means contrasts sharply with evidence of weak cognitive control of fears established under naturalistic conditions. Dog-avoidance responses were unaffected by informing children prior to the behavioral tests that the dogs were friendly and harmless. In fact, an initial procedure in which dog scenes were interspersed in absorbing cartoons had to be abandoned because the pictorial animals, although incapable of biting or otherwise hurting observers, nevertheless evoked strong aversive reactions so that many children promptly turned away from the screen whenever the canine characters appeared. Severe snake phobics likewise experience considerable emotional disturbance at the sight of a picture of a reptile while acknowledging that the agitation is groundless, since pictorial snakes cannot possibly inflict any injury. In the latter cases conditioned emotional responses are almost completely dissociated

from accompanying cognitions. It would appear that principles regarding avoidance behavior established solely on the basis of responses created under laboratory conditions may, in some cases, have limited applicability to naturalistic phenomena the investigations are intended to elucidate.

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(Received April 13, 1967)

SELF-REINFORCEMENT: THEORETICAL AND METHODOLOGICAL CONSIDERATIONS

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How behavior is viewed determines which facets of human functioning are studied most thoroughly and which are ignored or disavowed. Conceptions thus delimit research and are, in turn, shaped by findings from paradigms embodying that particular view. Theorists who exclude self-regulatory functions from their concept of human potentialities restrict the scope of their research to external influences on behavior. Detailed analysis of behavior as a function of external consequences provides confirmatory evidence that behavior is indeed subject to external control. However, limiting the scope of scientific inquiry not only yields redundant results but, by disregarding other significant determinants and processes, it can reinforce a truncated image of human nature.

From the perspective of social learning theory (Bandura, 1976), people are seen as capable of exercising some control over their own behavior. Among the various self-regulatory phenomena that have been investigated within this framework, self-reinforcement occupies a prominent position. In this process, individuals regulate their behavior by making self-reward conditional upon matching self-prescribed standards of performance. Acknowledgement of self-regulatory processes has added a new dimension to experimental analyses of reinforcement. Results of such studies have provided the impetus for extending the range of reinforcement practices in programs designed to effect personal change. Interest was shifted from managing behavior through imposition of contingencies to developing skills in self-regulation. In the latter approach, control is vested to a large extent in the hands of individuals themselves: They set their own goals, they monitor and evaluate their own performances, and they serve as their own reinforcing agents (Goldfried and Merbaum, 1973; Mahoney and Thoresen, 1974). The present paper discusses some major substantive issues in the conceptualization of self-reinforcement.

¹Preparation of this article was facilitated by research grant M-5162 from the National Institutes of Health, U.S. Public Health Service.

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Multifaceted criteria of self-reinforcement

A self-reinforcement event has several defining properties.

Control of Reinforcers. One important feature is that the organism exercises full control over the reinforcers so that they are freely available for the taking. In studies of self-reinforcement, subjects have at their disposal a generous supply of tangible rewards which they are free to administer to themselves at any time in whatever quantities they choose (Bandura and Kupers, 1964; Bandura and Perloff, 1967; Mahoney and Bandura, 1972). Symbolic and evaluative reinforcers have received less study, but, here too, people can produce self-approving and self-critical reactions most anytime.

Conditional Self-Administration of Reinforcers. Although reinforcers are freely available, their self-administration is made conditional upon performing requisite behaviors. Therefore, a second critical feature of self-reinforcement is the self-prescription of a performance requirement. This entails self-denial of rewards until the appropriate or conditional behavior has been achieved. The regulated use of incentives may involve not only performance requirements but also exercise of control over the amount of self-reward (Bandura and Kupers, 1964; Bandura and Mahoney, 1974).

Adoption of Performance Standards. Self-reinforcement requires adoption of performance standards for determining the occasions on which a given behavior warrants self-reward. Performances that match or exceed the minimum criterion serve as discriminative cues for self-reward, whereas reinforcers are withheld for substandard performances. The standards by which the adequacy of behavior is judged vary in complexity ranging from simple qualitative discernments of behavior to relational rules.

For most human activities there are no absolute measures of adequacy. The speed with which distances are run or the scores obtained on tests, in themselves, convey insufficient information for self-appraisal. When adequacy is defined relationally, performances are evaluated by comparing them with the attainments of others. A student, who achieves a score of 115 points on an examination and whose personal standard is to be in the upper ten percent of the group, will have no basis for making either a positive or negative self-assessment, without knowing the accomplishments of others. In performances gauged by social criteria, self-appraisals require relational comparisons of at least three sources of information to judge a given performance: absolute performance level, one's own personal standards, and a social referent. The referential comparisons may take different forms for different tasks. For some regular activities, standardized norms based on representative groups are used to determine one's relative standing. For other endeavors, people compare themselves to particular associates in similar situations. In most activities, individuals use their previous behavior as the reference against which to judge their ongoing performances apart from any social comparison.

In brief, the criteria that together constitute a self-reinforcement event include self-administration of freely available rewards contingent upon performances that meet adopted standards.

Distinction between operation and process of self-reinforcement

Theorizing and research in the area of self-reinforcement distinguish between the *operation* and the *process* of self-reinforcement. The operation is defined by the self-

administration of freely accessible reinforcers contingent upon requisite performances; the process refers to the resulting increase in the conditional performances. Social learning theory views the process by which consequences affect behavior as similar regardless of whether reinforcers are administered by oneself or by others. It is before rewards are administered that the main differences between externally- and self-regulated reinforcement arise. As we have previously seen, the latter practice entails at least three component processes: adoption of, and adherence to, reference standards; comparison of performance against standards to determine when it is appropriate to engage in self-reward; and self-privation of reinforcers for insufficient performances.

A complete understanding of self-reinforcement requires two separate lines of research for which the methodologies necessarily differ (Bandura, 1974). One line of investigation is designed to explain how referential standards for determining the occasions for self-reward are acquired, maintained, and modified. In experiments conducted for this purpose, influences likely to affect establishment of standards are the independent variables, and the performance attainments, which individuals self-reward and self-punish, constitute the dependent events.

The second line of research is designed to measure whether self-administered consequences do, in fact, enhance performance. In testing for enhancement effects, self-administered consequences represent the independent variables and performances levels the dependent ones.

The issue of when individuals choose to reward themselves and whether the self-administered rewards influence their behavior are separable; both must be investigated for a full understanding of self-reinforcement. The different methodologies are emphasized here because some writers (Premack and Anglin, 1973) have failed to distinguish studies investigating induction of self-reward standards from those measuring performance enhancement through self-reward. Such misconstruals can be read as inventive post-mortems for mistaken dependent variables (Bandura, 1974).

Acquisition of performance standards

Behavioral standards for determining self-reinforcing responses can be established either by tuition or by modeling. In the former process, adults prescribe standards that define the behavior worthy of reward. They generally respond positively when children achieve or exceed the standards and negatively when their behavior falls short of the valued levels. As a result of such differential reactions, children eventually come to respond to their own behavior in self-rewarding or self-punishing ways, depending on how it departs from the evaluative standards set by others.

Transmitting performance standards by means of differential consequences has not been analyzed experimentally with humans, but the process is illustrated in studies with infrahuman subjects (Bandura and Mahoney, 1974; Mahoney and Bandura, 1972). Standards are established by instituting performance requirements for self-reward and by administering negative consequences when animals reward themselves for insufficient performances. By progressively raising response requirements animals adopt increasingly higher performance standards for each self-reward. Once established, the perfor-

mance requirements continue to be self-imposed on both familiar and novel tasks long after negative consequences for unmerited self-reward have been discontinued.

The influence of modeling in the transmission of differential standards of self-reward has received substantial attention. In the paradigm typically used to study this process (Bandura and Kupers, 1964), children observe models performing a task in which the models adopt either high or low performance standards for self-reward. When models attain or exceed their performance requirements, the models reward themselves tangibly and voice self-praise, but when they fall short of their self-prescribed requirements, they deny themselves freely available rewards and react self-critically. Observers later perform the task alone, and the performance attainments for which they reward themselves with freely available reinforcers are recorded.

The findings show that children tend to adopt standards modeled by others, judge their own performances relative to those standards, and reinforce themselves accordingly (Bandura and Kupers, 1964). Children exposed to models who set high standards reward themselves only when they achieve superior performances, whereas children exposed to models who regard low achievements as sufficient reinforce themselves for minimal performances. The behavioral standards of adults are affected by modeling influences as are those of children (Marston, 1965). Modeling has proved to be a highly efficacious way of instituting not only performance standards, but even the generosity with which differential attainments are self-reward (Bandura, 1971).

Having established the influential role of modeling in the acquisition of performance standards, experimentation then focused on theoretically relevant variables that affect the adoption process. Competence disparity between model and observer is one such factor (Bandura and Whalen, 1966). Ordinarily people favor reference models with ability similar to theirs over highly divergent ones whose attainments can be matched only occasionally through great effort. However, when exposed to uniformly high standards, a conducive relationship between models and observers, and bestowal of public recognition on models for upholding excellence, observers adopt, and adhere to, stringent standards of self-reward though they seldom attain the lofty performances (Bandura, Grusec, and Menlove, 1967).

Learning performance standards is complicated by the multiplicity of social influences, many of which conflict. The disparities involve inconsistencies in the standards exemplified by different models or by the same models on different occasions (Bandura, Grusec, and Menlove, 1967; Allen and Liebert, 1969; Hildebrandt, Feldman, and Ditrichs, 1973), or contradictions between the standards that are prescribed and those that are modeled (McMains and Liebert, 1968; Mischel and Liebert, 1966; Ormiston, 1972; Rosenhan, Frederick, and Burrowes, 1968). Observers must therefore process the conflicting information and eventually arrive at a personal standard against which to measure their own performances. Opposing influences that include lenient alternatives tend to reduce adoption of high standards, but the relative power of the influences is determined by a number of interacting variables. Some of these include characteristics of the observers, such as their achievement orientation, and their predilection to perceive events as being either personally or externally determined (Soule and Firestone, 1975; Stouwie, Hetherington, and Parke, 1970).

Generalization of performance standards of self-reward

Development of self-regulatory functions would have limited value if they never generalized beyond the specific activity on which they were established. Indeed, the principal goal of social development is to transmit general standards of conduct that can serve as guides for self-regulation of behavior across a variety of activities.

Generic standards are best transmitted by varying the nature of the activities while requiring a similar level of performance for self-reward. The development of achievement standards typifies this process. Adults who subscribe to high standards of accomplishment expect children to excel in whatever academic subjects they are pursuing. After children adopt the criterion that only superior performances deserve self-reward, they tend to apply similar standards to their performance in new academic activities.

Self-regulated reinforcement generally involves not only adherence to performance requirements but also control over the magnitude of self-reward on each appropriate occasion. Findings of the program of research examining self-reinforcement processes with infrahuman subjects provide some evidence for the generalizability of both aspects of self-control. After animals learn to self-reward their own performances on different tasks in limited amounts, they transfer this dual self-regulation of reinforcement to new activities in which reinforcers are freely available independently of responding (Bandura and Mahoney, 1974). Adherence to performance requirements is more stringent, however, than adherence to self-limitation in amount of reward for conditional performances. To interrupt rewarding activities repeatedly for less preferred work when the rewards are under one's own control is both a taxing order and an impressive demonstration of self-regulation.

Standards of self-reward will generalize to some extent even when acquired on a single task. Children who, through modeling, adopt high performance standards of self-reward tend to apply similar standards on later occasions to somewhat different activities in dissimilar situations (Lepper, Sagotsky, and Mailer, 1975; Sagotsky and Lepper, 1976).

Discriminative activation of self-reinforcement

Development of self-reinforcement functions does not create an unvarying control mechanism within the organism, as implied by theories of internalization that portray incorporated entities as continuous internal overseers of conduct. Self-reinforcing influences operate only if activated, and there are many factors that selectively control their activation. Hence, the same behavior is not uniformly self-rewarded or self-punished irrespective of the circumstances under which it is performed.

Self-reinforcement contingencies that are customarily applied to certain classes of behavior can be temporarily suspended by relabeling the activities and by environmental arrangements that obscure or distort the relationship between actions and the effects they produce (Bandura, 1973). Moreover, people learn to discriminate between situations in which self-reward is contingent upon performance and those in which it is appropriate to reward one-self noncontingently.

The way in which contextual influences operate in discriminative activation of self-reinforcement is graphically revealed in experimentation with infrahuman subjects (Bandura, Mahoney, and Dirks, 1976). During acquisition, animals were required to work before rewarding themselves in certain environmental contexts, but not in others. As a result of such differential experiences, animals consistently self-imposed performance requirements for self-reward in the appropriate settings, but they rarely made self-reward contingent upon performance in settings where rewarding themselves without working beforehand was permissible.

In humans, the activation of self-reinforcing and self-punishing responses is regulated by more complex environmental cues, and by how one construes one's conduct, its links to social effects, and the effects themselves (Bandura, 1973). The cognitive and situational operations by which customary self-generated consequences can be disengaged from censurable conduct have only recently received systematic study under controlled conditions (Bandura, Underwood, and Fromson, 1975; Diener, 1974; Zimbardo, 1969). The discriminative disengagement of internal control is achieved by moral justifications of the conduct, by obscuring or distorting the relationship between actions and the effects they cause, by dehumanizing the people toward whom the actions are directed, and by ignoring, or misrepresenting the social consequences of the actions. Because self-control through self-administered consequences can be discriminatively disengaged in these numerous ways, marked changes in people's conduct can occur without altering their moral standards and self-reinforcement systems. The extreme increase in violent conduct in military as compared to peacetime conditions is a notable example of this process.

Determinants of self-denial

In analyzing regulation of behavior through self-reinforcement, it is important to distinguish between two sources of incentives that operate in the process. First, there is the arrangement of self-reward contingent upon designated performances to create incentives for oneself to engage in the activities. Second, there are the incentives for adhering to the contingency. One of the significant, but insufficiently explored, issues in self-reinforcement is why people adhere to contingencies requiring difficult performances, thereby temporarily denying themselves rewards over which they exercise full control.

Adherence to performance standards is partly sustained by periodic environmental influences which take a variety of forms. When standards for self-reinforcing reactions are being acquired or when they are later applied inconsistently, unmerited self-reward often results in negative consequences. Rewarding oneself for inadequate or undeserving performances is more likely than not to evoke critical reactions from others. And lowering one's performance standards is rarely considered praiseworthy.

The role of negative sanctions in the acquisition and maintenance of contingent self-reward has been investigated in several studies with animals. Caplan (1976) found that punishment for noncontingent self-reward during acquisition increased later adherence to performance requirements for self-reward. Prior experiences, in which animals consumed rewards freely without having to work for them, did not affect the rate with

which they learned to work before rewarding themselves. However, it did reduce their subsequent willingness to withhold rewards contingent upon performance when negative sanctions were no longer in effect.

When environmental supports are removed, animals continue to maintain their behavior by self-reward for some time but eventually discard self-imposed contingencies, especially if they entail onerous performances. However, periodic punishment for unmerited self-reward serves to maintain contingent self-reinforcement. The higher the certainty of negative sanctions for unmerited self-reward, the greater is their sustaining capacity (Bandura and Mahoney, 1974).

Contextual influences, which signify past environmental prescripts that self-reward should be made dependent upon performance, provide additional supports. Animals are thus inclined to adhere to self-imposed contingencies in environmental settings in which performance has been previously required for self-reward, even though negative sanctions for rewarding themselves noncontingently no longer exist (Bandura, Mahoney, and Dirks, 1976).

Findings of the preceding studies suggest that organisms continue to withhold rewards from themselves until performance standards have been met because they fail to discriminate between conditions in which they have been required to do so and subsequent periods wherein rewards are freely available for the taking without negative consequences. In the case of behaviors that are nonproblematic or useless to the organisms, the threat of occasional negative sanctions may indeed be the main restraining influence against noncontingent self-reward. However, there are some findings, even with neutral behaviors, that might not be fully explainable solely in terms of discrimination processes. In one experiment, monkeys were tested for their relative preference for externally- and self-managed systems of reinforcement (Mahoney, Bandura, Dirks, and Wright, 1974). Over a long series of sessions, the animals engaged from time to time in unmerited self-reward without any adverse consequences, but, nevertheless, they continued to self-impose a work requirement for longer periods and at higher levels than one would expect from the usual course of extinction. High transgression sessions were characteristically followed by increased, rather than less, adherence to performance requirements for self-reward. In this study the animals periodically chose the external reward system so that some of their performances were also intermittently reinforced on an external basis. These findings are sufficiently interesting to warrant further investigation of the maintenance of self-imposed performance contingencies under multiple reinforcement conditions containing varying proportions of external and self-regulated reinforcement.

Threat of negative sanctions is not the most reliable basis upon which to rest a system of self-regulation. Fortunately, there are more advantageous reasons for exercising some influence over one's own behavior through self-arranged incentives. In most instances of self-regulation, effects associated with the conditional behavior provide incentives for maintaining the contingency. People are motivated to impose upon themselves requirements for self-reward when the effects of the behavior they seek to change are aversive. To those burdened with excessive weight, for example, the discomforts, maladies, and social costs of obesity create inducements to control overeating. Heavy smokers are motivated to reduce their consumption of cigarettes by physiological dysfunctions and

fear of cancer. Students are prompted to alter avoidant study habits when failures in completing assignments make academic pursuits sufficiently aversive.

By making self-reward conditional upon performance attainments, individuals can reduce the aversive effects of their behavior thereby creating a natural source of reinforcement for their efforts. They lose weight, they curtail or cease smoking, and they improve their course grades by increasing study activities. When people procrastinate about required tasks, thoughts about what they are putting off continuously intrude on, and detract from, enjoyment of their other activities. By setting themselves a given accomplishment for self-reward, they mobilize their efforts to complete what needs to be done and are thus spared intrusive self-reminders.

The benefits of self-regulated change may provide natural incentives for continued self-imposition of contingencies in the case of valued behaviors as well as for aversive ones. People commonly motivate themselves by arranging contingent self-reward to improve their skills in activities they aspire to master and to enhance their competencies in dealing with the demands of everyday life. Here the personal gains accruing from improved proficiency can strengthen self-prescription of contingencies.

As indicated in the foregoing discussion, because self-regulated reinforcement involves brief periods of self-denial it does not necessarily create an adverse state of affairs. Singling out self-privation from the total effects accompanying self-directed change overemphasizes the negative aspects of the process. Let us compare the aggregate rather than only the momentary consequences of behavior with and without the aid of conditional self-reward. Under noncontingent arrangements, rewards are available for the taking but the likelihood of engaging in potentially advantageous behavior is reduced for lack of self-motivation. In contrast, self-directed change provides both the rewards that were temporarily withheld as well as the benefits accruing from increased proficiency. For activities that have some potential value, self-regulated reinforcement can provide the more favorable aggregate consequences. Thus, on closer analysis, the exercise of momentary self-denial becomes less perplexing than it might originally appear. However, there are no particular advantages for self-regulation of behavior that is devoid of any value. It is in the latter instances that continued extraneous supports for adherence to self-reward contingencies assume special importance.

Modeling has been shown to be a powerful means of inducing behavior, but it has rarely been studied as a maintainer. In view of evidence that human behavior is extensively under modeling stimulus control (Bandura, 1976), there is every reason to expect that seeing others successfully regulate their own behavior by holding to contingent self-reward would increase the likelihood of adherence to self-prescribed contingencies in observers.

Upholding high standards is actively promoted by a vast system of rewards including praise, social recognition, and awards, whereas few accolades are bestowed on people for self-rewarding mediocre performances. Praise fosters adherence to high performance standards as does occasional admonishment for undeserved self-reward (Brownell et al., 1976; Drabman, Spitalnik, and O'Leary, 1973). Moreover, seeing others publicly recognized for upholding excellence promotes emulation of high standards (Bandura, Grusec, and Menlove, 1967). Vicarious reinforcement can therefore supplement periodic direct consequences as another source of support for abiding by self-prescribed contingencies.

Self-Reinforcement: Theoretical and Methodological Considerations

In social learning theory, self-regulated reinforcement is conceptualized not as an autonomous regulator of behavior but as a personal source of influence that operates in conjunction with environmental factors. Because self-reinforcing functions are created and occasionally supported by external influences does not negate the fact that exercise of that function partly determines how people behave. In the case of refractory habits, environmental inducements alone often fail to produce change, whereas the same inducements with contingent self-incentives prove successful. Thus, for example social pressures for and future benefits of shedding excess weight usually do not help the obese control their overeating, but exercising self-influence while actually eating effects change.

In other instances, the behavior developed through the aid of self-reward activates environmental influences that would otherwise remain in abeyance. Here the potential benefits cannot occur until self-motivated improvements in performance produce them. In still other instances, the behavior fashioned through contingent self-reward transforms the environment. Formerly passive individuals who facilitate development of assertive behavior through self-reward will alter their social environment by their firm actions.

Because personal and environmental influences affect each other in a reciprocal fashion, it is just as important to analyze the self-reinforcement determinants of environments as it is to study the environmental determinants of self-reinforcement. After all, environmental contingencies have determinants as do behaviors. Searching for the ultimate environmental contingency for activities regulated by self-reward is a regressive exercise that in no way resolves the issue under discussion because, for every ultimate environmental contingency that is invoked, one can find prior actions that created it. Promotion systems for occupational pursuits, grading schemes for academic activities, and reverence of slimness are human creations, not decrees of an autonomous impersonal environment. In the regress of prior causes, for every chicken discovered by a unidirectional environmentalist, a social learning theorist can identify a prior egg.

Operant theorists have always argued against attributing behavior to causes that extend far into the future. However, in explaining increases in self-reinforced behavior, some adherents of this view appeal to ultimate benefits of prospective behavior but neglect self-reactive determinants of behavior that operate in the here and now (Catania, 1975; Rachlin, 1974). Although anticipated benefits of future accomplishment undoubtedly provide some incentive for pursuing self-directed change, the self-regulated incentives serve as continual immediate inducements for change. We will consider later attempts to redefine the phenomenon of self-reinforcement out of existence by relabeling it or by finding some external source of reinforcement for it. In the final analysis, it is not the legitimacy of self-reinforcement but the nature of reinforcement itself that is in question.

The discussion thus far has been concerned mainly with tangible self-rewards. By initially studying operations that are fully observable, investigators were able to confirm different aspects of the phenomenon of self-reinforcement. The more complex and fascinating process concerns the self-regulation of behavior through evaluative self-reinforcement. In the social learning analysis, the process operates in the following manner: The standards people adopt for activities they invest with evaluative significance specify the conditioning requirements for positive self-evaluation. By making self-

satisfactions contingent upon goal attainment, individuals persist in their efforts until their performances match what they are seeking to achieve. Both the anticipated satisfactions of desired accomplishments and the negative appraisals of insufficient performances provide incentives for action. Most successes do not bring lasting satisfaction; having accomplished a given level of performance, individuals ordinarily are no longer satisfied with it and make positive self-evaluation contingent upon higher attainments.

Writing provides a familiar example of behavior that is continuously self-regulated through evaluative self-reactions. Authors do not require someone sitting at their sides selectively reinforcing each written statement until a satisfactory manuscript is produced. Rather, they possess a standard of what constitutes an acceptable piece of work. Ideas are generated and phrased in thought several times before anything is committed to paper. Initial attempts are successively revised until authors are satisfied with what they have written. Self-editing often exceeds what would be acceptable to others.

Although covert evaluative operations are not directly measurable, they can be studied through indirect observational evidence. At this point it might be appropriate to distinguish between theorizing about unobservable events and about indirectly observable ones. Self-evaluative reactions are directly observable to the person generating and experiencing them. Although investigators cannot measure their operation directly, they can elucidate the role of evaluative self-regulation by instating the evaluative standards and testing the verifiable behavioral consequences. This is a different matter from positing unobservable events that have neither any experiential referents nor any explicitly definable effects.

In the social learning view, self-evaluative consequences enhance performance not because self-praise automatically strengthens preceding responses, but because negative discrepancies between performance and standards create dissatisfactions that serve as motivational inducements to do better. Self-satisfaction is withheld until a suitable level of performance is attained. This perspective predicts that the higher the standards upon which self-satisfaction is made conditional, the more frequent are the corrective improvements and the higher are the performance attainments likely to be. There are other performance implications of adherence to self-evaluative contingencies that permit empirical verification of the operation of this covert regulatory process.

In experiments in which children are at liberty to select the performance level they consider deserves self-reward, some impose upon themselves surprisingly difficult performance requirements. For example, in one study (Bandura and Perloff, 1967), although children worked alone and were free to select any goal, not a single child chose the lowest standard, which required the least effort. Many selected the highest level of achievement as the minimal performance deserving self-reward. Still others raised their initial standard to a higher level without commensurate increase in amount of self-reward, thereby demanding of themselves considerably more work for the same recompense. Many children do, of course, select easy performance standards, but those who adhere steadfastly to, and even raise, stringent standards for self-reward on their own provide the more challenging findings.

The social learning analysis of evaluative reinforcement predicts that, under low external constraints, standards necessitating much effort at minimum material recompense, are most likely to be self-imposed in activities invested with self-evaluative

significance. Performing well on such tasks becomes an index of personal merit. Conflicts therefore arise when material gains can be increased by resorting to behavior that elicits negative self-evaluative reactions. Individuals are tempted to maximize rewards for minimum effort by lowering their standards. However, rewarding mediocre performances incurs negative self-evaluative consequences. The behavioral effects will be determined by the relative strength of material and evaluative rewards. When people hold their self-evaluation above material things, they do not act in accordance with utility theories that explain behavior in terms of optimal reward-cost balances, unless such formulations include the self-evaluative costs of rewarding oneself for devalued behavior.

Some misconceptions

In a recent article in this journal, Catania (1975) raises a number of issues concerning self-reinforcement. It deserves comment because the misconceptions contained in the article are a potential source of confusion regarding a phenomenon of some importance. Indeed, in many instances the characterization of theory and research on self-reinforcement bears only a superficial resemblance to what, in fact, is the case.

Self-Reinforcement of Conditional Responses. Most of the hypothetical problems posed by Catania in the designation of self-reinforcement arise only because he disregards the multifaceted criteria that define the phenomenon. Consider first the prescript that "one must speak not of reinforcing oneself but of reinforcing one's own responses." This statement conveys the impression that previous designations of self-reinforcement have not specified a conditional response. In point of fact, they always do. As evident from the defining criteria, organisms make the self-administration of rewards conditional upon performance of a selected behavior. The pseudo issue is created by singling out the self-delivery feature but ignoring the performance requirement for self-reinforcement.

Distinction Between Conditional Responses and Self-Reinforcing Responses. Catania compounds the confusion by overlooking another critical criterion of self-reinforcement. Continuing with the hypothetical problem, he reasons that "If the reinforced response is not specified, it becomes impossible to distinguish the self-delivery of a reinforcer from the delivery of a reinforcer through some other agency." The hungry rat that produces food by pressing a lever, he argues, could be said to reinforce itself with food. Hence, "All instances of reinforcement then would become instances of self-reinforcement as well." Here again, the alleged problem arises only because no account is taken of the distinguishing feature, that in self-reinforcement the organism has free access to the rewards but withholds them until requisite performances are attained. In externally regulated reinforcement, an external agent sets the performance requirement and controls the reinforcers so they cannot be obtained without working for them. Although the difference in the agency of delivery, itself, is not insignificant, self-reinforcement entails several complex functions that are carried out by external agents in externally monitored forms. To self-reinforce one's own performances contingently requires adoption of a performance standard, evaluation of ongoing performance relative to the standard, and self-privation of freely available reinforcers when performances do not warrant self-reward.

One cannot dismiss the operational differences between externally- and self-regulated reinforcement with the counterexample of a limitless supply of reinforcers that can be gained simply by performing a response. In such a situation the conditional (requisite) response and the self-delivery response become one and the same. By contrast, in self-reinforcement the self-delivery response is different from, and can be performed independently of, the conditional response. Thus, for example, in testing the response maintenance capacity of self-reinforcement, children perform effortful manual responses until they reach their preselected goal, whereupon they reward themselves by pressing a button that delivers tokens exchangeable for valued items (Bandura and Perloff, 1967). The manual activity is the conditional response; the button press that produces the reinforcers is the self-delivery response.

In other investigations, the rewards are presented with equally free access but in full view as well (Bandura and Kupers, 1964; Bandura and Mahoney, 1974; Mahoney and Bandura, 1972). In each case, the conditional response does not produce the rewards because they are already present; rather, it sets the occasion for self-delivery of rewards. Subjects, of course, are at liberty to consume the rewards noncontingently at any time, should they choose to do so.

In the most stringent test of self-regulated reinforcement, animals not only impose performance requirements for self-reward, but they even control how many reinforcers they consume on each appropriate occasion from the continually available supply (Bandura and Mahoney, 1974). Let us return now briefly to the rat at the bar. Pressing a lever to produce reinforcers is not in itself an instance of self-reinforcement, but performing requisite responses and then pressing a lever to secure reinforcers, which are continually and freely available for the taking, does qualify as a self-reinforcement operation.

Catania eventually resolves the problem of his own creation in the example of the lever-pressing rat by recognizing that, "Self-reinforcement, then, cannot involve only one response. An instance of self-reinforcement must include not only a response that is reinforced, but also the same organism's response of reinforcing the first response." These are precisely the conditions that are routinely instituted in analyses of self-reinforcement. No one, to this writer's knowledge, has ever defined self-reinforcement solely in terms of the self-delivery response. Self-administration of consequences is but one of several criteria of self-reinforcement.

Disembodied Responses and Dispossessed Organisms. Catania's dichotomization of responses and organisms brings to the fore a fundamental issue that is rarely discussed in the conceptual analysis of reinforcement. Consider a few common examples of reinforcement. An animal presses a lever whereupon food appears after a momentary delay. In the verbal conditioning paradigm, subjects emit verbal responses and, after judging them to fall within a reinforcible class, the experimenter dispenses social rewards. In applications of reinforcement practices using tangible reinforcers, tokens, or preferred activities are presented minutes, hours, or even days after the requisite performances have been completed. As these examples illustrate, reinforcers are almost invariably delivered after the response has ceased to exist. How can something that is no longer in existence be reinforced? In actuality, one can only reinforce an organism for having selected and performed particular classes of responses. Theorists who adopt the position

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that it is responses not organisms that are reinforced are faced with a dilemma that can be resolved only by postulating some kind of enduring residue of the spent response.

One could argue that responses leave either enduring cognitive representations or lasting neural traces that get reinforced by the succeeding consequences. Reinforcement of neural traces of responses has received little study, but there is growing evidence that cognitions can partly determine how consequences affect behavior. It has been shown that behavior is not much influenced by its consequences until the point at which contingencies are discerned (Dawson and Furedy, 1976; Dulany, 1968); misinformation conveyed about the prevailing schedules of reinforcement can outweigh the influence of actual consequences in the regulation of behavior (Kaufman, Baron, and Kopp, 1966); behavior that is positively reinforced does not increase if individuals believe from other information that the same actions will not be rewarded on future occasions (Estes, 1972); and the same reinforcing consequences can increase, reduce, or have no effect on behavior depending upon whether individuals are led to believe that the consequences signify correct responses, incorrect responses, or occur noncontingently (Dulany, 1968). If cognitive determinants are disavowed or simply relegated to an epiphenomenal status, the question remains as to how functional relationships are created through juxtaposition of consequences and nonexistent events.

Control of Reinforcers. Conceptualizations of self-reinforcement have always stated explicitly that organisms have free access to reinforcers because they exercise control over them. Catania needlessly raises alleged problems with this criterion as well, by failing to distinguish between availability and free access. There are large sums of money available in local banks, but individuals are not granted free access to the supply. Consider, with this distinction in mind, Catania's example of the shopper surveying shelves of commodities: "The shopper may take the commodity and leave the store with it (perhaps chancing an arrest for shoplifting), or the shopper may leave the store with the commodity only after paying the teller. Because the commodity is available for the taking at all times, is it not appropriate to say that the paying is a response that is self-reinforced by the taking of the commodity?" Certainly not. Store managers make goods continually available, but they control them; shoppers are at liberty to take the commodities whenever, and in whatever quantities, they choose provided they negotiate transfer of control through payment. In many of the material rewards of everyday life, money provides the open access. Thus, for example, individuals do not own theatres but they are free to purchase their way into them anytime they wish.

Once again the predicament posed by Catania arises from equating the multifaceted operation of self-reinforcement solely with the self-delivery response. Shoppers paying to gain commodities constitute the self-delivery responses. In self-reinforcement individuals either already possess the reinforcers or are free to get them when they so choose, but they do not reward themselves until they achieve conditional performances. The shopping activity would qualify as an instance of self-reinforcement if individuals withheld treating themselves to appetizing foods, movies, or prized goods until they completed activities they assigned to themselves.

After citing the shoplifting case and other examples in which rewards are consumed noncontingently, Catania asks rhetorically, "What then is the essence of the concept of

self-reinforcement?" The essence is easily captured by reflecting upon the defining criteria of the phenomenon.

Distinction between Induction and Testing Conditions. In analyzing paradigms for investigating self-regulated reinforcement, it is essential to distinguish training from testing conditions. Mahoney and Bandura (1972) devised a self-reward procedure for animals to examine more definitively some of the rudimentary processes in self-reinforcement that cannot be easily elucidated with humans who have undergone years of social learning. In this paradigm, animals are taught to self-reward their own performances by presenting them with food in advance, but if they help themselves to it before performing appropriate responses at a designated level, the food is temporarily withdrawn. Eventually, animals learn to make the food reinforcers contingent upon appropriate behaviors even though the reinforcers are continually present.

After animals learn to adhere to performance requirements for self-reward, punishment by loss of reinforcers for self-feeding without prior working is discontinued. Thus, during this testing phase, animals are free to consume the food reinforcers, which are continually present, without any punishment even if they treat themselves to the food before performing appropriate responses. Measures are obtained of how long animals continue to impose performance requirements for self-reward.

In speculating about the process by which self-administered rewards affect behavior, Catania presents a schematic diagram comparing the temporal relationships among requisite behavior, access to reinforcers, and consummatory responses for externally- and self-regulated reinforcement. The presentation is potentially misleading because it fails to distinguish between training and testing conditions. For example, Catania reports that the relationship between behavior and access to reinforcers is similar in external and self-reinforcement, and that in both instances there is a higher likelihood of reinforcers being present if a response has occurred than if it has not. This statement describes the training conditions, but it does not accurately represent the response-reinforcer dependencies during tests of self-reinforcement. Under testing conditions, reinforcers are continually present, there is free access to them at all times, and they can be consumed independently of responding without loss of rewards, or any other negative consequences for that matter.

Process of self-reinforcement

We turn now to the issue of whether people can exercise some influence over their own behavior by arranging incentives for themselves in response-contingent relationships. In recent years enhancement and maintenance of behavior through contingent self-reward has been studied extensively under both laboratory and natural conditions. These investigations differ considerably in choice of self-rewards, self-reinforced behavior, and experimental methodologies. Among the self-rewards are included such diverse incentives as food, tokens redeemable for valued objects, money, televised material, preferred activities, and self-praise. An equally diverse range of behavior, comprising manual activities, academic performances, social behavior, and refractory personal habits, has been modified through self-reinforcement.

Results of these numerous studies demonstrate that effortful performances can be effectively increased and maintained over long periods by contingent self-reward. In experiments using intergroup comparisons, subjects who reward their own behavior exhibit significantly higher levels of responding than those who perform the same activities but receive no reinforcement, are rewarded noncontingently, or monitor their own behavior and set goals but do not reinforce their own performances (Bandura and Perloff, 1967; Bellack, 1976; Felixbrod and O'Leary, 1973; Bolstad and Johnson, 1972; Glynn, 1970; Jeffrey, 1974; Johnson, 1970; Litrownik, Franzini, and Skenderian, 1976; Mahoney, 1974; Montgomery and Parton, 1970; Speidel, 1974; Switzky and Haywood, 1974).

Other studies, which measure level of performance under baseline and different reinforcement conditions, reveal substantial increases in self-reinforced behavior when subjects reward their own attainments (Drabman, Spitalnik, and O'Leary, 1973; Glynn, Thomas, and Shee, 1973; Kaufman and O'Leary, 1972; McLaughlin and Malaby, 1974). Findings based on intergroup comparisons are further corroborated by results of intrasubject reversal designs measuring performance across successive baseline and self-reinforcement conditions without any confounding effects of prior external reinforcement. All children enhance their level of performance when they self-reward their own efforts, and they reduce their productivity when they no longer arrange incentives for themselves (Glynn and Thomas, 1974). As the latter findings reveal, self-reinforcement contingencies can be suspended and the behavioral effects measured just as changes in responding can be assessed after external contingencies have been discontinued or after reinforcers are administered independently of performance.

Most of the experiments cited above also compare level of performance under externally- and self-regulated reinforcement. People who engage in contingent self-reward perform as well or better than do their counterparts whose behavior is reinforced by others. Although both procedures alter behavior, the practice of self-reinforcement can have the advantage of developing a generalizable skill in self-regulation that will be continually available. It is perhaps for this reason that self-reinforced behavior is sometimes maintained more effectively than if it has been externally regulated (Jeffrey, 1974).

Researchers favoring intrasubject designs are inclined to discount empirical evidence from intergroup comparisons on the grounds that it is presented in the form of group performances and statistical evaluations of significance (Catania, 1975). In the case of self-reinforcement, facts are not easily discounted when they are replicated by intergroup, intragroup, and intrasubject reversal designs. However, because the methodological issue is often raised in the study of other phenomena as well, the criteria used for making inferences from data deserve some comment. Preference for subjective judgments of variations in individual performance over statistical evaluations of multiple data does not necessarily establish the former approach as the more stringent one for identifying causal relationships. Advocates of intrasubject designs often argue that visual appraisal of individual data yields better evidence concerning functional relationships than does statistical analysis of group data. The claim is debatable.

Interpreting intrasubject changes poses no problems when behavior is highly stable during baseline assessment and when treatments are so powerful that performances during baseline and treatment conditions never overlap. But most factors are not that powerful when manipulated separately because behavior is typically regulated by multiple interacting variables and not every potential determinant can be controlled. Consequently, results are usually not that orderly. When researchers are asked to judge variability in the behavior of an individual across successive conditions, they do not always agree among themselves as to whether or not interventions have produced an appreciable change in level of performance (Jones, Weinrott, and Vaught, 1975). They tend to be better at detecting nonsignificant changes than in detecting significant ones. Eventually statistical analysis may replace visual inspection in the evaluation of intrasubject variability. But gaining consensus on intrasubject change is only part of the interpretative reliability problem.

Eventually researchers must move beyond inspecting individual cases to generalizing about whether a given variable influences behavior. The single-case methodology provides no criteria for determining what generalizations are warranted, given the commonly observed heterogeneous results from different individuals. Typically, procedures are applied only to a few cases; the successes are attributed to the procedures, but when effects do not obtain, the procedures are assumed not to have exercised their usual control in the negative cases. The possibility that the observed changes in behavior resulted from unrecognized factors that happen to covary with the manipulated one is rarely considered. The irreversibility of learning processes and the confounding of successive operations by previous influences hardly justifies sole allegiance to intrasubject replication designs. Without objective criteria for evaluation, investigators are likely to differ in how they interpret the same data on the basis of visual inspection of fluctuating baselines, mixed effects of initial treatments on different individuals, and confounded results from successive reversals of baseline and treatment conditions.

Investigators using intergroup designs not only collect more data for gauging the generality of lawful relationships, but they typically require a higher level of replicability before ascribing causal significance to a variable. For example, in quantitative evaluation by the Sign Test of differences between matched groups of five subjects each, all the treated subjects would have to out-perform the baseline controls before the variable will be said to have influenced the behavior. It is safe to say that, whenever statistical analyses yield significant intergroup differences, one can find more than ample evidence of lawful relationships by inspection of the individual cases.

Statistical evaluation of data from numerous subjects can indicate a causal relationship even though the effects do not occur in every case. Some writers have therefore concluded that group data obscure individual behavioral processes. But the same problem of abstraction from particular instances arises in drawing generalizations on the basis of visual appraisal of variable results from individual cases — here, too, lawful relations are claimed although the effects are not demonstrated in every single case. Hence, disputes about the methodologies for identifying the determinants of behavior ultimately reduce to whether one prefers inspectional or quantitative evaluation of generality.

It should be noted in passing that intrasubject and intergroup designs are not incompatible. One can examine how each individual is affected by experimental pro-

dures during induction or successive phases, and also compare statistically whether the individual demonstrations of the phenomenon occur more frequently among subjects who receive the procedures than among those who do not. Adding baseline comparison groups and quantitative evaluation of data in no way detracts from inspection of individual variability. Rather, it encourages studying more cases and requires a higher proportion of individual demonstrations of effects before causal relationships are claimed. Intrasubject replication combined with intergroup quantitative evaluation provides the most rigorous method for identifying the determinants of behavior.

Alternative explanations of the process of self-reinforcement

Several alternative explanations have been proposed for why contingent self-reward enhances performance. These various interpretations are considered next.

Self-Awareness. Catania (1975) attributes the behavioral effects of self-reward to the development of "self-awareness." Self-reinforcement increases behavior because the behavior provides a discriminative stimulus for self-reward. In this view, the process of self-reinforcement becomes a matter of "self-discrimination," "self-awareness," or "self-monitoring." This type of analysis essentially amounts to explanation by description of one of the component processes operating in the phenomenon.

It is true that behavior that matches or exceeds referential standards signifies the occasions for self-reward. However, enhancement of self-reinforced behavior cannot be ascribed simply to awareness of when it is appropriate to reward oneself. An explanation contending that individuals engage in behavior over a period because they later notice that they have met a performance standard, places the cause after the effect. People enhance their behavior by contingent self-reward, not because of self-awareness, but because they withhold from themselves desired incentives until they achieve self-prescribed standards. It is the subjects' *regulation* rather than *awareness* of the response-reinforcer dependency that is the critical factor. In the case of students who increase their study activities by making coffee breaks contingent on completing ten pages of a reading assignment, discriminating when it is appropriate to tap the coffee pot is of secondary interest in explaining how self-reinforcement augments behavior.

Theorists working within the operant framework subscribe to the view that awareness is a by-product rather than a determinant of performance. Being aware of aspects of one's behavior does not cause the behavior of which one is aware. Thus, in positing that self-awareness causes behavioral changes, Catania appears to be abandoning the very theory he is embracing.

The weight of the evidence is heavily against attributing the effects of conditional self-incentives solely to self-monitoring. As a rule, simply observing and recording one's own behavior has no consistent behavioral effects (Kazdin, 1974). When self-monitoring does produce change, it is likely to be under circumstances that activate covert goal-setting and self-evaluative consequences. Moreover, many of the investigations of self-reinforcement explicitly include controls for the effects not only of self-monitoring but of goal-setting as well. Both children and adults who monitor their performances and goal attainments and reward themselves for goal achievement typically surpass their counterparts who also monitor their own performances and goal attainments but never

engage in overt self-reinforcement (Bandura and Perloff, 1967; Bellack, 1975; Flaxman and Solnick, 1975; Mahoney, 1974; Switzky and Haywood, 1974). Those who self-monitor and receive feedback on goal attainments often do not perform any better than do baseline control groups.

Stimulus Salience. According to Rachlin (1974), performance is increased by contingent self-rewards, not because of their incentive properties, but because they are distinctive stimuli. Results of studies cited above, that include control conditions in which subjects receive distinctive feedback on goal attainments, also have bearing on this conceptualization. Neither vivid stimuli signaling goal attainments nor contingent self-administration of tokens lacking material value have demonstrable effects on behavior, whereas valued self-rewards augment performance (Bandura and Perloff, 1967; Flaxman and Solnick, 1975). It would be further predicted from social learning theory that the greater the value of the self-reward, the higher the level of performance.

There is a general observation concerning the process of self-reinforcement that should be offered in this context. Because external and self-regulated reinforcement in all probability change behavior through similar mechanisms, whatever interpretations are proposed for self-reinforcement would apply equally to external reinforcement.

Social Demand. Another explanation that is routinely invoked, whatever the phenomenon might be, is that of "demand characteristics." This is a descriptive term used as though it were explanatory. To designate changes as demand effects does not explain them. All forms of social influence (e.g., comments, environmental displays, instructions, persuasive appeals, conditioning, modeling, reinforcement) represent demands in the sense that they function as prompts for behavior. Social influences are therefore better analyzed in terms of their explicitness, coerciveness, and whether they change behavior directly or through cognitive processing, rather than whether they involve demand properties.

Characterizing the effects of self-reward as manifestations of social demand receives little support from findings of control conditions. As was previously noted, control subjects perform under identical circumstances except they do not reward themselves. In studies in which social demands and contingent self-rewards are varied factorially, performances that are difficult to maintain are enhanced by self-reward but are unaffected by increasing social pressure to engage in the activities (Flaxman and Solnick, 1975). Evidence that self-reinforcement functions established under specific modeling conditions operate over a long intervening period in dissimilar situations with different persons, and on different tasks (Lepper, Sagotsky, and Mailer, 1975; Sagotsky and Lepper, 1976) is not easily explainable in terms of situational demands.

Self-motivation. Reinforcement operations can affect behavior in several different ways. Explanation of reinforcement originally assumed that consequences increase behavior automatically without conscious involvement. This view emphasizes the automatic *strengthening function* of response consequences. Although the empirical issue is not yet fully resolved, evidence that human behavior is not much affected by consequences until the point at which the reinforcement contingencies are discerned, raises serious questions concerning the automaticity of reinforcement. Therefore, if reinforcement is equated with automatic response enhancement, then most external regulation of human behavior through consequences would not qualify as "reinforcement." The

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notion of "response strengthening" is, at best, a metaphor. After responses are acquired the likelihood that they will be used in any given situation can be readily altered by varying the effects they produce, but the responses cannot be strengthened any further. Thus, for example, people will drive automobiles for the resulting benefits, but the benefits do not add increments of strength to the driving responses.

It is fortunate that consequences do not automatically enhance every response they follow. If behavior were reinforced by every momentary effect it produced, people would be overburdened with so many competing response tendencies that they would become immobilized. Limiting behavioral effects to events that are sufficiently salient to gain recognition has adaptive value. However, for lower organisms possessing limited symbolizing capacities there are evolutionary advantages to being biologically structured so that response consequences produce lasting effects mechanically without requiring symbolic processing of ongoing experiences.

Consequences can alter behavior through their *informative function*. By observing the differential outcomes of their actions, individuals eventually discern which responses are appropriate in which settings. Reinforcing consequences thus serve as an unarticulated way of informing performers what they must do to gain beneficial outcomes or to avoid punishing ones. Findings of research cited earlier show that people regulate their performances in accordance with contingency and schedule information even though it may not accurately reflect prevailing conditions of reinforcement.

The informative function of reinforcement is not involved in self-reinforcement because, in setting their own standards and rewarding their own attainments, participants know full well from the outset what performances they require of themselves for self-reward. In studies of self-reinforcement, control subjects, who monitor and set goals for the same activities, are likewise fully informed of the requisite behavior.

In the third mode of operation, consequences enhance behavior through their incentive *motivational function*. If valued rewards can be secured by performing certain activities, then individuals are motivated by the incentives to engage in those activities. A vast amount of evidence lends validity to the view that reinforcement serves principally as a motivational operation rather than as a mechanical response strengthener.

According to social learning theory (Bandura, 1976), self-regulated reinforcement augments performance mainly through its motivational function. By making self-reward conditional upon attaining a certain level of performance, individuals create self-inducements to persist in their efforts until their performances match self-prescribed standards. The level of self-motivation generated by this means will vary as a function of the type and value of the incentives and the nature of the performance standards. In analyzing changes resulting from reinforcement operations, whether they be externally- or self-regulated, the robust motivational functions should be given priority over the elusive strengthening function.

The dubious status of both automaticity and response strengthening, and the vestigial connotations of the term reinforcement make it more fitting to speak of *regulation* than *reinforcement* of behavior by its consequences.

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On Paradigms and Recycled Ideologies¹

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The present article examines some of the ideologies underlying the theorizing, experimentation, and applications of knowledge in the field of psychological change. This analysis shows how the sickness ideology recycled under new euphemisms permeates all facets of psychological change—the conceptions of divergent behavior, social labeling practices, the modes of treatment and methodologies for studying their processes and effects, and even the structure of psychological services. Among its more pernicious consequences, this ideology undermines valuable research strategies for advancing knowledge and narrowly restricts the social contributions of psychology.

March ushered in the "Year of the Serpent," an event that should not go unnoticed by the readership of this journal. It is most fitting that on this occasion some tribute be paid to this elongated creature which, though limbless, has done much to move the field of psychological change in new and promising directions. It also helped to smoke out some of the implicit doctrines on which theorizing and practice in this field are premised.

One can point to several reasons why the snake-phobia paradigm was widely adopted for studying basic mechanisms of change. First, although a phobic dread of reptiles appears at first glance to be a circumscribed problem, in fact, it has generalized debilitating effects on vocational and recreational activities, and provides a chronic source of aversive rumination (Bandura, Jeffery, & Wright, 1974; Bandura, Jeffery, & Gajdos, 1975). Second, the phobic condition is relatively refractory to modification, especially if measured in terms of the stringent criterion of elimination, rather than

¹The research by the author reported in this article was supported by Research Grant M-5162 from the National Institute of Mental Health, United States Public Health Service.

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simply reduction, of phobic behavior. Third, the level, generality, and persistence of behavioral change can be measured precisely.

A fourth, and particularly important, benefit derives from the fact that reptiles are rather retiring creatures who tend to keep to themselves and their intimates in unpopulated locales. Consequently, treatment effects are rarely confounded by extratherapeutic encounters with the threats during the course of treatment. In most other conditions, the effects of treatment are almost invariably confounded by experiences arising from periodic contact with the feared events between sessions. People receiving treatment for assertiveness are repeatedly confronted with situations requiring assertive action; acrophobics are faced with elevated locales all around them that they need to enter from time to time; retiring individuals who are in the process of overcoming their speech anxieties engage in a considerable amount of talk in their everyday life; and those who are developing social and cognitive skills can hardly avoid drawing on them in their everyday life. Any successes achieved in these extratherapeutic encounters make treatment look good, whereas intervening failures detract from its apparent effectiveness. The longer the interval over which the procedures are applied, the greater the likelihood of confounding from extraneous sources of influence.

There is an additional aspect of snake phobias, revealed only recently, that holds promise of elucidating the determinants and functions of some of the most intriguing cognitive activities. Virtually all people who dread the sight, and even the thought, of reptiles are plagued by distressing thoughts and recurring nightmares. Mastery experiences achieved through participant modeling rapidly eliminate ruminative thought and nightmares of long standing (Bandura, Adams, & Beyer, 1977; Bandura et al., 1975). The snake phobia thus provides an effective vehicle for studying the influence of waking experiences on dream activity.

Over the years the lowly reptile has contributed much to the understanding of the mechanisms by which psychological procedures effect changes in irrational avoidance behavior. It has also furnished a reliable, standardized procedure for sifting therapeutic promise from ideological promotion and for gauging the relative power of alternative modes of treatment. Whatever other procedures investigators might choose to employ, at least one common methodology existed for investigating, with a high level of experimental control, the processes and outcomes of different modes of treatment. This was a unique development in the history of psychotherapy research, where ambiguity and chaos reigned, and control techniques were lacking for determining whether changes, however poorly measured, resulted from the interventions, however poorly specified, or from a host of unmeasured influences operating concurrently. A sign of maturity of a discipline is that it evolves a set of standardized procedures for studying, under controlled conditions, the phenomena it encompasses. Without some commonality of methods, the findings from one laboratory to another lack comparability, and there is little continuity within the field.

But a reptile's life, burdened as it is with the symbol of Satan, has never been an easy one. Nor did common practice of representing in folklore evil forces in the universe as a huge fire-breathing reptile help its image any. Even in societies that regarded the lethargic reptile as a phallic deity, it was more feared than worshiped. Considering these evil associates, there was every reason to expect that the incarnation of the reptile in the guise of an experimental paradigm possessing advantageous aspects would be viewed with consternation. So eventually it came to pass that some investigators saw fit to purge the lowly reptile from its new-found respectability.

In the remainder of this paper I shall develop the thesis that the sacrificial edict, and other methodological decrees like it, are being issued largely in the name of recycled clinical ideologies that are as misleading today as they were in the past. Because the ideologies are widely invoked toward a variety of experimental formats, let us now take leave of the serpent and center our attention on the more generalized reincarnated notions. They include several facets, each of which deserves careful analysis.

STRATEGIES OF RESEARCH

Researchers in the field of behavioral change face an interesting predicament of their own making. Many of the old conceptions, which are being embraced under new labels, undermine the very methods that are best suited to advance the field of personal and social change. One of the issues concerns the role of laboratory experimentation in the development of powerful modes of treatment and in elucidating the mechanisms by which they produce their effects.

Development of efficacious psychological procedures requires a threefold program of research. At the most basic level, investigations are needed into the *mechanisms of change*. Knowledge of the determinants and processes of change provides a sound basis on which to evolve psychological procedures. Without such knowledge, the search for effective methods reduces to a fortuitous process of trial and error in which failures typically far exceed successes.

At the second level of research, *prototypes of procedures* are developed and tested under controlled conditions to evaluate and to enhance their potential effectiveness. Powerful procedures usually include multiple forms of influence. Therefore, component analyses are needed to determine whether the constituent factors are necessary, facilitative, irrelevant, or serve as impediments to the outcomes produced by the compound prototype.

The third level of research involves applied trials designed to *maximize benefits*. Here, the aim is to identify the optimal combination of proven methods needed to achieve maximal changes in particular types of condi-

tions. It is only after the effects produced by given procedures are known and their potential value is established that widespread applications are warranted. The major purpose of research at the applied level is not to determine whether a given procedure is capable of producing beneficial changes. One can cite both humanitarian and empirical reasons why controlled verification tests should precede applications.

Untested methods, and many practices that are followed with the best humanitarian intent, can, and often do, produce harmful effects (Bergin, 1971; Harris, Wolf, & Baer, 1964; Lovaas, 1967; Rogers, 1967). Even if the procedures are simply ineffective, those who have invested their time, money, and effort are discouraged from trying potentially beneficial treatments on future occasions.

On the empirical side, so many unrecognized and unmeasured influences operate in clinical applications that efforts to unravel the determinants of behavioral changes become frustrating expeditions into methodological jungles. Those who undertake the task of reviewing the data of such studies present essentially the same litany of criticisms, regardless of the particular treatments being examined. The methodological transgressions predictably include multiple confounding of treatment variables, inadequate controls for extraneous influences, noncomparability of cases, variable implementation of procedures, contaminating assessment biases, and weak or unreliable measures of outcome. Such reviews typically conclude with wishful prescriptions for more rigorous experimental designs. In point of fact, there are too many human costs, environmental constraints, and free-floating variables to use naturalistic applications as the level at which to identify the processes or the factors contributing to the effects accompanying given modes of treatment.

Comparative studies at the applied level should be designed to maximize benefits attainable by alternative approaches, rather than to equate them on the particulars of treatment. Indeed, to equalize treatments on the minutiae is to destroy the main purpose of such research. There are some important methodological requirements, however. To provide useful data, participants must be equated across treatments on the behavior to be modified, and the same objective measures of change must be applied. But the treatment ingredients should be allowed to vary as required by each approach to achieve optimal results. The relative worth of a treatment is gauged in terms of how much benefit is achieved, at what cost in staff, resources, time, and effort.

A good example of such research is the evaluation by Fairweather and his colleagues of omnibus treatments designed for chronic schizophrenics (Fairweather, Sanders, Maynard, & Cressler, 1969). The investigators compared, on multifaceted measures of change, the relative value of psychiatric

treatment with a self-managed subcommunity founded on sociobehavioral principles. The latter approach produced substantially greater improvement on all facets of psychological functioning at much lower cost than did the traditional psychiatric program.

Although research at the applied level is ill-suited for elucidating the determinants and mechanisms of change, it has important social and policy significance. It provides the type of data that clients and decision-makers need for choosing among alternative modes of treatment. Unfortunately, as will be shown later, most of the omnibus evaluations of psychological procedures have neither much explanatory nor social value because the behavioral treatments undergoing change are not equated across treatments and outcomes are inadequately measured.

This is not to say that progress in knowledge and practice proceeds through a unidirectional flow from mechanism, to prototype, to maximizing applications. A field is best advanced by reciprocal interaction between these complementary research endeavors. Conceptions of mechanisms provide guides for practice, and the results of applied tests, in turn, provide checks on the conceptions. One can, of course, predict and change behavior without knowing the basis for the occasional successes. But fortuitous practice with people in distress, who must bear the consequences of missteps, is hardly the way to go about developing efficacious treatment procedures.

The extent to which verification tests precede applied trials of a given mode of treatment depends on how immediate and noticeable its effects are, and on its potential harmfulness if inadequately implemented. In heart transplantation, for example, where mistakes can produce sudden death, extensive investigations of rejection mechanisms and transplantation methods are conducted on animals before any clinical trials are attempted. In pharmacological interventions, where negative side effects are usually delayed and less readily noticeable, drugs are often used without adequate testing, and it is not until their adverse consequences become apparent that they are discontinued. In the case of psychological procedures, it is even more difficult to verify that anyone has been maimed or seriously harmed by psychological ministrations. This is because the effects are usually gradually cumulative and, with delayed results, causal links are difficult to discern.

Because the effects of psychological interventions lack striking immediacy, a rather casual attitude prevails about subjecting troubled people to psychological procedures before they have been adequately tested. New approaches are promoted enthusiastically, and it is not until after the methods have been applied for some time by a coterie of advocates that any tests of efficacy are conducted, if at all. Usually the methods are unceremoniously retired by impressionistic evaluations or by subsequent con-

trolled studies, only to be replaced by another novelty that follows a similar course. Hence, workers in the field of psychological change have come to view new approaches as passing fads. When verification tests of processes and outcomes precede applications, new methods are subjected to close empirical scrutiny at each stage of development. The treatments that evolve through such a process are likely to produce outcomes sufficiently beneficial to weather the test of time, faddish cycles, and objective examinations.

Analogue Ideology Recycled

In the early research on interview modes of psychotherapy, investigators designated studies of artificially created conditions as "analogue research." For example, the contributions of the therapists' personal characteristics to psychotherapy might be assessed by recording their verbal reactions to unfamiliar clients presented on brief filmed segments (Strupp & Wallach, 1965). Or a researcher might select words suggestive of disturbance because of faulty recall on successive trials and then evaluate different interpretive techniques for their success in recovering the words (Keet, 1948). Both the faulty recall and the brief interpretive activity were regarded as bearing only vague resemblance to genuine repression and to interpretive analyses of emotional reactions as they occur in the context of a transference relationship. Since the analogue did not provide an adequate experimental counterpart of the actual clinical treatment, workers within this tradition contended that the processes and outcomes of psychotherapy could be established only by examining psychotherapy itself. Just as one could not create an Oedipal complex in a laboratory, one could not concoct an appropriate laboratory treatment of it without duplicating a host of processes that can evolve only over a protracted series of sessions within a developing social relationship. In short, there was little place for laboratory investigations in the traditional conversational approaches to personal change.

With the advent of treatments based on learning principles, laboratory investigations were considered essential for gaining an adequate understanding of psychological change. However, a number of behavioral therapists surprisingly embraced the notion of "analogue research" and misapplied it to experimentation within their own framework. In doing so, they failed to specify in what way the experimentation was analogizing the real modes and processes of change. Let us examine the major aspects of change—treatment, behavioral condition, operative mechanism, and outcome—for whether actuality or its facsimile is being analyzed in laboratory investigations.

The treatments applied in laboratory projects are the real thing rather than partial analogues. For example, in laboratory studies of systematic desensitization, participants are taught how to relax and then aversive scenes are paired with relaxation in a hierarchical order just as they are in naturalistic applications. In laboratory investigations of participant modeling, therapists model feared activities and enlist response induction aids to help participants gain mastery over threatening situations as they would in so-called clinical applications. The parallelism in the different undertakings applies equally to other behavioral forms of treatment.

Not only are the treatments alike, but no one has ever presented any evidence that the treatment effects produced in laboratory and in nonlaboratory settings are mediated by different mechanisms. Nor is there much reason to expect that they would be. However, some differences across settings could arise in results and how they are produced simply because treatments in laboratory situations are better controlled and, hence, less confounded than when they are applied in clinical situations.

Unlike the analogues of yesteryear, the behavioral conditions that are being modified in laboratory situations are authentic rather than artificial concoctions. Participants are overcoming fears and inhibitions, reducing psychosomatic hyperactivity, changing personal habits that are hazardous to their health, and alleviating recurrent problems arising from deficits in social and cognitive skills. The severity of the behavioral conditions varies widely among participants in different laboratory investigations, as it does among the people who happen to appear in settings designated as clinics and thereby automatically become "clinical" cases. We shall consider later the contemporary recycling of the mental disease ideology under clinical euphemisms.

Severity of behavior should be considered for what it is, rather than used for arbitrary categorization of people into "clinical" and "nonclinical" types, or for dichotomizing investigative enterprises into "analogue" and "clinical" research. The main issues of interest are twofold: Are conditions that vary in level of severity differentially responsive to alternative modes of influences? Are changes in weak, moderate, and severe conditions mediated through fundamentally different mechanisms? Theorists who see some merit in the artificial dichotomizations face the difficult task of finding acceptable criteria for casting people and research into one or another type, and demonstrating that it is worthwhile to do so.

The categorical labeling is often justified in the name of generalizability of findings. In addressing this issue from the dichotomous perspective, writers confine their concerns almost exclusively to the generalizability of results from laboratory investigations to clinical treatment. However, the reliability and generality of findings based on treatments administered in

clinical settings should arouse even greater concerns. Of the vast numbers of people who suffer severe problems only a minute, selective sample of them ever appear in clinics. As will be shown shortly, because of nonrepresentativeness, the data obtained from the clientele of clinics are not only of limited generalizable value, but may in fact be seriously misleading. Moreover, treatments applied in clinical settings are more subject to confounding influences. One does not dispose of the problem of generality by collecting confounded data of doubtful reliability on samples of questionable representativeness. The generality of determinants and processes of psychological change is established by conducting replications across samples rather than by attributing generality on the basis of arbitrary clinical labels.

The analogue affair raises issues beyond those of semantic labeling. It discourages laboratory investigations in a field that has been hampered all too long by a tradition of antipathy toward controlled experiments. As for its social implications, it gives license to commentators on psychotherapy to disregard some of the most reliable evidence concerning the relative efficacy of different modes of treatment.

Consider the comparative evaluation of psychotherapies reported by Luborsky, Singer, & Luborsky (1975). After excluding "analogue" studies from consideration, the authors compare the improvement rates of psychoanalytic, Rogerian, and behavioral (desensitization) approaches using as the criterion of change mainly clinicians' ratings of therapists' ratings of their clients' apparent improvement. Such quasi-outcome data are analogous to judging the relative effectiveness of different treatments of hypertension on the basis of raters' impressions of physicians' judgments of clients' reported symptoms without anyone ever bothering to measure the clients' blood pressure. If evaluative research is to advance the field of psychological change, studies that fail to equate behavioral dysfunctions across treatments and do not include objective assessment of clients' actual psychological functioning should be excluded from the analysis. Comparisons based on heterogeneous variations in dysfunctions and methodologies and inadequate measures of change predictably yield one of two conclusions, depending on the methodological ardor of the reviewer: (1) No treatment has been proven better than nothing, or (2) everything is better than nothing. Luborsky et al. conclude that all forms of psychotherapy are equally effective and better than nothing.

Applying the supermarket approach to the issue of therapeutic efficacy, Smith and Glass (1977) rely on undiscriminating volume of data rather than on quality of design and evidence. They find, not unexpectedly, that if variant subclasses of treatments are lumped together and the results achieved by these "superclasses" of treatment are thrown together into a conglomerate potpourri, even fancy statistics cannot extract much of

differential value from the jumble. A widely publicized study by Sloane, Staples, Cristol, Yorkton, and Whipple (1975) comparing the relative efficacy of behavioral therapy and psychotherapy, similarly contains the usual share of confounded variables, unmatched mixtures of dysfunctions, and inadequately measured outcomes relying on amorphous clinical ratings rather than on direct assessment of behavioral functioning. As is now predictable for studies of this type, the different forms of treatment appear comparable and better than nothing on some of the global ratings but not on others. With such quasi-outcome measures even the controls, who receive no therapeutic ministrations, achieve impressive improvement. Based on this level of research, weak modes of treatment are given a new lease on life for those who continue to stand steadfastly by them.

Results of well controlled experiments using objective measures of changes in behavior and other aspects of psychological functioning lend little validity to either of the two common conclusions. Rather, the studies show that treatments implemented through enactive mastery are decidedly superior to those relying on symbolic procedures. These findings are consistently replicated with different modes of treatment, and with different types of behavioral dysfunctions exhibited by both children and adults.

Enactive desensitization achieves substantially greater reductions in defensive behavior and anxiety arousal than does symbolic desensitization (Barlow, Leitenberg, Agras, & Wincze, 1969; LoPiccolo, 1970; Sherman, 1972; Strahley, 1966). Real encounters with threats produce results decidedly superior to imagined exposure, which has weak, variable effects (Emmelkamp & Wessels, 1975; Stern & Marks, 1973; Watson, Mullett & Pillay, 1973). Participant modeling has been compared with different types of symbolically based treatments. These studies corroborate the superiority of enactive mastery facilitated by modeling as compared to vicarious experience alone (Bandura, Blanchard, & Ritter, 1969; Bandura et al., 1977; Blanchard, 1970; Lewis, 1974; Ritter, 1969; Röper, Rachman, & Marks, 1975), to symbolic desensitization (Bandura et al., 1969; Litvak, 1969), and to imaginal modeling in which clients visualize themselves or others coping successfully with threats (Thase & Moss, 1976). When enactive mastery through participant modeling is subsequently provided for those who benefit only partially from the symbolic procedures, avoidance behavior, anxiety arousal, and negative attitudes are thoroughly eliminated within a brief period (Bandura & Adams, 1977; Bandura et al., 1969; Thase & Moss, 1976).

Not only do some treatments work a great deal better than others, but the results of laboratory investigations and controlled trials specify reliable ways in which demonstrably effective treatments can be further improved in their power to produce and to enhance the generality of changes in psycho-

logical functioning (Bandura, 1977b; Rosenthal & Bandura, 1978). This large body of evidence can be integrated within a unified theoretical framework that successfully predicts the level of behavioral changes produced by different modes of treatment, variations displayed by individuals receiving the same type of treatment, and performance success on specific tasks (Bandura, 1977a, 1977b). Theoretical advances, in turn, provide guides for new directions in practice.

Had the analyzers of amorphous outcome data included, at least as a separate part of their analysis, evidence from carefully controlled investigations, they could have identified promising directions for developing powerful treatments rather than concluding on a note of self-congratulatory complacency with treatments of marginal value [“everybody has won and all must have prizes” (Luborsky et al., 1975)]. Behaviorally oriented therapists share neither the equipotentiality conclusion nor the complacency, but paradoxically many embrace the very negative ideology toward laboratory investigations that give such conclusions credibility.

Ecological Validity

Closely allied to the slighting of experimentation by recourse to the analogue argument is the ready invocation of ecological validity. This notion, which has lost much of its identity from its earlier parentage, is in danger of being transformed into a cliché through indiscriminate use. Some writers have misinterpreted this notion to mean that laboratory investigations either have little utility, or that they must mimic the specific characteristics of everyday events. Like most terms that catch the popular fancy, it is widely used but no one has furnished explicit criteria for judging ecological validity.

The study of psychological phenomena can vary on a variety of dimensions. These include, among other things, the context of investigation, the characteristics of participants, the procedures of influence, their mode of implementation, the operative mechanisms, the psychological effects selected for examination, and the way in which they are measured. If the gauge of ecological validity is to be helpful in stimulating research that will deepen our understanding of human behavior, it must be founded on two methodological requirements: First, it should specify a reliable set of criteria for judging the degree to which a given investigation is ecologically valid. Secondly, it should provide empirical support for the relevance of the chosen criteria. Without serviceable guidelines, judgments of the potential usefulness of empirical endeavors are easily swayed by intuitive appeal and conceptual allegiances.

Findings of experimental studies are often discounted on the grounds that the artificiality of laboratory conditions precludes extrapolation to

natural situations. Such an attitude reflects misunderstanding of how knowledge is advanced. Experiments are not intended to duplicate all aspects of events as they occur in everyday life, and they would lose their value if they did. Experiments advance understanding of human behavior to the extent that they include determinants that are relevant to the phenomenon one seeks to explain and tap the basic processes as they operate in everyday situations which may differ extensively in physical appearances.

Experiments on psychological change should be judged, not in terms of physical resemblances to situations of everyday life, but on the degree to which they identify the important determinants and processes of change. This view of experimentation is taken for granted in all other branches of science. Airliners are built on aerodynamic principles developed largely in artificial wind tunnels; bridges and skyscrapers are erected on structural principles derived from experiments that bear little resemblance to the actual constructions; and knowledge about physiological functioning is principally gained from artificially induced changes, often in animals. Indeed, preoccupation with mimicking things as they occur naturally can retard advancement of knowledge—witness the demise of venturesome fliers who tried to remain airborne by flapping wings strapped to their arms in the likeness of soaring birds.

In the final analysis, experiments are judged not on artificiality criteria, but in terms of the explanatory and predictive power of the principles they yield. Air travelers rarely discount or become exercised over research using artificial models in wind tunnels provided it produces reliable airliners; rather, they would question the wisdom of researchers who insisted on constructing airliners and unloading them from high altitudes for discovering basic aerodynamic principles. Nor do they require that airliners flap their wings because that is the manner in which flying occurs in nature.

Laboratory investigations are not analogues of reality. They are controlled situations for clarifying essential determinants and processes of phenomena. It bears repeating that, unlike most of the experimentation in psychology, the laboratory investigations of behavioral change do not involve artificially created situations. There is nothing artificial about the behavioral dysfunctions being modified or about the modes of influence, processes, and outcomes of change being explored.

IDEOLOGY OF THE INGRAINED DISEASE MODEL

For years the field of psychological change was plagued by the quasi-disease model of behavioral dysfunction. Anomalous behavior was presumably a symptomatic expression of an underlying disease, but one that was mental rather than neurophysiological. Behavior theorists argued con-

vincingly that most anomalous behavior is better explained in terms of social learning and labeling processes than by medical analogizing. They rejoiced in the success of their efforts. Enlightenment on the determinants of behavior and how values affect the labeling of conduct finally put a damper on the practice of characterizing divergent thought and behavior as diseases of the mind. A new perspective was ushered in on the origins, modes, and processes of psychological change free of disease and demonic conceptions. At least so it seemed. But appearances are often misleading. In fact, the sickness model is not only very much alive in behavioral approaches, but is flourishing in old forms and under new euphemisms.

The disease model permeated all facets of theorizing and practice in the field of psychological change. It shaped conceptions of divergent behavior, social labeling practices, the modes of treatment and the methodologies for studying their processes and effects, and even the structure of psychological services. Let us now examine each of these various facets.

Sickness Labeling

Social learning views deviance as divergent, rather than diseased, behavior. Whether or not particular forms of conduct are construed as deviant is heavily influenced by social customs and by values of the labelers. Social learning favors functional analysis of human problems rather than diagnostic labeling that categorizes people into psychopathologic types. Identifying the conditions governing behavior provides greater guidance for effecting beneficial change than does labeling a person. Such labeling is not without detrimental consequences. Most diagnostic labels stigmatize people. Once cast into a stigmatized status they tend to be treated by others in ways that exacerbate their problems and create impediments to constructive change. Labels also serve as vehicles for social regulation. After individuals have been given a diagnostic label, social agencies are granted authority to deal with them in special ways.

This is not to say that biological elements do not influence behavioral functioning. Obviously, many factors interact in determining behavior. Because psychological functioning is multiply determined it is not easily categorizable into disciplinary domains. Learning, for example, is mediated by neurophysiological processes, but this does not make education a branch of medicine. By the same token, evidence that personal habits and environmental conditions detrimental to health are major determiners of life expectancy (Fuchs, 1974) does not make cardiovascular disorders a branch of psychology. The problem of partitioning causes along social, psychological, and biological lines is further complicated because behavioral and social

factors often produce physiological dysfunctions which, in turn, affect behavior in a reciprocal fashion. Even if organic impairments were found to be a contributing cause of some forms of deviant behavior, the propriety of labeling that behavior a mental illness would be as questionable as labeling cardiac patients mentally ill because their bad habits contribute heavily to their cardiovascular disorders.

If sensitization to the inappropriateness of the sickness model accomplished anything, it dissuaded psychological professionals from labeling divergent behavior as diseased. However, this did not get rid of the disease. It simply shifted the sickness labeling from the behavior to the carrier. It is not that divergent behavior is symptomatic of the metaphoric disease, but that the people who perform it are "clinical" cases. The term "clinical population" has become the leading sickness euphemism. People are categorized into clinical and nonclinical types. Although the same laws are said to govern different forms of behavior, it is only the study of people who happen to be clinically labeled that is believed to shed much light on issues of psychological change.

The sickness perspective is similarly reflected in the labeling practices applied to research activities. As previously noted, sharp distinctions are being drawn between "analogue research" and "clinical research" on the assumption that it is only examination of the sick ones that can provide genuine knowledge about the determinants and processes of psychological change. The merits of this categorical thinking have already been reviewed and will not be repeated here. There is one thing that should be said in its favor, however. The criteria used in diagnostic labeling are usually specified only in general terms (e.g., inappropriateness of affect, distortions of reality), thus requiring considerable subjective interpretation. To complicate matters further, it is difficult to categorize people into designated types because they display idiosyncratic mixtures of thought and behavior that do not exactly fit any of the categories. Consequently, the business of classifying people creates serious problems of agreement. By contrast, the dichotomous clinical classification, relying as it does mainly on the criterion of physical locus, can be made with precision. A "clinical case" becomes a person who appears in a place called a clinic, and "clinical research" becomes research conducted on the clientele of clinics. Considering the idiosyncratic factors that bring people to clinics and keep them there, one would question the representativeness of a body of knowledge tied to a restricted locale. This is hardly the dimension on which to organize a field of study, or to use as a basis for ordering a body of evidence.

The distinction between analogue and clinical research is sometimes drawn in terms of voluntariness of the participants. The analogues presumably use volunteers. If clinical researchers are imposing their treatments on

involuntary subjects, they should promptly cease such practices on ethical grounds. If their subjects are not forced to undergo treatment, then the dispute revolves around an empty issue. It might be argued that clinical cases are more highly motivated by distress to alter dysfunctional patterns of behavior than are the "analogue" ones. Even if this disputable assumption were true, it would hardly justify disinterest in the findings of laboratory investigations. On the contrary, a treatment that proved effective in changing the behavior of unmotivated participants should work even better with people who are highly motivated to change.

The nature of the behavioral dysfunction has also been widely used to categorize research into analogue and clinical types. A number of investigators have expressed concern that many of the laboratory studies may be dealing with only "subphobic" fears of lesser intensity than those exhibited by clinical populations. Influences that are shown to affect weak fears, they argue, may not be generalizable to more intense ones. Some researchers have even suggested that formats using small animal phobias (i.e., reptiles) be abandoned in favor of other dysfunctions. However, selecting some other type of dysfunction will not dispose of the alleged problem. Psychologists who see little purpose to laboratory investigations will question as well the severity of the selected dysfunction and its relevance to authentic "clinical neuroses." They will argue, as have critics of animal phobias, that rarely in their clinical practice have they encountered clients who embarked on a course of treatment for the condition in question.

If the reasoning in terms of clinical equivalence were extended to other scientific enterprises, surgeons would dismiss the knowledge gained through cardiovascular research with animals because they had never been consulted by a Labrador retriever for chest pains caused by occlusion of coronary arteries, and physicians would question the value of genetic knowledge derived from small laboratory animals and plants because they had never been consulted by a fruit fly anxious about possible chromosomal abnormalities in its progeny. We shall return to this issue later because the arguments raised about the relevancy of conditions being treated in laboratory investigations, in fact, call into question the social benefits of psychological services modeled on the sickness ideology. It might be noted in passing that proponents of treatments that do not fare well under stringent tests are especially quick to find fault with laboratory formats.

There is merit in using several standardized formats involving different behaviors for studying the determinants and processes of change. As for the problem of weak fears, a simple solution is to select from the population at large people who are plagued by intense, irrational, incapacitating fears that are refractory to change by coaxing or even coercion (Bandura et al., 1969; Bandura et al., 1975; Bandura et al., 1974; Rosen, 1975). Such condi-

tions provide stringent tests of the potential power of different approaches. Moreover, the findings have greater generality than those based on clinic samples, which are hardly representative of the afflicted who exist in the larger population.

With severe phobic conditions, "analogue" research is suddenly transformed into "clinical" research simply by diverting the gaze from the size of the animal to the magnitude of the psychological problem it creates in phobics. Small animals can produce large problems that affect one's everyday life in important ways. It is not the animals, however large or small, that are of central concern to the severe phobics in laboratory studies. Rather, they seek help because they cannot perform their vocational activities or force themselves to do so under heavy stress costs; they cannot venture into, and enjoy, the outdoors because of their fear; and they are frequently tormented by intrusive frightening thoughts and recurrent nightmares.

To contend that because phobics completely avoid a threatening object it has no impact on their daily living (Borkovec & O'Brien, 1976; Cooper, Furst, & Bridger, 1969), is to miss the point that it is the avoidance maneuvers that constrict and impair the phobic's life. Acrophobics who succeed in never venturing above ground level are hardly unimpaired by their successful avoidance. Consider some of the debilitating effects experienced by snake phobics who have been treated in several laboratory investigations: Some could not pursue their vocational work, as in the case of geologists and biologists who feared snake encounters in their field work, telephone repairmen and firemen who dreaded work in rustic areas, real estate salesmen who could not enter houses containing pet snakes, plumbers who were unable to conduct repairs under houses for fear of snakes lurking in the dark areas, land speculators who could not inspect certain areas of land, and countless teachers who were frightened by the prospect of children bringing snakes to school.

Virtually all the participants had abandoned recreational activities such as hiking, camping, swimming in lakes, or fishing because of their dread of snakes. New information about snakes usually produced additional constriction of activities as illustrated by a person who gave up swimming in open waters upon seeing an article on sea snakes. They refused to reside in suburban rustic areas and only reluctantly visited their friends in such areas. The golfers strained their friendships and pocketbooks by their inability to retrieve golf balls from the rough.

Others were incapacitated in more unusual ways. One individual, for example, was unable to use her bathroom in San Francisco for several weeks upon learning that a snake had escaped into the municipal sewer system in Santa Barbara, despite reassurances, appeals to reason, and coaxing.

Another participant, emulating the frontiersman's approach to problems, shot himself in the foot while trying to kill a harmless snake with his shaky aim. Another one required her husband to edit every magazine and newspaper that entered the household for possible items related to reptiles. A person suffering from a cardiac disorder was referred by her physician because she was in a chronic state of anxiety upon learning that her neighbor had acquired a boa constrictor. Several Peace Corps volunteers and sabbatical travelers about to leave for reptile-infested countries sought help for their phobia, in anticipation of the serious problems it would pose for them.

The most pervasive consequences of the snake phobia were thought-produced distresses. The magnitude of the problem is best conveyed in the words of the participants themselves: ("During spring and summer they [snakes] are constantly on my mind when I'm outdoors . . . Once I've seen one or a picture of one, it is hard for me to get them out of my head . . . Now that I know they are on some land we purchased, I feel tense about living there . . . I have nightmares about twice a month. I used to be afraid every time I walked into a dark room or got into a car alone at night, thinking that maybe there was a snake on the floor. I haven't had a nightmare since the treatment program. I also used to feel revulsion whenever I even heard the word 'snake.' My body tensed up, and I would often get a chill and feel sick to my stomach. That never happens anymore.") Most suffered recurrent nightmares, in which they were dropped into snake pits and encircled or pursued by menacing serpents.

As the preceding comments illustrate, people dwell on potential threats, even though they rarely if ever encounter them, in order to fend them off. In so doing, they revify the threats and constrict their lives by their defensive actions. The external danger is trivial compared to the dire ruminations and their debilitating defensive effects (Rosenthal & Bandura, 1978). The treatments being analyzed in these laboratory investigations enable people burdened with such phobias to master their fears and to engage in activities they formerly avoided, and it eliminates their ruminative thoughts and nightmares.

The Clinical Misdirection

As indicated earlier, of the vast number of people who manifest deviant behavior and suffer distress, only a trivially small number ever appear in clinics or psychiatric hospitals. No one has ever undertaken the challenging task of studying how the tiny sample of clinic patrons differs from the huge population of troubled nonpatrons. However, one need not wait for results of formal comparative studies to appreciate the nonrepresentativeness of the clinic sample. For the most part, the residents of mental

hospitals are the disadvantaged, ineffectual, and powerless members of the various diagnostic categories. They serve as the major source of data for theories of psychopathology because researchers lack access to most of the successful schizophrenics, the successful depressives, and the successful compulsives. Rather, we admire their paintings, enjoy their music, read their novels, and vote for them in public office. Textbooks that catalog the characteristic infirmities of the different psychopathologies rarely, if ever, cite examples of the afflicted who succeed, such as the Lincolns among the depressed.

Any theories that are based on institutionalized samples most likely represent the psychopathologies of the indigent. Clinic patrons are more affluent than institutionalized people but also probably the less effectual members of the deviant population within their socioeconomic level. They provide the data for theories of neuroses of the disconsolate. People accommodate to, flatter, and emulate "neurotics" who succeed in gaining power, fame, and fortune, rather than refer them to clinics. It is interesting to speculate on how the defining characteristics and determinants of various psychopathologies would change if samples were drawn at random from the deviant population at large rather than confined to the few who gravitate, for one reason or another, to psychiatric facilities. In short, data based on clinical populations not only have limited generality, but can be grossly misleading.

Analysis of aggression illustrates how theories change depending on the source of the sample. In studies in which hyperaggressive children are selected from institutions or clinics, aversive familial determinants emerge as critical factors (Bandura & Walters, 1959; Patterson, in press). The exemplary studies by Patterson of family interactions show negative reinforcement to play a central role in both eliciting and maintaining aggressive behavior. Children are inadvertently trained to use coercive behavior as the means of commanding parental attention or terminating social demands. The children's antagonistic behavior rapidly accelerates parental counter-aggression in an escalating power struggle. By escalating reciprocal aggression each member provides aversive instigation for each other, and each member is periodically reinforced for behaving coercively by overpowering the other by more painful counteractions. Mutual coercion is most likely to appear as a prominent factor in families that find their children's control techniques painful and therefore seek relief from clinics. However, intra-familial coercion is not a significant factor in families of predelinquent children who are forced to consult clinics because of legal threats rather than mutual torment (Reid & Patterson, 1976).

A quite different theory of aggression emerges if hyperaggressive children are selected from the population at large rather than from clinics. In one study (Bandura, 1960), the most hyperaggressive children in an entire

community were identified in school settings and their social behavior was systematically observed. Despite the fact that these children were highly belligerent, assaultive, and destructive of property, few of these families had ever consulted a clinic. This was because their training in aggression did not produce torment in the home. The parents modeled aggressive attitudes and, while nonpermissive and punitive for aggression toward themselves, they actively encouraged and rewarded aggression directed at others outside the home. As a result of this differential training, the children were reasonably well behaved at home but readily assaultive toward others. If these parents' youngsters misbehaved, it was because others were at fault. The parents of these hyperaggressive children not only saw little reason to consult clinics, but many of them considered aggression to be a valued attribute. In the words of one of the fathers: "If there is anything Jim (son) should have that I don't have, it would be a little more aggression . . . aggression pays off in better jobs, that's the reason I've got where I am, because I have pushed." In these families, the development of aggression is better explained in terms of a positive, than a negative, reinforcement model.

Were one to study other forms of problematic behavior with samples drawn from the cases that exist in the population, the prevailing theories of "psychopathology" would doubtless require extensive revision. For the reasons already presented, a comprehensive science of psychological dysfunction and change cannot be built solely, or even largely, on the clientele of hospitals and clinics.

Conception of the Processes of Change

When viewed from the sickness perspective, the processes of psychological change get defined in terms that are suitable for describing the course of physical disease processes but misleading for behavioral change. For years the effects of psychological procedures were discussed in terms of rates of "cure," "spontaneous remission," and "relapse." Behavioral phenomena, however, are fundamentally different from physical disease processes. If a malignant tumor has been excised or an infectious disease arrested, it is meaningful to speak of cures and relapses because all cancerous cells may not have been removed or the infective agents completely counteracted. In contrast, psychological functioning involves a continuous reciprocal interaction between behavioral, cognitive, and environmental influences (Bandura, 1978). Hence, the likelihood that a given behavior will be performed can vary markedly in different environmental settings toward different people, and at different times. This is analogous to having malignancies appear in some situations only to disappear in others. Behavioral phenomena clearly require a different conceptual scheme.

With the advent of behavioral approaches, characterizations of psychological changes in the terminology of disease processes declined, except among proponents of traditional treatments. However, the shift is reflected more in nomenclature than in analytic practices. The effects of psychological procedures continue to be judged and compared largely in terms of undifferentiated outcomes akin to cure rates.

Multiprocess Analysis. Social learning theory distinguishes among three basic subprocesses of change, namely, *induction*, *generalization*, and *maintenance* of behavior. Analysis of treatment in terms of these subprocesses provides a more informative basis for evaluating and improving psychological methods than do undifferentiated assessments of outcomes.

The table below depicts different patterns of effects that might obtain for any given treatment. Pluses and minuses signify successes and failures, respectively. From this perspective, the general issue of therapeutic efficacy is divided into the more analytic questions of whether a method induces psychological changes, whether the changes generalize across situations and response systems (behavioral, affective, attitudinal), and whether the changes are maintained over time.

Applying this multiprocess analysis, the first treatment shown in the table fails on all counts. The second induces changes, but they are circumscribed and transitory. This does not necessarily mean the method is inadequate. Quite the contrary. It may be effective for creating changes, but it requires a supplemental transfer and maintenance program. The third treatment produces generalized changes that are short-lived. Here the deficiencies lie in the maintenance component of the approach. The fourth treatment achieves enduring but circumscribed changes, thus requiring supplementary procedures to enhance transfer effects. The fifth, and most powerful treatment, succeeds on all indices—induction, generality, and durability. Just as one does not rely on unplanned influences to initiate psychological changes, neither should generalization and maintenance be left to fortuitous circumstances.

Because psychological change involves different facets, each governed by diverse sets of determinants, investigators must differentiate the major

Table I

Processes	Treatment accomplishments				
	1	2	3	4	5
Induction	—	+	+	+	+
Generalization	—	—	+	—	+
Maintenance	—	—	—	+	+

subprocesses in their theorizing and experimentation. Separate programs of research are needed to identify the conditions that are best suited for creating psychological changes, those that promote generalization of changes across modalities and settings, and those that govern whether or not instated changes will endure. If studies of comparative efficacy of treatments are to be informative, they should analyze separately the relative power of different methods for instating, generalizing, and maintaining changes in behavioral functioning. The retirement of amorphous, inadequately measured outcomes is long overdue.

Structure of Psychological Services

The manner in which psychological services are provided to the public is deeply entrenched in the disease model. Clients come to clinics where therapists try to figure out what ails them. After a troublesome condition has been identified, treatments are applied to alleviate the source of distress. In virtually every respect—the nomenclature, the preoccupation with pathology, and the structure of the ministrations—psychological services mimic traditional medical practices. The disease approach has effectively limited the impact of medical knowledge on the quality of health in a society. It is a defective model to imitate if psychology seeks to contribute significantly to people's well-being.

Let us first consider the parent model. It is becoming increasingly evident that traditional medical approaches do not do much to improve the health of a population. In this approach, which is oriented more toward disease than health, people consult physicians mainly for treatment of physical illnesses. Epidemiological research shows that, apart from physiological endowment which is not changeable, physical health is largely determined by personal habits and environmental conditions. These include nutritional patterns, overeating, smoking, inadequate exercise, deficits in coping skills, and environments that produce detrimental stresses, hazards, and harmful pollutants.

People experience physical debilities and die prematurely mostly of preventable bad habits. It is, therefore, behavioral and environmental approaches that can yield the large health benefits. Increasing medical care has only a small impact on level of health and life expectancy (Fuchs, 1974).

Physicians are paid by clients, governmental agencies, and insurance carriers for treating illnesses, not for preventing them. Hence, it is not difficult to understand why a model of service so limiting in its social impact would become so firmly entrenched. As the public gains increasing awareness of how its health habits contribute to risk of disease, it must turn to nonprofessional sources for help on how to change personal habits and to

successfully manage its health. Witness the proliferation of weight-control enterprises, smoking-cessation programs, and stress-management courses. More sophisticated and comprehensive health centers offering audiovisual instruction and habit training programs are being developed outside the medical and psychological fields to fill the void created by the professional preoccupation with pathology.

This need not be so. Medical and psychological knowledge can be used to benefit vast numbers of people at minimal costs by restructuring and enlarging the nature of human services. One can point to some promising examples. In an innovative program of research, Maccoby and Farquhar (1975) drew on knowledge from epidemiology, communications, and social learning of self-regulatory skills to reduce the risk of cardiovascular disease in entire communities. Mass media were used on a community-wide basis to inform the public on how personal habits affect the risk of premature heart disease and to alter risk-related behaviors of long standing. Multimedia campaigns created interest in the health programs; instructional aids and personal guidance relying on modeling, guided practice, and reinforcing feedback were used to change habits injurious to health. Medical examinations of people selected from the community reveal that media influences produce significant and enduring reductions in risk factors, whereas people in control communities continue in their detrimental ways. Personal guidance in conjunction with mass media produces greater social diffusion of health information and more extensive and rapid behavioral changes than does the use of the media alone. Results of this project demonstrate how personal habits conducive to health can be promoted on a community-wide basis with minimal involvement of health professionals.

A socially oriented approach enhances the general well-being of people; the disease-oriented approach provides surgery and medications for individual casualties who seek relief from their protracted suffering. The ill need effective care, but a health profession can ill afford to neglect the very conditions that adversely affect the health of huge numbers of people.

Because most of our psychological practices have embodied the disease ideology, we offer remedies for the few rather than benefits to the many. The relevance of research, the adequacy of behavioral analyses, and the utility of psychological procedures all tend to be measured against the pathology metaphor. We have the knowledge and the means to bring benefit to many. We have the experimental methodology with which to advance psychological knowledge and practice. But to accomplish this calls for a broader vision of how psychology can serve people, and a fundamental change in the uses to which our knowledge is put.

When the general public is informed on how social learning approaches are used effectively to help people with common problems of life (Bandura, 1967), it brings a flood of inquiries about the availability of such

services. Most of these conditions, which needlessly impair the quality of people's lives, are readily amenable to change through brief, focused applications of social learning procedures. When practitioners report that people rarely come to them with the types of problems treated in laboratory investigations, such admissions testify more to the limited relevancy of the traditional service for the population at large than to the inconsequentialness of the problems. Relatively few people seek cures for neuroses, but vast numbers of them are desirous of psychological services that can help them function more effectively in their everyday lives. As in the case of medicine, they are turning in increasing numbers for these neglected services to programs offered by nonprofessionals while psychologists pursue their preoccupation with pathology.

Proponents of different conceptual orientations are not equally mesmerized by the sickness ideology. Humanistic psychologists never embraced it. By emphasizing the development of human potential the humanistically oriented advocate a commendable set of values. But, unfortunately, they do not offer much in the way of reliable methods for effecting personal change. Indeed, certain of their doctrines are not especially conducive to actualizing the potentials of psychology in contributing the means for personal and social change. In the image of human nature embodied by this view, people are motivated by an innate drive for self-actualization. Since the drive, if externally unencumbered, provides the impetus and direction for behavior, it is self-expression rather than guided learning that is most emphasized. The prescriptives for effecting personal change therefore dwell more on how not to thwart the innate drive, than on how to cultivate interests and skills for realizing one's potentialities.

Theoretical accounts of self-actualization typically cite examples of human virtue and laudable achievements, but never mention people who actualized their potential for destructive purposes. Human potentialities can be actualized for good or evil. Over the years, many people have suffered considerably, and will continue to do so, at the hands of self-actualized tyrants. It might be argued that a tyrant cannot be genuinely self-actualized. However, one person's tyranny is another person's benevolence. Through moral justification reprehensible conduct becomes honorable (Bandura, 1973). A self-centered ethic of self-actualization must be tempered by concern for the social consequences of one's conduct. The new realities of existence, wherein pursuit of activities that bring maximal self-fulfillment can create hardships for others, will require an even greater sense of social responsibility.

Humanistic conceptions of behavior, stressing as they do holistic and phenomenal notions, provide a somewhat nebulous account of the determinants and processes of psychological change. The negative stance

adopted by exponents of this orientation toward the standard methods of science limit the progress that can be made in the understanding of human behavior.

Adherents of the operant approach not only eschewed the sickness ideology, but excised all internal determinants from analysis of causal processes. They can hardly be faulted for modest pretensions about what behavioral technology can do for society. However, the fondness for the language of control and human engineering and the truncated image of human nature articulated by operant workers arouse public concern about the potential misuse of psychological knowledge for exploitative and inhumane purposes.

Humane psychological services can be developed without having to abandon the methods of science or to dispossess people of their capacity for thought and self-direction. Because of their relative efficacy, methods derived from social learning principles can be used effectively to advance self-determination and enhance personal potentialities. Thus applied to proper ends, social learning approaches support changes encompassing a humanistic view of life.

Psychological services can be restructured in two directions to increase their social impact. As alluded to earlier, psychology can offer benefits to many by creating comprehensive Psychological Development Centers that provide a broad range of beneficial services to the public. Here the participants would be considered not as patients suffering from psychic pathologies, but as people who pursue specific programs designed to modify troublesome conditions and to develop requisite skills for expanding their potentialities.

Many human problems are primarily institutional and not individual. An important issue is the relative attention devoted to changing individuals or to altering social conditions that create widespread detrimental effects. If psychologists are to have a significant impact on common problems of life, we must apply our corrective measures to detrimental social practices rather than limiting ourselves to treating the causalities of these practices. Unfortunately, the conditions of reinforcement that govern the social applications of psychological knowledge are not especially conducive to a socially oriented emphasis. It is much easier, for example, to secure employment and funds for alleviating human disorders than for preventing them. Current problems command attention. Future incidence rates are not the types of events that impel people to action, even though the benefits of preventive measures are infinitely greater.

Practitioners, whatever their specialty, are reinforced more powerfully for using their knowledge and skills in the service of existing operations than for changing them. Those who attempt structural and functional

alterations in existing institutional arrangements meet with resistance from conflicting interests. As a consequence, socially oriented approaches to human problems are difficult to develop. Rapidly changing conditions, which are impairing the quality of our social and physical environments, increase the necessity for socially oriented solutions to human problems and greater commitment to shared purposes. As the strains increase, so will the need for effective means for altering values, institutional practices, and personal lifestyles. The task of social change has never been an easy one. But the substantial human benefits make the pursuit most worthwhile.

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SOCIAL COGNITION

Microanalysis of Action and Fear Arousal as a Function of Differential Levels of Perceived Self-Efficacy

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Two experiments combining intergroup and intrasubject designs were conducted to test the hypothesis that self-percepts of efficacy operate as cognitive mediators of coping behavior and fear arousal. Differential levels of self-efficacy were induced in phobic subjects through either enactive mastery or modeling. Their coping behavior and accompanying fear arousal were then measured. In the next phase, self-efficacy was successively raised to designated levels within the same subjects, whereupon their behavior and fear arousal were again measured. Coping behavior corresponded closely to instated self-percepts of efficacy, with higher levels of perceived self-efficacy being accompanied by greater performance attainments. The efficacy-action relationship was replicated across different modes of efficacy induction, different types of behavioral dysfunctions, and in both intergroup and intrasubject comparisons. The hypothesis that fear arousal stems largely from perceived coping inefficacy also received support from the findings. As subjects' self-efficacy level was raised, they experienced progressively less anticipatory and performance distress while coping with threats. Results of a third experiment using cardiac acceleration and elevation in blood pressure as indicants of arousal further corroborate the generality of the relationship between perceived coping inefficacy and stress reactions.

In their daily lives people must make decisions about whether to attempt risky courses of action or how long to continue, in the face of difficulties, those they have undertaken. Social learning theory posits that the initiation and regulation of transactions with the environment are partly governed by judgments of self-efficacy (Bandura, 1977). People tend to avoid situations they believe exceed their coping capabilities, but they undertake and perform assuredly activities they judge themselves capable of managing (Bandura, 1982b).

Self-judged efficacy also determines how much effort people will expend and how long they will persist in the face of obstacles or

aversive experiences. The stronger the perceived self-efficacy, the more vigorous and persistent are the efforts. In the face of difficulties, people who entertain serious self-doubts about their capabilities slacken their efforts or give up altogether, whereas those who have a strong sense of efficacy exert greater effort to master the challenges (Brown & Inouye, 1978; Schunk, 1981).

Previous research sought to clarify the causal contribution of perceived self-efficacy to performance by administering diverse treatments and then examining the link between whatever self-percepts of efficacy were produced and subsequent action. Results of these studies reveal that self-percepts of efficacy are generally good predictors of how people are likely to behave and how much emotional arousal they will experience on specific tasks. Self-judged efficacy predicts action regardless of whether self-efficacy is enhanced by enactive mastery, vicarious experience, reduction of emotional arousal, or

This research was supported by Public Health Research Grant M-5162 from the National Institute of Mental Health. The authors are indebted to Grace Dooseman for her valuable assistance with this research.

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cognitive execution (Bandura & Adams, 1977; Bandura, Adams, & Beyer, 1977; Bandura, Adams, Hardy, & Howells, 1980; Condiotte & Lichtenstein, 1981; Weinberg, Gould, & Jackson, 1979; Barrios, Note 1).

Two of the experiments reported in this article were conducted to test more directly the causal relationship between perceived self-efficacy and behavior. This was achieved by creating designated levels of perceived self-efficacy and analyzing their behavioral and arousal effects. To test the generality of the postulated efficacy mechanism, the experiments employed different modes of self-efficacy induction, different forms of coping behavior, and both intergroup and intrasubject designs.

Experiment 1: Induction of Differential Levels of Self-Efficacy Through Enactive Mastery

In the first experiment participant modeling was used to produce differential levels of self-efficacy because it provides a powerful means of enhancing self-efficacy, and it can be administered in a finely graduated way so as to permit close control over how highly self-efficacy is developed. In this approach the therapist models the feared activities. Then subjects are helped, through a variety of performance induction aids (Bandura, Jeffery, & Wright, 1974), to confront and master progressively more threatening tasks. Persons with severe snake phobias underwent a sequential procedure in which each task mastery was followed by a self-efficacy probe until subjects achieved either a low, medium, or high level of perceived self-efficacy. Their coping behavior and accompanying fear arousal toward a generalized threat were then measured.

The next phase of the study included successive modifications of self-efficacy levels within the same subjects. After the effects of the initially produced levels of self-efficacy were assessed, subjects in the low and moderate conditions received further treatment until they attained succeeding levels of self-efficacy, whereupon their coping behavior and fear arousal were again measured. This combined experimental design thus provided both intergroup and intrasub-

ject tests of the theory under consideration. We predicted that increasing levels of self-efficacy both across groups and within the same subjects would give rise to progressively higher performance accomplishments.

Mastery experiences served as the vehicle for conveying self-efficacy information. However, many factors can affect the efficacy import of performance successes. Judgment of self-efficacy is, therefore, an inferential process in which the relative contributions of personal and situational factors to performance successes and failures must be weighed and integrated (Bandura, 1982a). The extent to which people are likely to raise their perceived self-efficacy through performance successes will partly depend on how much effort they had to expend. Successes gained through laborious effort connote lesser self-efficacy than those achieved through minimal effort. Successes carry less efficacy value if credited more heavily to external aid received than to personal capabilities. The same level of performance suggests higher efficaciousness if attained through continuous progress rather than through discouraging reversals and plateaus. If people selectively attend to the more negative aspects of their performances, they are likely to underestimate their self-efficacy. Conversely, selective self-monitoring can magnify perceptions of self-efficacy if it is the more competent aspects that are noticed and remembered.

Seen from this perspective, it is through cognitive appraisal that performance successes gain their efficacy-informative value. Hence, we hypothesized that, in microanalyses of congruence between events, perceived self-efficacy would surpass treatment performance as a predictor of subsequent behavior in posttreatment assessments.

According to the social learning view of fear arousal, it is mainly perceived inefficacy in managing potentially aversive events that makes them fearsome (Bandura, 1981). People who judge themselves ineffectual in coping with threatening situations become excessively preoccupied with their personal deficiencies and cognize potential difficulties as more formidable than they really are (Beck, 1976; Lazarus & Launier, 1978; Meichenbaum, 1977; Sarason, 1975). Such

frightful self-referent thought generates high emotional arousal. To the extent that people believe they can prevent, attenuate, or terminate aversive events, they have little reason to fear them.

Several lines of evidence from laboratory studies have shown that perceived controllability decreases fear of physically aversive stimuli (Averill, 1973; Miller, 1979, 1980). People who are led to believe they can exercise some control over aversive events display less autonomic arousal and impairment of performance than do those who believe they have no personal control, even though both groups are subjected to the same aversive stimulation. That perceived self-efficacy may operate as a cognitive mechanism by which controllability reduces fear arousal receives support from microanalysis of fear of phobic threats as a function of varying strengths of coping self-efficacy (Bandura et al., 1980). Regardless of the coping tasks involved, the higher the corresponding self-percepts of efficacy, the lower were the stress reactions. The present experiment tested further the role played by perceived coping inefficacy by analyzing fear arousal experienced by subjects at varying levels of self-efficacy on the highest common performance task. We hypothesized that as level of perceived self-efficacy increases, the degree of anticipatory and performance arousal will decline.

Method

Subjects

Ten subjects, three males and seven females, whose lives were adversely affected by snake phobias of long standing were recruited through advertisements in community newspapers. They ranged in age from 25 to 62 years with a mean age of 41 years. They sought help because their phobic dread seriously impaired their recreational and vocational activities. In addition to the problems created by constriction of their lives, they were tormented by intrusive ruminations and recurrent nightmares about snakes.

This type of disorder permits the high degree of control over extraneous influences needed to clarify causal processes. When procedures are applied over a period of time, changes in self-efficacy and behavior can be confounded by positive or negative extraexperimental experiences with threats occurring between sessions. Such confounding influences are essentially eliminated with snake phobias because subjects rarely, if ever, have contact with snakes during the period of treatment.

Pretest Procedures

Behavioral avoidance. Subjects were first administered the test of behavioral avoidance to determine whether they were sufficiently phobic to qualify for the study. The test consisted of a series of performance tasks requiring increasingly more threatening interactions with a corn snake. The set of tasks required subjects to approach a glass cage containing the snake, to look down at it, to touch and hold the snake with gloved and bare hands, to let it loose in the room and return it to the cage, to hold it within 12 cm of their faces, and finally to tolerate the snake crawling in their laps while they held their hands passively at their sides.

A female tester administered all the assessment procedures. Prior to measuring phobic behavior, subjects were given factual information about the characteristics and habits of snakes to eliminate moderately fearful subjects who might be emboldened by factual information alone. Those who could not enter the room containing the snake received a score of zero; subjects who did enter were asked to perform the various tasks in the graded series. Those who could lift the snake inside the cage with a gloved hand were considered insufficiently fearful and were not included in the experiment.

Fear arousal accompanying interaction responses. In addition to measuring performance capabilities, the degree of fear aroused by each approach response was assessed. During the behavioral test, subjects rated orally, on a 10-interval scale, the intensity of fear they experienced when each snake interaction task was described to them (*anticipatory fear*) and again while they were performing the corresponding behavior (*performance fear*).

Self-efficacy judgments. Subjects were provided with the list of 18 performance tasks included in the behavioral test and instructed to designate those they judged they could perform at that time. For each task so designated, they rated the strength of their efficacy on a 100-point scale, ranging in 10-unit intervals from high uncertainty, through intermediate values of certainty, to complete certitude. The level of self-efficacy was the number of performance tasks with a value of 20 and above that subjects judged they could perform.

Efficacy-Induction Procedure

Of the 10 subjects, 6 were so markedly phobic that they could not even approach the cage in the pretest assessment. They were matched in avoidance behavior in triads and assigned randomly to either low, medium, or high efficacy-induction conditions. The remaining four subjects, who were moderately phobic, were matched in dyads and randomly assigned to medium- or high-efficacy conditions.

The treatment was conducted by a female experimenter using a red-tailed boa constrictor. Different snakes were used in the test and treatment phases of the experiment to gauge the generalized effect of differential self-efficacy on action and fear arousal. Although distinctly different in appearance and color patterns, the two snakes were shown, in a previous study (Bandura

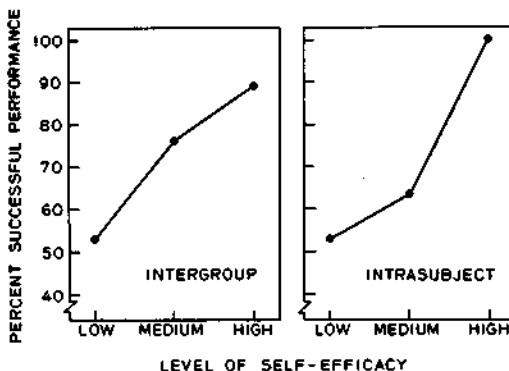


Figure 1. Mean performance attainments as a function of differential levels of perceived self-efficacy. (The left panel shows the performances of subjects whose self-percepts of efficacy were raised to different levels. The right panel shows the performances of the same subjects at different levels of self-efficacy.)

et al., 1980), to be of equivalent threat value as measured by subjects' avoidance behavior and fear arousal.

The tasks to be mastered were graded into 18 progressively more threatening activities that ranged from approaching, looking at, touching, holding, and finally interacting closely with the boa. The experimenter first modeled coping strategies for these various activities. The subjects were then helped, through whatever response induction aids might be needed, to master each step in the hierarchical series. The induction aids included fractionation of tasks into easily mastered steps, enactment over graduated temporal intervals, joint performance, and use of protective aids (Bandura et al., 1974).

Following the preparatory modeling, and after mastering each task, subjects designated on the 18-item efficacy scale which tasks they judged they could perform and the strength of their perceived self-efficacy. If they achieved their designated self-efficacy level through modeling alone, as did two subjects, they were administered the performance test. Those who still fell short of their requisite efficacy level were presented with the first task until they mastered it, whereupon their perceived self-efficacy was again measured to determine whether the success experience had sufficiently heightened their efficacy. This procedure of sequential task mastery followed by a self-efficacy probe was continued until subjects reached their designated level of perceived self-efficacy.

Differential Levels of Self-Efficacy

Subjects assigned to the low self-efficacy level were treated until they judged they could interact proximally with the snake but just short of any physical contact with it. Specifically, they judged they could place their hands in the cage in the vicinity of the snake.

Subjects in the medium self-efficacy level were treated until they judged they could engage in physical contact by touching and lifting the snake inside the cage.

Those assigned to the high self-efficacy level received treatment until they judged they could perform the entire set of threatening interactions with the snake outside the cage. These included holding the snake in front of their faces, letting it loose in the room and returning it to the cage, and tolerating the snake crawling in their laps while they held their hands passively at their sides.

The labels *low*, *medium*, and *high* are used for convenience of discussion, but it should be noted that the corresponding performances are much more demanding than the labels might imply. Placing one's hand in a cage near a mobile snake is a large threatening step for persons suffering from a phobic dread of reptiles. Handling a snake reflects more than simply a medium level of boldness. Being able to tolerate a snake crawling freely on one's body is an exceedingly demanding task.

As soon as subjects achieved their preassigned level of perceived self-efficacy, regardless of the amount of treatment needed to produce it, they were tested for their coping behavior and fear arousal toward the corn snake. The same female tester who conducted the pretest administered the posttreatment measures. To control for any possible bias, she was not informed of the self-efficacy conditions to which subjects had been assigned.

Intrasubject Variation in Self-Efficacy

Successive levels of perceived self-efficacy were developed within subjects as a further test of the postulated relation between self-efficacy, action, and fear arousal. After subjects in the low and medium conditions completed the first phase of the experiment, they were administered additional treatment until they achieved the next level of perceived self-efficacy, whereupon their coping behavior and fear arousal were again measured. Thus, subjects in the medium condition were tested after they had attained medium and high levels of self-efficacy, whereas the low subjects were tested after they had successfully achieved low, medium, and finally high levels of self-efficacy.

Results

Performance as a Function of Self-Efficacy Level

Figure 1 presents the mean performances of subjects at different levels of perceived self-efficacy. Results of both the intergroup and the intrasubject design show that the higher the level of perceived self-efficacy, the greater the performance accomplishments.

Performance scores within each matched set were examined at varying levels of self-efficacy development. Except for a single tie in one of the dyads between a medium and a high self-efficacy subject, in each of the remaining matched sets subjects with the higher level of perceived self-efficacy out-

performed their matched counterparts who perceived themselves to be less efficacious. To determine the chance probability of obtaining the hypothesized order across all matched sets, the following statistical procedure was used: For each triad the probability of getting by chance the one hypothesized order of the data out of all possible orderings was determined. This procedure was repeated for the other matched sets, excluding the tied dyad. Because the predicted order occurred in all matched sets, the product of the separate probabilities can be used to provide the overall chance probability of getting total concordance to the hypothesis. The probability of obtaining by chance such complete ordering of performance attainments across successively higher levels of self-efficacy is .01.

Intrasubject variations in performance as a function of differential levels of perceived self-efficacy were equally striking. Except for one tied dyad, in each of the remaining matched sets the higher levels of perceived self-efficacy consistently gave rise to higher performances. The probability of obtaining by chance such progressively higher performances with increasing self-efficacy is .02.

Enactive Mastery and Growth of Self-Efficacy

It will be recalled that subjects' self-percepts of efficacy were measured after each task mastery. This fine-grained analysis provides detailed information on how vicarious and enactive mastery experiences contribute to the development of self-efficacy. It should be noted that during the induction phase, the mastery tasks were presented in a standard hierarchical order rather than varied in accordance with changes in subjects' perceived efficacy. If a small success instilled a large increase in perceived self-efficacy, to present next a correspondingly high mastery task would run the risk of raising self-efficacy beyond the preassigned level. These treatment-process data portray the impact of each incremental mastery experience on subsequent self-percepts of efficacy. After subjects reached their designated level of perceived efficacy, the performance test gauged fully what they were able to do, at which

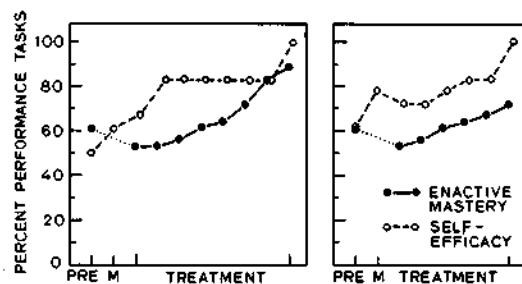


Figure 2. Data from two moderately phobic subjects illustrating how similar mastery experiences have variable effects on perceived self-efficacy over the course of treatment. (Pre represents the subjects' pretest status; M, the changes produced in perceived self-efficacy by the preparatory modeling alone; and the data points under Treatment, the changes in subjects' self-percepts of efficacy measured after each task mastery.)

point actions were closely congruent with self-percepts.

At the outset of treatment, subjects observed the experimenter model the feared activities. This vicarious experience alone produced a 14% increase in perceived self-efficacy, a rise that is highly significant, $t(9) = 5.13, p < .001$. Indeed, two subjects, one in the low and one in the medium condition, achieved their designated level of self-efficacy on the basis of modeling alone.

Although mastery experiences foster development of personal efficacy, the fine-grained analysis reveals that self-percepts of efficacy are not merely isomorphic reflections of performance. Examination of several representative cases illustrates how similar enactive mastery experiences are accompanied by variable changes in self-efficacy. Consider first the sequential patterns of changes exhibited by two moderately phobic subjects. For the subject presented in the left panel of Figure 2, modeling and initial enactive successes heightened self-efficacy substantially. But self-percepts of efficacy did not change at all, even though progressively more tasks were mastered. An additional success produced maximal self-efficacy. The subject portrayed in the right panel judged himself to be more and more efficacious with each enactive success. However, self-percepts of efficacy consistently exceeded prior performance attainments.

In Figure 3 the patterns of changes are

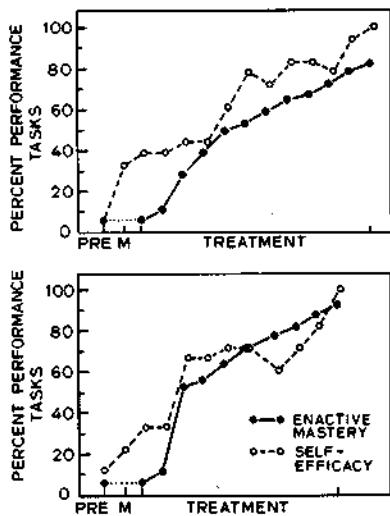


Figure 3. Data from two severely phobic subjects illustrating how similar mastery experiences have variable effects on perceived self-efficacy over the course of treatment. (Pre represents the subjects' pretest status; M, the changes produced in perceived self-efficacy by the preparatory modeling alone; and the data points under Treatment, the changes in subjects' self-percepts of efficacy measured after each task mastery.)

plotted for two markedly phobic subjects. The subject in the upper panel gains considerable self-efficacy from merely observing the feared activities modeled, but enactive successes produce little additional change for some time. Thereafter, advancing mastery is accompanied by variable growth of self-percepts of efficacy that, at each hierarchical step, are well above those for the preceding performances. For the subject in the lower panel, self-efficacy outstrips performance in the initial phase of treatment, plateaus in the intermediate phase, then drops below performance and remains beneath it until eventually self-efficacy surpasses performance. As these microdata illustrate, self-percepts of efficacy may exceed, match, or remain well below performance attainments depending on how they are appraised.

Microanalysis of Congruence

Because performance attainments in treatment and perceived self-efficacy typically differ, it is of interest to compare how these two factors predict actions toward the generalized threat in the posttest assessment.

For the efficacy-action congruence analysis, any judgment of self-efficacy at a strength value of 20 or above was defined as an instance of *self-judged capability*. Instances in which subjects judged themselves capable of performing a given task and executed it successfully in the posttest, or judged themselves incapable and later failed the task, constituted *congruence*. For purposes of comparison, similar congruence analyses were computed using performance attainment in treatment as predictors. Instances in which subjects successfully performed comparable tasks in both treatment and posttest, or had never performed the tasks in treatment and failed them in the posttest, represented congruence.

Separate congruence analyses were conducted on data from the first posttest and from all of the posttests administered to any given subject. Behavior in the initial posttest was 86% congruent with perceived self-efficacy and 73% congruent with performance attainments in treatment. The higher predictiveness of self-efficacy is significant, $t(9) = 2.29, p < .025$. Behavior in all of the posttests administered to each of the subjects was similarly more congruent with self-efficacy (88%) than with performance attainments in treatment (77%). This difference is also significant, $t(9) = 2.31, p < .025$.

Differential Self-Efficacy and Fear Arousal

Subjects in the low self-efficacy condition were treated until they judged themselves capable of placing their hands in the cage near the snake. When tested with the generalization snake on reaching this level of self-efficacy, they all executed the task successfully. Because this task was performed by subjects in all treatment conditions, it provides a common basis for analyzing how fear arousal on the same task varies as a function of differential levels of self-efficacy.

Figure 4 presents the intensity of anticipatory and performance fear arousal experienced on the same task by different subjects at different levels of self-efficacy and by the same subjects at successively higher levels of self-efficacy. Regardless of whether the analysis involved anticipatory or perfor-

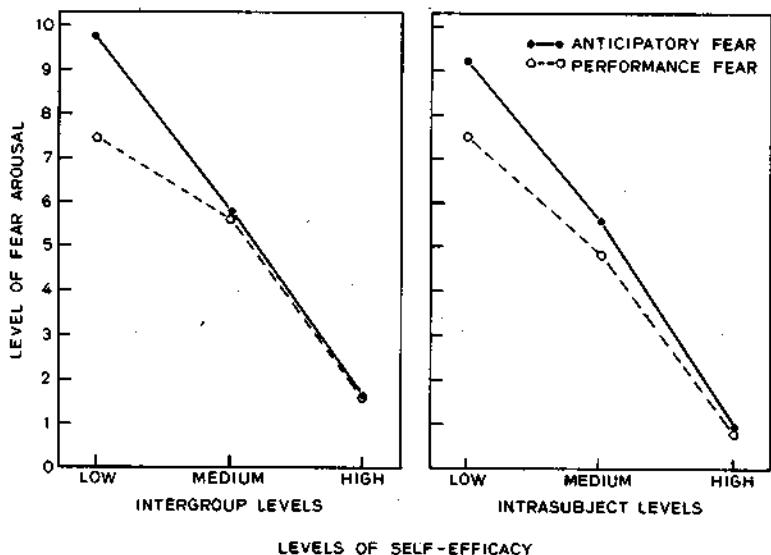


Figure 4. Mean intensity of anticipatory and performance fear arousal experienced by different subjects at different levels of perceived self-efficacy (intergroup) and by the same subjects at successively higher levels of perceived self-efficacy (intrasubject).

mance fear based on intergroup and intra-subject data, the more efficacious subjects judged themselves to be, the less fear they experienced. Low self-efficaciousness was accompanied by higher fear arousal than was moderate self-efficaciousness, which, in turn, exceeded high self-efficaciousness in this regard. These patterns of differences were significant for anticipatory ($p < .01$)

fear arousal between subjects and for anticipatory ($p = .01$) and performance ($p = .01$) fear arousal for the same subjects. Although the hypothesized order of effects was also obtained for performance fear arousal in the intrasubject design, a single reversal within one of the triads between a low and moderate self-efficacious subject precluded use of the procedure described earlier for estimating the overall chance probability.

The relation between perceived inefficacy and fear arousal can be tested further by analyzing the mean fear intensity corresponding to varying strengths of self-efficacy across all of the threatening tasks. For this analysis the strength of subjects' perceived self-efficacy after treatment for each task they subsequently performed in posttest was recorded, as was the amount of fear they experienced in anticipation of and while performing each of these tasks.

Figure 5 shows the intensity of fear arousal plotted as a function of strength of perceived self-efficacy. Subjects experienced high anticipatory and performance fear on tasks in which they perceived themselves to be ine-ficacious, but as the strength of their self-judged efficacy increased, their fear arousal declined.

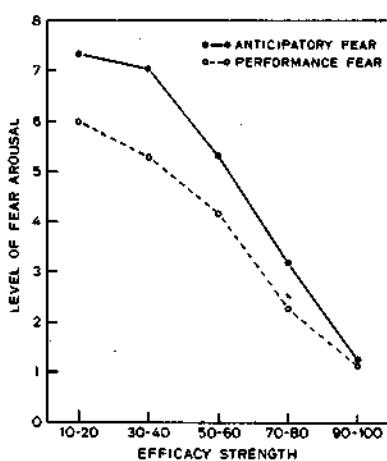


Figure 5. Mean intensity of anticipatory and performance fear arousal plotted as a function of strength of perceived self-efficacy.

Experiment 2: Vicarious Induction of Differential Levels of Self-Efficacy

Results of the preceding experiment lend support to the view that coping behavior and fear arousal are mediated through self-percepts of efficacy. The present experiment was designed to provide an even more stringent test of the causal contribution of perceived self-efficacy to action and affect by creating differential levels of self-efficacy vicariously.

In the vicarious mode of efficacy induction, persons observe coping strategies being modeled, but they themselves do not execute any actions (Bandura et al., 1977). Consequently, they have no behavioral data for forming generalizable perceptions of their own capabilities, nor do possible motoric mediators arising from behavioral enactments and their effects come into play. Self-efficacy appraisals based on vicarious information require inferences from the performances of others. Although performance-based information also affects self-efficacy appraisal through cognitive activity, in vicarious influence observers have to rely solely on their judgments of what they see.

This study used the same causal paradigm in which level of performance and fear arousal were examined as a consequence of induced differential levels of self-efficacy. To increase the generality of the causal dependencies being explored, a different type of phobic disorder, as well as a different mode of efficacy induction, was selected. People who suffered from severe spider phobias served as subjects.

While modeling coping activities with fearsome spiders, the experimenter conducted periodic self-efficacy probes until subjects' self-percepts of efficacy were raised to preassigned levels, whereupon their coping behavior and accompanying fear arousal were measured. Self-efficacy was varied in two levels—low and medium. The third level—maximal self-efficacy—was not included because, for the purposes of this experiment, it was essential to control completely any possible confounds that might arise from chance encounters with spiders in the natural environment. Because low and medium self-efficacy could be created within a single session, the changes produced in

self-efficacy, affect, and action were due entirely to symbolic and vicarious influence unconfounded by any physical contact. Induction of maximal self-efficacy would not only have entailed multiple sessions with weaker control over extraexperimental experiences but some subjects would undoubtedly have required at least some performance mastery experiences to feel totally efficacious.

After the effects of induced low self-efficacy were measured, subjects in the low condition received further modeling until their self-efficacy was raised to the medium level, at which point their behavior and fear arousal were again assessed.

We hypothesized that coping behavior would correspond closely to self-percepts of efficacy, with higher self-efficacy being accompanied by greater performance attainments and lower fear arousal.

Method

Subjects

The subjects were 14 females who responded to advertisements in local newspapers seeking participants who suffered from phobic dread of spiders. They ranged in age from 16 to 61 years with a mean age of 31 years. They sought help because they were tormented and immobilized in every imaginable way by their fear. In some cases if they noticed a spider in their residence they fled the place until the spider was destroyed ("I would have to call on my neighbor to come over to kill them in my apartment"). Others were unable to enter places where they had previously seen a spider or even imagined spiders might inhabit. Because spiders are not especially choosy about their habitats, the phobia severely constricted the subjects' lives. Chance encounters with spiders converted harmless settings into frightening places ("I got to the point where I wouldn't take a bath because I was surprised by a spider in the tub once"). In some cases the phobia endangered life and limb as in the subject who promptly leaped out of an automobile she was driving upon noticing a spider in it.

Constant apprehensive vigilance detracted from enjoyment of everyday activities and produced enduring distress ("I could not watch TV, read, enjoy any of the things I normally did at home since I was always uncomfortable and watchful of a possible spider in the room"). The mere sight or picture of a spider often elicited intense physiological reactions such as "convulsive shivers," "vomiting for hours," and "heart pounding and shortness of breath."

All of the subjects were plagued by distressing ruminations and nightmares about spiders ("Whenever I'd see a spider I'd picture myself being eaten by a spider. Every once in a while thoughts of spiders would pop into my head out of nowhere. I would also have night-

mares"). Even sleep itself was fitful and provided no deliverance from apprehensive vigilance ("I'd wake up 3 or 4 times a night to see if there was a spider on the ceiling. If there was, I'd get my step stool and spray and kill it. If it fell alive in the shag rug I would lie awake for hours to see if it began its climb up the wall").

Pretest Procedures

Behavioral avoidance. Subjects were first tested for avoidance behavior with a series of 18 performance tasks requiring increasingly more threatening interactions with a large wolf spider. This species was used because pilot testing showed it to be the most frightening to all subjects. The set of tasks required subjects to approach the spider in a plastic bowl; to look down at it; to place their bare hands in the bowl; to let the spider crawl freely on a chair in front of them; to tolerate it crawling on their gloved hands, bare hands, and forearm; to handle the spider with their bare hands; and to tolerate it crawling in their lap.

A female tester administered the assessment procedures. The subjects selected for the study were either unable to approach the caged spider or, at most, could only look down at it from a safe distance.

Fear arousal accompanying interaction responses. As in the preceding experiment, during the behavioral test subjects rated orally, using a 10-interval scale, the intensity of their fear both in anticipation of each task and while performing the relevant activity.

Self-efficacy judgments. Subjects were provided with the list of 18 performance tasks included in the behavioral test on which they recorded the ones they judged they could perform at that time. For each task so designated, they rated the strength of their efficacy on the 100-point scale. The level of self-efficacy was the number of performance tasks with a value of 20 and above that subjects judged they could perform.

Vicarious Induction of Self-Efficacy

Subjects were matched in avoidance behavior and assigned randomly from matched pairs to low or medium efficacy-induction conditions. The treatment was conducted by a female experimenter with two spiders from the wolf species, noticeably different in shape and color patterns from the one used to measure subjects' avoidance behavior. Different spiders were employed in the test and treatment phases of the experiment to tap the generalized effect of differential self-efficacy on action and fear arousal. The treatment included multiple spiders to enhance the impact of the vicarious influence and, because several hours of repeated modeling were often needed to create the desired level of self-efficacy, to platoon the spiders to avoid exhaustion.

Subjects were first asked to look at a spider in a glass vial until they became familiar with its appearance and movements. The experimenter then modeled a variety of threatening activities with the spider, first at the far end of the room and then near the subject. For example, the experimenter placed the spider in a large plastic bowl and poked it with her finger as it scooted about. She then removed the spider from the container and

modeled how to handle such a creature and control its course of movement as it scurried over her hands, forearm, and upper body. The spider was then placed on a towel draped over a chair where additional strategies were modeled for handling spiders as they roam the furniture.

To expand even further the means of personal control, the experimenter modeled effective ways of catching spiders on the loose. A rested wolf spider was released on the floor. As it dashed for a safe hiding place, the experimenter placed a plastic cup over it and slipped a thin card underneath. In this easy way a captive spider could be transported from house to more hospitable outside environs. These modeling episodes were capped by a brief excursion to the lobby of the building where a spider had been planted to spin its wondrous web. Here, the subject observed modeled inquisitiveness into cobweb construction.

The modeling activities were designed to convey a set of coping strategies that would be serviceable in whatever situations might arise involving commerce with spiders and other insects. What phobic thinking rendered frightful, instructive modeling made predictable and personally controllable.

At periodic intervals in this modeling sequence, subjects recorded on the 18-item efficacy scale the tasks they judged they could perform and the strength of their efficacy. These self-efficacy probes were repeated until subjects reached their preselected level.

Differential Levels of Self-Efficacy

Subjects were matched in severity of avoidance behavior and assigned randomly to the two treatment conditions. Those assigned to the low self-efficacy level were treated until they judged they could engage in close contact with the spider but come just short of touching it. This involved letting the spider crawl freely on a chair immediately in front of them or placing their bare hand in the plastic container near the spider.

Subjects in the medium self-efficacy level were treated until they judged they could engage in physical contact by having the spider crawl freely on their gloved or bare hand. As noted in the preceding experiment, the performances corresponding to the low and medium levels are considerably more taxing for persons with severe phobias than the terms might suggest.

When subjects' self-percepts of efficacy were raised to the appropriate level, they were tested for their coping behavior and fear arousal. The female tester who conducted the pretest administered the posttreatment measures without knowledge of the self-efficacy conditions to which subjects had been assigned.

Intrasubject Variation in Self-Efficacy

Following their posttreatment assessment subjects in the low condition received additional modeling until their perceived self-efficacy was raised to the medium level. Their interactive behavior and fear arousal were then measured. One subject had to forego the supplementary treatment because she had to attend to a serious family illness.

After the experiment was concluded, subjects received

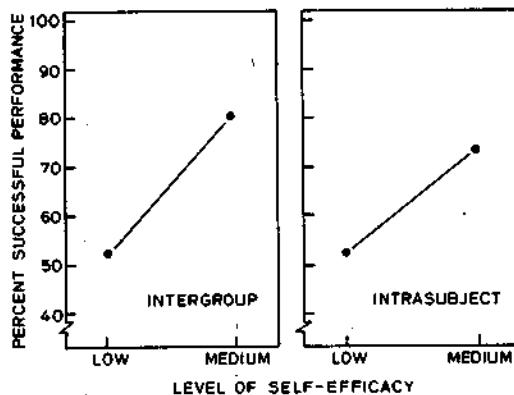


Figure 6. Mean performance attainments by different subjects at different levels of perceived self-efficacy (intergroup) and by the same subjects at higher levels of perceived self-efficacy (intrasubject).

supplementary participant modeling until they achieved complete mastery of their fear. All departed maximally self-efficacious and fearless.

Results

Performance as a Function of Self-Efficacy Level

As shown in Figure 6, the higher level of perceived self-efficacy produced the higher performance attainments. Analyses were performed on the differences between the paired scores using *t* tests for correlated means. The rise in performance is significant for both intergroup, $t(6) = 4.33, p < .01$, and intrasubject, $t(5) = 4.02, p < .01$, variations in level of self-efficacy.

Microanalysis of congruence between self-efficacy and action on individual tasks reveals a close fit of performance to self-percepts of efficacy. Behavior was 89% congruent with self-judged efficacy on the initial posttest and 91% congruent on the initial and supplementary posttests combined. The efficacy-action congruences on tasks subjects had not done before were 85% and 86% on the initial and the combined posttests, respectively.

Differential Self-Efficacy and Fear Arousal

All but one of the subjects were able to perform the tasks in the low self-efficacy range. This provides the highest common

activity on which to compare the fear arousal experienced by subjects of low and medium efficacy. In Figure 7 intensity of anticipatory and performance fear arousal for the similar activity is plotted as a function of level of perceived coping efficacy.

Bolstering self-efficacy reduces fear arousal. This is shown in the significant decrements in anticipatory, $t(5) = 4.04, p < .01$, and performance, $t(5) = 5.52, p < .01$, fear arousal between subjects of differing self-efficacy and for anticipatory, $t(4) = 5.76, p < .01$, and performance, $t(4) = 4.38, p < .01$, fear arousal for the same subjects at different levels of self-efficacy.

That perceived ineffectiveness is conducive to fear arousal is shown further when mean fear intensity is plotted as a function of strength of self-efficacy for all subjects across all the threatening tasks they performed in the posttest assessment (Figure 8). The less efficacious subjects judged themselves to be on a particular task, the more apprehensive they were about the prospect of performing it and the more tense they felt while actually doing it.

Experiment 3: Autonomic Arousal as a Function of Strength of Perceived Self-Efficacy

Findings of the preceding studies are in accord with the view that perceived ineffi-

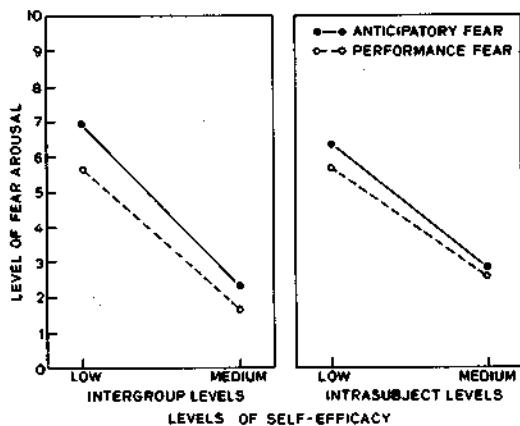


Figure 7. Mean intensity of anticipatory and performance fear arousal experienced by different subjects at different levels of perceived self-efficacy (intergroup) and by the same subjects at higher levels of perceived self-efficacy (intrasubject).

cacy in coping with potentially aversive events gives rise to fear arousal. In these, and earlier, studies fear arousal is indexed by level of experienced distress. The present experiment was designed to test the generality of the self-efficacy theory of fear arousal by examining degree of physiological arousal as a function of differential strength of perceived self-efficaciousness.

Persons with spider phobias received a modeling treatment with periodic self-efficacy probes until self-percepts of efficacy were induced that spanned the entire range of strength values. Subjects' autonomic reactions were then measured during anticipation and performance of threatening tasks, corresponding to strong, medium, and weak strength of perceived self-efficaciousness. In the final phase of the study, participant modeling was administered until self-percepts of efficacy were raised to maximal strength, whereupon autonomic reactions to the same performance tasks were again measured.

We predicted that the weaker the self-percepts of efficacy, the greater would be the autonomic stress reactions during anticipation and performance of tasks that are subjectively intimidating. After self-percepts of efficacy were strengthened to a uniformly high level, the same tasks would no longer generate heightened autonomic reactions.

Method

Subjects

The subjects were 12 females whose lives were unsettled by phobic dread of spiders. They varied in age from 16 to 57 years with a mean age of 33 years.

This type of phobia was selected because spiders present a severe threat to those who fear them. Moreover, performance tests can be conducted while subjects are seated, with tasks requiring frightening contact with a spider but little or no physical action that might affect the physiological measures.

Pretest Procedures

Behavioral avoidance. Subjects were tested for avoidance behavior with the performance tasks described earlier, requiring increasingly more threatening contact with a large wolf spider. A female tester administered the assessment procedure.

Self-efficacy judgments. Subjects were provided with the list of performance tasks included in the behavioral test. They rated the strength of their self-judged efficacy to perform each of the tasks using the 100-point

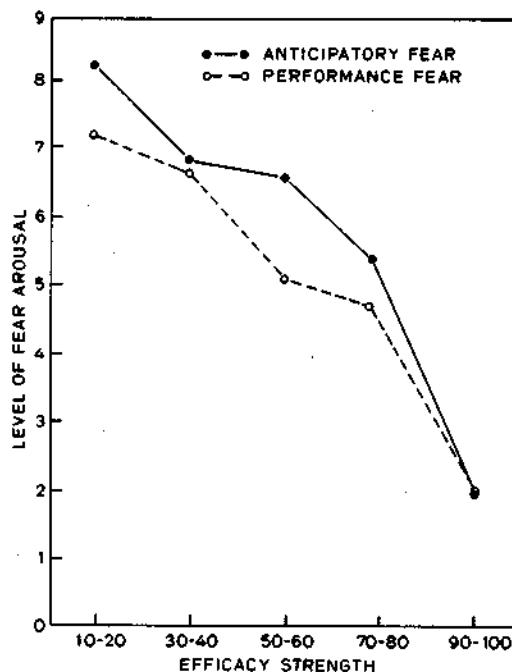


Figure 8. Mean intensity of anticipatory and performance fear arousal plotted as a function of strength of perceived self-efficacy.

scale, ranging in 10-unit intervals from high uncertainty, through intermediate values of certainty, to complete certitude.

Vicarious Expansion of the Self-Efficacy Range

At the outset subjects typically presented a constricted range of perceived self-efficacy. Modeling was used to induce self-percepts of efficacy that spanned the entire range of strength values. As in the previously reported experiment, subjects merely observed while a female therapist demonstrated the predictability of spiders' actions and modeled effective means of handling them. Modeling was enlisted for this purpose because it is of special interest to determine how self-percepts of efficacy based largely on inferences from nonbehavioral experience affect subsequent physiological arousal.

At periodic intervals during the modeling procedure, the therapist readministered the self-efficacy scale. These self-efficacy probes were repeated until subjects designated at least two tasks at each of the strong (80-100), medium (30-70), and weak (0-20) values of self-efficacy strength. If any of the three levels of self-efficacy strength included several tasks, the two with efficacy strength values closest to the midpoint of the interval were selected.

Task selection. Performance tasks for the test of physiological arousal were individually selected for each subject according to her self-efficacy judgments. Six

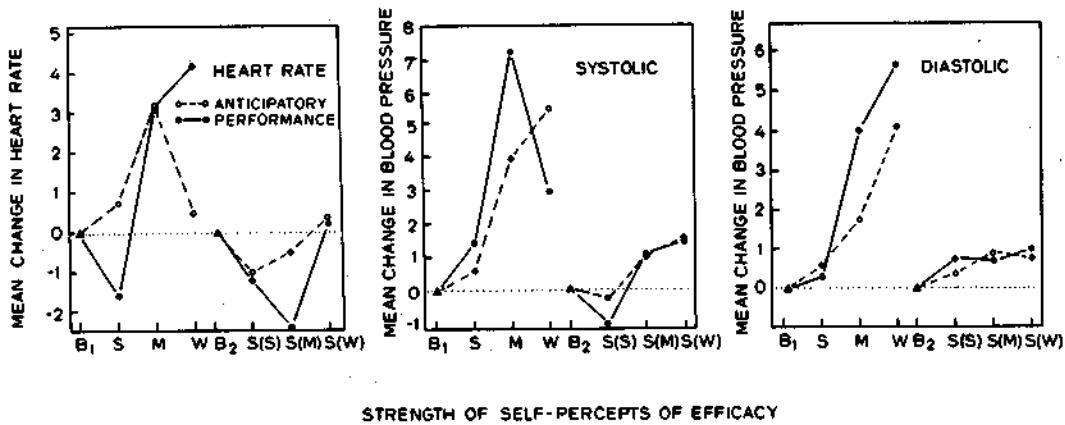


Figure 9. Mean changes in heart rate and blood pressure from each of their respective baseline levels during anticipatory and performance periods as a function of differential strength of self-percepts of efficacy. (B refers to baseline, and S, M, and W signify strong, medium, and weak strengths of perceived self-efficacy, respectively. For each physiological measure the graph on the left shows the autonomic reactions related to self-percepts that differ in strength—the performance arousal at weak self-efficacy is based on only the few subjects who displayed some response. The graph on the right shows the autonomic reactions to the same set of tasks after self-percepts of efficacy were strengthened to maximal level. For the latter data the symbols within the parentheses refer to the coping tasks previously perceived with strong, medium, and weak self-efficacy.)

items were chosen in all: two each from the strong, medium, and weak strength values. The performance tasks corresponding to each of the three values of self-efficacy strength thus varied across subjects. For example, for one subject, observing a caged spider from a distance of 1 foot was a task in the strong self-efficacious range, and placing a gloved hand near the caged spider was a task in the weak self-efficacious category; for a second subject, looking down at the spider with the top of the cage removed was a strong self-efficacious item, whereas letting the spider crawl freely over the hands was the task falling in the category of weak self-efficaciousness.

This selection procedure provided the most stringent test of the hypothesis under study, because physiological arousal was examined as a function of differential strength of self-efficacy regardless of what the particular performance tasks might be. To control for habituation effects and the effects of performance experiences on subsequent autonomic arousal, the order in which the tasks were presented was varied systematically across subjects, with tasks corresponding to the three strengths of self-efficaciousness each appearing in the initial, middle, and final positions in the test sequence.

Physiological Recording

Because physiological stress reactions are often specific and vary in their patterning across individuals (Lacey, 1967), two forms of autonomic arousal were recorded. They included changes in heart rate and blood pressure, both of which are common autonomic reactions to stressful events.

Subjects were told that their heart rate and blood pressure would be measured in order to gain a better

understanding of their fear of spiders. After subjects were seated comfortably, silver disc electrodes were attached to the lower right and left sides of the chest to monitor heart rate. Blood pressure was measured by an occlusion cuff attached with a pulse transducer to the upper portion of the right arm. The cuff was inflated and deflated by a remote servomechanism. The physiological reactions were recorded on a Grass Model-7 polygraph located in an adjoining room.

A 10-minute adaptation period followed in which subjects were encouraged to sit quietly and relax. Blood pressure readings were taken at periodic intervals during this time to adapt subjects to the inflation of the cuff. The last minute of the adaptation phase provided the baseline measure of autonomic arousal.

Following adaptation the experimenter who served as the tester presented the instructions for the next phase of the study. She explained that the subject would be asked to perform a variety of tasks with the spider and, further, that although the subject would not be forced to perform every task, she should make every effort to try to do them all. The tester then administered all six tasks in the order prepared by the therapist without knowledge of the specific efficacy strength values associated with them.

For each task autonomic reactions were measured during a 30-sec anticipatory interval and, if the subject could do it, during a 30-sec performance interval. Pilot testing of the procedure revealed that if subjects recognize the anticipatory phase as a time when all performance requirements are temporarily suspended, it becomes a safety signal for relaxation. To minimize this protective set, the anticipatory phase was structured as a prelude to performance in which the tester was about to present the spider in the manner called for in the description of the task.

Heart rate was computed by measuring the number of heart beats occurring within each of the 30-sec anticipatory and performance intervals. Measures of systolic and diastolic blood pressure were obtained for each task midway in the anticipatory and performance interval.

Maximizing Strength of Self-Efficacy

In the final phase of the experiment, subjects received participant modeling treatment to raise their self-percepts of efficacy to maximal strength for the six particular coping tasks selected for each of them. Efficacy probes were administered and treatment continued until subjects perceived themselves to be maximally self-efficacious on all tasks, whereupon their physiological reactions were again measured.

Before presenting the performance tasks, a new baseline of autonomic arousal was established by having the subject relax for 10 min after the recording electrodes were attached. The same six performance tasks were then administered by the tester in the same sequence the subject had received them earlier. Both heart rate and blood pressure were measured during the 30-sec anticipatory and performance interval.

Results

Differential Self-Efficacy Strength and Autonomic Arousal

Changes in subjects' heart rate and blood pressure during the test periods were calculated from their respective baseline levels. In Figure 9 the mean changes in heart rate and blood pressure are plotted for anticipatory and performance arousal as a function of self-efficacy strength. Analysis of variance performed on the repeated measures obtained in the first phase shows strength of self-efficacy to be a uniformly significant source of variance in all autonomic modalities for both anticipatory arousal—heart rate, $F(3, 33) = 3.52, p < .03$; systolic, $F(3, 33) = 12.74, p < .001$, and diastolic, $F(3, 33) = 9.85, p < .001$, blood pressure—and performance arousal—heart rate, $F(2, 22) = 7.79, p < .005$; systolic, $F(2, 22) = 20.34, p < .001$, and diastolic, $F(2, 22) = 9.44, p < .001$, blood pressure. Because only a few subjects displayed only partial performance at low self-efficacy, the analysis of performance arousal did not include the latter level.

In comparisons of pairs of means, arousal on tasks subjects regarded with utmost self-efficacy did not differ significantly from their baseline level of activation for either antici-

patory or performance arousal on any of the three physiological measures. Although subjects were viscerally unperturbed by stressors they viewed with strong efficaciousness, they displayed cardiac acceleration and elevated blood pressure when confronted with stressors about which they had doubts they could manage. Compared to baseline level, the heightened autonomic arousal on tasks judged with medium self-efficacy is uniformly significant across all indicants of stress reactions. The heightened anticipatory arousal is highly significant for heart rate, $t(11) = 3.42, p < .005$; systolic blood pressure, $t(11) = 5.72, p < .001$; and diastolic blood pressure, $t(11) = 2.84, p < .01$. Similarly, elevation of visceral arousal while these tasks were being performed is highly significant for heart rate, $t(11) = 2.33, p < .025$; systolic blood pressure, $t(11) = 5.23, p < .001$; and diastolic blood pressure, $t(11) = 3.26, p < .005$.

Comparisons between autonomic arousal corresponding to strong and to medium degrees of self-efficacy strength also yielded significant differences. While anticipating tasks at medium self-efficaciousness, subjects displayed greater cardiac acceleration, $t(11) = 2.87, p < .01$, and higher elevation of systolic blood pressure, $t(11) = 4.78, p < .001$. The magnitude of the differences in autonomic reactions at these two degrees of perceived self-efficaciousness is even more pronounced during performance of the activities. In executing tasks for which subjects expressed some doubts about their coping capabilities, they endured a faster heart rate, $t(11) = 4.03, p < .005$, and their systolic, $t(11) = 4.73, p < .001$, and diastolic, $t(11) = 4.64, p < .001$, blood pressure rose higher.

As tasks at the weak self-efficacy range were presented for gauging anticipatory arousal, most subjects promptly announced that they could not even attempt them, let alone do them. Indeed, 8 of the 12 subjects were unable to do any of the tasks: Three performed only one, and only one subject was able to do both tasks. This is not at all surprising because it is now well established that perceived inefficacy impedes action. The nonperformers expressed zero self-efficacy for these tasks, whereas the average self-efficacy strength for the few partial performers

was five. Although the performance phase yielded insufficient instances for any meaningful analysis, data from the anticipatory phase, which are available for all subjects, shed some light on how visceral reactions change when individuals preclude transactions with threats they judge will overwhelm their coping capabilities. Compared to stress reactions at medium self-efficaciousness, cardiac reactivity subsided, $t(11) = 2.10$, $p < .10$, but systolic blood pressure continued to climb, though short of statistical significance, and diastolic blood pressure rose significantly, $t(11) = 2.52$, $p < .025$.

Had subjects been forced to contend with situations they judged themselves ineffectual to manage, their anticipatory stress reactions would doubtless have been greatly heightened. Were they able at least to try what they judged themselves markedly ineffectual to do, their performance stress reactions would also probably have been equally intense or even more so.

Autonomic Arousal Accompanying Maximal Self-Efficacy

The second baseline of autonomic arousal, taken after subjects' self-percepts of efficacy were raised to a uniformly high level, was significantly lower than the first one for heart rate, $t(11) = 3.44$, $p < .01$, but the two baselines did not differ for either systolic or diastolic blood pressure.

Figure 9 shows the level of anticipatory and performance arousal after strong self-percepts of coping efficacy were instated. Subjects were now able to perform all of the tasks. Examination of the figure shows relatively small variations above and below the baseline arousal, few of which reached significance. Results of the analysis of variance showed that neither the variations in anticipatory nor performance heart rate were significant. With regard to systolic blood pressure, the variations in arousal reached significance in the anticipatory, $F(3, 33) = 3.80$, $p < .025$, and the performance, $F(3, 33) = 4.38$, $p < .025$, phases. In intergroup comparisons, neither anticipatory nor performance arousal on any of the tasks differed from the baseline level except for the slightly higher arousal on the tasks representing ini-

tially weak self-efficacy. However, with the slight drop in systolic blood pressure on the strong self-efficacy tasks, anticipatory and performance arousal at the latter level differed significantly beyond the .05 level from that on the medium and weak tasks, which did not differ from each other. Diastolic blood pressure yielded no significant differences after self-percepts of efficacy were strengthened to the maximal level.

Arousal at Differential and Maximal Strength of Self-Efficacy

The notion that maximizing self-percepts of efficacy diminishes stress reactions was tested further by comparing differences in autonomic arousal to the same tasks at the two phases of the experiment. To adjust the heart rate scores for the differential baseline levels, the tests of significance were computed on differences between scores based on changes in cardiac reactivity during test periods from each subject's baseline for that phase. On tasks for which self-percepts of efficacy were at maximal strength to begin with, subjects were just as unperturbed by them in the first as in the second assessments. At this high self-efficacy strength, no significant differences appeared on either anticipatory or performance arousal on any of the indicants of autonomic arousal.

Maximizing self-efficacy on tasks that were previously regarded with only medium self-efficacy sharply reduced anticipatory stress reactions on all measures of arousal: heart rate, $t(11) = 2.22$, $p < .025$; systolic blood pressure, $t(11) = 2.93$, $p < .01$; and diastolic blood pressure, $t(11) = 1.83$, $p < .05$. Stress reactions were similarly diminished on all measures of performance arousal: heart rate, $t(11) = 3.91$, $p < .005$; systolic blood pressure, $t(11) = 4.61$, $p < .005$; and diastolic blood pressure, $t(11) = 3.04$, $p < .01$.

On tasks representing weak self-efficacy, which subjects judged exceeded their coping capabilities and which they did not attempt to perform, their cardiac reactions did not differ at the two phases of the study. But after subjects' weak self-percepts of efficacy were raised to maximal strength, both their anticipatory systolic, $t(11) = 2.66$, $p < .025$,

and diastolic, $t(11) = 2.73, p < .01$, blood pressure subsided.

General Discussion

Results of the first two experiments lend validity to the general thesis that self-percepts of efficacy operate as cognitive mediators of performance. The higher the level of induced self-efficacy, the higher were the subjects' performance attainments. The close link between self-efficacy judgment and action obtained in microanalyses of individual tasks provides further empirical support for the postulated mechanism. Subjects executed successfully tasks that fell within their enhanced range of self-efficacy but failed those that exceeded their perceived coping capabilities.

Evidence that the efficacy-action relation is replicated across different modes of efficacy induction, different types of behavioral dysfunctions, and in both intergroup and intrasubject experimental designs adds to the generality of the findings. Converging evidence from other lines of research, showing that self-percepts of efficacy predict performance regardless of whether the self-percepts are instated enactively, vicariously, persuasively, or illusorily for different domains of functioning that do or do not involve fear arousal (Bandura, 1982b), provides additional indications that people's perceptions of their efficacy affect what they choose to do and their likelihood of success. In these diverse tests of self-efficacy theory, self-efficacy is used not simply as an inferred construct but as a measurable cognitive mediator linked to action and effect.

Data furnished by the vicarious treatment are especially well suited for clarifying the causal relationship between self-efficacy judgment and action. Subjects simply observed a model's performances, made inferences from the modeled information about their own coping capabilities, and later behaved in accordance with their self-judged efficacy. In observational modes of self-efficacy induction, motoric mediators are not present to complicate analysis of the causal contribution of perceived self-efficacy to action.

The modeling display emphasized two as-

pects—predictability and controllability—that are conducive to the enhancement of self-percepts of efficacy. In demonstrating predictability the model repeatedly interacted with spiders in ways that exemplified how they are likely to behave in each of many different situations. Predictability reduces stress and increases preparedness in coping with threats (Averill, 1973; Miller, 1981). In modeling controllability the model demonstrated highly effective techniques for handling spiders in whatever situation might arise. In follow-up questionnaires subjects reported using these very techniques in their everyday life ("The other night I found a spider in my room and I caught it with a cup and cardboard with absolutely no feeling of anxiety. . . . My son used to kill them for me but had become afraid of them himself. He wouldn't go into the garage because there was a spider in the corner. I am now working with him in the same fashion you helped me—it's working!"). Thus, having gained knowledge observationally that enabled them to predict and to exercise control over what they had previously feared, subjects raised their sense of coping efficacy even though they engaged in no behavior during the acquisition process.

Enactive mastery provides firsthand information concerning predictability and manageability of threats for developing and authenticating strong self-percepts of efficacy. Evidence from the fine-grained analysis that similar performance successes had variable effects on self-judged efficacy bears testimony to the fact that it is how people read their performance successes rather than the successes per se that determines the course of cognitive and behavioral change. Consequently, perceived self-efficacy was a somewhat better predictor of subsequent behavior than was performance attainment in treatment. Indeed, two subjects achieved the requisite level of self-efficacy and performance through preparatory modeling alone without requiring any enactments and response feedback to convince them of their new capabilities.

To shed some light on the cognitive processing of success experiences, two additional subjects were studied who verbalized aloud their thoughts as they progressed

through the enactive mastery treatment. In their ongoing verbalizations they expressed big boosts in self-efficacy when their experiences disconfirmed their worst fears about how the animal might behave (e.g., contact with the snake elicited predictable withdrawal reactions rather than the attack they feared). Increases in self-efficacy also accompanied judgments that subjects had gained sufficient skill to manage particular task demands. They held weak self-percepts of efficacy in a provisional status, testing their newly acquired knowledge and skills before raising judgments of what they were able to do. If, in the course of completing a task, they discovered something that appeared intimidating about the threat or suggested vulnerability of their mode of control, they registered a decline in self-efficaciousness despite their successful performance. In such instances apparent successes left them shaken rather than emboldened. It remains a problem of future research to corroborate these preliminary observations and to extend the analysis to the types of cues used to gauge coping capabilities from enactive mastery experiences.

The findings of all three studies offer support for the view that perceived self-efficacy may be a basic mechanism that underlies aversive arousal as well as action. Although all subjects subsequently performed the same task, the higher their level of induced self-efficacy, the less anticipatory and performance distress they experienced. This was true regardless of whether self-percepts of efficacy were instated vicariously or through enactive mastery. In the intrasubject replications, bolstering the self-efficacy level of the less efficacious reduced their experienced distress. The marked changes noted in intensity of arousal as a function of variations in perceived self-efficacy both across and within subjects document how stress stems more from perceived coping inefficacy than from the properties of the task itself.

Perceived self-efficacy and arousal undoubtedly involve some interactive, though asymmetrical, effects, with coping efficacy exercising the much greater sway. That is, perceived self-inefficacy in coping with potential threats leads people to approach such situations anxiously, and the experience of

disruptive arousal in turn lowers their sense of efficacy that they will be able to perform skillfully. However, self-percepts of efficacy predict avoidance behavior, whereas autonomic arousal bears no uniform relation to it (Bandura, 1978; Bolles, 1972; Leitenberg, Agras, Butz, & Wincze, 1971; Schwartz, 1978). Such findings indicate that people are much more likely to act on their self-percepts of efficacy than on visceral cues. Thus, for example, accomplished actors who interpret their momentary nervousness before a play as a normative reaction rather than as an indicant of personal incapability will not be dissuaded by their viscera from going on stage and performing well what they assuredly know they can do once they get started.

The generality of the relation between perceived inefficacy and stress reactions is further corroborated with physiological indexes of arousal. Subjects were viscerally unperturbed by tasks they regarded with utmost self-efficaciousness. However, on tasks about which they were moderately insecure concerning their coping efficacy, their heart accelerated and their blood pressure rose regardless of whether they were anticipating or performing the activities. After self-percepts of efficacy were fully strengthened, the same task demands were managed unperturbedly.

Of some interest is the finding that when subjects dismissed tasks that far exceeded their self-judged coping efficacy, their heart rate subsided but their blood pressure rose during the anticipatory phase. There are several explanations for these divergent reactions. One possible explanation concerns differences in when the autonomic reactions were measured. Heart rate was recorded throughout the anticipatory interval, thus including any cardiac deceleration occurring on dismissal of the task. Blood pressure was measured only at the midpoint of the anticipatory interval, which might precede relief in not having to perform tasks judged overwhelming to one's coping capabilities. A check of this possibility, by sectioning each anticipatory interval into five successive units, revealed no sharp drop in cardiac rate beyond the midpoint.

An alternative interpretation for the dif-

ferential pattern of reactivity is that heart rate is likely to be affected more quickly than is blood pressure by personal restructuring of stressful demands. There exists some evidence that catecholamines are released in different temporal patterns in response to external events (Mefford et al., 1981). Heart rate is especially sensitive to momentary changes in hormonal patterns, with epinephrine, which is rapidly discharged, having a more pronounced effect on cardiac activity than on arterial pressure. Understanding of the physiological mechanisms by which self-percepts of efficacy give rise to stress reactions can be carried one step further by linking strength of perceived self-efficacy to hormonal releases.

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Received August 3, 1981
Revision received November 23, 1981 ■

Differential Engagement of Self-Reactive Influences in Cognitive Motivation

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The present research tested the hypothesis that self-reactive influences exert differential impact on motivation as a function of the level and direction of discrepancy between a comparative standard and attainments. Subjects pursued a challenging standard in a strenuous activity and received preselected feedback that their effort fell either markedly, moderately, or minimally short of the standard, or that it exceeded the standard. They then recorded their perceived self-efficacy, self-evaluation, and self-set goals, whereupon their motivational level was measured. In accord with prediction, perceived self-efficacy contributes to motivation across a wide range of discrepancy conditions. Self-evaluation operates as an influential motivator only when attainments fall markedly or moderately short of a comparative standard. Self-set goals contribute to motivation at all discrepancy levels except when attainments are markedly discrepant from the standard. The relevant self-influences operating in concert at particular discrepancy levels explain a substantial amount of the variance in motivation. © 1986 Academic Press, Inc.

The capacity to exercise self-influence by personal challenge and reaction to one's own attainments provides an important cognitive mechanism of motivation. Motivation through pursuit of challenging standards has been the subject of extensive research on goal setting. Different lines of investigation provide substantial converging evidence that explicit challenging goals enhance and sustain motivation (Locke, Shaw, Saari, & Latham, 1981). Research has also begun to delineate the self-reactive influences by which personal standards create these powerful motivational effects (Bandura & Cervone, 1983; Locke, Frederick, Lee, & Bobko, 1984).

Motivation based on standards involves a cognitive comparison process. When people commit themselves to explicit standards or goals, the perceived negative discrepancies between performance and the standard they seek to attain create self-dissatisfaction that serves as a motivational inducement for enhanced effort. Activation of self-evaluative reactions by internal comparison requires both personal standards and knowledge

This research was supported by Public Health Research Grant M-5162-24 from the National Institute of Mental Health. We are indebted to Dr. William L. Haskell, Stanford Medical Center, for the loan of the ergometer equipment. Requests for reprints should be sent to Albert Bandura, Department of Psychology, Building 420, Jordan Hall, Stanford University, Stanford, CA 94305.

about one's performance level. When these constituent factors are systematically varied, neither knowledge of performance without standards nor standards without knowledge of performance has lasting motivational impact (Bandura & Cervone, 1983; Becker, 1978; Strang, Lawrence, & Fowler, 1978). Studies in which self-evaluative reactions are measured antecedently to motivational change provide more direct evidence that self-evaluation contributes to motivation (Bandura & Cervone, 1983; Locke, Cartledge, & Knerr, 1970). The findings show that the higher the self-dissatisfaction with substandard attainments, the greater is the subsequent intensification of effort.

Perceived self-efficacy is another cognitive factor that plays an influential role in the exercise of personal agency in ways that affect motivation. It is partly on the basis of self-percepts of efficacy that people choose what challenges to undertake, how much effort to expend in the endeavor, and how long to persevere in the face of difficulties (Bandura, 1982, 1986). Whether perceived discrepancies between personal standards and attainments are motivating or discouraging is likely to be determined by the strength of people's perceived capabilities to attain the standards they have been pursuing. Those who distrust their capabilities are easily discouraged by failure, whereas those who are highly assured of their efficacy for goal attainment will intensify their efforts when their performances fall short and persevere until they succeed. That strong belief in one's efficacy heightens perseverance in difficult pursuits is corroborated by evidence across diverse activity domains for both children and adults (Bandura & Cervone, 1983; Brown & Inouye, 1978; Cervone & Peake, 1986; Schunk, 1984; Weinberg, Gould, & Jackson, 1979).

The goals people set for themselves at the outset of an endeavor are likely to change, depending on the pattern and level of progress they are making (Campion & Lord, 1982). They may maintain their original goal, lower their sights, or adopt an even more challenging goal. Thus, the third constituent self-influence in the regulation of motivation concerns the goals people set for themselves in response to feedback about their attainments. Csikszentmihalyi (1979) examined what it is about activities that fosters continuing deep engrossment in life pursuits. The common factors found to be conducive to enduring motivation include adopting challenges in accordance with one's perceived capabilities and having informative feedback about how one is doing. Self-set goals are accorded a significant role in Locke's (1968) goal theory. As long as personal goals appear reachable, the more challenging are the standards people continue to set for themselves, the higher is their performance motivation (Garland, 1983; Locke *et al.*, 1984).

Different theorists agree that goal difficulty raises performance level, but they differ in how they view the nature of the relationship. Expectancy-valence theory predicts a curvilinear relationship between goal dif-

ficulty and performance, with both effort and performance being highest for moderately difficult goals (Atkinson, 1964; Feather, 1982; Heckhausen, 1977). In contrast, Locke (1968) postulates an increasing linear function between goal level and performance motivation. However, the linear relationship is assumed to hold only if people accept the goals and are committed to them.

Each of the three self-influences—self-evaluation, perceived self-efficacy, and self-set goals—has been shown to affect level of motivation. The next fruitful stage for research is to further our understanding of how these self-influences operate in concert to affect motivation when the results of people's efforts diverge in varying degrees from standards within their reach. The present research was designed to test hypotheses that the constituent self-influences contribute differentially to motivation, depending on the direction and magnitude of the discrepancy between selected standards and attainments.

Subjects performed a strenuous physical activity on an ergometric device with the goal of sustaining at least a 50% increase in effort above their previous level. This goal level was selected because it was regarded as highly challenging but potentially reachable (Bandura & Cervone, 1983). Following performance on the ergometer, subjects received preselected feedback that their effort fell either markedly, moderately, or minimally short of their standard, or that it exceeded the standard. They then recorded how dissatisfied they would be were they to attain the same level again, their perceived efficacy for goal attainment, and their self-set goal for their next attempt. The level of effort they mobilized in the pursuit was then measured.

Self-dissatisfaction is likely to be activated most strongly when efforts fall either markedly or moderately short of the standard one seeks to attain. It is a cause for satisfaction when one has just about accomplished a highly challenging standard or has surpassed it. People who would be quite satisfied to equal their prior attainment in a future attempt will mobilize the effort needed to do as well, whereas those who would be dissatisfied with a similar subsequent level of attainment will intensify their efforts to do better. Hence, it was hypothesized that self-dissatisfaction would operate as a motivator mainly under negative discrepancies in the marked to moderate range.

Perceived self-efficacy to attain a challenging standard can enhance and sustain motivation, whatever the level of prior attainment might be. The research cited earlier amply documents that perseverant effort is partly regulated by assurance in one's efficacy to master a given challenge. It was, therefore, predicted that the strength of perceived self-efficacy would contribute to motivation at all discrepancy levels.

When attainments fall far short of a standard considered reachable, people would have no inclination to set even more taxing goals for them-

selves. Rather, their self-set goals are likely to remain at or near the standard they have set out originally to fulfill. At the level of large discrepancy, variation in effort would be accounted for predominantly by the level of self-dissatisfaction and the strength of perceived self-efficacy for goal attainment. However, some people set their sights even higher when their attainment diverges moderately (Bandura & Cervone, 1983) or minimally from the standard, so that self-set goals come into play as determinants of how much effort is to be mobilized in the pursuit. Personal goal setting would similarly function as an important contributor to motivation when attainments surpass the challenge. After fulfilling a difficult standard, subsequent motivation will depend on the level at which future aims are set. To the extent that people raise their standards, they create new motivating challenges for themselves. For these reasons, it was hypothesized that personal goal setting would contribute to motivation at all discrepancy levels except at the large substandard one.

METHOD

Subjects

The subjects were 44 males and 44 females drawn from an introductory psychology course. Twenty subjects, equally divided by sex, were randomly assigned to each of four treatment conditions. Eight subjects were similarly randomly assigned to a self-judgment control condition to determine whether recording one's self-satisfaction, self-percepts of efficacy, and self-set goals, in itself, had any reactive effects on performance motivation. Two such subjects were randomly paired with two experimental subjects from each of the four treatment conditions for this purpose.

General Procedure and Apparatus

The introductory instructions, which were identical for all subjects, presented the experiment as part of a research program ostensibly designed to develop performance tasks for planning and evaluating postcoronary rehabilitation programs. It was explained that the information being gathered would not only aid development of diagnostic devices, but also provide normative data on physical stamina at different age levels. The relationship between cardiovascular fitness and performance on aerobic tasks was then described to lend further credibility to the activity.

The task for measuring changes in motivation was a Schwinn Air-Dyne ergometer, an exercise device requiring effortful activity. The ergometer is operated by alternatively pulling and pushing two arm levers. The force exerted rotates a wheel with fanlike wind vanes creating resistance to the physical effort. The ergometer was connected by a cable to a work load indicator, with an odometer, in the adjoining room. The odometer readings were recorded at 1-min intervals during the 5-min sessions. To measure precisely the effort expended during the 5-min sessions, the

odometer readings were converted to kilopond meter units. Kilopond units are indices of effort expenditure that consider both the speed at which the ergometer is operated and the exponential increase in air resistance with increasing speed. The five sets of kilopond scores resulting from the five 1-min intervals were summed to obtain a total score of effort expenditure for each session.

The ergometer task, which in previous research proved to be ideally suited for studying sustained effort (Bandura & Cervone, 1983), was chosen for a number of reasons. The major defining property of motivation is the level of effort mobilized and sustained in a pursuit. The ergometer measures changes in effort precisely, with virtually no upper limit. Because it requires considerable effort over extended periods, the task provides a stringent test of how the postulated determinants and mechanisms affect the mobilization and maintenance of motivation. Moreover, the task itself provides little implicit feedback of the cumulative level of effort expended over a given period, which allows for credible prearranged feedback. Because subjects cannot easily discern quantitative variations in their physical output across sessions, feedback information can be systematically varied without jeopardizing the perceived veridicality of the feedback. This effortful activity combined with the rationale is highly credible.

Before starting the experiment, subjects completed a background questionnaire asking about their age, sex, height, weight, and smoking habits. It was included both to add further credence to the prior instructions and to increase the naturalness of the assessment, in a later session, of self-reactions imbedded among filler items ostensibly measuring other aspects of physical status. They also filled out a physical readiness questionnaire designed to exclude any subject for whom extended physical exertion would be medically contraindicated. Three subjects, who reported a history of cardiovascular problems, were excluded on this basis.

Subjects removed their watches to control for possible variations in the regulation of effort by checking the elapsed time. They were informed that each session would last 5 min but were not told how many sessions they would be asked to complete. The latter procedure was instituted to eliminate the possibility that subjects might intensify their effort in the third session if they knew it was their final attempt.

The experimenter concluded the general instructions by explaining that he would be in the adjoining room tending to the recording instruments during each session. The subject would be signaled when to begin and end each session via an intercom system.

Baseline Session

All subjects performed alone on the ergometer for a 5-min baseline pe-

riod. Pretesting indicated that a 5-min session required substantial effort without being overly fatiguing.

A random order of assignment to treatment conditions within sex groupings was devised for the entire sample at the outset of the study. After each subject completed the baseline and the second session, the experimenter removed a cover card which revealed the condition to which the particular subject had been assigned. Thus, the experimenter had no prior knowledge of a subjects' condition assignment during the baseline and the second session.

Goal-Setting and Discrepancy Variations

At the beginning of the second session, all subjects selected a goal for improved attainment in subsequent sessions. The experimenter explained that, in coronary rehabilitation programs, patients are assigned goals for increasing their physical activity. These goals vary in each case. Therefore, the subjects would perform the ergometer task with goals to shed light on the effects of this goal variability.

Subjects cannot actually choose what goal to pursue because those who choose high goals are likely to differ on other personal characteristics from those who opt for low goals. To avoid such confounding, goals must either be assigned by the experimenter or selected by subjects through an apparent choice procedure. In the present experiment goals were not simply assigned to subjects. Rather, they ostensibly selected their goal in a way that also controlled goal level across discrepancy conditions. They were told that in order to study goal levels representative of the range found in rehabilitation programs, they were to choose one goal from among a wide range of goal levels. It was explained that in rehabilitation programs, goals are set according to the patient's current physical status. But since this physiological information was not available for the participants in the present study, there was no basis for assigning particular goals to particular subjects. Hence, subjects were simply to select one from among a variety of goals.

Different goal levels representing decrements and improvements, expressed in percentages above or below the baseline level, were printed on cards. After the subjects inspected the full range of goal levels, the experimenter placed all the goal cards in a cloth bag attached to a wooden rim and handle, shook the bag and presented it to the subject, who selected a goal. Unbeknown to subjects, they were selecting their goal from a preloaded compartment of goal cards, all of which designated a +50% increase in effort above the baseline level. A +50% goal level was chosen because it represented an attainable goal, and a performance discrepancy from it, in either direction, would appear credible. Although a large body of evidence reveals that assigned and self-selected goals are equally motivating (Latham & Yukl, 1975; Locke & Schweiger, 1979), the apparent

choice procedure was used to enlist a sense of commitment to a goal which, from the subjects' perspective, they had some part in selecting. As Langer (1975) has shown, even choice on chance tasks instills a sense of personal determination. The apparent choice procedure was shown in a previous study (Bandura & Cervone, 1983) to serve well the dual function of ensuring goal equivalence and moderately high initial commitment to it.

To control for any possible experimenter bias, all the information for creating the requisite conditions for the main phase of the experiment was remotely presented via a video system. The experimenter explained that he had to reset the recording instruments after the second session. Thus, the video system would be used to convey further information. Subjects then performed the ergometer task for 5 min alone in the room, whereupon they were instructed through the intercom to turn on the video terminal.

The feedback and goal-setting information were printed on a card. A camera in the adjoining room transmitted the relevant information to the video terminal. The card read, "The goal you were aiming for is ____." The experimenter wrote "+ 50%." The second part of the feedback card read "Your performance score for the last session was ____ % ____ your first session." The experimenter wrote the appropriate feedback information in the blanks depending on the discrepancy condition to which the subject had been preassigned. This information, independent of the subject's actual performance, was written in the blanks to avoid the impression that the feedback may have been prearranged.

Subjects assigned to the condition involving a *large substandard discrepancy* were informed that they had attained a 24% increase above their baseline level. The experimenter wrote "24% above" in the blanks on the feedback card. Since they were aiming for a 50% gain, they were faced with a sizable negative discrepancy (-26%) between selected standard and attainment. In the *moderate substandard discrepancy*, subjects were informed that they achieved a 36% increase, creating a -14% negative discrepancy. Subjects in the *small substandard discrepancy* received information that they achieved a 46% increase, falling just short (-4%) of the selected standard. Subjects assigned to the condition involving a *small suprastandard discrepancy* were informed that they attained a 54% increase, which surpassed the selected standard by +4%.

For subjects in all conditions, the next sign that appeared on the screen instructed them to complete a questionnaire next to the video terminal.

Measurement of Self-Evaluation, Perceived Self-Efficacy, and Self-Set Goals

The questionnaire contained the three measures of central interest:

subjects' level of self-satisfaction with their attainment, their perceived self-efficacy at reaching various levels of attainment, and the goals they set for themselves for the next session. These scales were embedded in a set of filler items (cast in the same format) measuring exercise routines and general physical status.

In measuring self-evaluative reactions, subjects rated their self-reactions on a 25-interval scale, ranging from highly self-satisfied, through neutral, to highly self-dissatisfied. They first rated their level of self-satisfaction or dissatisfaction with their performance in the second session, which they had just completed. However, this served mainly as a filler item. For the second rating, which is the relevant one to the hypothesized relationships, subjects rated how self-satisfied or self-dissatisfied they would be if they attained the same level on the next session. It is the self-evaluative prescript for subsequent endeavor rather than evaluation of past endeavor that serves as the critical motivator. That is, subjects who would be quite content to do as well as they did before will mobilize less effort than those who would be highly dissatisfied if they were to do no better the next time than they did before. Indeed, people may be pleased with their prior progress but self-dissatisfied were they to make no further gains on their subsequent attempts. Consider, by way of example, a runner who was satisfied in placing third in a preliminary race. Self-dissatisfaction in coming in third again would lead the runner to try much harder than would satisfaction with another third-place finish. The second self-evaluation measure, which is the one of major interest because it reflects the future attainments subjects judge they must fulfill to feel self-satisfied, was used in the analyses.

Subjects recorded their perceived self-efficacy for goal attainments on an efficacy scale that described 15 possible levels of attainments relative to the baseline level. The goal attainments varied in 10% intervals from a 30% decrement to an 110% increase above the baseline level. For each of the 15 levels, subjects rated the strength of their perceived efficacy that they could attain them using a 100-point scale, ranging in 10-unit intervals from high uncertainty, to intermediate values of certainty, to complete certitude. The strength of subjects' perceived efficacy that they could achieve the original goal of a 50% increase was the most pertinent efficacy measure. Previous research confirms that the strength of perceived self-efficacy for the original goal level is most predictive of how much effort subjects enlist in the activity (Bandura & Cervone, 1983).

To assess subjects' self-set goals, they were asked to indicate what level of attainment they were personally aiming for in the next session. The item was cast in a free response form, but all subjects recorded their personal goals in terms of the percentage change in effort they set for themselves.

Test of Motivational Level

After the assessment of self-processes, subjects were instructed via the intercom to resume the ergometer task. They engaged in the effortful activity for 5 min during which their effort expenditure was recorded. It is this third session, when all four treatments were fully formed and operating, that provided the data for testing the effects of the antecedent self-reactive influences on motivation. The measure of motivational change is the percentage change in effort in this third session relative to that of the second session.

At the conclusion of the formal experiment, subjects completed a questionnaire in which they rated their perceptions of the attainability of a 50% increase in the degree of challenge presented by such a goal and the strength of their commitment to their self-set goals. The groups did not differ in their responses to these items. Nor did they differ on the earlier filler items, on which they had rated their physical stamina and the type and amount of physical activity they regularly performed each week.

RESULTS

Effects of Recording Self-Judgments

The subjects who participated in the test for possible reactive effects of recording self-judgments performed with goals and feedback, but did not record their self-evaluative reactions, self-percepts of efficacy, or self-set goals. The questionnaire they completed contained only the filler items. The change in the effort they expended was compared with that of their matched counterparts, who also performed with goals and feedback, after recording their self-satisfaction, perceived self-efficacy, and self-set goals. The analysis revealed no significant difference between the groups in percentage change in motivation, $t(7) = 0.77$. Nor did these two groups differ in how they responded to the postexperiment questionnaire. These results are congruent with earlier findings (Bandura & Cervone, 1983), that the assessment of factors that serve as self-influences has no reactive effects.

Mean Level and Pattern of Self-Reactive Influences

Analyses revealed no significant sex differences on any of the three self-reactive influences. Table 1 presents the mean levels of the self-reactive influences and the percentage increase in motivation in the various discrepancy conditions. The issue of major interest is whether the posited self-reactive influences contribute similarly or differentially to motivation at various levels of discrepancy between attainment and standard. How-

TABLE I
MEAN LEVELS OF SELF-REACTIVE INFLUENCES AND INCREASE IN EFFORT IN THE
VARIOUS DISCREPANCY CONDITIONS

Measures	Large (- 26%) substandard		Moderate (- 14%) substandard		Small (- 4%) substandard		Small (+ 4%) suprastandard	
	M	SD	M	SD	M	SD	M	SD
Self-dissatisfaction	12.55	6.07	10.90	4.63	9.45	5.61	7.30	4.65
Self-efficacy	37.00	33.10	48.00	30.88	48.50	34.22	60.50	36.49
Self-set goals	36.10	16.80	41.40	24.23	47.00	19.96	46.65	29.76
% Increase in effort	77.06	70.48	72.57	70.26	41.67	52.35	66.40	86.97

ever, before addressing this issue the mean level and pattern of self-reactive influences are analyzed as a function of discrepancy levels.

Subjects were self-dissatisfied with a large substandard performance, but, as the discrepancy between the selected standard and the performance narrowed, they became more self-satisfied with their attainments, $F(3,76) = 3.52, p < .02$. The self-evaluative reactions to the large substandard performance differed significantly from those of performances that fell just short of the selected standard, $t(76) = 1.86, p < .04$, or surpassed it, $t(76) = 3.15, p < .001$. Subjects were also more self-satisfied with an attainment that surpassed the standard than with one that fell moderately short of the standard, $t(76) = 2.16, p < .02$, or fell just short of it, $t(76) = 1.29, p = .10$.

Strength of perceived self-efficacy to attain a 50% gain also rose as performance discrepancy narrowed, ranging from a low mean strength value of 36 in the large substandard condition to a relatively high value of 60 in the suprastandard condition (Table 1). However, the notable finding is the variable impact that feedback information exerted on perceived self-efficacy. The means do not differ, but the patterns of perceived self-efficacy for goal attainment vary as a function of discrepancy levels. This can be shown by plotting the percentage of subjects within each discrepancy condition falling in the bottom, middle, or upper third of the efficacy strength range. These patterns are presented graphically in Fig. 1.

Subjects in the large and medium substandard conditions predominantly expressed weak to moderate efficacy that they could attain the selected standard of a 50% gain in performance. Feedback that subjects had surpassed the selected standard left most of them (75%) moderately to highly self-efficacious. But interestingly, a small subgroup (25%) within the suprastandard condition harbored strong self-doubts that they could do it again. Even more noteworthy is the bimodal impact on perceived self-efficacy of high sustained effort that falls just short of the standard being sought. When vigorous effort produces a near miss, subjects (45%) judge themselves either supremely self-efficacious that they

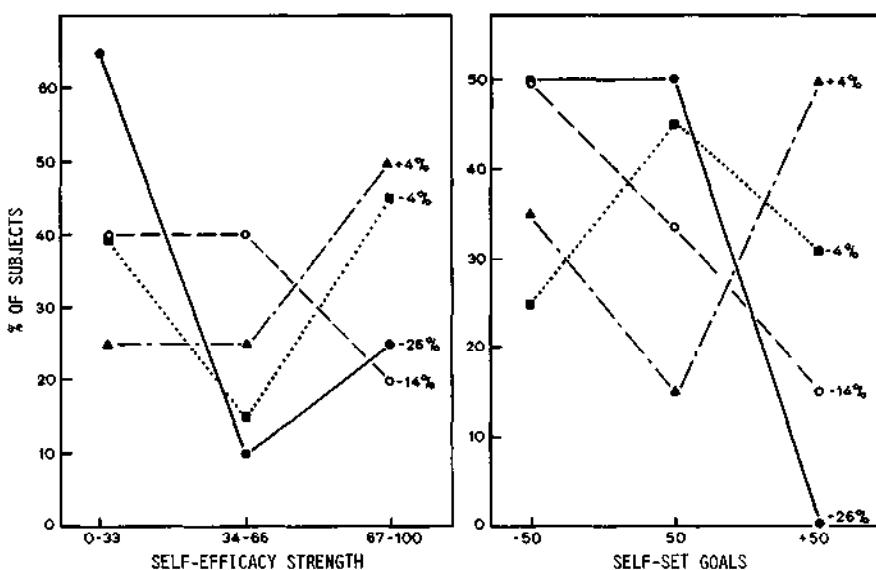


FIG. 1. Patterns of changes in self-reactive influences at each discrepancy level. The panel on the left shows the changes in perceived self-efficacy for goal attainment; the panel on the right shows the changes in personal goal setting.

will triumph in their next attempt, or they (40%) strongly distrust their capability of attaining the standard again. The χ^2 test shows these differences to be significant, $\chi^2(6) = 12.26, p = .056$.

As in the case of perceived self-efficacy, self-set goals did not differ in mean level, but here, too, variation in discrepancy level produced substantially different patterns of personal goal setting. For the pattern analysis, subjects were categorized in terms of whether they adhered to the selected standard, abandoned it for a lower one, or set themselves an even more challenging goal. As shown in Fig. 1, when performance attainments were presented as either moderately or markedly discrepant from the selected standard, subjects either adhered to the standard of a 50% gain or lowered their goal. When they were informed that their attainment fell just short of the selected standard, 45% continued to strive for it, 30% raised their goal, and 25% set their sights lower. In the condition in which subjects were told they surpassed the standard, half of them (50%) set themselves even more challenging goals, 15% stuck to the goal, but a sizable proportion of them (35%) lowered their goal. These variable patterns of personal goal setting are highly significant, $\chi^2(6) = 17.74, p < .01$.

In a succession of setbacks, huge failures would undoubtedly erode perceived self-efficacy and lower personal goals faster and more extensively than would small failures. However, the present research sought to

clarify how self-processes contribute to motivation under less massive impact when challenging goals could still be regarded by some performers as within reach even though their initial efforts fell substantially short. By using a task requiring sustained hard effort, as do many naturalistic endeavors, not all performers who attain a lofty goal necessarily believe they can mount a similar extraordinary effort.

Subjects in the different conditions exerted comparable effort both in the initial session ($F = 0.13$) and in the second session ($F = 0.78$) before they received the prearranged information that created the appropriate level of discrepancy for the test session. An analysis of covariance was computed on percentage change in effort in the test session, with discrepancy conditions and sex as the factors, and the first session's effort as the covariate. Effort did not differ in mean level across the various discrepancy conditions ($F = 1.10$). There was a small but significant sex difference ($F(1,71) = 7.25, p < .01$), with males displaying a 12% larger increment in effort than females. Similar results are obtained if the analysis of covariance is computed for the level of effort in the third session, with effort in the second session serving as the covariate.

Mechanisms Governing Motivational Effects

Table 2 presents the pattern of zero-order correlations among the different self-processes and their relation to change in effort for each level of discrepancy.

The relations among the self-reactive influences differ depending on the level and direction of discrepancy. The stronger the subjects' perceived self-efficacy for goal attainment, the higher the goals they set for

TABLE 2
INTERCORRELATIONS OF THE SELF-REACTIVE INFLUENCES AND THEIR RELATION TO
CHANGES IN EFFORT

Measures	Large (-26%) substandard	Moderate (-14%) substandard	Small (-4%) substandard	Small (+4%) suprastandard
Effort expenditure with				
Self-dissatisfaction	.53***	.44*	-.12	.29
Self-efficacy	.69*****	.57****	.20	.52***
Self-set goals	.64****	.69*****	.84*****	.59****
Self-efficacy with				
Self-dissatisfaction	.49**	.39*	-.32	.46**
Self-set goals	.54***	.48**	.26	.43*
Self-dissatisfaction with				
Self-set goals	.71*****	.52**	-.17	.27

* $p < .05$.

** $p < .025$.

*** $p < .01$.

**** $p < .005$.

***** $p < .001$.

themselves and the more self-dissatisfied they were with substandard attainments. These relations of perceived self-efficacy to personal goal setting and self-dissatisfaction are replicated at each level of discrepancy, except when attainments fell just short of the selected standard. When subjects received feedback that their attainments fell either substantially or moderately short of the selected standard, the higher the goals they set for themselves, the greater was their self-dissatisfaction.

The self-reactive influences are also differentially related to effort under different conditions of discrepancy (Table 2). All three self-reactive influences are predictors of the degree of motivational increase when the disparity between attainment and standard is large or moderate. Motivational change is predicted by self-set goals when the standard was just barely missed and by both perceived self-efficacy and self-set goals when the standard was surpassed.

Regression Analysis

To determine the proportion of variance in motivation accounted for by the various self-reactive influences, a hierarchical multiple regression analysis was performed separately for each level of discrepancy. Degree of motivational change was regressed on self-dissatisfaction, perceived self-efficacy, and self-set goals. Self-evaluation is considered as the first motivational factor because personal investment of self-evaluative significance in an activity contributes some incentive to exercise one's capabilities. Variations in perceived self-efficacy influence how well effort is mobilized and sustained in a continuing endeavor, and the level at which proximal personal goals are set. To base one's proximal goals on one's perceived capabilities has considerable functional value. People do not choose to swim a treacherous body of water and then wonder whether they have the swimming capabilities to reach the opposite shore. Rather, they tend to select proximal goals they judge to be within their reach. The higher people judge their capabilities the higher the proximal goals they are likely to set for themselves. Indeed, several studies have shown that perceived self-efficacy raises the level of self-set goals (Locke *et al.*, 1984; Taylor, Locke, Lee, & Gist, 1984). Self-set goals, in turn, specify the level of effort needed to realize them. The results of the regression analysis are summarized in Table 3. The incremental *r*'s were transformed into *z*'s and tested for significance between the predicted groupings.

Self-evaluation. In accord with prediction, the average incremental *r* for the large and moderate substandard conditions differed significantly from the average incremental *r* for the small substandard and suprastandard conditions, $z = 1.89$, $p < .05$. Level of self-dissatisfaction was thus a significant contributor to motivation when attainments fell substantially

TABLE 3
SELF-REACTIVE PREDICTORS OF CHANGES IN EFFORT

Predictors	Discrepancy condition										
	Large (-26%) substandard			Moderate (-14%) substandard			Small (-4%) substandard			Small (+4%) suprastandard	
	<i>r</i>	<i>R</i> ² inc	<i>F</i> inc	<i>r</i>	<i>R</i> ² inc	<i>F</i> inc	<i>r</i>	<i>R</i> ² inc	<i>F</i> inc	<i>r</i>	<i>R</i> ² inc
Self-dissatisfaction	.53	.29	10.65****	.44	.19	6.68***	-.12	.02	0.79	.29	.08
Self-efficacy	.69	.24	8.86****	.57	.19	6.68***	.20	.03	1.54	.52	.20
50% goal	.46	.21	7.16***	.41	.17	5.72**	.26	.07	3.74*	.50	.25
30-70% goal	.64	.05	1.79	.69	.17	6.03**	.84	.66	35.55*****	.59	.16
Self-set goals											

* $p < .07$.

** $p < .05$.

*** $p < .025$.

**** $p < .01$.

***** $p < .005$.

***** $p < .001$.

or moderately short of the selected standard, but not when attainments fell just short, or surpassed the standard.¹ Subjects were quite self-satisfied with approximating or surpassing attainments, and self-evaluation for a similar future accomplishment no longer operated as a motivator at these levels of attainment. When a hoped for standard is surpassed, subjects' perceived self-efficacy and the new goal challenges they set for themselves govern their future effort.

Self-efficacy. Except for the condition in which the standard was almost matched, perceived self-efficacy for goal attainment contributed significantly to motivation, regardless of direction and level of discrepancy (Table 3). The incremental r 's in the various conditions did not differ significantly from each other. The more self-efficacious subjects judged themselves to be, the more they intensified their effort.

In a previous study using a moderate goal-performance discrepancy (Bandura & Cervone, 1983), subjects' perceived self-efficacy to attain the initially selected goal was a uniformly better predictor of motivational change than perceived self-efficacy for any other level of goal attainment. In the present study, discrepancy levels varied over a broad range. To determine the predictiveness of perceived self-efficacy for a wider range of goal attainments, regression analyses were performed with perceived self-efficacy averaged over the 30-70% goal attainment range. The results in Table 3 show that aggregated efficacy does not improve predictiveness under marked or moderate discrepancy, but it accounts for additional variance when people are told that their effortful performance approached or surpassed the initially selected standard, which led some of them to set their sights even higher. In fact, perceived self-efficacy contributes to motivation even in the minimal discrepancy condition, albeit at a borderline level of significance.

When attainment exceeds the standard, the contribution of perceived self-efficacy to motivation is even higher if the strength of perceived self-efficacy is measured for goal levels above a 50% gain. Since subjects had already surpassed the 50% standard their perceived efficacy for even higher goal attainment assumes greater significance. The proportion of variance that this measure of perceived self-efficacy accounts for in motivation is $R^2_{inc} = .28, p < .01$.

Self-set goals. When subjects received feedback that their attainments

¹ As previously noted, self-motivation is apt to be affected less by how one feels about a past substandard performance than by how one would feel about a similar substandard performance in a subsequent attempt. Regression analyses using self-evaluation for past attainment show this measure to be a less reliable predictor of motivational change. The incremental R^2 's are as follows when performance fell short markedly, $R^2 = .03, F = 1.38$; moderately, $R^2 = .26, F = 10.40, p < .005$; minimally, $R^2 = .01, F = 0.50$; or surpassed the standard, $R^2 = .13, F = 4.08, p < .06$.

fell markedly short of the selected standard, their self-set goals either corresponded to the standard or were set slightly below, and personal goal setting was not a contributing factor (Table 3). However, at every other level of discrepancy, where personal goal setting spanned a wider range, the goals subjects set for themselves emerged as a significant motivator. Comparison of the incremental r in the large discrepancy condition with that of the other three discrepancy conditions yielded a significant difference, $z = 1.59, p = .056$.

The failure of personal goals to contribute unique variance to motivation in the large discrepancy condition does not seem to be due simply to greater collinearity. The degree to which perceived self-efficacy, self-dis-satisfaction, and personal goals correlate with each other does not differ significantly between the large and moderate discrepancy conditions, yet personal goals account for variance in motivation under moderate discrepancy but not under large discrepancy.

The preceding analyses indicate the contribution of self-reactive influences to motivation, but they do not give a sense of the magnitude of the motivational impact of the self-reactive influences operating in concert. This is most clearly revealed by comparing the effort exerted by subjects who were high or low in the self-reactive influences identified by the regression analysis as the significant contributors at each discrepancy level. For this descriptive purpose, subjects were categorized on two levels of each factor by whether they would be self-satisfied or self-dis-satisfied with a comparable future attainment to that achieved in the prior session; whether their perceived efficacy for attaining the selected standard exceeded the 50% strength value or fell below it; and whether they set their personal goal at or above the selected standard, or below it. The mean percentage changes in motivation as a function of the appropriate combination of self-reactive influences are presented in Fig. 2.

Variations in self-reactive influences are accompanied by striking differences in motivation. Subjects for whom the relevant self-influences were operating at a high level exhibited huge increases in effort, whereas when self-influences were low, they mobilized relatively little effort in the endeavor.

The findings from the small substandard condition in which a vigorous effort falls just short of the standard that appears difficult to fulfill are especially intriguing. To corroborate the motivational determinants at this level of discrepancy, a replication was conducted with 20 subjects in which they received feedback that their effort fell -4% short of the standard. The replication yielded a pattern of results identical to that of the original condition. Degree of motivational change was highly related to the goals subjects set for themselves ($r = .50, p < .02$) but not to self-dis-satisfaction ($r = .04$) or to perceived self-efficacy ($r = .18$). In the re-

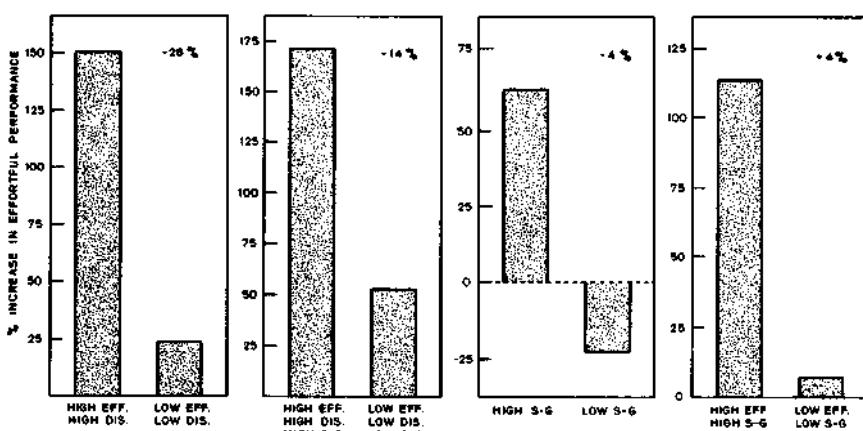


FIG. 2. Mean percentage change in effort by subjects who are high or low in the self-reactive influences identified by the regression analysis as the critical motivators at each discrepancy level. EFF signifies perceived self-efficacy for attaining a 50% increase in effort, DIS the level of self-dissatisfaction with the same level of attainment as in the prior attempt, and S-G the goals subjects set for themselves for the next attempt.

gression analyses, self-set goals account for a good part of the variance in motivation, $R^2_{inc} = .31$, $p < .025$, whereas the other two factors do not contribute significantly to it. However, as in the original study, the aggregated measure of perceived self-efficacy correlates more highly with degree of motivational change ($r = .31$) at this discrepancy level and contributes to variance in motivation at a borderline level of significance, $R^2_{inc} = .13$, $F = 3.67$, $p < .07$.

DISCUSSION

The findings of the present study reveal that self-reactive influences account for a substantial portion of the variation in motivation. However, the degree of impact exerted by the different self-reactive influences on motivation varies depending on the level and direction of the discrepancy between attainment and a comparative standard.

In accord with prediction, perceived self-efficacy contributed to motivation across a wide range of discrepancy conditions. The stronger the subjects' perceived self-efficacy that they could meet a challenging standard, the more they intensified their efforts. Perceived self-efficacy operated as a motivator, regardless of whether attainments supposedly fell substantially or moderately short of the goal, or exceeded it. These findings, taken together with converging evidence from other lines of research using diverse tasks and efficacy induction procedures, attest to the generality of the relationship between perceived self-efficacy and motivation (Bandura & Cervone, 1983; Cervone & Peake, 1986; Jacobs, Prentice-Dunn, & Rogers, 1984; Locke *et al.*, 1984; Schunk, 1984).

Failure to fulfill a challenging standard had variable effects on perceived self-efficacy. Many people remained unshaken in their self-beliefs of efficacy, others became less sure of themselves, while still others seemed to lose faith in their capabilities. In everyday life the important matter is not that failure rouses some self-doubt, which is a natural immediate reaction, but rather the degree and speed of recovery from adversity. Resiliency of perceived self-efficacy is a possible factor that might underlie some of the variability in the effects of failure feedback. Resilient self-percepts of efficacy are developed by overcoming setbacks and obstacles through perseverant effort (Bandura, 1986). A succession of failures may eventually erode perceived efficacy to the point where valued goals are abandoned (Campion & Lord, 1982), but the pursuits of people with resilient self-percepts of efficacy should be less vulnerable to successive failures. Research in which resiliency of perceived self-efficacy is systematically varied may provide further insight into motivation under taxing conditions.

Self-dissatisfaction operates as an influential affective motivator when attainments fall substantially or moderately short of a comparative standard. The more self-dissatisfied people are with substandard attainments, the more they heighten their efforts. However, if they are satisfied with approximating or surpassing the standard they do not invest increased effort in the pursuit. Rather, under such circumstances, many people motivate themselves by setting greater challenges that create new discrepancies to be mastered for a sense of self-satisfaction. Thus, notable attainments bring temporary satisfaction, but people enlist new challenges as personal motivators for further accomplishment. Naylor and Ilgen (1984) present a formal analysis of how goals can influence motivation by altering the shape of the attainment-evaluation contingency function.

Self-set standards contribute to motivation at all discrepancy levels, except when subjects supposedly fell far short of attaining what they had sought. For most of them, this marked disparity undermined their perceived self-efficacy. Although many of them lowered their aspirations, even so, it would be difficult for them to mobilize and sustain high effort in the service of goals when they had serious self-doubts concerning their capabilities. Some evidence that such an attenuating effect may be operating is provided by Locke and his associates, who found that perceived self-inefficacy lowers commitment to goals (Locke *et al.*, 1984).

The data from the small substandard discrepancy warrant special comment. It will be recalled that, in this condition and in the replication of it, motivation was strongly affected only by the challenges subjects set for themselves. Perceived self-efficacy also seemed to account for some variance in motivation when perceived efficacy is considered for a wide range of goal attainments. Knowledge that attainment fell just short of the demanding standard produced several different patterns of self-reactions.

Some subjects became demoralized. Their perceived self-efficacy plummeted, and, although they abandoned the selected standard, they remained discontent with their substandard attainment. Others were self-efficacious and aspiring, but insufficiently discontent to motivate themselves to do better. Still others remained aspiring although somewhat less certain of their capabilities and pleased with having performed as well as they did. However, about a quarter of the subjects became overcomplacent. They viewed themselves as highly efficacious in meeting the challenge, but they were too content with a near miss to mobilize the effort needed to do better. Folk wisdom cautions that too much confidence has deceived many a person. Indeed, Salomon (1984) has found that a high level of perceived self-efficacy as a learner fosters a heavy investment of cognitive effort and superior learning when the task is considered difficult, but less investment of effort and poor learning when the task is believed to be easy. Motivation is perhaps best maintained by a strong sense of self-efficacy to withstand failure, coupled with some uncertainty (construed in terms of the challenge of the task, rather than fundamental doubts about one's capabilities) to spur the effort needed to fulfill personal challenges. It remains a problem of future research to delineate the factors that contribute to overcomplacency.

It is commonly assumed that accomplishments raise performance standards. Evidence from research on level of aspiration shows that, indeed, people generally set their goals above their immediately preceding level of attainment (Festinger, 1942; Ryan, 1970). However, the use of simple tasks that call for little effort, such as tossing darts, limits the generality of the results. This is because, in everyday life, most accomplishments require arduous effort over an extended period. People do not necessarily expect to surpass each past accomplishment in an ever-rising series of triumphs. Lofty accomplishments achieved through sustained extraordinary effort are not easily repeated or excelled.

The findings of the present study show that accomplishments are more complexly related to perceived self-efficacy and personal goal setting than might appear intuitively. Knowledge of having surpassed a demanding standard through laborious effort does not automatically strengthen perceived self-efficacy and raise aspiration. Half the performers in the suprastandard condition did respond to their success by affirming a strong sense of efficacy and setting themselves even more challenging goals to accomplish. However, some of the performers were left with self-doubts that they could muster the same level of laborious effort again, and they set their sights on simply trying to match the standard they had previously surpassed. Having driven themselves to success, a number of the performers judged themselves inefficacious to repeat the demanding feat and lowered their aspirations.

The combined influence of a robust sense of self-efficacy and self-set

challenges had marked motivational effects when attainments supposedly exceeded the comparative standard. When both of these self-reactive influences were low, performers failed to heighten their subsequent effort, whereas if they judged themselves highly self-efficacious and set themselves greater challenges they more than doubled their effort. These findings, as well as those from the other discrepancy levels, lend support to the view that one prominent form of motivation stems from challenges created by self-standards and self-belief in one's capability to realize them.

That motivating challenge arises from the match between self-standard and perceived self-efficacy is further revealed in data from the conditions involving appreciable negative discrepancies. When performance fell substantially short of the selected standard, most subjects continued to subscribe to that standard or a slightly lower one. Those who judged themselves highly efficacious to meet that level of challenge and who were self-dissatisfied at not having done so heightened their effort markedly. However, the same standard had weak motivating potential for those who doubted their capability to realize it. Negative discrepancy at a moderate level yielded similarly marked motivational differences, except that some of the subjects set their standard higher than the one they had originally selected, thus creating for themselves even greater challenges.

When analyses of motivation focus on internal standards, self-evaluation, regulation of effort, and the like, the process may sound like one of self-inflicted burdens. Extreme examples readily spring to mind of individuals who drive themselves relentlessly in pursuit of unattainable goals and whose ever-rising standards negate any sense of self-fulfillment along the way. But this is not the common psychological effect of motivation. Findings of this line of research reveal that motivation through aspiration provides an important and continuing source of self-efficacy, interest, and personal satisfaction (Bandura & Schunk, 1981; Locke *et al.*, 1970; Malone & Lepper, 1985). Without aspirations and active involvement in activities, people are unmotivated, bored, and uncertain about their capabilities. Life without elements of challenge can be rather dull.

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RECEIVED: March 15, 1985

Human Agency in Social Cognitive Theory

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ABSTRACT: The present article examines the nature and function of human agency within the conceptual model of triadic reciprocal causation. In analyzing the operation of human agency in this interactional causal structure, social cognitive theory accords a central role to cognitive, vicarious, self-reflective, and self-regulatory processes. The issues addressed concern the psychological mechanisms through which personal agency is exercised, the hierarchical structure of self-regulatory systems, eschewal of the dichotomous construal of self as agent and self as object, and the properties of a nondualistic but nonreductional conception of human agency. The relation of agent causality to the fundamental issues of freedom and determinism is also analyzed.

The recent years have witnessed a resurgence of interest in the self-referent phenomena. One can point to several reasons why self processes have come to pervade many domains of psychology. Self-generated activities lie at the very heart of causal processes. They not only contribute to the meaning and valence of most external influences, but they also function as important proximal determinants of motivation and action. The capacity to exercise control over one's own thought processes, motivation, and action is a distinctively human characteristic. Because judgments and actions are partly self-determined, people can effect change in themselves and their situations through their own efforts. In this article, I will examine the mechanisms of human agency through which such changes are realized.

The Nature and Locus of Human Agency

The manner in which human agency operates has been conceptualized in at least three different ways—as either *autonomous agency*, *mechanical agency*, or *emergent interactive agency*. The notion that humans serve as entirely independent agents of their own actions has few, if any, serious advocates. However, environmental determinists sometimes invoke the view of autonomous agency in arguments designed to repudiate any role of self-influence in causal processes.

A second approach to the self system is to treat it in terms of mechanical agency. It is an internal instrumentality through which external influences operate mechanistically on action, but it does not itself have any motivative, self-reflective, self-reactive, creative, or self-directive properties. In this view, internal events are mainly products of external ones devoid of any causal efficacy. Because the agency resides in environmental

forces, the self system is merely a repository and conduit for them. In this conception of agency, self-referent processes are epiphenomenal by-products of conditioned responses that do not enter into the determination of action. For the material eliminativist, self-influences do not exist. People are not intentional cognizers with a capacity to influence their own motivation and action; rather, they are neurophysiological computational machines. Such views fail to explain the demonstrable explanatory and predictive power of self-referent factors that supposedly are devoid of causal efficacy or do not even exist.

Social cognitive theory subscribes to a model of emergent interactive agency (Bandura, 1986). Persons are neither autonomous agents nor simply mechanical conveyors of animating environmental influences. Rather, they make causal contribution to their own motivation and action within a system of triadic reciprocal causation. In this model of reciprocal causation, action, cognitive, affective, and other personal factors, and environmental events all operate as interacting determinants. Any account of the determinants of human action must, therefore, include self-generated influences as a contributing factor. Empirical tests of the model of triadic reciprocal causation are presented elsewhere and will not be reviewed here (Wood & Bandura, in press). The focus of this article is on the mechanisms through which personal agency operates within the interactional causal structure.

Exercise of Agency Through Self-Belief of Efficacy

Among the mechanisms of personal agency, none is more central or pervasive than people's beliefs about their capabilities to exercise control over events that affect their lives. Self-efficacy beliefs function as an important set of proximal determinants of human motivation, affect, and action. They operate on action through motivational, cognitive, and affective intervening processes. Some of these processes, such as affective arousal and thinking patterns, are of considerable interest in their own right and not just as intervening influencers of action.

Cognitive Processes

Self-efficacy beliefs affect thought patterns that may be self-aiding or self-hindering. These cognitive effects take various forms. Much human behavior is regulated by forethought embodying cognized goals, and personal goal setting is influenced by self-appraisal of capabilities. The stronger their perceived self-efficacy, the higher the goals people set for themselves and the firmer their commitment

to them (Locke, Frederick, Lee, & Bobko, 1984; Taylor, Locke, Lee, & Gist, 1984; Wood & Bandura, in press). As I will show later, challenging goals raise the level of motivation and performance attainments (Locke, Shaw, Saari, & Latham, 1981; Mento, Steel, & Karren, 1987).

A major function of thought is to enable people to predict the occurrence of events and to create the means for exercising control over those that affect their daily lives. Many activities involve inferential judgments about conditional relations between events in probabilistic environments. Discernment of predictive rules requires cognitive processing of multidimensional information that contains many ambiguities and uncertainties. In ferreting out predictive rules, people must draw on their state of knowledge to generate hypotheses about predictive factors, to weight and integrate them into composite rules, to test their judgments against outcome information, and to remember which notions they had tested and how well they had worked. It requires a strong sense of efficacy to remain task oriented in the face of judgmental failures. Indeed, people who believe strongly in their problem-solving capabilities remain highly efficient in their analytic thinking in complex decision-making situations, whereas those who are plagued by self-doubts are erratic in their analytic thinking (Bandura & Wood, 1989; Wood & Bandura, 1989). Quality of analytic thinking, in turn, affects performance accomplishments.

People's perceptions of their efficacy influence the types of anticipatory scenarios they construct and reiterate. Those who have a high sense of efficacy visualize success scenarios that provide positive guides for performance. Those who judge themselves as ineffectual are more inclined to visualize failure scenarios that undermine performance by dwelling on how things will go wrong. Cognitive simulations in which individuals visualize themselves executing activities skillfully enhance subsequent performance (Bandura, 1986; Corbin, 1972; Feltz & Landers, 1983; Kazdin, 1978; Markus, Cross, & Wurf, in press). Perceived self-efficacy and cognitive simulation affect each other bidirectionally. A high sense of efficacy fosters cognitive constructions of effective actions, and cognitive reiteration of efficacious courses of action strengthens self-perceptions of efficacy (Bandura & Adams, 1977; Kazdin, 1979).

Self-efficacy beliefs usually affect cognitive functioning through the joint influence of motivational and information-processing operations. This dual influence is illustrated in studies of different sources of variation in memory performance. The stronger people's beliefs in their memory capacities, the more effort they devote to cognitive processing of memory tasks, which, in turn, enhances their memory performances (Berry, 1987).

Preparation of this article was facilitated by Public Health Research Grant No. MH-5162-25 from the National Institute for Mental Health. This article was presented as an invited address at the XXIV International Congress of Psychology, Sydney, Australia, August 1988.

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Motivational Processes

People's self-efficacy beliefs determine their level of motivation, as reflected in how much effort they will exert in an endeavor and how long they will persevere in the face of obstacles. The stronger the belief in their capabilities, the greater and more persistent are their efforts (Bandura, 1988a). When faced with difficulties, people who are beset by self-doubts about their capabilities slacken their efforts or abort their attempts prematurely and quickly settle for mediocre solutions, whereas those who have a strong belief in their capabilities exert greater effort to master the challenge (Bandura & Cervone, 1983, 1986; Cervone & Peake, 1986; Jacobs, Prentice-Dunn, & Rogers, 1984; Weinberg, Gould, & Jackson, 1979). Strong perseverance usually pays off in performance accomplishments.

There is a growing body of evidence that human attainments and positive well-being require an optimistic sense of personal efficacy (Bandura, 1986). This is because ordinary social realities are strewn with difficulties. They are full of impediments, failures, adversities, setbacks, frustrations, and inequities. People must have a robust sense of personal efficacy to sustain the perseverant effort needed to succeed. Self-doubts can set in quickly after some failures or reverses. The important matter is not that difficulties arouse self-doubt, which is a natural immediate reaction, but the speed of recovery of perceived self-efficacy from difficulties. Some people quickly recover their self-assurance; others lose faith in their capabilities. Because the acquisition of knowledge and competencies usually requires sustained effort in the face of difficulties and setbacks, it is resiliency of self-belief that counts.

In his revealing book, titled *Rejection*, John White (1982) provides vivid testimony that the striking characteristic of people who have achieved eminence in their fields is an inextinguishable sense of efficacy and a firm belief in the worth of what they are doing. This resilient self-belief system enabled them to override repeated early rejections of their work. A robust sense of personal efficacy provides the needed staying power.

Many of our literary classics brought their authors repeated rejections. The novelist, Saroyan, accumulated several thousand rejections before he had his first literary piece published. Gertrude Stein continued to submit poems to editors for about 20 years before one was finally accepted. Now that is invincible self-efficacy. Such extraordinary persistence in the face of massive uninterrupted rejection defies explanation in terms of either reinforcement theory or utility theory. James Joyce's book, the *Dubliners*, was rejected by 22 publishers. Over a dozen publishers rejected a manuscript by e. e. cummings. When his mother finally published it, the dedication, printed in upper case, read: "With no thanks to . . ." followed by the long list of publishers who had rejected his offering.

Early rejection is the rule, rather than the exception, in other creative endeavors. The Impressionists had to arrange their own art exhibitions because their works were routinely rejected by the Paris Salon. Van Gogh sold only one painting during his lifetime. Rodin was repeatedly

rejected by the Ecole des Beaux-Arts. The musical works of most renowned composers were initially greeted with derision. Stravinsky was run out of Paris by an enraged audience and critics when he first served them the *Rite of Spring*. Many other composers suffered the same fate, especially in the early phases of their career. The brilliant architect, Frank Lloyd Wright, was one of the more widely rejected architects during much of his career.

To turn to more contemporary examples, Hollywood initially rejected the incomparable Fred Astaire for being only "a balding, skinny actor who can dance a little." Decca Records turned down a recording contract with the Beatles with the nonprophetic evaluation, "We don't like their sound. Groups of guitars are on their way out." Whoever issued that rejective pronouncement must cringe at each sight of a guitar.

It is not uncommon for authors of scientific classics to experience repeated initial rejection of their work, often with hostile embellishments if it is too discrepant from the theories in vogue at the time. For example, John Garcia, who eventually won well-deserved recognition for his fundamental psychological discoveries, was once told by a reviewer of his oft-rejected manuscripts that one is no more likely to find the phenomenon he discovered than bird droppings in a cuckoo clock. Verbal droppings of this type demand tenacious self-belief to continue the tortuous search for new Muses. Scientists often reject theories and technologies that are ahead of their time. Because of the cold reception given to most innovations, the time between discovery and technical realization typically spans several decades.

It is widely believed that misjudgment produces dysfunction. Certainly, gross miscalculation can create problems. However, optimistic self-appraisals of capability that are not unduly disparate from what is possible can be advantageous, whereas veridical judgments can be self-limiting. When people err in their self-appraisals, they tend to overestimate their capabilities. This is a benefit rather than a cognitive failing to be eradicated. If self-efficacy beliefs always reflected only what people could do routinely, they would rarely fail but they would not mount the extra effort needed to surpass their ordinary performances.

Evidence suggests that it is often the so-called normals who are distorters of reality, but they exhibit self-enhancing biases that distort appraisals in the positive direction. The successful, the innovative, the sociable, the nonanxious, the nondespondent, and the social reformers take an optimistic view of their personal efficacy to exercise influence over events that affect their lives (Bandura, 1986; Taylor & Brown, 1988). If not unrealistically exaggerated, such self-beliefs foster the perseverant effort needed for personal and social accomplishments. The findings of laboratory studies are in accord with the records of human triumphs regarding the centrality of the motivational effects of self-beliefs of efficacy in human attainments. It takes a resilient sense of efficacy to override the numerous dissuading impediments to significant accomplishments.

Affective Processes

People's beliefs in their capabilities affect how much stress and depression they experience in threatening or taxing situations, as well as their level of motivation. Such emotional reactions can affect action both directly and indirectly by altering the nature and course of thinking. Threat is not a fixed property of situational events, nor does appraisal of the likelihood of aversive happenings rely solely on reading external signs of danger or safety. Rather, threat is a relational property concerning the match between perceived coping capabilities and potentially aversive aspects of the environment.

People who believe they can exercise control over potential threats do not conjure up apprehensive cognitions and, therefore, are not perturbed by them. But those who believe they cannot manage potential threats experience high levels of stress and anxiety arousal. They tend to dwell on their coping deficiencies and view many aspects of their environment as fraught with danger. Through such ineffectual thought they distress themselves and constrain and impair their level of functioning (Bandura, 1988b, 1988c; Lazarus & Folkman, 1984; Meichenbaum, 1977; Sarason, 1975).

That perceived coping efficacy operates as a cognitive mediator of anxiety has been tested by creating different levels of perceived coping efficacy and relating them at a microlevel to different manifestations of anxiety. Perceived coping inefficacy is accompanied by high levels of subjective distress, autonomic arousal, and plasma catecholamine secretion (Bandura, Reese, & Adams, 1982; Bandura, Taylor, Williams, Mefford, & Barchas, 1985). The combined results from the different psychobiological manifestations of emotional arousal are consistent in showing that anxiety and stress reactions are low when people cope with tasks in their perceived self-efficacy range. Self-doubts in coping efficacy produce substantial increases in subjective distress and physiological arousal. After perceived coping efficacy is strengthened to the maximal level, coping with the previously intimidating tasks no longer elicits differential psychobiological reactions.

Anxiety arousal in situations involving some risks is affected not only by perceived coping efficacy but also by perceived self-efficacy to control intrusive perturbing cognitions. The exercise of control over one's own consciousness is summed up well in the proverb: "You cannot prevent the birds of worry and care from flying over your head. But you can stop them from building a nest in your head." Perceived self-efficacy in thought control is a key factor in the regulation of cognitively generated arousal. It is not the sheer frequency of aversive cognitions but the perceived inefficacy to turn them off that is the major source of distress (Kent, 1987; Salkovskis & Harrison, 1984). Thus, the incidence of aversive cognitions is unrelated to anxiety level when variations in perceived thought control efficacy are controlled for, whereas perceived thought control efficacy is strongly related to anxiety level when the extent of aversive cognitions is controlled (Kent & Gibbons, 1987).

The role of perceived self-efficacy and anxiety arousal in the causal structure of avoidant behavior has also been examined extensively. The results show that people base their actions on self-perceptions of coping efficacy in situations they regard as risky. The stronger the perceived coping efficacy, the more venturesome the behavior, regardless of whether self-perceptions of efficacy are enhanced through mastery experiences, modeling influences, or cognitive simulations (Bandura, 1988b). Perceived self-efficacy accounts for a substantial amount of variance in phobic behavior when anticipated anxiety is partialled out, whereas the relationship between anticipated anxiety and phobic behavior essentially disappears when perceived self-efficacy is partialled out (Williams, Dooseman, & Kleifield, 1984; Williams, Kinney, & Falbo, in press; Williams, Turner, & Peer, 1985). In short, people avoid potentially threatening situations and activities, not because they are beset with anxiety, but because they believe they will be unable to cope with situations they regard as risky. They take self-protective action regardless of whether they happen to be anxious at the moment. The dual control of anxiety arousal and avoidant behavior by perceived coping efficacy and thought control efficacy is revealed in analyses of the mechanisms governing personal empowerment over pervasive social threats (Ozer & Bandura, 1989). One path of influence is mediated through the effects of perceived coping self-efficacy on perceived vulnerability and risk discernment, and the other through the impact of perceived cognitive control self-efficacy on intrusive aversive thoughts.

Perceived self-inefficacy to fulfill desired goals that affect evaluation of one's self-worth and to secure things that bring satisfaction to one's life can give rise to bouts of depression (Bandura, 1988a; Cutrona & Troutman, 1986; Holahan & Holahan, 1987a, 1987b; Kanfer & Zeiss, 1983). When the perceived self-inefficacy involves social relationships, it can induce depression both directly and indirectly by curtailing the cultivation of interpersonal relationships that can provide satisfactions and buffer the effects of chronic daily stressors (Holahan & Holahan, 1987a). Depressive rumination not only impairs ability to initiate and sustain adaptive activities, but it further diminishes perceptions of personal efficacy (Kavanagh & Bower, 1985). Much human depression is also cognitively generated by dejecting ruminative thoughts (Nolen-Hoeksema, 1987). Therefore, perceived self-inefficacy to exercise control over ruminative thought figures prominently in the occurrence, duration, and recurrence of depressive episodes (Kavanagh & Wilson, 1988).

Other efficacy-activated processes in the affective domain concern the impact of perceived coping efficacy on basic biological systems that mediate health functioning (Bandura, in press-a). Stress has been implicated as an important contributing factor to many physical dysfunctions. Controllability appears to be a key organizing principle regarding the nature of these stress effects. Exposure to physical stressors with a concomitant ability to control them has no adverse physiological effects, whereas exposure to the same stressors without the ability to con-

trol them impairs cellular components of the immune system (Coe & Levine, in press; Maier, Laudenslager, & Ryan, 1985). Biological systems are highly interdependent. The types of biochemical reactions that have been shown to accompany perceived coping inefficacy are involved in the regulation of immune systems. For example, perceived self-inefficacy in exercising control over cognitive stressors activates endogenous opioid systems (Bandura, Cioffi, Taylor, & Brouillard, 1988). There is evidence that some of the immunosuppressive effects of inefficacy in controlling stressors are mediated by release of endogenous opioids. When opioid mechanisms are blocked by opiate antagonists, the stress of coping inefficacy loses its immunosuppressive power (Shavit & Martin, 1987).

In the laboratory research demonstrating immunosuppression through stress mediation, controllability is studied as a fixed dichotomous property in which animals either exercise complete control over physical stressors, or they have no control whatsoever. In contrast, most human stress is activated in the course of learning how to exercise control over recurring cognitive and social stressors. It would not be evolutionarily advantageous if acute stressors invariably impaired immune function, because of their prevalence in everyday life. Indeed, in a recently completed project, my colleagues and I found (Wiedenfeld et al., 1989) that stress aroused in the process of gaining coping efficacy over stressors enhances immune function. The rate of efficacy acquisition is a good predictor of whether exposure to acute stressors enhances or suppresses immune function.

Selection Processes

People can exert some influence over their life course by their selection of environments and construction of environments. So far, the discussion has centered on efficacy-activated processes that enable people to create beneficial environments and to exercise control over them. Judgments of personal efficacy also affect selection of environments. People tend to avoid activities and situations they believe exceed their coping capabilities, but they readily undertake challenging activities and select social environments they judge themselves capable of handling. Any factor that influences choice behavior can profoundly affect the direction of personal development because the social influences operating in the environments that are selected continue to promote certain competencies, values, and interests long after the decisional determinant has rendered its inaugurating effect. Thus, seemingly inconsequential determinants can initiate selective associations that produce major and enduring personal changes (Bandura, 1986; Snyder, 1986).

The power of self-efficacy beliefs to affect the course of life paths through selection processes is clearly revealed in studies of career decision-making and career development (Betz & Hackett, 1986; Lent & Hackett, 1987). The more efficacious people judge themselves to be, the wider the range of career options they consider appropriate and the better they prepare themselves educationally for

different occupational pursuits. Self-limitation of career development arises more from perceived self-inefficacy than from actual inability. By constricting choice behavior that can cultivate interests and competencies, self-disbeliefs create their own validation.

It should be noted that the sociocognitive benefits of a sense of personal efficacy do not arise simply from the incantation of capability. Saying something should not be confused with believing it to be so. Simply saying that one is capable is not necessarily self-convincing, especially when it contradicts preexisting firm beliefs. No amount of reiteration that I can fly will persuade me that I have the efficacy to get myself airborne and to propel myself through the air. Action tendencies vary with the strength of self-beliefs of efficacy (Bandura, 1977). Efficacy beliefs exhibit a gradient of strength as a function of temporal and physical proximity to the relevant activity. One must consider the height and slope of the efficacy gradient and the threshold strength for acting on one's self-belief. These characteristics of a self-belief system are affected by the authenticity of the efficacy information on which they are based. Self-efficacy beliefs that are firmly established are likely to remain strong regardless of whether one is far removed from the taxing or threatening activities or is about to perform them. Such beliefs are resilient to adversity. In contrast, weakly held self-beliefs are highly vulnerable to change: Self-doubts mount the nearer one gets to the taxing activities (Kent, 1987; Kent & Gibbons, 1987), and negative experiences readily reinstate self-disbelief in one's capabilities.

Efficacy beliefs are the product of a complex process of self-persuasion that relies on cognitive processing of diverse sources of efficacy information. These include performance mastery experiences, vicarious experiences for judging capabilities in comparison with performances of others, verbal persuasion and allied types of social influences indicating that one possesses certain capabilities; and physiological states from which one may partly judge one's capabilities, strength, and vulnerability. Information that is relevant for judging personal capabilities is not inherently enlightening. Rather, in the self-appraisal of efficacy these different sources of efficacy information must be cognitively processed, weighed, and integrated through self-reflective thought. Acting on one's self-efficacy judgment produces confirming or disconfirming experiences that prompt further reappraisals of personal efficacy.

Development of resilient self-efficacy requires some experience in mastering difficulties through perseverant effort. If people experience only easy successes, they come to expect quick results and their sense of efficacy is easily undermined by failure. Some setbacks and difficulties in human pursuits serve a useful purpose in teaching that success usually requires sustained effort. After people become convinced they have what it takes to succeed, they persevere in the face of adversity and quickly rebound from setbacks. By sticking it out through tough times, they emerge from adversity with a stronger sense of efficacy.

Exercise of Agency Through Goal Representations

Another distinctive human characteristic through which personal agency is exercised is the capacity of forethought. People do not simply react to immediate environmental influences like weathervanes, nor are they mechanically steered by implants from their past. Most human behavior, being purposive, is regulated by forethought. The future time perspective manifests itself in many different ways. People anticipate the likely consequences of their prospective actions, they set goals for themselves, and they plan courses of action likely to produce desired outcomes. Through the exercise of forethought and self-regulative standards, they motivate themselves and guide their actions anticipatorily. Theories that seek to explain human behavior solely as the product of external influences or the remnants of past stimulus inputs present a truncated image of human nature. This is because people possess self-directive capabilities that enable them to exercise some control over their thoughts, feelings, and actions by the consequences they produce for themselves. Psychosocial functioning is, therefore, regulated by an interplay of self-produced and external sources of influence.

The capability for intentional and purposive action is rooted in symbolic activity. Future events cannot be causes of current motivation and action because that would entail backward causation in which the effect precedes the cause. However, by being represented cognitively in the present, conceived future events are converted into current motivators and regulators of behavior. Action is motivated and directed by cognized goals rather than drawn by remote aims. Forethought is translated into incentives and guides for action through the aid of self-regulatory mechanisms.

Many theories of self-regulation are founded on a negative feedback control model. This type of system functions as a motivator and regulator of action through a discrepancy reduction mechanism. Perceived discrepancy between performance and an internal standard triggers action to reduce the incongruity. In negative feedback control, if performance matches the internal standard the person does nothing. A regulatory process in which matching a standard begets inertness does not characterize human self-motivation. Such a feedback control system would produce circular action that leads nowhere. Nor could people be stirred to action until they receive feedback of a shortcoming. Although comparative feedback is essential in the ongoing regulation of motivation, people can initially raise their level of motivation by adopting goals before they receive any feedback regarding their beginning effort (Bandura & Cervone, 1983). Negative feedback may help to keep them going on a preset course, but from time to time they must transcend the feedback loop to initiate new challenging courses for themselves. Different self-regulatory systems operate in the initiation and continued regulation of motivation.

Human self-motivation relies on *discrepancy pro-*

duction as well as on *discrepancy reduction*. It requires both *proactive control* and *reactive or feedback control*. People initially motivate themselves through proactive control by setting themselves valued challenging standards that create a state of disequilibrium and then mobilizing their effort on the basis of anticipatory estimation of what it would take to accomplish them. Feedback control comes into play in subsequent adjustments of effort to achieve desired results. After people attain the standard they have been pursuing, those who have a strong sense of efficacy generally set a higher standard for themselves. The adoption of further challenges creates new motivating discrepancies to be mastered. Similarly, surpassing a standard is more likely to raise aspiration than to lower subsequent performance to conform to the surpassed standard. Self-motivation thus involves a hierarchical dual control process of disequilibrating discrepancy production followed by equilibrating discrepancy reduction. An evaluative executive control system with a proactive component must therefore be superimposed on a negative feedback operation that keeps changing aspirational standards with progressive performance attainments. To capture the complexity of human self-regulation, such an executive control system must be invested with the evaluative agentive properties shown to play an important role in self-directedness. These properties are discussed next.

Goals operate largely through self-referent processes, rather than regulating motivation and action directly. These processes provide the links between goals and action. Cognitive motivation based on goal systems is mediated by three types of self-reactive influences: (a) affective self-evaluation, (b) perceived self-efficacy for goal attainment, and (c) ongoing readjustment of internal standards. Goals create motivating involvement in activities by specifying the conditional requirements for positive self-evaluation. People seek self-satisfactions from fulfilling valued goals and are prompted to intensify their efforts by discontent with substandard performances.

Perceived self-efficacy is another self-referent factor that plays an influential role in the self-regulation of motivation through goal systems. As previously noted, it is partly on the basis of self-beliefs of efficacy that people choose what challenges to undertake, how much effort to expend in the endeavor, and how long to persevere in the face of difficulties (Bandura, 1986, 1988a). In the face of negative discrepancies between personal standards and attainments, those who are assured of their capabilities heighten their level of effort and perseverance, whereas those who are beset by self-doubts about their capabilities are easily dissuaded by failure. The goals people set for themselves at the outset of an endeavor are subject to change, depending on the pattern and level of progress they are making (Campion & Lord, 1982). They may maintain their original goal, lower their sights, or adopt an even more challenging goal. Thus, the third constituent of self-influence in the ongoing regulation of motivation concerns the readjustment of internal standards in light of one's attainments. These self-referent influences op-

erating in concert account for the major share of variation in motivation through goal systems (Bandura & Cervone, 1986).

In brief, the agentive properties of a self-motivational control system must include (a) predictive anticipatory control of effort, (b) affective self-evaluative reactions to one's performances rooted in a value system, (c) self-appraisal of personal efficacy for goal attainment, and (d) self-reflective metacognitive activity concerning the adequacy of one's efficacy appraisals and the suitability of one's standard setting. Evaluation of perceived self-efficacy relative to task demands indicates whether the standards being pursued are within attainable bounds or are unrealistically beyond one's reach.

Exercise of Agency Through Anticipated Outcomes

The ability to envision the likely outcomes of prospective actions is another way in which anticipatory mechanisms regulate human motivation and action. People strive to gain anticipated beneficial outcomes and to forestall aversive ones. However, the effects of outcome expectancies on performance motivation are partly governed by self-beliefs of efficacy. There are many activities that, if performed well, guarantee valued outcomes, but they are not pursued if people doubt they can do what it takes to succeed (Beck & Lund, 1981; Betz & Hackett, 1986; Wheeler, 1983). Self-perceived inefficacy can thus nullify the motivating potential of alluring outcome expectations.

The degree to which outcome expectations contribute to performance motivation independently of self-efficacy beliefs is partly determined by the structural relation between actions and outcomes in a particular domain of functioning. In activities in which the level of competence dictates the outcomes, the types of outcomes people anticipate depend largely on their beliefs of how well they will be able to perform in given situations. In most social, intellectual, and physical pursuits, those who judge themselves highly efficacious will expect favorable outcomes, whereas those who expect poor performances of themselves will conjure up negative outcomes. When variations in perceived self-efficacy are partialled out, the outcomes expected for given performances do not have much of an independent effect on behavior (Barling & Abel, 1983; Barling & Beattie, 1983; Godding & Glasgow, 1985; Lee, 1984a, 1984b; Williams & Watson, 1985). Expected outcomes contribute to motivation independently of self-efficacy beliefs when outcomes are not completely controlled by quality of performance. This occurs when extraneous factors also affect outcomes, or outcomes are socially tied to a minimum level of performance so that some variations in quality of performance above and below the standard do not produce differential outcomes.

Hierarchical Dual Control Mechanisms in the Construction and Regulation of Action

As already noted, motivation is self-regulated through the joint influence of proactive and feedback mechanisms. The same dual control operates in the construction and

regulation of complex patterns of behavior (Bandura, 1986, in press-b). Foresighted conceptions of actions guide the production of appropriate behavior and provide the internal standards for corrective adjustments in the development of behavioral proficiency (Carroll & Bandura, in press). These conceptions are formed on the basis of knowledge gained through observational learning, inferences from exploratory experiences, information conveyed by verbal instruction, and innovative cognitive syntheses of preexisting knowledge. The mechanism for transforming cognition into action operates through a conception-matching process. This involves both transformational and generative operations. Execution of a skill must be constantly varied to suit changing circumstances. Adaptive performance, therefore, requires a generative conception rather than a one-to-one mapping between representation and action. By applying an abstract specification of the activity, people can produce many variations on the skill.

Conceptions are rarely transformed into masterful performance on the first attempt. Monitored enactments serve as the vehicle for transforming knowledge into skilled action. Performances are perfected by corrective adjustments during behavior production until a close match is eventually achieved between conception and action (Carroll & Bandura, 1985, 1987). Because errors can produce costly and injurious consequences, the prospects of healthy survival would be bleak if people had to rely solely on negative feedback to develop competencies. Negative feedback operates as a complementary but subordinate mechanism in the process of action construction.

Dual control is similarly involved in the regulation of preestablished modes of action. Forethought guides the selection of actions, and the results produced by those actions verify the adequacy of the chosen course. A system of self-regulation combining *proactive guidance* with *reactive adjustments* is best suited for adaptive functioning, especially under changing circumstances. Psychological theories that rely exclusively on a negative feedback model provide only a fractional view of human self-regulation.

Human action is, of course, regulated by multilevel systems of control. Cognitive guidance is critical during the acquisition of competences (Carroll & Bandura, in press). But after skills have been perfected, they no longer require cognitive control. Their execution is largely regulated by lower level sensorimotor systems (Carroll & Bandura, 1987). Partial disengagement of thought from proficient action frees cognitive resources for other purposes. If routinized behavior fails to produce expected results, the cognitive control system again comes into play. New courses of action are constructed and tested. Control reverts to the lower control system after an adequate means is found and becomes the habitual way of doing things.

The Power of Forethought to Override Feedback Control

Human adaptation and survival depend increasingly on the power of forethought to override immediate feedback

control of action. We now possess the capacity to create technologies that can have pervasive effects not only on current life but also on that of future generations. Many technical innovations that provide current benefits also entail hazards and cumulative harmful effects that can eventually take a heavy future toll on human beings and the environment.

The capacity to extrapolate future consequences from known facts enables people to take corrective actions to avert disastrous futures. It is the expanded time perspective and symbolization of futures afforded by cognition that increase the prospects of human survival. Had humans been ruled solely by immediate consequences, they would have long ago destroyed most of the ecological supports of life. Forethought often saves us from the perils of a foreshortened perspective. However, the power of anticipative control must be enhanced by developing better methods for forecasting distal consequences and stronger social mechanisms for bringing projected consequences to bear on current behavior to keep us off self-destructive courses.

Distinction Between Self as Agent and as Object

Social cognitive theory rejects the dichotomous conception of self as agent and self as object. Acting on the environment and acting on oneself entail shifting the perspective of the same agent rather than reifying different selves regulating each other or transforming the self from agent to object. In acting as agents over their environments, people draw on their knowledge and cognitive and behavioral skills to produce desired results. In acting as agents over themselves, people monitor their actions and enlist cognitive guides and self-incentives to produce desired personal changes. They are just as much agents influencing themselves as they are influencing their environment.

The same is true for metacognitive activity. In their everyday transactions, people act on their thoughts and later analyze how well their thoughts have served them in managing events. However, the same person is doing the operative thinking and later evaluating the adequacy of his or her knowledge, thinking skills, and action strategies. The shift in perspective does not transform an individual from an agent to an object. One is just as much an agent reflecting on one's experiences as in generating and executing the original courses of action. The same self performing multiple functions does not require creating multiple selves endowed with different roles.

Human Agency and Psychoneural Processes

Human agency does not imply psychophysical dualism. Thoughts are higher brain processes rather than psychic entities that exist separately from brain activities. Ideational and neural terminology are simply different ways of representing the same cerebral processes. The view that cognitive events are neural occurrences does not mean that psychological laws regarding psychosocial functioning are derivable from neurophysiological ones.

One must distinguish between biological laws governing the mechanics of cerebral systems and psychological laws of how cerebral systems can be orchestrated to serve different purposes. Psychological knowledge of how best to structure influences to create belief systems and personal competencies is not derivable from knowledge of the neurophysical mechanisms that subserve such changes. Thus, understanding the brain circuits involved in learning does not tell one much about how best to present and organize instructional contents, how to code them for memory representation, and how to motivate learners to attend to, cognitively process, and rehearse what they are learning. Nor does understanding of how the brain works furnish rules on how to create social conditions that cultivate the skills needed to become a successful parent, teacher, or executive. The optimal conditions must be specified by psychological principles.

The influences needed to produce the neural occurrences underlying complex human behavior include events external to the organism acting together with self-generated ones. The laws of psychology specify how to structure environmental influences and to enlist cognitive activities to achieve given purposes. Although psychological laws cannot violate what is known about the physiological system that subserves them, they need to be pursued in their own right. Were one to embark on the road to reductionism, psychology would be reduced to biology, biology to chemistry, and chemistry to physics, with the final stop in atomic particles. Neither atomic particles, chemistry, nor biology will provide the psychological laws of human behavior.

The construal of cognitions as cerebral processes raises the intriguing question of how people come to be producers of thoughts that may be novel, inventive, visionary, or that take complete leave of reality as in flights of fancy. One can originate fanciful but coherent thoughts as, for example, visualizing a hippopotamus gracefully riding the waves on a surfboard. Similarly, one can get oneself to cognize several novel acts and choose to execute one of them. Cognitive production, with its initiating and creative properties, defies explanation in terms of external cueing of preexisting cognitive products. Neither situational cues, knowledge structures, conditioned responses, nor prior brainwaves are likely to be highly predictive of the specific forms fanciful thoughts will take. Emergent cognitive events draw on existing cognitive structures but go beyond them.

If thought processes are conceived of as cerebral processes, the relevant question is not how mind and body act on each other, but how people can bring into being cognitive or cerebral productions. The issues of interest concern the brain dynamics of cognitive generation. The novel scenario of the surfing hippopotamus was produced by the intentional exercise of personal agency. Intentionality and agency raise the fundamental question of how people activate the cerebral processes that characterize the exercise of agency and lead to the realization of particular intentions. In addition to asking how people originate thoughts and actions, one may also ask the intriguing

question of how people occasion self-perceiving and self-reflecting cognitive activities.

Human Agency, Freedom, and Determinism

The notion of human agency also raises the fundamental issue of its relation to determinism. The term *determinism* is used here to mean the production of effects by events, rather than in the doctrinal sense that actions are completely determined by a prior sequence of causes independent of the individual. When viewed from the perspective of social cognitive theory, there is no incompatibility between human agency and determinism (Bandura, 1986). Freedom is not conceived negatively as the absence of external coercion or constraints. Rather, it is defined positively in terms of the exercise of self-influence. I have already examined how the exercise of personal agency is achieved through reflective and regulative thought, the skills at one's command, and other tools of self-influence that affect choice and support selected courses of action. Self-generated influences operate deterministically on behavior the same way as external sources of influence do. Given the same environmental conditions, persons who have developed skills for accomplishing many options and are adept at regulating their own motivation and behavior are more successful in their pursuits than those who have limited means of personal agency. It is because self-influence operates deterministically on action that some measure of self-directedness and freedom is possible.

Those who argue that people do not exercise any control over their motivation and action usually invoke a selective regression of causes in the analysis of self-regulation. They emphasize that external events influence judgments and actions, but neglect the portion of causation showing that the environmental events, themselves, are partly shaped by people's actions. Environments have causes as do behaviors. In the model of reciprocal causation, people partly determine the nature of their environment and are influenced by it. Self-regulatory functions are personally constructed from varied experiences not simply environmentally implanted. Although people's standards and conceptions have some basis in reality, they are not just ingrafts of it. Through their capacity to manipulate symbols and to engage in reflective thought, people can generate novel ideas and innovative actions that transcend their past experiences. They bring influence to bear on their motivation and action in efforts to realize valued futures. They may be taught the tools of self-regulation, but this in no way detracts from the fact that by the exercise of that capability they help to determine the nature of their situations and what they become. The self is thus partly fashioned through the continued exercise of self-influence.

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Perceived Self-Efficacy in Cognitive Development and Functioning

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In this article, I review the diverse ways in which perceived self-efficacy contributes to cognitive development and functioning. Perceived self-efficacy exerts its influence through four major processes. They include cognitive, motivational, affective, and selection processes. There are three different levels at which perceived self-efficacy operates as an important contributor to academic development. Students' beliefs in their efficacy to regulate their own learning and to master academic activities determine their aspirations, level of motivation, and academic accomplishments. Teachers' beliefs in their personal efficacy to motivate and promote learning affect the types of learning environments they create and the level of academic progress their students achieve. Faculties' beliefs in their collective instructional efficacy contribute significantly to their schools' level of academic achievement. Student body characteristics influence school-level achievement more strongly by altering faculties' beliefs in their collective efficacy than through direct affects on school achievement.

The attention of our discipline has centered heavily on how the mind works in processing, organizing, and retrieving information. The mind as a computational program became the conceptual model for the times. Research on how people process information has clarified many aspects of cognitive functioning. However, this austere cognitivism has neglected self-regulatory processes that govern human development and adaption. Effective intellectual functioning requires much more than simply understanding the factual knowledge and reasoning operations for given activities. The self-regulatory social, motivational, and affective contributors to

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cognitive functioning are best addressed within the conceptual framework of the exercise of human agency.

The recent years have witnessed a resurgence of interest in the self processes by which human agency is exercised (A. Bandura, 1986). There are several reasons why self-referent phenomena have come to pervade diverse areas of psychology. Self influences affect the selection and construction of environments. The impact of most environmental influences on human motivation, affect, and action is heavily mediated through self processes. They give meaning and valence to external events. Self influences thus operate as important proximal determinants at the very heart of causal processes.

People make causal contributions to their own functioning through mechanisms of personal agency. Among the mechanisms of agency, none is more central or pervasive than people's beliefs about their capabilities to exercise control over their own level of functioning and over events that affect their lives. Efficacy beliefs influence how people feel, think, motivate themselves, and behave. Self-efficacy beliefs produce these diverse effects through four major processes (A. Bandura, 1992). They include cognitive, motivational, affective, and selection processes. Each of these processes is analyzed in the sections that follow.

COGNITIVE PROCESSES

The effects of self-efficacy beliefs on cognitive processes take a variety of forms. Much human behavior, which is purposive, is regulated by forethought embodying cognized goals. Personal goal setting is influenced by self-appraisal of capabilities. The stronger the perceived self-efficacy, the higher the goal challenges people set for themselves and the firmer is their commitment to them (A. Bandura, 1991).

Most courses of action are initially shaped in thought. People's beliefs in their efficacy influence the types of anticipatory scenarios they construct and rehearse. Those who have a high sense of efficacy visualize success scenarios that provide positive guides and supports for performance. Those who doubt their efficacy visualize failure scenarios and dwell on the many things that can go wrong. It is difficult to achieve much while fighting self-doubt.

The conception of human ability has undergone considerable change in recent years. Ability is not a fixed attribute residing in one's behavioral repertoire. Rather, it is a generative capability in which cognitive, social, motivational, and behavioral skills must be organized and effectively orchestrated to serve numerous purposes. It also involves skill in managing aversive emotional reactions that can impair the quality of thinking and

action. There is a marked difference between possessing knowledge and skills and being able to use them well under taxing conditions. Personal accomplishments require not only skills but self-beliefs of efficacy to use them well. Hence, a person with the same knowledge and skills may perform poorly, adequately, or extraordinarily depending on fluctuations in self-efficacy thinking.

The self-efficacy contribution to skill utilization is illustrated in a study by Collins (1982). She selected children at three levels of mathematical ability—low, medium, and high. Within each of these ability levels, she found children who were assured in their perceived mathematical self-efficacy and others who had self-doubts. They were given difficult problems to solve. At each level of ability, children who believed strongly in their capabilities were quicker to discard faulty strategies. They performed better (Figure 1). They chose to rework more of the problems they failed and did so more accurately than did children of equal ability who were plagued by self-doubts. Positive attitudes toward mathematics were better predicted by perceived self-efficacy than by actual ability. As this study shows, people who perform poorly may do so because they lack the skills or they have the skills but they lack the sense of efficacy to use them well. Bouffard-Bouchard (1989) and Bouffard-Bouchard, Parent, and Larivée (1991) not only corroborated the independent contribution of perceived self-efficacy to cognitive performance but identified self-regulative processes through which it does so.

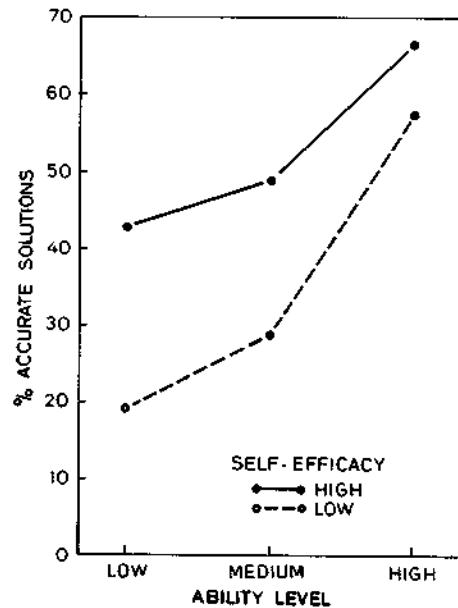


FIGURE 1 Mean levels of mathematical solutions achieved by students as a function of mathematical ability and perceived mathematical self-efficacy. Plotted from Collins's (1982) data. From "Perceived Self-Efficacy in the Exercise of Personal Agency" by A. Bandura, 1989, *The Psychologist: Bulletin of the British Psychological Society*, 2, p. 412. Copyright 1989 by the British Psychological Society. Reprinted by permission.

A major function of thought is to enable people to predict events and to develop ways to control those events that affect their lives. Such skills require effective cognitive processing of information that contains many ambiguities and uncertainties. In learning predictive and regulative rules, people must draw on their knowledge to construct options, to weight and integrate predictive factors, to test and revise their judgments against the immediate and distal results of their actions, and to remember which factors they had tested and how well they had worked. It requires a strong sense of efficacy to remain task oriented in the face of pressing situational demands and failures that have social repercussions.

The powerful influence of self-efficacy beliefs on cognitive processes is revealed in a program of research on complex learning and decision making (Wood & A. Bandura, 1989b). Individuals manage a computer-simulated organization in which they have to match individuals to subfunctions based on their interests and talents. They also have to learn and implement instructive and motivational strategies for enhancing the performance of their group. This is not unlike what teachers and principals have to do. At the outset, organizational properties are systematically varied, and belief systems are instilled that can enhance or undermine the managers' beliefs in their capabilities. The managers make the complex sets of decisions on repeated occasions in efforts to fulfill different task demands. At periodic intervals, their perceived self-efficacy, organizational aspirations, and quality of analytic thinking are assessed. The level of organizational performance they achieve is also measured.

Conception of Ability

One belief system that affects cognitive functioning is concerned with how people construe ability (M. M. Bandura & Dweck, 1988; Dweck & Leggett, 1988; Nicholls, 1984). Some children regard ability as an acquirable skill that can be increased by gaining knowledge and competencies. Such children adopt a functional-learning goal. They seek challenges that provide opportunities to expand their knowledge and competencies. They regard errors as a natural part of an acquisition process. One learns from mistakes. Therefore, they are not easily rattled by difficulties. They judge their capabilities more in terms of personal improvement than by comparison against the achievement of others.

Other children view ability as an inherent capacity. For them, performance is diagnostic of their inherent intellectual capacities. Deficient performances carry high evaluative threats that they lack basic intelligence. Therefore, they prefer tasks that minimize errors and reveal their proficiency at the expense of expanding their knowledge and competencies. Having to exert high effort is also threatening because it presumably reveals

one is not smart. The successes of others belittle their own perceived ability. The inherent capacity view fosters a self-diagnostic focus aimed at protecting a positive evaluation of one's competence. The acquirable skill view fosters a task-diagnostic focus aimed at expanding one's competence and mastering challenges.

We (Wood & A. Bandura, 1989a) tested the notion that conceptions of ability affect thought processes and performance attainments through the self-efficacy mechanism. Before the individuals began, we instilled the different conceptions of ability by telling some of them that proficient management of the simulated organization reflected inherent intellectual capacity. Others were told that performance on this managerial task reflected an acquirable intellectual skill. Then we measured how these two conceptions of ability affected the self-regulatory factors governing performance attainments (Figure 2).

For those who viewed ability as reflecting an inherent intellectual aptitude, their perceived efficacy plummeted as they encountered problems, they became more and more erratic in their analytic thinking, and they lowered their aspirations for the group. The group they managed showed a progressive deterioration in performance. In contrast, conception of ability as an acquirable skill fostered a highly resilient sense of personal efficacy. Under this belief system, the individuals remained steadfast in their perceived efficacy, despite difficult standards to fulfill, they continued to set challenging goals for the group, and they used analytic strategies in efficient ways. Such a self-efficacious orientation paid off in high group attainments.

Human functioning is also affected by the beliefs people hold about how ability changes over time. Those who regard ability as a biologically shrinking capacity with increasing age are quick to read faulty performances as indicants of declining capacity. They do little to exploit their capabilities. Those who view ability as a skill that must be developed and practiced achieve higher attainments. Berry (1987) found that the more older adults believe in their memory capabilities, the more time they devote to cognitive processing of memory tasks. Higher cognitive effort, in turn, produces better memory performance (Figure 3). Perceived cognitive self-efficacy affects memory performance both directly and indirectly by raising cognitive effort.

Social Comparison Influences

Most activities do not provide objective standards for assessing ability. People must, therefore, assess their capabilities in relation to the attainments of others. The people with whom individuals compare themselves influence how they judge their ability. Social comparative standards also

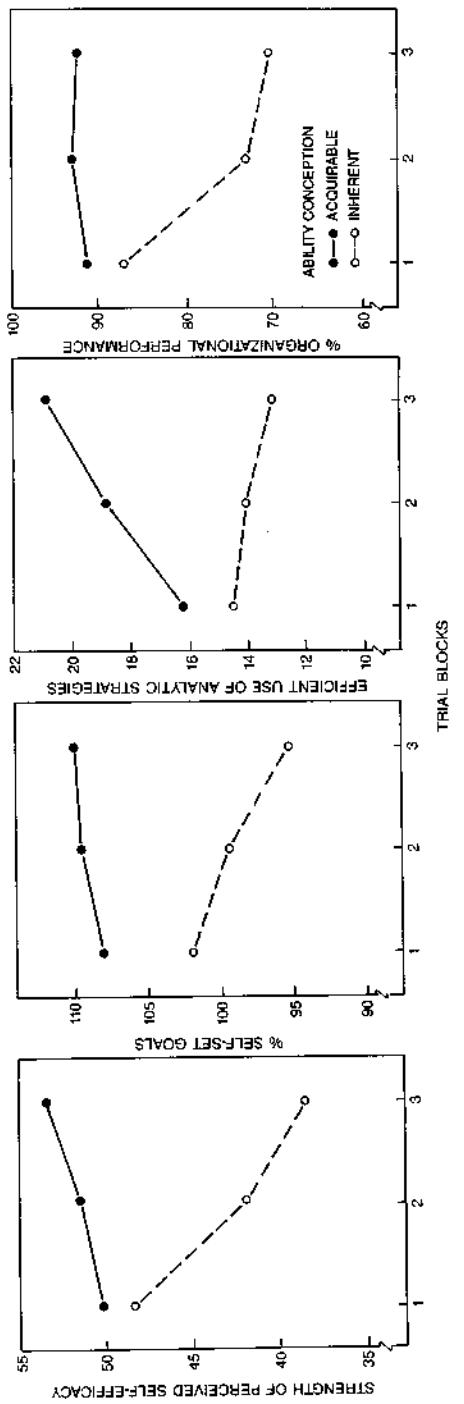


FIGURE 2 Changes in perceived managerial self-efficacy, the performance goals set for the organization relative to the preser standard, effective use of analytic strategies, and achieved level of organizational performance across blocks of production trials under conceptions of ability as an acquirable skill or as an inherent intellectual aptitude. Each trial block comprises six different production orders (Wood & A. Bandura, 1989a). From "Impact of Conceptions of Ability on Self-Regulatory Mechanisms and Complex Decision Making" by R. Wood and A. Bandura, 1989a, *Journal of Personality and Social Psychology*, 56, p. 412. Copyright 1989 by the American Psychological Association. Reprinted by permission.

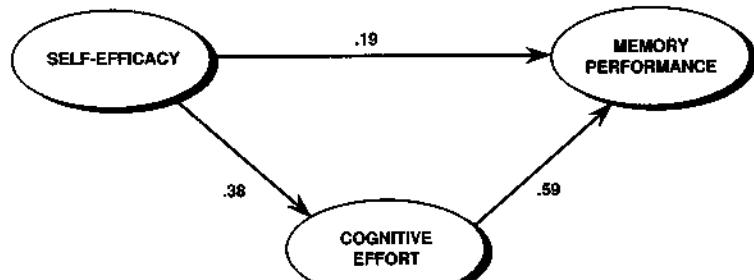


FIGURE 3 Path analysis showing that perceived self-efficacy enhances memory performance directly and by increasing cognitive processing of information. Plotted from Berry's (1987) data.

affect their self-esteem and how much satisfaction they derive from their accomplishments. In their academic work, students receive a great deal of comparative information about their capabilities from grading practices and teachers' evaluations of their scholastic performances (Marshall & Wienstein, 1984; Rosenholtz & Simpson, 1984). These unremitting comparative evaluations carry strong efficacy implications.

Our organizational research confirms that social comparison affects performance through its impact on self-regulatory mechanisms (A. Bandura & Jourden, 1991). Individuals received accurate feedback about how well their group performed and preset information on how well others managed their groups. In one condition, the comparative information showed the manager performing poorer than the comparison group at the outset, then gradually closing the gap and eventually surpassing the comparators. In a second condition, the comparative information showed the manager doing as well as the comparison group at the outset, then falling behind and ending well below the comparators.

Seeing oneself surpassed by others undermined personal efficacy, increased erratic analytic thinking, and progressively impaired performance attainments (Figure 4). By contrast, seeing oneself gain progressive mastery strengthened personal efficacy, fostered efficient thinking, and enhanced performance attainments.

Framing of Feedback

In their various pursuits, people strive for certain goals or levels of competence and receive social feedback from time to time concerning their performances. These desired accomplishments are reached gradually rather than fulfilled quickly. The way in which their progress is socially evaluated can strongly affect their self-efficacy appraisal and thereby alter the course

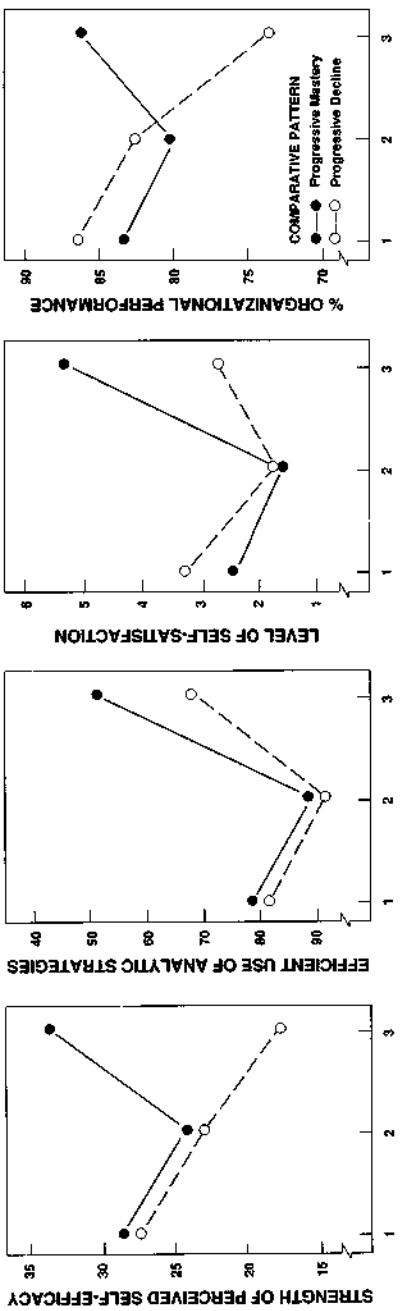


FIGURE 4 Changes in perceived managerial self-efficacy, quality of analytic thinking, and achieved level of organizational performance across blocks of production tasks under comparative appraisal, suggesting progressive mastery or progressive decline relative to a similar comparison group of managers (A. Bandura & Jourden, 1991). From "Self-Regulatory Mechanisms Governing the Impact of Social Comparison on Complex Decision Making" by A. Bandura and F. J. Jourden, 1991, *Journal of Personality and Social Psychology*, 60, p. 946. Copyright 1991 by the American Psychological Association. Reprinted by permission.

of their attainments. Performance feedback that focuses on achieved progress underscores personal capabilities. Feedback that focuses on shortfalls highlights personal deficiencies.

Jourden (1992) examined management of the simulated organization in which the feedback to different individuals was factually equivalent but varied in whether progress or shortfalls were emphasized. For example, if an individual performed at a 75% level of a standard, the positive social feedback highlighted the 75% progress already achieved. The negative feedback highlighted the 25% shortfall. As shown in Figure 5, accenting the gains achieved enhances perceived self-efficacy, aspirations, efficient analytic thinking, self-satisfaction, and performance accomplishments. Highlighting deficiencies undermines self-regulative influences with resulting deterioration of performance.

Learning environments that construe ability as an acquirable skill, deemphasize competitive social comparison, and highlight self-comparison of progress and personal accomplishments are well suited for building a sense of efficacy that promotes academic achievement.

Perceived Controllability

Another important belief system concerns people's views about the extent to which their environment is controllable. There are two aspects to the exercise of control. The first concerns the level and strength of personal efficacy to produce changes by perseverant effort and creative use of capabilities and resources. The second aspect concerns the modifiability of the environment. This facet represents the constraints and opportunities provided by the environment to exercise personal efficacy. People who are plagued by self-doubts anticipate the futility of efforts to modify their life situation. They produce little change even in environments that provide many potential opportunities. But those who have a firm belief in their efficacy, through ingenuity and perseverance, figure out ways of exercising some control, even in environments containing limited opportunities and many constraints.

Our (A. Bandura & Wood, 1989) research underscores the power of perceived controllability of the environment on the self-regulatory factors that govern cognitive functioning. One group of individuals managed our simulated organization with an instilled view that group behavior is not easily influenceable. They quickly lost faith in their capabilities, even when performance standards were within easy reach. They lowered their aspirations, and their group's performance deteriorated (Figure 6).

Other individuals operated with the view that group behavior is amenable to influence. They exhibited a highly resilient self-efficacy, even in the face of numerous difficulties; set themselves increasingly challenging goals; and

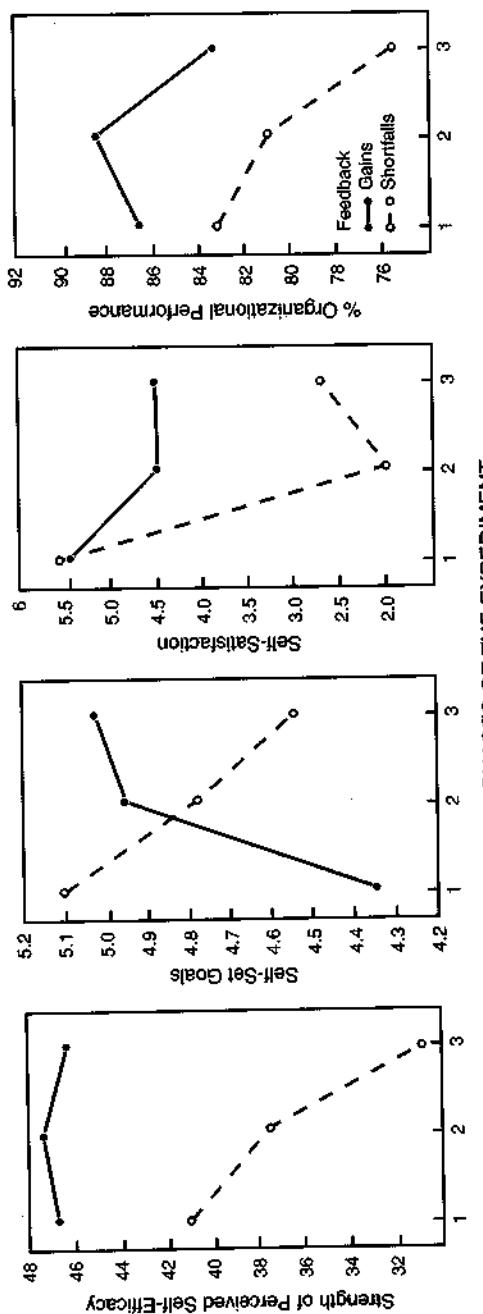


FIGURE 5 Changes in self-regulatory factors and performance attainments depending on whether performance feedback is given as level of progress toward a selected standard (Mastery) or as shortfalls from the standards (Deficit). Plotted from Jourden's (1992) data.

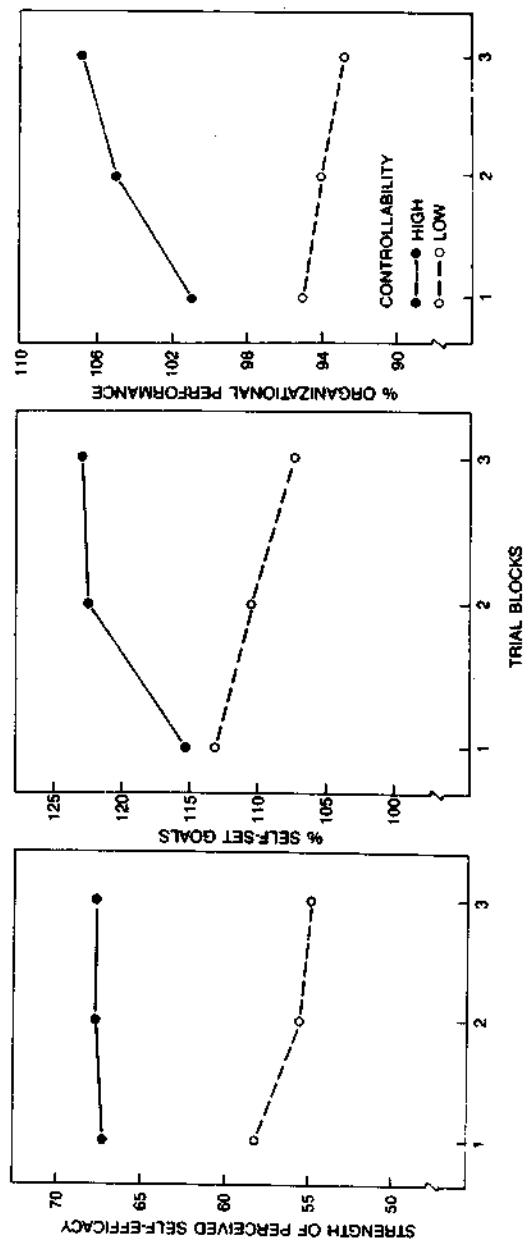


FIGURE 6 Changes in strength of perceived managerial self-efficacy, the performance goals set for the organization, and level of organizational performance for managers who operated under a cognitive set that organizations are controllable or difficult to control. Each trial block comprises six different production tasks (A. Bandura & Wood, 1989). From "Effect of Perceived Controllability and Performance Standards on Self-Regulation of Complex Decision-Making" by A. Bandura and R. Wood, 1989, *Journal of Personality and Social Psychology*, 56, p. 809. Copyright 1989 by the American Psychological Association. Reprinted by permission.

used good analytic thinking. They achieved a high level of group performance.

Casual Structure

Figure 7 summarizes the path analysis of the casual structure in the series of experiments just described. Initially, people relied heavily on their past performance in judging their efficacy and setting their aspirations. But as they began to form a self-schema concerning their efficacy through further experience, their performance attainments were powered more strongly and intricately by their belief in their personal efficacy. Perceived self-efficacy influences performance both directly and through its strong effects on goal setting and analytic thinking. Personal goals, in turn, enhance performance attainments through analytic strategies.

MOTIVATIONAL PROCESSES

Self-beliefs of efficacy play a key role in the self-regulation of motivation (A. Bandura, 1991). Most human motivation is cognitively generated. People motivate themselves and guide their actions anticipatorily by the exercise of forethought. They form beliefs about what they can do. They anticipate likely outcomes of prospective actions. They set goals for themselves and plan courses of action designed to realize valued futures. Forethought is translated into incentives and appropriate action through self-regulatory mechanisms.

One can distinguish three different forms of cognitive motivators around which different theories have been built. These include *casual attributions*, *outcome expectancies*, and *cognized goals*. The corresponding theories are attribution theory, expectancy-value theory, and goal theory, respectively. Figure 8 summarizes schematically these alternative conceptions of cognitive motivation. Self-efficacy beliefs operate in each of these various forms of cognitive motivation. They influence causal attributions. People who regard themselves as highly efficacious ascribe their failures to insufficient effort; those who regard themselves as inefficacious attribute their failures to low ability (Alden, 1986; Collins, 1982; McAuley, Duncan, & McElroy, 1989; Silver, Mitchell, & Gist, 1989). Casual attributions affect motivation, performance, and affective reactions mainly through beliefs of self-efficacy (Chwalisz, Altmaier, & Russell, 1992; McAuley, 1991; Schunk & Gunn, 1986; Schunk & Rice, 1986).

In expectancy-value theory, motivation is governed by the expectation that behavior will produce certain outcomes and the value of those outcomes. But people act on their beliefs about what they can do, as well as

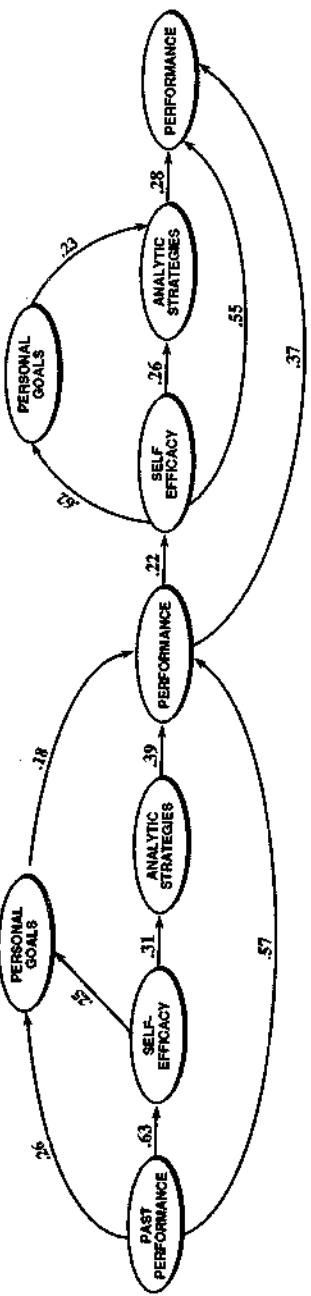


FIGURE 7 Path analysis of causal structures. The numbers on the paths of influence are the standardized path coefficients significant at the .05 level. The network of relations on the left side of the figure are for the initial managerial efforts, and those on the right side are for later managerial efforts (Wood & Bandura, 1989b). From "Social Cognitive Theory of Organizational Management" by R. Wood and A. Bandura, 1989b, *Academy of Management Review*, 14, p. 379. Copyright 1989 by the Academy of Management. Reprinted by permission.

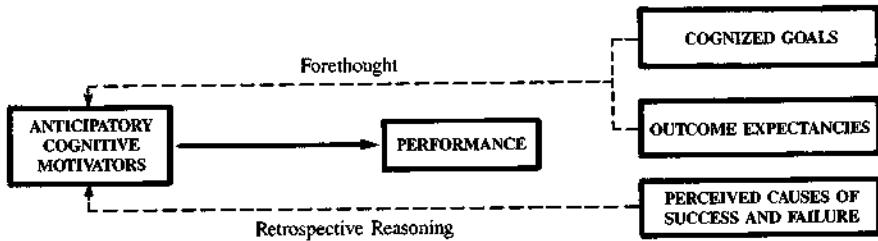


FIGURE 8 Schematic representation of conceptions of cognitive motivation based on cognized goals, outcome expectancies, and causal attributions. From "Perceived Self-Efficacy in the Exercise of Personal Agency" by A. Bandura, 1989, *The Psychologist: Bulletin of the British Psychological Society*, 2, p. 416. Copyright 1989 by the British Psychological Society. Reprinted by permission.

their beliefs about the likely outcomes of performance. The motivating potential of outcome expectancies is thus partly governed by self-beliefs of capability. There are countless attractive options people do not pursue because they judge they lack the capabilities for them. The predictiveness of expectancy-value theory is enhanced by including the self-efficacy determinant (de Vries, Dijkstra, & Kuhlman, 1988; Dzewaltowski, Noble, & Shaw, 1990; Madden, Ellen, & Ajzen, 1992; McCaul, O'Neill, & Glasgow, 1988; Wheeler, 1983).

Cognized Goals

The capacity to exercise self-influence by personal challenge and evaluative reaction to one's own attainments provides a major cognitive mechanism of motivation. Behavior is motivated and guided by cognized goals operating in the present rather than pulled by an unrealized future state. A large body of evidence shows that explicit, challenging goals enhance and sustain motivation (Locke & Latham, 1990). Goals operate largely through self-influence processes rather than regulate motivation and action directly. Motivation based on goal setting involves a cognitive comparison process. By making self-satisfaction conditional on matching adopted goals, people give direction to their behavior and create incentives to persist in their efforts until they fulfill their goals. They seek self-satisfaction from fulfilling valued goals and are prompted to intensify their efforts by discontent with substandard performances.

Self-Reactive Influences

Motivation based on goals or standards is governed by three types of self influences. They include affective reactions to one's performance, perceived

self-efficacy for goal attainment, and readjustment of personal goals based on one's progress. Self-efficacy beliefs contribute to motivation in several ways: They determine the goals people set for themselves, how much effort they expend, how long they persevere in the face of difficulties, and their resilience to failures. When faced with obstacles and failures, people who harbor self-doubts about their capabilities slacken their efforts or give up quickly. Those who have a strong belief in their capabilities exert greater effort when they fail to master the challenge. Strong perseverance usually pays off in performance accomplishments.

The contribution of these three self influences to motivation is shown in a study (A. Bandura & Cervone, 1986) in which the direction and magnitude of discrepancy between performance and a difficult assigned goal were varied. The more sources of self influence individuals brought to bear on themselves, the higher the effort they exerted to attain their goals (Figure 9). Taken together, this set of self influences accounts for the major share of variation in motivation.

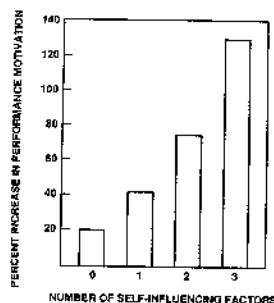
Schunk's (1984) studies of children's academic learning through self-regulated instruction reveal that perceived self-efficacy contributes to development of cognitive skills by two paths of influence (Figure 10). It does so directly and by sustaining perseverant effort in the face of difficulties.

Proactive Control of Motivation

Most theories of motivation and self-regulation are founded on a negative feedback system. In this view, discrepancy between one's perceived performance and an adopted standard motivates action to reduce the disparity. This is the basic motivator in control theory, homeostatic drive theories, and cybernetic models. Reduction of discrepancy between internal schemata and perceived events is also the sole motivating mechanism in Piaget's (1960) theory.

Motivation by negative discrepancy tells only half the story, and by no

FIGURE 9 Mean percentage of change in motivational level as a function of the number of self-reactive influences operating in given individuals. The three self-reactive factors include strong perceived self-efficacy for goal attainment; self-dissatisfaction with substandard performance; and adoption of challenging standards. Plotted from A. Bandura and Cervone's (1986) data.



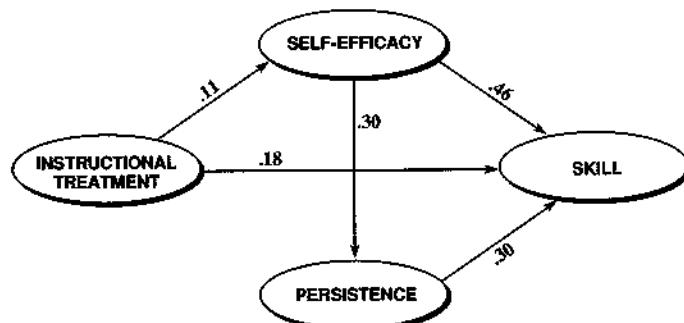


FIGURE 10 Path analysis showing the mediating role of perceived mathematical self-efficacy in the mastery of mathematical competencies (Schunk, 1984). From "Self-Efficacy Perspective on Achievement Behavior" by D. H. Schunk, 1984, *Educational Psychologist*, 19, p. 51. Copyright 1984 by the American Psychological Association. Reprinted by permission.

means is it the more interesting half. In fact, people are proactive, aspiring organisms. Human motivation relies on discrepancy production as well as discrepancy reduction. It requires proactive control as well as reactive feedback control. People motivate and guide their actions through proactive control by setting themselves challenging goals that create a state of disequilibrium. Then they mobilize their skills and effort to accomplish what they seek. After people attain the goal they have been pursuing, those with a strong sense of efficacy set higher goals for themselves. Adopting further challenges creates new motivating discrepancies to be mastered. Self-motivation, thus, involves a dual control process of motivating discrepancy production followed by discrepancy reduction.

AFFECTIVE PROCESSES

People's beliefs in their capabilities affect how much stress and depression they experience in threatening or difficult situations, as well as their level of motivation (A. Bandura, in press). This is the emotional mediator of self-efficacy belief. Perceived efficacy to exercise control over stressors plays a central role in anxiety arousal. People who believe they can exercise control over threats do not conjure up disturbing thought patterns. But those who believe they cannot manage threats experience high anxiety arousal. They dwell on their coping deficiencies. They view many aspects of their environment as fraught with danger. They magnify the severity of possible threats and worry about things that rarely happen. Through such

inefficacious thinking, they distress themselves and impair their level of functioning.

When people try to cope with threats for which they distrust their efficacy, their stress mounts, their heart rate accelerates, their blood pressure rises, they activate stress-related hormones, and they suffer a decline in immune function (A. Bandura, 1988b). After their coping efficacy is strengthened to the maximal level by guided mastery experiences, they handle the same tough situations without being burdened with stress reactions.

Perceived coping self-efficacy regulates avoidance behavior as well as anxiety arousal. The stronger the instilled sense of coping self-efficacy, the bolder people are in taking on taxing and threatening activities (A. Bandura, 1988a). The role of perceived coping efficacy and anxiety in the causal structure of avoidant behavior has been examined in numerous studies. The results show that people base their actions in threatening situations on their coping efficacy rather than on anxiety arousal. Perceived coping efficacy predicts behavior when anticipated anxiety is partialled out. But anticipated anxiety does not predict avoidant behavior when perceived coping self-efficacy is partialled out (Williams, 1992).

Thought Control Efficacy

Stress is affected not only by perceived coping efficacy but by perceived efficacy to control disturbing thoughts. The exercise of control over one's own consciousness is summed up well in the proverb: "You cannot prevent the birds of worry and care from flying over your head. But you can stop them from building a nest in your head." Perceived self-efficacy to control thought processes is a key factor in regulating thought produced stress and depression. It is not the sheer frequency of disturbing thoughts but the perceived inability to turn them off that is the major source of distress (Kent & Gibbons, 1987). Both perceived coping self-efficacy and thought control efficacy operate jointly to reduce anxiety and avoidant behavior (Ozer & A. Bandura, 1990).

Coping Efficacy and Achievement Anxiety

Students who have a low sense of efficacy to manage academic demands are especially vulnerable to achievement anxiety. As Meece, Wigfield, and Eccles (1990) showed, past academic successes and failures arouse anxiety through their effects on perceived self-efficacy. If failures weaken students' sense of efficacy, they become anxious about scholastic demands. But if their perceived efficacy is unshaken by failures, they remain unperturbed. Student's beliefs in their capabilities to master academic subjects predict

their subsequent academic attainments. Their level of scholastic anxiety bears little or no relationship to their academic performances.

These findings carry important implications for how to alleviate scholastic anxiety. It is best reduced not by anxiety palliatives but by building a strong sense of efficacy. This is achieved through development of cognitive capabilities and self-regulative skills for managing academic task demands and self-debilitating thought patterns.

Many teachers find themselves beleaguered day in and day out by disruptive and nonachieving students. Eventually, their low sense of efficacy to fulfill academic demands takes a stressful toll. Teachers who lack a secure sense of instructional efficacy show weak commitment to teaching and spend less time on academic matters. Burnout in academe is not all that uncommon. This graphic metaphor encompasses a syndrome of reactions to chronic occupational stressors that include physical and emotional exhaustion, depersonalization of the people with whom one is working, and feelings of futility concerning personal accomplishments. Chwalisz et al. (1992) provides evidence that teachers with high perceived coping efficacy manage academic stressors by directing their efforts at resolving problems. In contrast, teachers who distrust their efficacy try to avoid dealing with academic problems and, instead, turn their effort inward to relieve their emotional distress. This pattern of withdrawal coping contributes to occupational burnout.

Self-Efficacy and Depression

A low sense of efficacy to exercise control produces depression as well as anxiety. It does so in at least three different ways (A. Bandura, *in press*). One route to depression is through unfulfilled aspiration. People who impose standards of self-worth they cannot attain drive themselves to bouts of depression. A second efficacy route to depression is through a low sense of social efficacy. People who judge themselves to be socially efficacious seek out and cultivate social relationships that provide models on how to manage difficult situations, cushion the adverse effects of chronic stressors, and bring satisfaction to people's lives. Perceived self-efficacy both fosters enlistment of social support and mediates its beneficial effects on psychological well-being and functioning. Much human depression is cognitively generated by dejecting ruminative thought. A low sense of efficacy to exercise control over ruminative thought also contributes to the occurrence, duration, and recurrence of depressive episodes (Kavanagh & Wilson, 1989).

SELECTION PROCESSES

The discussion so far has centered on efficacy-activated processes that enable people to create beneficial environments and to exercise some

control over them. People are partly the product of their environment. Therefore, beliefs of personal efficacy can shape the course lives take by influencing choice of activities and environments. People avoid activities and situations they believe exceed their coping capabilities. But they readily undertake challenging activities and select situations they judge themselves capable of handling. By the choices they make, people cultivate different competencies, interests, and social networks that determine life courses. Any factor that influences choice behavior can profoundly affect the direction of personal development. This is because the social influences operating in selected environments continue to promote certain competencies, values, and interests long after the self-efficacy determination of their choice has rendered its inaugurating effect.

Career choice and development is but one example of the power of self-efficacy beliefs to affect the course of life paths through choice-related processes (Betz & Hackett, 1986; Lent & Hackett, 1987). The stronger people's belief in their efficacy, the more career options they consider possible, the greater the interest they show in them, the better they prepare themselves educationally for different occupations, and the greater their staying power and success in difficult occupational pursuits.

The efficacy-regulated processes reviewed in the preceding sections play a key role in setting the course of intellectual development. They also influence how well preexisting cognitive skills are used in managing the demands of everyday life. There are three principal ways in which perceived efficacy operates as an important contributor to academic development: students' beliefs in their efficacy to regulate their own learning and to master different subject matters, individual teachers' beliefs in their efficacy to motivate and promote learning in their students and staffs' collective sense of efficacy that their schools can accomplish significant academic progress. The influence of these different efficacy belief systems are addressed next.

STUDENTS' COGNITIVE SELF-EFFICACY

Let us first consider students' beliefs in their intellectual and learning efficacy. Schunk (1989) conducted numerous studies in which children who have serious academic deficits pursue self-directed learning of mathematical and language skills. The material is structured for them in easily mastered subskills. The self-directed learning is supplemented with instructional social influences designed to enhance children's sense of academic efficacy. These influences include verbal modeling of cognitive strategies, proximal goal setting, ability and effort attributional feedback, positive incentives, and self-verbalization of task strategies.

The findings show that such instructional programs and the supplemen-

tary social factors build children's beliefs in their intellectual capabilities. The higher their perceived efficacy, the better they perfect their cognitive capabilities. Self-efficacy is influenced by acquisition of skills, but it is not merely a reflection of them. Children with the same level of cognitive skill development differ in their intellectual performance depending on the strength of their perceived self-efficacy.

Self-Efficacy in Self-Regulated Cognitive Development

A major goal of formal education should be to equip students with the intellectual tools, self-beliefs, and self-regulatory capabilities to educate themselves throughout their lifetime. These personal resources enable individuals to gain new knowledge and to cultivate skills either for their own sake or to better their lives. The rapid pace of technological change and accelerated growth of knowledge are placing a premium on capability for self-directed learning.

Metacognitive theorists have addressed the pragmatics of self-regulation in terms of selecting appropriate strategies, testing one's comprehension and state of knowledge, correcting one's deficiencies, and realizing the utility of cognitive strategies. Metacognitive training aids academic learning. However, students do not necessarily transfer the skills spontaneously to dissimilar pursuits. They do not always use the metacognitive skills with regularity. Clearly, there is room for improvement. It is commonly acknowledged that self-directed learning requires motivation as well as cognitive and metacognitive strategies. The motivational facet of self-directed learning encompasses a variety of interlinked self-referent processes including self-monitoring, self-efficacy appraisal, personal goal setting, outcome expectations, and affective self incentives (A. Bandura, 1986, 1991).

Zimmerman (1990) has been the leading exponent of an expanded model of academic self-regulation. In social cognitive theory, people must develop skills in regulating the motivational, affective, and social determinants of their intellectual functioning as well as the cognitive aspects. Zimmerman and Martinez-Pons (1986) showed that good self-regulators do better academically than poor self-regulators.

Self-regulatory skills will not contribute much if students cannot get themselves to apply them persistently in the face of difficulties, stressors, and competing attractions. Firm belief in one's self-regulatory skills provides the staying power. This is confirmed in a recently completed study (Zimmerman, A. Bandura, & Martinez-Pons, 1992). High school students, mainly of minority status, were tested for the perceived self-efficacy to structure environments conducive to learning, to plan and organize their academic activities, to use cognitive strategies to enhance understanding, to

obtain information and get teachers and peers to help them when needed, to motivate themselves to do their school work, to get themselves to complete scholastic assignments within deadlines, and to stick to academic activities when there are more interesting things to do. The higher the students self-regulatory efficacy, the more assured they were in their efficacy to master academic subjects (Figure 11). Perceived efficacy promoted academic achievement both directly and by raising personal goals. The parents aspirations influenced academic achievement only indirectly through their effects on their children's personal goals. It is not enough for parents simply to set academic standards for their children. Unless parents also build their children's sense of efficacy, they are likely to view high standards as beyond their reach and disregard them.

Cognitive development and functioning depends heavily on writing literacy. All too often promising ideas are mangled, if not massacred, by a deadening impenetrable prose. Research on the development of writing proficiency clarifies how perceived self-efficacy operates in concert with other self-regulatory factors in the mastery of this important skill (Zimmerman & A. Bandura, 1992). Enhancement of perceived writing efficacy by instruction raises, through different paths of influence, perceived self-efficacy for academic activities, personal standards for the quality of writing considered self-satisfying, and academic goals and attainments. Whereas verbal aptitude affects academic attainments only indirectly by raising personal standards of writing, the increased sense of academic efficacy promotes academic attainments both directly and by heightening aspirations.

Impact of Cognitive Self-Efficacy on Developmental Trajectories

Children's intellectual development cannot be isolated from the social relations within which it is imbedded or from its social consequences. It

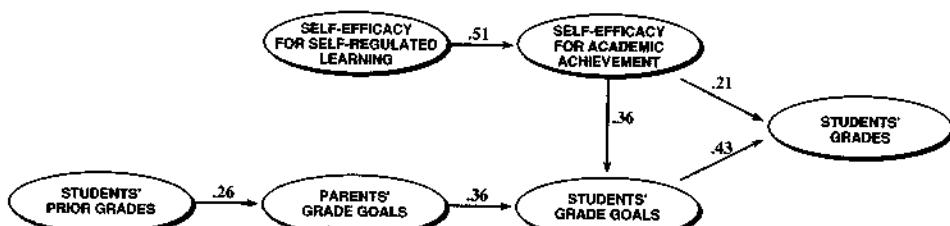


FIGURE 11 Path model of the influence of perceived self-efficacy and parental and children's goal setting on academic achievement (Zimmerman et al., 1992). From "Self-Motivation for Academic Attainment: The Role of Self-Efficacy Beliefs and Personal Goal-Setting" by B. J. Zimmerman, A. Bandura, and M. Martinez-Pons, 1992, *American Educational Research Journal*, 29, p. 671. Copyright 1992 by the American Educational Research Association. Reprinted by permission.

must be analyzed from a sociocultural perspective. The broader developmental impact of perceived cognitive efficacy is revealed in a large-scale developmental project (Caprara, Pastorelli, & A. Bandura, 1992). Children's perceived self-efficacy was measured across a variety of domains including efficacy for self-regulated learning and mastery of different academic subject matters; efficacy to form and maintain social relationships; efficacy to resist peer pressures to engage in high risk behavior such as alcohol, drugs, and unprotected sex; and perceived self-efficacy to meet personal and social expectations. A principal components analysis of these different facets of self-efficacy yielded three factors: Perceived Self-Regulatory, Academic, and Social Efficacy. These forms of perceived self-efficacy were related to different patterns of interpersonal and emotional behavior.

The findings show that children who have a high sense of academic and self-regulative efficacy behave more prosocially, are more popular, and experience less rejection by their peers than do children who believe they lack these forms of academic efficacy (Table 1). Moreover, a low sense of academic and self-regulatory efficacy is associated with emotional irascibility, physical and verbal aggression, and ready disengagement of moral self-sanctions from harmful conduct. The impact of children's disbelief in their academic efficacy on socially discordant behavior becomes stronger as they grow older.

The relationship of perceived social efficacy to social and emotional behavior changes with age. For the younger children, perceived social self-efficacy bore no relationship to emotional and interpersonal patterns of behavior, whereas the academic forms of self-efficacy did. However, for the older children, their social and emotional behavior was related to their perceived social efficacy as well as to their perceived academic and self-regulatory efficacy. The adverse social and emotional effects of a low sense of cognitive efficacy are understandable. It is difficult for children to remain prosocially oriented and retain their emotional well-being in the face of repeated scholastic failures and snubbing by peers that erode their sense of intellectual efficacy. Peer affiliations promote different developmental courses depending on the types of values, standards of conduct, and lifestyles that are modeled and sanctioned by those with whom one regularly associates. Young children have neither had the time and consolidating experiences to develop their styles of behavior to the point where they differ greatly in conventionality, nor are their peer groupings firmly set. In adolescence, peer groups become more differentiated and influential. The activities in which they engage have greater potential to alter the future direction of personal development. Students who doubt their social as well as their intellectual efficacy are likely to gravitate to peers who do not subscribe to academic values and lifestyles. Over time, growing self-doubts

TABLE 1
Relationship of Various Facets of Perceived Self-Efficacy to
Social and Emotional Behavior

<i>Social and Emotional Behavior</i>	<i>Domains of Self-Efficacy</i>		
	<i>Social</i>	<i>Self-Regulatory</i>	<i>Academic</i>
Elementary School Children			
Self-ratings			
Prosocial behavior	.07	.20**	.39****
Emotional irascibility	.08	.08	-.19**
Physical and verbal aggression	.04	.02	-.18**
Moral disengagement	.01	-.21***	-.16**
Teacher ratings			
Prosocial behavior	.13*	.21**	.18**
Emotional irascibility	-.07	-.15*	-.20**
Physical and verbal aggression	-.01	-.04	-.17*
Peer ratings			
Prosocial behavior	-.07	.20**	.34****
Emotional irascibility	.01	-.08	-.14*
Physical and verbal aggression	.03	-.01	-.06
Popularity	-.01	.25****	.27****
Rejection	-.01	-.12*	-.16**
Junior High School Children			
Self-ratings			
Prosocial behavior	.37****	.42****	.30****
Emotional irascibility	-.15*	-.01	-.25***
Physical and verbal aggression	-.16*	-.13*	-.30****
Valuation of aggression	-.15*	-.17*	-.20*
Moral disengagement	-.26****	-.27****	-.37****

* $p < .05$. ** $p < .01$. *** $p < .001$. **** $p < .0001$.

in cognitive competencies foreclose many occupational life courses, if not prosocial life paths. In these different ways, self-beliefs of cognitive self-efficacy can have reverberating effects on developmental trajectories well beyond the academic domain.

Sociocognitive Instructional Strategies

Sociocognitive theory advocates a multifaceted approach to promoting cognitive development. Ability is construed as a changeable attribute over which one can exercise some control. Guided mastery serves as the principal vehicle for the cultivation of competencies (A. Bandura, 1986). In this approach, cognitive modeling and instructive aids are used to convey relevant knowledge and strategies in graduated steps. Diverse opportunities are provided for guided practice in when and how to use cognitive strategies

in the solution of diverse problems. Activities, incentives, and personal challenges are structured in ways that ensure self-involving motivation and continual improvement. Instructive aids are progressively reduced as children's competencies are expanded. Self-directed mastery experiences are then arranged to strengthen and generalize the sense of personal efficacy. Each of these modes of influence is structured in ways that strengthen students' self-beliefs that they have what it takes to exercise control over their self-development.

TEACHERS' SELF-EFFICACY

The task of creating environments conducive to learning rests heavily on the talents and self-efficacy of teachers. Evidence indicates that classroom atmospheres are partly determined by teachers' beliefs in their instructional efficacy. Gibson and Dembo (1984) found that teachers who have a high sense of instructional efficacy devote more classroom time to academic learning, provide students who have difficulty learning with the help they need to succeed, and praise them for their accomplishments. In contrast, teachers who have a low sense of instructional efficacy spend more time on nonacademic pastimes, readily give up on students if they do not get quick results, and criticize them for their failures. Thus, teachers who believe strongly in their instructional efficacy create mastery experiences for their students. Those beset by self-doubts construct classroom environments that are likely to undermine students' sense of efficacy and cognitive development.

As Woolfolk and Hoy (1990) reported, teachers' sense of personal efficacy affects their general orientation toward the educational process as well as their specific instructional practices. Those who have a low sense of instructional efficacy favor a custodial orientation that relies heavily on extrinsic inducements and negative sanctions to get students to study. Teachers who believe strongly in their instructional efficacy support development of students' intrinsic interests and academic self-directedness. Ashton and Webb (1986) documented the cumulative impact of teachers' instructional self-efficacy on students' academic achievement. Teachers' beliefs concerning their efficacy predict students' level of mathematical and language achievement over the course of the academic year, with variations in students' entering ability statistically controlled.

COLLECTIVE SCHOOL EFFICACY

The preceding studies shed some light on how teachers' perceived self-efficacy affects the quality of instructional transactions and rate of

academic progress in individual classrooms. Teachers operate collectively within an interactive social system rather than as isolates. The belief systems of staffs create school cultures that can have vitalizing or demoralizing effects on how well schools function as a social system (Brookover, Beady, Flood, Schweitzer, & Wisenbaker, 1979; Good & Brophy, 1986; Purkey & Smith, 1983; Rutter, Maughan, Mortimore, Ouston, & Smith, 1979). The quality of leadership is also an important contributor to the development and maintenance of effective schools. Strong principals excel in their ability to get their staff to work together with a strong sense of purpose and to believe in their capabilities to surmount obstacles to educational attainments. Schools in which the staff collectively judge themselves as powerless to get students to achieve academic success convey a group sense of academic futility that can pervade the entire life of the school. School staff members who collectively judge themselves capable of promoting academic success imbue their schools with a positive atmosphere for development.

We have been conducting research on how collective school efficacy contributes to school-level achievement. Schools are the unit of analysis. There are two approaches to evaluating how collective efficacy affects organizational performance. In one approach, teachers' beliefs in their efficacy to promote academic learning in their own classrooms are aggregated for a given school. In the second approach, teachers' beliefs in their schools' capability as a whole are aggregated.

In activities requiring low system interdependence, members of the group need to coordinate their efforts, but the system's level of attainment is the sum total of the outcomes produced independently. In endeavors requiring high system interdependence, members must work jointly to achieve group outcomes. School systems rank at an intermediate level of interdependence. Although the level of academic progress achieved by a school largely reflects the summed contributions of teachers in their individual classrooms, schools involve organizational interdependencies that contribute to teachers' collective sense of efficacy.

Teachers' perceived collective efficacy changes markedly across grade levels (Figure 12). They express a low sense of efficacy to promote learning in students at the entry level. Because scholastic demands are minimal at entry, the low sense of instructional efficacy may partly reflect the perceived unpreparedness of the children for classroom instruction. In the early grades, when students are better acclimatized to school routines and academic demands are not too rigorous, teachers express a stronger sense that their school can educate their students. However, in succeeding grades, when the complexities of academic demands increase and scholastic deficits become increasingly salient, teachers view their schools as declining in instructional efficacy.

The demoralizing decline in staffs' beliefs in their schools instructional

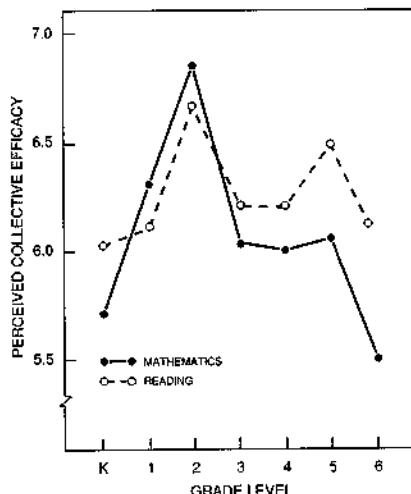


FIGURE 12 Changes in teachers' perceived collective efficacy to promote mathematical and reading competencies across different grade levels.

efficacy takes on special significance from evidence that teachers' perceived self-efficacy affects how well students manage school transitions (Midgley, Feldlaufer, & Eccles, 1989). Students who end up being taught by teachers with a low sense of efficacy suffer losses in perceived self-efficacy and performance expectations in the transition from elementary school to junior high school. This is particularly true for students who have a low opinion of their academic capabilities. Students self-doubts become even more severe if the teachers to whom they transfer harbor self-doubts about their capabilities to promote academic attainments.

To evaluate the role of perceived collective efficacy in how well schools perform, the pattern of hypothesized influences among factorially verified indices of teacher and student body characteristics, collective efficacy, and prior level of school achievement were tested by path analysis. Figure 13 shows the causal structure of the factors measured at the beginning of the academic year and school-level achievement in reading and mathematics at the end of the academic year. Adverse characteristics of student body populations reflecting largely socioeconomic disadvantage erode schools' sense of instructional efficacy. Thus, the higher the proportion of students from low socioeconomic levels and the higher the student turnover and absenteeism, the weaker the staffs' beliefs in their efficacy to achieve academic progress and the poorer the schools fare academically. Student body characteristics reflecting low racial composition and ethnic diversity are weakly linked to schools' prior achievements but have no direct influence on schools' collective sense of efficacy or on subsequent achievements. Longevity in teaching represents the total number of years teaching, years teaching in the same school and same grade, and the number of

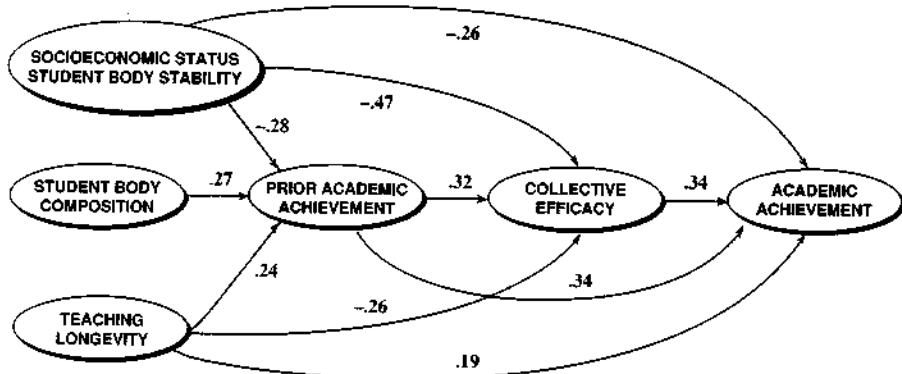


FIGURE 13 Path analysis showing the role of perceived collective efficacy in the causal structure of school-level achievement in reading and mathematics.

different grades taught. Teaching longevity has a small, positive effect on school achievement; but, interestingly, it also seems to create in teachers a jaundiced view of their schools' collective instructional efficacy. Staffs' collective sense of efficacy that they can promote high levels of academic progress contributes significantly to their schools' level of academic achievement.

Adverse student body characteristics influence schools' academic attainments more strongly by altering faculties' beliefs about their collective efficacy to motivate and educate their students than through direct effects on school achievement. Indeed, with staffs who firmly believe that, by their determined efforts, students are motivatable and teachable whatever their background, schools heavily populated with minority students of low socioeconomic status achieve at the highest percentile ranks based on national norms of language and mathematical competencies.

Parental Self-Efficacy and School Involvement

The family plays a key role in their children's success in school. Parents contribute to their children's intellectual growth in a variety of ways. They prepare their children for school, place a value on education, convey belief in their children's scholastic ability, encourage language development and comprehension through reading, set standards for them, establish regular homework habits, help them with their school work at home, keep track of their academic progress, reward their efforts, support school-related functions, assist with school activities, and participate in school governance or community advocacy groups for school improvement (Epstein, 1990). Some of the efforts to increase the effectiveness of schools are, therefore, aimed

at reestablishing connectedness between home, school, and the larger community. Self-efficacious parents regard education as a shared responsibility. The higher their sense of efficacy to instruct their children, the more they guide their children's learning and participate actively in the life of the school (Hoover-Dempsey, Bassler, & Brissie, *in press*). In contrast, parents who doubt their efficacy to help their children learn turn over their children's education entirely to teachers.

There is some evidence to suggest that teachers' sense of efficacy partly determines the level of parental participation in their children's scholastic activities (Hoover-Dempsey, Bassler, & Brissie, 1987). Self-efficacious teachers increase parents' ability to help their children learn. The resultant scholastic progress and parental support of school activities, in turn, raise teachers' sense of instructional efficacy. Because of the centrality of familial influence on children's scholastic success, the contribution of perceived efficacy to parental involvement in educational activities is of considerable import. This line of research further illustrates the need to broaden our view of the educational enterprise.

SUMMARY REMARKS

The substantial body of research on the diverse effects of perceived personal efficacy can be summarized as follows. People who have a low sense of efficacy in a given domain shy away from difficult tasks, which they perceive as personal threats. They have low aspirations and weak commitment to the goals they choose to pursue. They maintain a self-diagnostic focus rather than concentrate on how to perform successfully. When faced with difficult tasks, they dwell on their personal deficiencies, on the obstacles they will encounter, and on all kinds of adverse outcomes. They slacken their efforts and give up quickly in the face of difficulties. They are slow to recover their sense of efficacy following failure or setbacks. Because they diagnose insufficient performance as deficient aptitude, it does not require much failure for them to lose faith in their capabilities. They fall easy victim to stress and depression.

A strong sense of efficacy enhances personal accomplishment in many ways. People with high efficacy approach difficult tasks as challenges to be mastered rather than as threats to be avoided. Such an efficacious outlook fosters interest and deep engrossment in activities. They set themselves challenging goals and maintain strong commitment to them. They maintain a task-diagnostic focus that guides effective performance. They heighten and sustain their efforts in the face of failure. They attribute failure to insufficient effort or deficient knowledge and skills that are acquirable. They quickly recover their sense of efficacy after failures or setbacks. They

approach threatening situations with assurance that they can exercise control over them. Such an efficacious outlook produces personal accomplishments, reduces stress, and lowers vulnerability to depression.

The multiple benefits of a sense of personal efficacy do not arise simply from the incantation of capability. Saying something should not be confused with believing it to be so. Simply saying that one is capable is not necessarily self-convincing. Self-efficacy beliefs are the product of a complex process of self-persuasion that relies on cognitive processing of diverse sources of efficacy information conveyed enactively, vicariously, socially, and physiologically (A. Bandura, 1986). Once formed, efficacy beliefs contribute significantly to the level and quality of human functioning.

ACKNOWLEDGMENTS

This article was presented as an invited address at the annual meeting of the American Educational Research Association, San Francisco, April 1992. Some of the research projects reported in this article were supported by a grant from the Spencer Foundation.

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ONTOLOGICAL AND EPISTEMOLOGICAL TERRAINS REVISITED

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Summary — The present commentary discusses the scientific legitimacy of theories confined to correlations of observables and those that specify the mechanisms governing the relations between observable events. Operant analysts frame the theoretical differences misleadingly when the operant approach is portrayed as addressing environmental influence for effecting change but cognitive approaches are depicted as disembodied from environmental influences and thus can only provide correlates with action. In point of fact, both approaches encompass environmental influences. The major issues in contention are whether human thinking is entirely or only partially shaped by environmental influences; whether the influences in the person-environment relation flow unidirectionally or bidirectionally; and whether human thought serves a determinative function or is a functionless epiphenomenon. Proponents of epiphenomenalism regard other people's thinking as functionless by-products of conditioned responses, but present their own thoughts on matters as the right ones that provide functional guides for structuring interventions. This commentary discusses the self-negating nature of the epiphenomenalism argument. It also corrects misunderstandings and misrepresentations of self-efficacy theory. Copyright © 1996 Elsevier Science Ltd

It is a common practice for behaviorists to proclaim that the only legitimate scientific enterprise is one that links directly observable events. This position fails to recognize that scientific advances are promoted by two kinds of theories. One form seeks to identify relations between directly observable events but shies away from the underlying mechanisms governing the observable phenomena. The second form seeks to elucidate the mechanisms that explain the relations between observable events. In commenting on the issue of observability in scientific inquiry, Nagel (1961) explains that some of the most comprehensive theories of the natural sciences are not about factors that are "observable." Physicists, for example, have done remarkably well with atomic theory even though atoms are not given to direct public view. Several of the commentators in the previous special issue (Reyna, 1995) address the structure and the scientific legitimacy of the two types of theories (Corrigan, 1995; Dougher, 1995;

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Spaulding, 1995). I do not harbor any illusions that the exchanges on this topic will produce any conversions to alternative epistemologies. But if they help to temper the behavioristic stance that there is only one legitimate type of scientific inquiry and anyone who does not conform to it is trading in fictions, the exchanges may have served some purpose. The factors posited by sociocognitive theories have been shown to possess explanatory, predictive and operative value. Such achievements are not realizable with fictions.

A commentator once remarked colorfully that a human being is not a sack of potatoes. Humans have evolved an extraordinary capacity for thought. This remarkable capability for symbolization provides humans with a powerful tool for comprehending their environment and for creating and regulating environmental conditions that touch virtually every aspect of their lives. Thoughts have existence that is not publically observable, but they have indicants through which they can be known indirectly. People can tell you what they are thinking—how they are construing events, the value they place on them, their action plans and strategies, their outcome expectations, their aspirations and self-evaluative standards, their self-appraisals, and how they give structure, meaning and continuity to their life experiences. These indicants of thought are separate from the behavior to be explained.

Data provided by verbal probes yield functional dependencies between indirectly assessed thoughts and subsequent behavior (Bandura, 1986; Dulany, 1968; Ericsson & Simon, 1980). Indeed, innumerable studies have shown that people's reported thoughts about outcome contingencies are better predictors of behavior change than sheer frequency of reinforcement (Brewer, 1974; Farber, 1963; Gholson, 1980; Spielberger & DeNike, 1966). In these studies, reinforcement produces little change until the individuals figure out what the experimenter wants them to do, whereupon they respond either dutifully, desultorily, or oppositionally (Farber, 1963). These early studies demonstrated that thought mediates the effects of response consequences. Cognitive theorists moved beyond these simple performances to alter complex levels of human functioning. To cite but one example, they built successful expert systems for decision making in diverse pursuits based on structural and process models of reasoning (Feigenbaum, 1977; Shortliffe, Buchanan & Feigenbaum, 1979). They did so by drawing on the concurrent reports of the thought processes of experts as they go about analyzing and generating appropriate solutions to problems in complex work environments. The volume by Ericsson and Simon (1994) documents how understanding the functional value of cognition can be advanced by treating thought processes and thought probes creatively rather than dismissively. The power of human thought has been vastly enhanced by combining inventive thinking with computer technology in cognitively-guided productions. People are now freed from costly and time consuming physical enactments by designing, testing and refining electronically whatever they seek to create.

Operant analysts tell us that Skinner does not deny private events. To say that one recognizes private events is to make a trivial statement. A sentient human being would have to be in a comatose state not to recognize internal events. The issue in contention is not whether private events exist but the functional properties they have in conceptual schemes. Operant analysts frame the causality issue as a linear chain with the cognitive system serving as a redundant link devoid of any generative, creative, proactive or other determinative properties. Environmental events are said to produce the internal events but they are only linking proxies for the environmental inputs. People are merely repositories for past stimulus inputs and conduits for external stimulation but they can add nothing to their performance. Through conceptual juggling, the determinants of human action are regressed to an "initiating cause" located in the environment, thus rendering human thought completely redundant.

The cognitive bypass in the linear chaining rests on two premises: thought is completely shaped by past stimulus inputs and the individual adds nothing to it; thinking is not a functional activity with any generative or determinative properties. In short, human thought is claimed to be entirely externally implanted and acausal. It comes as no surprise that, in the exteriorization of cognitive regulation, Catania (1995) selected a fixed arithmetic rule that is applied mechanically to produce the identical outcome each time. Most human transactions cannot be managed in such a rigid manner. Life would be incredibly dull if it could. Because of the complexity and changeability of environmental conditions, people can be taught general guides of action but they have to assess situational demands, make decisions about suitable courses of action under given circumstances, appraise their capabilities to execute them, and give thought to possible outcomes of the options they consider. Thought is obviously partly influenced by experience, but thought is not completely shaped by past stimulus inputs. The limitations of regression to sole environmental authorship is strikingly evident in the creative nature of human endeavors. Try regressing Bach's prodigious creativity to an "initiating cause" such as his technical instruction in music.

In the operant view, to find the laws of human behavior one needs only to correlate observable environment with observable behavior. But there is a nettling problem with this conceptual scheme. Human behavior does not covary all that well with situational events. People are often unresponsive to situational cues and unaffected by the consequences of their actions. Therefore, operant analysts had to look elsewhere for a better explanation of human behavior. The explanatory burden fell increasingly on determinants inside the organism, namely the implanted history of reinforcement. Behavior was conceptualized as controlled by external stimulation acting together with the implanted organismic state. The $S^d \rightarrow R \rightarrow S^r$ model thus grew into the mediational $S^d \rightarrow O \rightarrow R \rightarrow S^r$ model with the accumulated environmental history residing in the mediating O . Like other internal determinants, ontogenetic history is neither observable nor directly accessible. Operant analysts extol the nonobservables they like, but decry those posited in other theories. The commentaries in this journal would lead one to believe that the dispute over internal determinants is exclusively between behaviorists and cognitivists. In point of fact, there is a growing rift among operant analysts about the shift of emphasis within their own conceptual framework from models of environment-based control to organism-based control (Machado, 1993). In short, operant analysts are deep into internal determinants. One can expect more fissures in this conceptual terrain as operant analysts increasingly acknowledge the influential role of organism-based control in human adaptation and change.

The operant analytic position on internal events is difficult to pin down because the characterizations vary widely. Internal events are alternatively depicted as explanatory fictions, as epiphenomenal by-products of conditioned responses, or as acausal conduits in the chain of events. Catania (1995) portrays internal events as intermediate causes. He is very much of a cognitivist in his example of a person performing mental calculations to solve multiplication problems. In acknowledging cognitive activities generating solutions that guide actions, Catania assigns causal properties to cognitions but then promptly demotes them by environmental regression. They are simply internal proxies for external inputs. To grant thought generative and determinative functional properties is, in Catania's view, to embrace "creationism." Let us consider the issue of creativity.

In his analysis of creativity, Skinner (1972) maintained that, in creating poems, poets add nothing to the product. They are merely the receptacle where external input and internalized history generate those novel poems. In his lecture on "having" a poem, Skinner (1972) argued

that producing a poem is no different in creative achievement from a hen laying an egg. Neither the struggling poet nor the dutiful hen is originating anything. The creations are merely the products of external stimuli acting on the implanted vestiges of the past. The host poets, who bask in undeserved glory, *undergo* poems rather than *construct* them. In applying this non-agentic view to their own commentaries, proponents would have to acknowledge that they are not originating anything. They are simply a locus undergoing an article through the auspices of the history of reinforcement prompted externally. Conceptual commentaries thus become contests of evoked conditioned histories.

Unlike the dependable hens, which are genetically programmed to deposit the same type of egg day in and day out wherever they may be, each of the creative eggs laid by the Bachs, Shakespeares, Picassos and the Beatles are strikingly different from each other. Efforts to define creativity out of existence by analogy to inborn bodily functions performed mechanically and invariantly can hardly be taken seriously. Bach's magnificent masterpieces, which fill 60 volumes of prolific originality, are not completely reducible to his prior instruction in the mechanics of musical composition, his predecessors' musical works and a catalogue of stimulus inputs. Since Bach was not genetically endowed with fully orchestrated Brandenburg concertos, from which repository did the environmental reinforcers select these artistic creations? Reinforcement cannot select what is nonexistent in a repertoire. One can, of course, create simple new responses by waiting around for random variations to produce some approximate elements to reward. But how did environmental selection write those several hundred church cantatas within a relatively short period? Given Bach's prolific output it would take countless lifetimes to shape up such artistic creations by selective reinforcement of random variations, if it could be achieved at all by this slow laborious process. Indeed, it took 10 editors more than 50 years just to assemble everything Bach had composed covering virtually every field of musical writing. Although human ingenuity incorporates some aspects of past experience, innovators transform it, add novel features to it and thereby create something new that is not just a conglomerate or replica of the past. People act upon the environment just as the environment acts upon them. Through this transactional process they produce things that did not previously exist. Transactional models involving two-way causation have largely replaced one-sided behavioristic models in which autonomous environmental forces select responses from a host organism reacting thoughtlessly. (We shall return to the generative quality of human thought in evaluating behavioristic efforts at environmental regression of self-efficacy judgment.)

The implanted history now occupies a central role in the operant analytic scheme. But the nature and mode of operation of this nonobservable determinant are shrouded in ambiguity. The vast research on attentional, perceptual, representational and memorial processes indicates that what is internalized is not isomorphic with the information conveyed by external occurrences. Personal biases influence what is attended to and how the events given salience are construed, as revealed in experiments demonstrating that believing is seeing. The extracted information is further altered as it is transformed and organized for memory representation. People operate as partial authors not only of their past experiences but of their memory of them as well. The retrieved history is a reconstruction rather than a faithful reproduction. In accord with a transactional model of causation, humans help to make their own history through idiosyncratic construal, selection and construction of environments rather than have it simply implanted in them by autonomous environmental forces (Bandura, 1986; Neisser, 1976; Nisbett & Ross, 1980; Snyder, 1981). It is cognitively-oriented research that is contributing most to the understanding of ontogenetic history--how events are perceived, how the personally edited

information is coded for memory representation, how it is reactivated and acted upon by cognitive operations to guide human judgment and action.

The lack of one-to-one correspondence between external inputs and ontogenetic history underscores the need for a methodology to assess the nature of personal histories. Having introduced into their conceptual scheme an organismic factor that is hidden from the senses, operant analysts have to explain how it works. Is the implanted history merely an acausal predictor of behavior or does it operate determinatively? If it is given determinative properties, how do operant analysts exempt it from the regress argument that, if external events influence organismic history, it is a redundant reflector of them? But whatever it is, and however the history operates, operant analysts had better tell us how to assess it in humans so that their claims about its origins, nature and functions can be empirically tested.

Dougher (1995), commenting from an operant perspective, attributes different functional properties to the alternative types of theories described earlier. Those that specify mechanisms linking observables presumably can only predict, whereas the ones that link observables without knowing the processes through which effects are produced serve both prediction and control. The latter theories are said to be pragmatic; the former are predictive. Dougher does not explain why a good model of how inputs affect outcomes strips a theory of any operative power. Knowing how things work has not disabled theories positing explanatory mechanisms in the natural sciences. Quite the contrary. Physicists built bombs of massive destruction based on theories about release of immense energy by the splitting of an atomic nucleus which is unobservable. Knowledge of how things work substantially aids both prediction and change. Consider an example in the motivational realm. Lee, Locke and Phan (in press) report that people paid on an hourly, bonus, or piece-rate basis differ widely in their performances under the same monetary incentive system even after level of ability is controlled. They find that people's efficacy beliefs and the goals they set for themselves account for the subsequent performance variability. The stronger the people's perceived efficacy for high attainments the higher the personal goals they set and the more they accomplish. Such findings indicate that, in this particular pursuit, human performance can be better explained, predicted and raised by enhancing efficacy beliefs and aspiration along with incentive inducements than by restrictive allegiance to incentives alone. Post hoc attributions of performance variability to unknown phylogenetic and ontogenetic histories is an explanatory refuge that offers little for prediction or control.

There is nothing in the logic or substance of theories specifying mechanisms accounting for the covariation between observables that deprives them of any value to guide interventions. Such theories are not seeking predictive correspondence just for correspondence sake. Predictive verification of a theory has programmatic payoffs. Indeed, as is often said, there is nothing more practical than a good theory. Theories about explanatory mechanisms specify how manipulatable events should be structured to produce desired effects. For example, knowledge of the cognitive subfunctions mediating observational learning informs the construction and implementation of modeling influences in programs of personal and social change (Bandura, 1986). Similarly, self-efficacy theory presents a network of functional dependencies that provides the basis for structuring interventions (Bandura, 1997). It specifies in considerable detail the diverse sources of efficacy beliefs and how these multiple influences must be orchestrated to promote a resilient sense of efficacy. The fact that structured events contribute to the formation of efficacy beliefs does not mean that the environment is the sole cause. People act on the environment in ways that make them partial authors of their self beliefs. Because of the bidirectionality of influence, efficacy beliefs are formed through the

codetermination of personal and environmental influences acting together. Regression of causation solely to the environmental contribution fails to recognize the dynamic interplay between personal, behavioral and environmental influences in the multicausality.

As previously noted, operant analysts contend that the operant approach addresses environmental influences for effecting change, whereas the cognitive approach is disembodied from environmental influences and can only provide correlates with action. This portrayal not only frames the differences misleadingly but is contradicted by the extensive successful applications of sociocognitive principles for personal and social change (Bandura, 1986, 1988, 1992; Maddux, 1995; Schwarzer, 1992). In point of fact, both approaches encompass environmental influences, although social cognitive theory favors a wider range of influences (Bandura, 1986). The main issues in contention, as discussed in preceding sections, are whether human thinking is entirely or only partially shaped by environmental influences; whether the influences in the person-environment relation flow unidirectionally or bidirectionally; and whether human thought serves a determinative function or is a functionless epiphenomenon.

Self-efficacy theory further specifies the cognitive, motivational and affective processes through which efficacy beliefs regulate human action. Beliefs of personal efficacy are not simply inert predictors of future performance. People act on their efficacy beliefs in ways that bring about those performances. Those who strongly believe that they can produce desired effects by their actions approach difficult tasks as challenges to be mastered rather than as threats to be avoided. They set themselves challenging goals and maintain strong commitment to them. They heighten and sustain their efforts in the face of failure. They quickly recover their sense of efficacy after failures or setbacks. They attribute failure to insufficient effort or deficient knowledge and skills which are acquirable. They approach threatening situations with assurance that they can exercise control over them. Such an efficacious outlook produces personal accomplishments, reduces stress and lowers vulnerability to depression.

In contrast, people who doubt their capabilities shy away from difficult tasks, which they view as personal threats. They have low aspirations and weak commitment to the goals they choose to pursue. When faced with difficult tasks, they dwell on their personal deficiencies, on the obstacles they will encounter, and all kinds of adverse outcomes rather than concentrate on how to perform successfully. They slacken their efforts and give up quickly in the face of difficulties. They are slow to recover their sense of efficacy following failure or setbacks. Because they view insufficient performance as deficient aptitude it does not require much failure for them to lose faith in their capabilities. They fall easy victim to stress and depression. In sum, people are active producers rather than merely passive foretellers of their performances.

The behavior analytic approach to social modeling is rooted in the three-component contingency, $S^d \rightarrow R \rightarrow S^r$. Catania (1995) explains that this arrangement builds higher-order behavior classes rather than just increasing the rates of individually reinforced responses. He cites generalized imitation as an excellent case in point. Observational learning poses interesting challenges for this type of explanation. Observers do not perform any matching behavior in the setting in which it is modeled, neither the model nor the observers are reinforced, and whatever responses acquired through observation are first performed days, weeks, or months later. Under this set of conditions, which represents the pervasive form of observational learning, two of the elements ($R \rightarrow S^r$) in the three-component contingency are absent during acquisition, and the third element (S^d , the modeling cue) is absent from the situation in which the observationally learned behavior was first performed.

Operant analysts searched for a reinforcer that governed modeling phenomena. They did so within a mimicry paradigm in which a model demonstrates responses one at a time, tells

children to imitate them and rewards each correct imitation. After a while, children imitate nonrewarded responses as long as imitation of some of the modeled responses is rewarded. These findings were taken as evidence that reinforcement creates a generalized behavior class of social matching, that response similarity had become a conditioned reinforcer, and that nonreinforced imitations were maintained by conditioned reinforcement.

Humans are not mindless vessels implanted by reinforcers with generalized behavior classes. Close empirical scrutiny of prompted mimicry under these situational conditions demonstrated that nonreinforced imitations represented a simple failure in discrimination (Bandura & Barab, 1971). Children faithfully imitate the behavior of a female model when rewarded for doing so but quickly ignore the behavior of a male model when it brings them no rewards. When the discriminability of the rewarded modeled behavior is varied, children dutifully imitate rewarded motor responses, cease imitating discriminable nonrewarded verbal responses, but imitate motor responses that have no features that made them easily discriminable from the other rewarded motor responses.

A host of other studies, extensively reviewed elsewhere (Bandura, 1986), consistently demonstrate that whether or not children exhibit nonreinforced imitations is a matter of discrimination not conditioned reinforcement. The selective imitation is based on model characteristic, behavior typographies and contextual cues predictive of response outcomes. The mimicry paradigm is, of course, heavily infused with social demands for mimicry. Past experiences teach children that it is prudent to do what adults command them to do. Some children who discriminate the differential payoffs associated with different categories of modeled behaviors, nevertheless continue to imitate nonreinforced ones because of the coercive demands. As would be expected, nonreinforced imitations quickly cease when the social pressure for mimicry is removed. So much for imitation as a generalized behavior class supported by similarity as a conditioned reinforcer.

Treating humans as thinking organisms enables researchers to gain a fuller understanding of why people behave the way they do. When children in the preceding experiment were later asked why they sometimes imitated nonrewarded responses, some believed that the model demanded it ("I *supposed to*"); others performed nonrewarded imitations in the mistaken hope that the rewarding model would become more beneficent ("I *thought if I kept trying lots of times he might get used to it and start up giving candy like the lady did*"); and still others acted like seasoned scientists testing hypotheses about outcome contingencies by systematically varying their behavior and observing its effects ("Sometimes I'd do it and sometimes not to see if I'd get any candy.") Cognitive prohibitionism erects blinders to important classes of determinants of human behavior.

Social modeling provides a good example of how the two types of theories address the same phenomena. Operant analysts study modeling as correlation of observables. By manipulating stimuli and reinforcers one can push the rates of imitative responses up or down and link them to particular situational cues. Should the environmental manipulations fail to produce results, one restructures the environmental demands, raises the reinforcing sanctions or varies both factors in continued efforts to produce the imitative responses.

Social cognitive theory focuses on the mechanisms governing the adoption and regulation of modeled behavior (Bandura, 1986). Modeling operates through four major subfunctions (Figure 1). *Attentional processes* determine what is selectively observed and extracted from the profusion of modeling influences. People cannot be much influenced by modeled events if they do not remember them. *Representational processes* transform the modeled information into symbolic codes for memory representation. The better the symbolic coding of the modeled

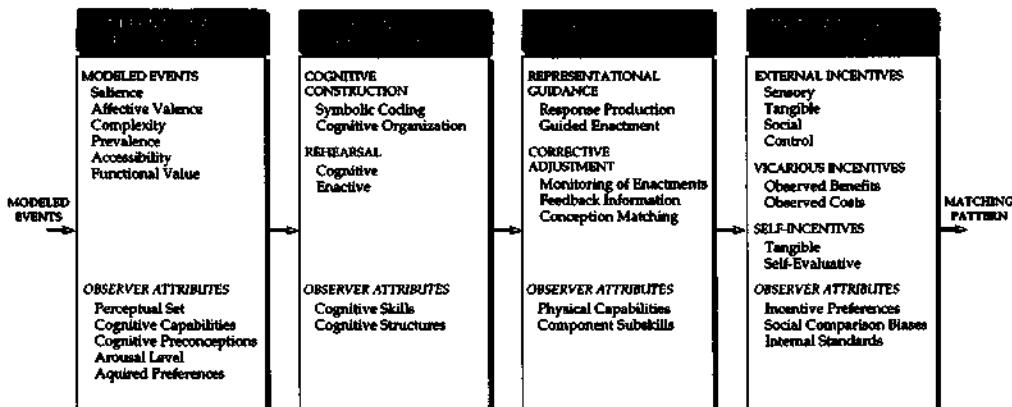


Figure 1. Four subprocesses governing observational learning.

activities the better the activities are learned and retained (Carroll & Bandura, 1990; Gerst, 1971). In the third subfunction, which involves *behavioral production processes*, the symbolic codes are transformed into appropriate courses of action through a conception-matching process. Social cognitive theory distinguishes between acquisition and performance because people do not perform everything they learn. The fourth subfunction of modeling concerns *motivational processes*. Performance of observationally learned behavior is influenced by three major types of incentive motivators—direct, vicarious and self-administered. Different lines of research verify the influential contribution of each of these subfunctions to social modeling. Knowledge of operative mechanisms provides the guidelines for how to devise programs of personal and social change.

When analyzed in terms of constituent subfunctions, facility in observational learning is not primarily a matter of learning to imitate or building a general category of behavior. Rather developing adeptness in observational learning involves acquiring multiple subskills in selective observation, symbolic coding and rehearsal, coordinating sensory-motor and conceptual-motor systems, and judging probable outcomes for adopting modeled patterns of behavior. Observational learning is hindered by deficits and enhanced by proficiency in its constituent subfunctions.

Social modeling is not merely a process of response mimicry. Indeed, it would be of limited value if people could only mimic what they see and hear. Modeling influences convey rules for generative and innovative behavior as well. This higher-level observational learning is achieved through abstract modeling. Exemplars may differ widely in content and other details but exemplify the same underlying structure. In abstract modeling, observers extract the rules and structure governing the behavioral expressions. They then use this knowledge to generate new instances of behavior that go beyond what they have seen or heard (Bandura, 1986; Rosenthal & Zimmerman, 1978). Much human learning is aimed at developing cognitive skills on how to gain and use knowledge for future use. Observational learning of thinking skills is greatly facilitated by having models verbalize their thoughts aloud as they engage in problem-solving activities (Meichenbaum, 1984). The thoughts guiding their decisions and action plans and strategies are thus made observable and observationally learnable.

The capacity for self-reactive influence enables people to regulate their own motivation and behavior rather than respond automatically to whatever situational influences happen to impinge upon them. In this self-regulatory process, people adopt self-evaluative standards,

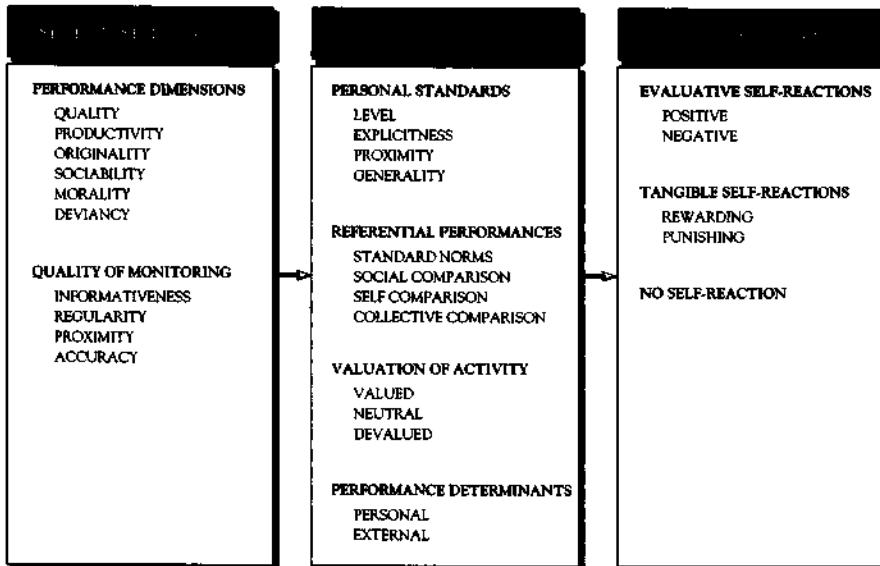


Figure 2. Subfunctions in the system of self-regulation of motivation and action through internal standards and self-reactive influences.

monitor their performances, evaluate them relative to their standards and the constellation of contextual events operating at the time, and react self-approvingly or self-critically. Much human behavior is regulated by anticipatory self-evaluative reaction. People also motivate themselves to perform onerous tasks by making rewarding activities contingent on task completion, as when students make recreational activities contingent on completing certain academic assignments. The various subfunctions governing human self-regulation are summarized in Figure 2. Thus, one line of research conducted within the sociocognitive framework examined different aspects of self-regulatory processes (Bandura, 1986, 1991a). These programs of research clarified how self-evaluative standards are constructed; the factors weighted in the evaluative judgments that set the occasion for positive or negative self-reactions; the comparative power of self-regulation and external regulation; the conditions under which self-evaluative outcomes override the influence of material outcomes; and the mechanisms through which self-sanctions are selectively engaged and disengaged from socially detrimental conduct.

Catania (1975) rejected the notion that organisms can reinforce their own behavior. I have responded elsewhere at some length to his arguments, so I have no interest in rehashing this issue here (Bandura, 1976). That exchange was essentially about the differing conceptions of "reinforcement" in sociocognitive and operant analytic frameworks. In the research under discussion, the term "self-reinforcement" referred to the *operation* of making rewards that are fully under one's control conditional on a given performance, not to a *process* of stamping in responses. In short, it is a self-reward operation supporting self-regulative behavior. Social cognitive theory views reinforcement as mainly a motivational device operating through outcome expectations for prospective courses of action. In humans, of course, the types of outcomes people anticipate depend largely on their judgments of how well they will be able to perform in given situations.

The contexts of human development and functioning vary in the values and styles of behavior they model, the resources and opportunity structures they provide, the constraints they impose, and the incentive structures they employ. The functional value of a given type of behavior can, therefore, change substantially across social milieus. The interrelationships among contextual influences operating in familial, educational, neighborhood and peer subsystems and their impact on behavioral functioning have been the subject of extensive study (Furstenberg, Eccles, Elder, Cook & Sameroff, 1997). Many of the influences in social systems operate collectively rather than manifested isolatedly by individuals. Research on perceived collective efficacy examines group functioning as the product of the interactive and coordinative dynamics of its members (Bandura, *in press*). Interactive dynamics create an emergent property that is more than the sum of the individual attributes. The stronger the beliefs people hold about their collective capabilities the more they achieve. This is true regardless of whether the group's sense of efficacy develops naturally or is created experimentally.

Some operant analysts are becoming contextualists as the commentaries reveal (Reyna, 1995). The issue of interest concerns the type of contextualisms being promoted. Does it recognize people as producers as well as products of contextual influences? Are humans simply reactive to environmental forces or reflectively proactive in their functioning? Or is the operant contextualism the old unidirectional environmental control clothed in new wrappings? The operant traditionalists have always recognized that context affects the probability of a given behavior. So the notion of contextual control is hardly new. Moreover, operant contextualists continue to subscribe to the traditional operant view of environmentally implanted acausal cognition. The operant contextualists also adhere faithfully to the single-case design, which is the preferred operant methodology. So what is new about functional contextualism? It appears to be mainly a repackaging of the standard product with the addition of a few epistemological features that are creating further fissures in the operant domain. The contextualists emphasize the uniqueness of individual acts in context and, therefore, do not necessarily assume generalizable principles about influences on behavior. They reject a mechanistic model of behavior that is independent of contextual influences. Some operant analysts are taking their contextual colleagues to task for invoking a simplistic mechanistic model for rejection, simply renaming stimulus control as contextualism without adding anything new, failing to specify a nonmechanistic process governing the relation between context and action, and having little concrete to show for their efforts (Marr, 1993; Shoneberger, 1995; Shull & Lawrence, 1993; Sidman, 1990). One might also add that a lot of cognitive influences, translated into behavioristic parlance and exteriorized in the environment, seem to be entering into functional contextualism. As operant analysts expand their field of inquiry to complex human behavior and modes of influence beyond reinforcement methods, one can expect an increase in the appearance of cognitive factors in operant analyses and practices.

Hawkins (1995) tells us that he is a "cognitive-behaviorist." In his conceptual scheme, cognition regulates how people feel, think and behave. Given that cognitive behaviorists subscribe to cognitive causation, why is Hawkins arguing that thoughts about one's capabilities do not exist? It is puzzling to see a cognitive behaviorist deny private events when even operant analysts acknowledge their existence. After asserting the nonexistence of efficacy cognitions, Hawkins contradicts himself by resurrecting them, but as epiphenomenal by-products of performance. But this only gets him further conceptual incoherence and self-negation of his stated theoretical position.

It is conceptually inconsistent to be an adherent to a theory that cognition regulates action,

but then to selectively strip cognitions about personal capabilities of any regulative function. Does Hawkins acknowledge the existence and regulative function of the cognitions he likes, or is he proposing a blanket cognitive prohibitionism? If so, what does the cognitively hyphenated theoretical affiliation he claims really mean? The epiphenomenal argument Hawkins is invoking selectively against cognitions concerning personal efficacy is self-annihilative because it applies equally to the cognitions he may favor. Hawkins never explains the ontological and epistemological basis for the selective disallowance of not only the regulative function of thoughts of personal efficacy but even their very existence.

Contrary to Hawkins' selective cognitive exclusion, a mounting body of evidence from diverse lines of research verifies that judgments of personal efficacy are a major basis of human action (Bandura, 1992, 1997). Unless people believe they can produce desired effects by their actions they have little incentive to act. There are many activities which, if done well, guarantee valued outcomes but they are not pursued by people who doubt they can do what it takes to succeed. A low sense of efficacy can thus nullify the motivating potential of alluring outcomes. Conversely, firm belief in one's efficacy can sustain efforts over prolonged periods in the face of uncertain or repeated negative outcomes. Indeed, high accomplishments require a resilient sense of personal efficacy because the road to success is usually strewn with countless impediments, failures, adversities and setbacks.

Perceived self-efficacy occupies a pivotal role in causal structures because such beliefs affect other classes of determinants as well. These include aspirations and the outcomes expected for one's efforts, the quality of analytic thinking, resilience under taxing environmental circumstances and vulnerability to stress and depression. In most of the important problems of choice that people face, they act on their beliefs of personal efficacy in choosing the particular courses of action to pursue.

The central behavioristic contention is that beliefs of personal efficacy to manage events are epiphenomena of conditioned responses. Through the regressive machination, efficacy beliefs are converted to functionless residues of conditioned responses. The claim that perceived self-efficacy is a reflection of past performance has long lost its credibility based on evidence from experimental variations in efficacy beliefs under conditions in which there are no relevant performances to generate epiphenomena. For example, in efficacy beliefs systematically varied by vicarious means, phobics simply observe coping strategies being modeled until their perceived self-efficacy is raised to preselected levels but they themselves do not perform any actions (Bandura, Reese & Adams, 1982). When later tested, the higher their beliefs in their coping capabilities the bolder they behave. As noted in my earlier commentary (Bandura, 1995) this is equally true for individuals who were so phobic that they could not perform a single response in the pretest assessment and, hence, had no pretreatment performance information from which to foretell what they could do after observing the models. The only thing their past behavior could tell them is that they could do nothing.

In studies that create differential levels of perceived efficacy using arbitrary anchors, subjects pick a number from a set concealed in a bag as an arbitrary reference point from which to judge their efficacy to solve problems (Cervone & Peake, 1986). The act of picking a number from a bag has absolutely nothing to do with solving intellectual problems, but it raises or lowers judgment of personal efficacy to solve problems depending on the size of the irrelevant number drawn. The higher the instated efficacy belief the more perseverant the performance. The anchoring influence has no effect on performance unless it alters beliefs of personal efficacy. This is another instance in which the epiphenomenon argument lacks any plausibility because no relevant behavior was performed to generate any efficacy epiphenomena.

Numerous experiments have been conducted in which efficacy beliefs are arbitrarily raised and lowered by providing subjects with veridical feedback about their own performance but bogus information of how others performed on the task. The multiple-trial experiment by Bandura and Jourden (1991) is one such example. Beliefs of personal efficacy arbitrarily raised in this manner are accompanied by efficient strategic thinking, adoption of challenging goals and high performance accomplishments. By contrast, efficacy beliefs lowered by how others allegedly did are accompanied by erratic thinking, goal abandonment, deficient performance and self-dissatisfaction. In some studies, such as the one conducted by Litt (1988), the bogus comparative information contradicts and overrides the impact of past performance on belief of personal efficacy.

Hawkins argues that the comparative information constitutes the performance that generates the efficacy epiphenomenon. Let us examine the logic of this reasoning. According to the epiphenomenal argument, thoughts are the co-occurring products of performances. Hawkins presents a most peculiar form of epiphenomenalism. Unbeknown to individuals that they will receive comparative information some time later, the co-occurring by-products of their performance are mysteriously suspended or somehow obliterated by phony information voiced by others that is completely irrelevant to, or contradicts, their actual performances. In point of fact, their efficacy beliefs are a product of social persuasion not of their performances. Sociocognitive theory provides a great deal of particularized knowledge on how best to structure persuasory influences to increase their efficacy-enhancing impact.

In multivariate investigations using panel designs, of which there are now many, it is almost routine to test for the unique contribution of efficacy belief to performance after controlling not only for past performance but for a host of other possible determinants. The results of these studies show that perceived self-efficacy is a significant contributor to performance over and above the influence of other factors (Bandura, 1997). This is a conservative estimate of the regulatory function of perceived self-efficacy because of statistical overcontrol. Behavior is not a cause of behavior. Correlations between prior and subsequent behavior simply reflect the degree of commonality of their determinants. If the determinants are similar across time, the performances will be highly correlated. Simply showing that past behavior is a predictor of future behavior reduces to the mundane notion that unspecified causes operating similarly on different occasions will produce similar performances. To stop there adds little, if anything, to the understanding of human behavior.

Many motivational and self-regulatory influences contribute to level of performance. Past performance is a confounded index of the set of unspecified determinants operating at the time. A sense of personal efficacy is an important part of that constellation of unmeasured determinants. Thus, past performance is itself affected by beliefs of personal efficacy. It is not as though efficacy beliefs operate on later performance but are totally absent as a determinant from prior performance. Because efficacy beliefs affect both prior and later performance, using unadjusted past performance scores also removes some of the effects of efficacy beliefs on future performance. Therefore, to avoid overcorrection, the contribution of perceived efficacy to prior performance should be removed from it before prior performance is introduced in the analyses of the contribution of perceived efficacy to future performance. In short, it is easy to apply statistical controls ritualistically but it requires careful analytic thought to use them appropriately. In any event, the issue of prior performance as the wellspring of efficacy belief is irrelevant in the experimental investigations reviewed earlier in which efficacy beliefs are raised and lowered without involvement of any performances. Despite the substantial body of empirical evidence to the contrary, Hawkins continues to hold to the view that efficacy beliefs

are epiphenomena of prior performance. This assertion seems to rely more on conceptual conviction than on science.

Perceived self-efficacy has been consistently conceptualized and operationalized in terms of beliefs in one's capabilities to produce given levels of attainments. However, the events over which personal influence is exercised varies widely depending on what one seeks to manage. It may entail effecting change in one's motivation, thought processes, affective states, actions or altering the practices of social systems. Although the nature of attainments varies, the basic conception of perceived self-efficacy as perceived capability to produce effects is unvarying. Corcoran (1995) strings together partial quotations addressing different aspects of perceived self-efficacy, some of which are definitional, others specifying perceived efficacy as one of the mechanisms of human agency, and still others distinguishing efficacy as a generative capability from views of capability as fixed acts in a behavioral repertoire. This is designed to convey the impression of variation in the basic definition of perceived self-efficacy. He then writes statements of his own and sets them in quotation marks, which readers may mistakenly assume are quotations from articles on self-efficacy.

I have commented elsewhere (Bandura, 1991b, 1995) in some detail on points reiterated in Corcoran's (1995) commentary and will readdress only the more relevant ones here. Corcoran grounded some of his views regarding self-efficacy beliefs in a disputable dichotomy that shooting basketballs through hoops involves skill but exercising control over addictive behavior does not. Many areas of human functioning are primarily concerned with perceived self-regulatory efficacy to guide and motivate oneself to get things done that one knows how to do. The issue is not whether one can do them occasionally, but whether one has the efficacy to do them regularly in the face of varied impediments. Shooting basketballs through hoops and controlling addictive behavior both involve the exercise of skills, but the latter relies on self-regulatory skills, the former on motor skills. It is not as though simply deciding to cease addictive behavior promptly eliminates it without the individual repeatedly mobilizing social, cognitive and affective self-regulatory skills and strategies to bring it all about, and to continue to override instigators to resume use of the substance. Informative studies are being conducted into the influential role of perceived self-regulatory efficacy in the self-management of nicotine, alcohol and drug dependence (Annis & Davis, 1989; Bandura, 1997; DiClemente, Fairhurst & Piotrowski, 1995; Marlatt, Baer & Quigley, 1995). Efficacy beliefs predict initiation of habit change, maintenance of abstinence, vulnerability to relapse, and recovery from lapses. Similarly, handling writhing reptiles requires a lot of versatile coping efficacy. The issue in contention is not a "distinction between the living and the nonliving world," as Corcoran frames it, but the requirement of different types of efficacy beliefs to meet different types of challenges.

Judgment of capability is conceptually and operationally separable from expression of a behavioral intention. Indeed, the separation of efficacy belief and intention is fully corroborated empirically. Regardless of the activity domain, efficacy belief affects performance both directly and through its impact on intention (deVries & Backbier, 1994; deVries, Dijkstra & Kuhlman, 1988; Dzewaltowski, 1989; Dzewaltowski, Noble & Shaw, 1990; Kok, deVries, Mudde & Strecher, 1991; Schwarzer & Fuchs, 1995). The results of numerous studies similarly show that perceived control affects behavior both directly and through its impact on intention (Ajzen & Madden, 1986). Because perceived self-efficacy is a major determinant of intention, the two are obviously positively correlated. Corcoran picks a single instance involving a high correlation and then jumps to the generalization that perceived capability and behavioral intention are indistinguishable.

Contrary to this claim, systematic analyses of the pattern of relations of these two factors to each other and to behavior demonstrate their conceptual separateness.

Beliefs of personal efficacy play an especially influential role during the development of competencies and their utilization under changeable environmental conditions. For example, people rely on their perceived efficacy in choosing what types of traffic situations to get into while they are developing their driving skills. But after they routinize their driving activities they do not have to continue to reappraise their driving efficacy each time they set forth on a familiar route with their automobile. This does not mean that efficacy belief is an important contributor to skill development but operates as less of a factor after the skill is routinized. Quite the contrary. As long as people continue to believe in their capability to perform a given activity they act habitually on that belief without having to keep reminding themselves of it. Should they cease to believe their operative capabilities they would behave differently. If significant changes occur in task demands or situational circumstances—such as driving in treacherous mountainous terrains, under hazardous weather conditions, in congested traffic in unfamiliar cities, or in foreign countries—personal efficacy is promptly reappraised as the guide for action under the altered conditions.

Routinization is advantageous when the ways that have been adopted are the optimal ones and remain so under a variety of circumstances. However, routinization is self-limiting when people settle for low-level pursuits on the basis of perceived inefficacy and no longer reappraise their capabilities or raise their vision for themselves. Corcoran repeats the old argument that people do not judge their personal efficacy each time they perform a routinized activity. It is time to retire this type of analysis. In their daily lives, people repeatedly confront situations where they have to choose among different options. Many of these choices have short-run effects that are of no lasting consequence. Of greater importance are efficacy-based choices that have more enduring outcomes or even alter the course lives take. A substantial body of evidence demonstrates that efficacy beliefs play an influential role in determining the set of options given any consideration (Bandura, 1997; Lent, Brown & Hackett, 1994; Wood & Bandura, 1989). People do not regard options in domains of perceived inefficacy worth considering whatever benefits they may hold. Such exclusions of large classes of options are made rapidly on self-efficacy grounds with little thought of costs and benefits. Perceived efficacy not only sets the slate of options for consideration, but influences how options are construed, perceptions of opportunities, impediments and risks, and the outcomes expected for different courses of action (Bandura, 1997). This rich body of knowledge refutes Corcoran's trivialization of the role of judgments of personal efficacy in human decision making.

Corcoran's argument excluding efficacy belief from routinized action applies equally to his analysis of choice behavior in terms of outcome expectations. Once commuters convince themselves that it is better to drive to work than to use public transportation, they no longer have to compute cost-benefit analyses each time they are about to set out to work. They do so without reanalysis as long as they continue to believe that it is in their best interest to drive. Should they cease believing in the comparative benefits of driving they would take public transport.

I am at a loss to explain some of the odd statements in Corcoran's commentary. Consider the claim that I have never specified the relations among the various factors in social cognitive theory. Not only are the causal structures specified, but they have been subjected to stringent empirical tests with causal modeling methods in multivariate designs (Bandura, Barbaranelli, Caprara & Pastorelli, 1996; Ozer & Bandura, 1990; Wood & Bandura, 1989; Zimmerman & Bandura, 1994; Zimmerman, Bandura & Martinez-Pons, 1992).

Lee (1995) claims that judgments of personal efficacy do not account for a large share of variance in performance. Catania (1995) echoes this claim without any empirical documentation. In point of fact, effect sizes vary from large to smaller ones as a function of a number of factors that affect the strength of the relation. These factors are identified and empirically documented in the recent book (Bandura, 1997). Many of them create artifactual discordances. For example, long temporal disparities between assessment of self-efficacy and action will yield a lower relation if self-efficacy has changed in the interim. Mismatch or only partial correspondence between what is assessed in self-efficacy and in performance lowers the relation because of the incongruity. Limited scope of self-efficacy assessment is another factor that reduces effect size. To cite a common example, weight is determined partly by what people eat and by their level of exercise. A study that assesses efficacy to stick to dietary change and to an exercise routine will yield a larger effect size than if only dietary efficacy is measured, as is usually the case. In academic functioning, which is multidetermined, perceived academic efficacy to regulate ones' own learning activities, social efficacy to cultivate supportive interpersonal relationships, and self-regulatory efficacy to resist peer pressures for activities that undermine academic pursuits together account for substantially more variance in academic achievement than does academic efficacy alone.

The adequacy of the postulated causal structure guiding the research is still another influential element. Thus, if the factor to which self-efficacy is targeted is a relatively small contributor to the given performance, perceived efficacy cannot emerge as a strong contributor because the activity to which it is tied carries limited weight in the causal structure. Reversal of causal ordering of factors in analyses similarly reduces effect size. For example, the higher the perceived efficacy the higher the goals people set for themselves and the stronger the commitment to them. Self-efficacy will be shown to have a larger effect size if, as postulated, it is causally prior to goals in regression analyses than if the order is inverted.

Faulty assessments of self-efficacy or performance are additional attenuators. Domain-related measures of self-efficacy yield much larger effect sizes than do discontextualized global measures. Performance is rarely, if ever, measured with complete accuracy, as evident in coefficients of reliability. Instability of the performance measure places an upper limit on how highly self-efficacy can correlate with performance. In socially appraised performance, disparities between self-efficacy and performance attainments can arise, not because people do not act on their efficacy beliefs, but because they may not be adequately informed about what evaluators consider to be important in judging the performances. These are but a few of the many factors that must be taken into account in evaluating effect sizes.

It should be noted in passing that perceived efficacy is but one determinant that operates in concert with other determinants in social cognitive theory in governing human motivation and action. Included among these additional cognitive determinants are outcome expectations in the form of physical, social and self-evaluative effects, proximal and distal aspirations and perceived personal, situational and sociostructural impediments. The contribution of efficacy beliefs to human functioning is being increasingly assessed within the totality of the theory (Bandura, 1997). The full set of cognitive determinants typically account for a substantial share of the variance in human behavior.

Perceived self-efficacy is embedded in a theory of human agency that addresses the origins of personal efficacy, its diverse effects, the processes through which it produces its effects and the modes by which it can be altered. Each of these aspects involves complex matters that require extensive conceptual and empirical analyses. Since omniscience is hard to come by, no

conceptual scheme ever spells out in complete detail, at the outset, everything that could possibly be said about the subject matter. Lee wants a complete model of cognitive processing of efficacy-relevant information. Theory formation takes time. The progress we are making in specifying and testing given aspects of the theory is bringing us closer to an understanding of how people form and change their efficacy judgments (Bandura, 1997).

Social cognitive theory specifies four major modes of influence. These include enactive experience, vicarious experience through modeling, social persuasion, and inferences from somatic states. Information that is relevant for judging personal efficacy, whether conveyed enactively, vicariously, persuasively, or physiologically is not inherently enlightening. It is only raw data. It becomes instructive through cognitive processing of efficacy information and reflective thought. One must distinguish between information conveyed by experienced events and information as selected, weighted, and integrated into self-efficacy judgments. A host of factors, including personal, social, and situational ones, affect how direct and socially-mediated experiences are cognitively interpreted.

The cognitive processing of efficacy information involves two separable functions. The first concerns the types of information people attend to and use as indicators of personal efficacy. The theory specifies the set of efficacy indicators that are distinctive for each of the four modes of conveying information about personal capabilities. The major efficacy indicators are summarized in Table 1. The findings of different lines of research verify their impact and refine our understanding of the judgmental process. The array of factors selected provides the information base on which the self-appraisal process operates. The second function concerns the combination rules or heuristics people use to weight and integrate efficacy information from different sources in constructing beliefs about their personal efficacy. Researchers are beginning to address how people combine and integrate the different sources of efficacy information. But there is much work to be done in this aspect of the efficacy judgmental process.

Lee (1995) presents an unrestrained political indictment of cognitive theories. Cognitivists are charged with two major offenses. They embrace a dualistic view in which human action is "determined by the soul, spirit or mind," to the neglect of environmental control of "actual behavior." This widespread allegiance to the soul as the wellspring of human action, Lee argues, explains the contemporary disaffection with behaviorism. But the cognitive dualists do more than just divert attention from the true causes of human behavior. The belief that cognitions "exist independently of the material world" has pernicious societal ramifications. The dualistic "ideology of cognitive psychology" leads advocates of this disembodied view to change people's cognitions to conform to existing reality rather than to change the objective reality. Cognitivists are thus defenders of the status quo and give short shrift to issues of inequality, poverty and violence. There is a bit of a problem in the logicality of this argument. If cognitions have no functional value as Lee firmly believes, and cognitivists are busily changing other people's cognitions, then they cannot be breeding conformity because what they are changing allegedly has absolutely no behavioral effects.

Lee informs readers that cognitivists are not in a "deliberate conspiracy to maintain social inequity." Rather, cognitivists' social and political conservatism allegedly stems from the fact that their "pleasant, comfortable and desirable lives," lead them unwittingly to fit people to the prevailing social mold. This political indictment will probably take most readers by surprise because it is the behaviorists who are routinely accused of training functionaries how to shape conformance to institutional systems through reward and punishment, rather than changing the structures of the social systems themselves. Indeed, a major commission on the ethics of

Table 1

The Distinctive Sets of Factors Within Each of the Four Modes of Influence That Can Affect the Construction of Efficacy Beliefs

Enactive efficacy information

- Interpretive biases
- Perceived task difficulty and diagnosticity
- Effort expenditure
- Amount of external aid received
- Situational circumstances of performance
- Transient affective and physical states
- Temporal pattern of successes and failures
- Selective bias in self-monitoring of performance
- Selective bias in memory for performance attainments

Vicarious efficacy information

- Model attribute similarity
- Model performance similarity
- Model historical similarity
- Multiplicity and diversity of modeling
- Mastery or coping modeling
- Exemplification of coping strategies
- Portrayal of task demands

Persuasory efficacy information

- Credibility
- Expertness
- Consensus
- Degree of appraisal disparity
- Familiarity with task demands

Somatic and affective efficacy information

- Degree of attentional focus on somatic states
- Interpretive biases regarding somatic states
- Perceived source of affective arousal
- Level of arousal
- Situational circumstances of arousal

behavior modification was explicitly created to devise social mechanisms to curb the coercive use of reinforcement procedures in the service of institutional control (Stoltz, 1978).

Lee's political creed rests insecurely on two false assumptions if it is meant as a critique of my views on cognition and its functional role in human adaptation and change. I am at a loss to know where Lee got the idea that I am a proponent of dualism. I have never espoused a dualistic doctrine. Quite the contrary. In *Social foundations of thought and action* (Bandura, 1986), I explicitly disavow such a view. Mental events are brain activities not immaterial entities residing apart from neural systems. I explain that, were one to perform Bunge's (Bunge,

1980) hypothetical brain transplant, the donor's unique psychic life would accompany the brain to the new host, rather than remain behind with the donor as a mental entity in a separate realm. However, materialism does not imply reductionism. Thought processes are emergent brain activities that are not ontologically reducible. In his treatise on the overriding paradigmatic shift to cognitivism, Sperry (1993) spells out some of the details of a nondualistic mentalism. Mental states are dynamic emergent properties of generating brain processes. Emergent properties differ in novel ways from the elements of which they are built. To use Bunge's (Bunge, 1977) analogy, the emergent properties of water, such as fluidity, viscosity, and transparency are not simply the aggregate properties of its microcomponents of oxygen and hydrogen. Certain brain structures are specialized for mentation. The higher psychoneural systems are involved in the regulation of visceral, motoric and other subsystems. Thus, an emergent interactive agency assumes ontological nonreductionism and ontological plurality.

Thought processes are not only emergent brain activities, but they exert determinative influence. The human mind is generative, creative and proactive not just reactive. The construal of cognitions as cerebral occurrences raises the intriguing issues of how people come to be producers of thoughts that may be novel, inventive, visionary or that take complete leave of reality as in flights of fancy. One can cognize several novel acts with no external cueing and choose to execute one of them. Such cognitive productions and proactiveness address, at the psychological level, the fundamental issues of intentionality and the exercise of human agency. Knowledge of lawful relations established at the psychological level provide guidelines for examining the phenomena at other levels of analysis.

Lee's political arguments additionally rely on a caricature of isolated cognitivism that social cognitive theory explicitly rejects. A major function of human thought is to predict events and to figure out ways of exercising control over those that are important. In the theory of triadic reciprocal causation, sociostructural and personal determinants are treated as interacting cofactors within a unified causal structure (Bandura, 1986). In these agentic transactions, people are producers as well as products of social systems. Research conducted within this interactional perspective sheds light on how socioeconomic conditions, familial, peer and self processes operate in concert to produce developmental outcomes (Bandura et al., 1996; Elder, 1994, 1995).

People do not live their lives as isolates. They work together to produce results they desire. Social cognitive theory extends the analysis of mechanisms of human agency to the exercise of collective agency. People's shared beliefs in their efficacy to produce desired effects collectively is a crucial ingredient of collective agency. Such beliefs influence the type of futures they seek to achieve, how they manage their resources, the plans and strategies they construct, how much effort they put into their group endeavor, their staying power when collective efforts fail to produce quick results or encounter forcible opposition, and their vulnerability to discouragement.

Some writers mistakenly equate self-efficacy with Western individualism. In point of fact, a strong sense of efficacy is vital for successful functioning regardless of whether it is achieved individually or by group members working together. In a series of informative studies, Earley (1993, 1994) has advanced understanding of how personal and collective efficacy beliefs contribute to productivity by members of collectivist cultures as well as those raised in individualistic cultures. I devote a major section in the recent book on *Self-efficacy: The exercise of control* to the exercise of collective efficacy for social change. It reviews a large body of research that specifies the conditions under which beliefs of political efficacy and perceptions of the system's responsiveness jointly influence whether efforts at social change

take conventional or confrontational forms. It presents promising approaches to building community wide efficacy for social change and how to structure social diffusion programs to ensure more equitable distribution of benefits of new technologies. The accelerated pace of technological change and extensive globalization of human interdependence is producing wrenching social changes that dislocate lives. The volume provides an analysis of the many conditions of contemporary life that can undermine a sense of collective efficacy and the new social alignments through which people are seeking to regain some measure of control in their lives.

This volume reviews a variety of other societal applications of social cognitive theory. The burgeoning population growth is the foremost and, by far, the most urgent global problem. Unless we check the explosive population growth we will rapidly destroy the interdependent ecosystems that sustain life. Media formats founded on sociocognitive principles are being diffused internationally and achieving success in reducing family size and raising the status of women in societies where they are relegated to a subservient role. In applications of this format in Africa, it is reducing sexual and drug injection practices that increase vulnerability to infection with the AIDS virus. New health promotion systems structured around self-regulatory principles with computer-assisted implementation are successfully reducing major health risks, retarding the progression of heart disease and enhancing health functioning. Chronic disease has become the dominant form of illness and the major cause of disability that does not lend itself well to biomedical approaches devised primarily to treat acute illness. Self-management programs based on sociocognitive principles are enabling people to live more productive lives with less pain and distress and large savings in health costs. These widespread applications of sociocognitive principles for human betterment stand in stark contrast to Lee's political rhetoric.

It is ironic that in attacking dualism, Lee is propounding a dualistic view of individuals and society. For the most part, social structures represent authorized social practices carried out by human beings occupying designated roles (Giddens, 1984). It is not a dichotomy between a disembodied social structure and personal agency but a dynamic interplay between individuals and those who preside over the institutionalized operations of social systems. These are agentic transactions between institutional functionaries and those who seek to change their practices. Social cognitive theory rejects a dualism between individuals and society and between social structure and personal agency.

Lee's unsubstantiated empirical claim that operant analysts are the ones who are creating the remedies for societal problems gets her into another contradictory predicament. I should remind Lee of Skinner's assertion that "a person does not act upon the world, the world acts upon him" (Skinner, 1971). This view of unidirectional environmental control must apply to operant analysts as well as to other folks. Viewed from this perspective, operant analysts can be conduits for environmental forces but they themselves cannot be creators of programs for environmental change. In portraying operant analysts as agents of change, proponents of this view conveniently exempt themselves from their own theory. People are said to be shaped and controlled by environmental contingencies but once they adopt the operant doctrine they are elevated to intentional agents capable of creating wondrous programs to solve societal problems.

I noted with bemused interest that none of the proponents of epiphenomenalism addressed the egocentric predicament created by fervent advocacy of the rightness of such a view. I am puzzled and disappointed by the collective non-answer. In their writings, operant analysts regard other people's cognitions as functionless residues of conditioned responses but present

their own thoughts on matters as the right ones that serve as functional guides on how to structure contingent rewards and punishments to manage behavior. This is not an issue to be dismissed by complaints of ad hominemism. Readers are entitled to know whether operant analysts give the same ontological status to their own thinking as they do to the thinking of others. If thoughts are merely functionless by-products of conditioned responses, and proponents regard their own thoughts as such, it is pointless to argue that those by-products have any special truth value. Why do epiphenomenalists foist their functionless cognitions on others or publish them in periodicals? I would still like to know how epiphenomenalists exempt themselves from the self-destruct nature of the epiphenomenalism argument.

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Mechanisms of Moral Disengagement in the Exercise of Moral Agency

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This research examined the role of mechanisms of moral disengagement in the exercise of moral agency. Regulatory self-sanctions can be selectively disengaged from detrimental conduct by converting harmful acts to moral ones through linkage to worthy purposes, obscuring personal causal agency by diffusion and displacement of responsibility, misrepresenting or disregarding the injurious effects inflicted on others, and vilifying the recipients of maltreatment by blaming and dehumanizing them. The study examined the structure and impact of moral disengagement on detrimental conduct and the psychological processes through which it exerts its effects. Path analyses reveal that moral disengagement fosters detrimental conduct by reducing prosocialness and anticipatory self-censure and by promoting cognitive and affective reactions conducive to aggression. The structure of the paths of influence is very similar for interpersonal aggression and delinquent conduct. Although the various mechanisms of moral disengagement operate in concert, moral reconstruals of harmful conduct by linking it to worthy purposes and vilification of victims seem to contribute most heavily to engagement in detrimental activities.

Psychological theories of moral agency focus heavily on moral thought to the neglect of moral conduct. The limited attention to moral conduct reflects both the rationalistic bias of many theories of morality (Kohlberg, 1984) and the convenience of investigatory method. It is much easier to examine how people reason about hypothetical moral dilemmas than to study how they behave in difficult life predicaments. People suffer from the wrongs done to them, regardless of how perpetrators might justify their inhumane actions. The regulation of conduct involves much more than moral reasoning. A theory of morality must specify the mechanisms by which people come to live in accordance with moral standards. In social cognitive theory (Bandura, 1991), moral reasoning is translated into actions through self-regulatory mechanisms through which moral agency is exercised.

In the course of socialization, moral standards are constructed from information conveyed by direct tuition, evaluative social reactions to one's conduct, and exposure to the self-evaluative standards modeled by others. Once formed, such standards serve as guides and deterrents for action. People regulate their actions by the consequences they apply to them-

selves. They do things that give them satisfaction and a sense of self-worth. They refrain from behaving in ways that violate their moral standards, because such behavior will bring self-censure. In the face of situational inducements to behave in inhumane ways, people can choose to behave otherwise, by exerting counteracting self-influence. Anticipatory self-sanctions thus keep conduct in line with internal standards. It is through the ongoing exercise of self influence that moral conduct is motivated and regulated.

Social cognitive theory grounds moral agency in a self-regulatory system that operates through three major subfunctions. These include self-monitoring, judgmental, and self-reactive subfunctions. Self-monitoring of one's conduct is the first step toward exercising control over it. Action gives rise to self-reactions through a judgmental function in which conduct is evaluated against internal standards and situational circumstances. Moral judgment sets the occasion for self-reactive influence. People get themselves to behave in accordance with their moral standards through anticipatory positive and negative self-reactions for different courses of action.

Development of self-regulatory functions does not create an invariant control system within a person, as implied by theories of internalization that incorporate entities such as consciences, superegos, or moral principles as perpetual internal overseers of conduct. Self-reactive influences do not operate unless they are activated, and there are many psychosocial processes by which self-sanctions can be disengaged from inhumane conduct (Bandura, 1990, 1991). Selective activation and disengagement of internal control permits different types of conduct with the same moral standards. Figure 1 summarizes schematically the four major points in the self-regulatory system at which internal moral control can be disengaged from detrimental conduct. Self-sanctions can be disengaged by reconstruing the conduct, obscuring personal causal agency, misrepresenting or disregarding the injurious consequences of one's actions, and vilifying the recipients of maltreatment by blaming and devaluing them.

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The research reported in this article was supported by grants from the Spencer Foundation to Albert Bandura and from the Johann Jacobs Foundation to Gian Vittorio Caprara. We thank Delbert Elliott for his assistance in the early phases of the development of the scale of moral disengagement.

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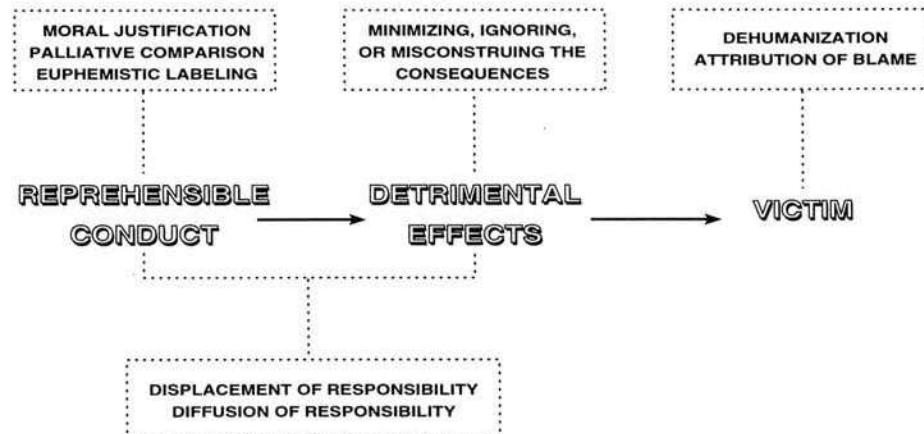


Figure 1. Mechanism through which moral self-sanctions are selectively activated and disengaged from detrimental behavior at different points in the self-regulatory process. From *Social Foundations of Thought and Action: A Social Cognitive Theory* (p. 376) by A. Bandura, 1986. Copyright 1986 by Prentice-Hall, Inc. Reprinted by permission of Prentice-Hall, Inc., Upper Saddle River, NJ.

A key set of disengagement practices operates on the construal of injurious behavior itself. People do not ordinarily engage in reprehensible conduct until they have justified to themselves the rightness of their actions. What is culpable can be made righteous through cognitive reconstrual. In this process of *moral justification*, detrimental conduct is made personally and socially acceptable by portraying it in the service of valued social or moral purposes (Kelman & Hamilton, 1989; Kramer, 1990; Sanford & Comstock, 1971). People then act on a social or moral imperative. In the transactions of everyday life, a lot of aggressive behavior gets justified in the name of protecting honor and reputation (Cohen & Nisbett, 1994).

Language shapes people's thought patterns on which they base many of their actions. Activities can take on markedly different appearances depending on what they are called. *Euphemistic language* thus provides a convenient tool for masking reprehensible activities or even conferring a respectable status upon them (Bolinger, 1982; Lutz, 1987). Through sanitized and convoluted verbiage, destructive conduct is made benign and those who engage in it are relieved of a sense of personal agency. Laboratory studies have revealed the disinhibitory power of euphemistic language (Diener, Dineen, Endresen, Beaman, & Fraser, 1975). People behave much more aggressively when assaulting a person is given a sanitized label than when it is called aggression.

Behavior can also assume very different qualities depending on what it is contrasted with. By exploiting *advantageous comparison* with more reprehensible activities, injurious conduct can be rendered benign or made to appear to be of little consequence. The more flagrant the contrasted activities, the more likely it is that one's own injurious conduct will appear trifling or even benevolent (Bandura, 1991). Cognitive transformation of harmful conduct into good conduct through moral justifications and palliative characterizations by euphemistic labeling and behavioral contrasts is the most effective psychological mechanism for disengagement of self-sanctions. This is because investing injurious means with high social or moral purpose not

only eliminates self-deterrants but also engages self-approval in the service of harmful exploits. What was once morally censurable becomes a source of positive self-valuation.

Self-sanctions are activated most strongly when personal agency for detrimental effects is acknowledged. The second set of dissociative practices operates by obscuring or distorting the agentive relationship between actions and the effects they cause. Under *displacement of responsibility*, people view their actions as springing from the social pressures or dictates of others rather than as something for which they are personally responsible (Andrus, 1969). Because they are not the actual agents of their actions, they are spared self-censuring reactions. Hence, they are willing to behave in ways they normally repudiate if a legitimate authority accepts responsibility for the effects of their actions (Diener, 1977; Milgram, 1974).

The exercise of moral control is also weakened when personal agency is obscured by *diffusion of responsibility* for detrimental conduct. This is achieved in several ways. Responsibility can be diffused by division of labor for a venture with different members performing subdivided aspects that seem harmless in themselves but harmful in its totality (Kelman, 1973). Group decision making is another common practice, one that enables otherwise considerate people to behave inhumanely. When everyone is responsible, no one really feels responsible. Group action is still another expedient for weakening moral control. Any harm done by a group can always be attributed largely to the behavior of others. People behave more cruelly under group responsibility than when they hold themselves personally accountable for their actions (Bandura, Underwood, & Fromson, 1975; Diener, 1977; Zimbardo, 1969, 1995).

Additional ways of weakening self-deterring reactions operate by *disregarding or distorting the consequences* of action. When people pursue activities harmful to others for personal gain, or because of social inducements, they avoid facing the harm they cause, or they minimize it. They readily recall prior information given them about the potential benefits of the behavior but are less able to remember its harmful effects (Brock & Buss,

1962, 1964). In addition to selective inattention and cognitive distortion of effects, the misrepresentation may involve active efforts to discredit evidence of the harm they cause. As long as the detrimental results of one's conduct are ignored, minimized, distorted, or disbelieved, there is little reason for self-censure to be activated. In his studies of commanded aggression, Milgram (1974) obtained diminishing obedience as victims' pain became more evident and personalized.

The final set of disengagement practices operates on the recipients of detrimental acts. The strength of moral self-sanctions depends partly on how perpetrators view the people they mistreat. To perceive another as human activates empathetic and vicarious emotional reactions through perceived similarity (Bandura, 1992; McHugo, Smith, & Lanzetta, 1982). The joys and suffering of those with whom one identifies are more vicariously arousing than are those of strangers, out-group members, or those who have been divested of human qualities. It is, therefore, difficult to mistreat humanized persons without risking personal distress and self-censure. Subhumans are regarded as not only lacking sensitivities but also as being influenceable only by harsh means. In research on the dynamics of victimization, Perry, Williard, and Perry (1990) reported that aggressive children exhibit little sympathetic concern over hurting devalued peers. Habitual aggressors care less about inflicting suffering on victimized classmates than on those who are not cast in the devalued-victim role.

Self-censure for injurious conduct can be disengaged or blunted by *dehumanization* that divests people of human qualities or attributes bestial qualities to them. Once dehumanized, they are no longer viewed as persons with feelings, hopes, and concerns but as subhuman objects (Haritos-Fatouros, 1988; Keen, 1986; Kelman, 1973). In experimental studies in which otherwise considerate people are given punitive power, they treat dehumanized individuals much more harshly than humanized ones (Bandura et al., 1975). Dehumanization fosters different patterns of thought. People enlist moral justifications for punitive conduct directed toward individuals who have been deprived of humanness, but they disavow punitive actions and condemn them on moral grounds toward individuals depicted in humanized terms.

Blaming one's adversaries or circumstances is still another expedient that can serve self-exonerative purposes. In moral disengagement by *attribution of blame*, people view themselves as faultless victims driven to injurious conduct by forcible provocation. Punitive conduct thus becomes a justifiable defensive reaction to instigations. Victims get blamed for bringing suffering on themselves (Ferguson & Rule, 1983). Self-exoneration is also achievable by viewing one's harmful conduct as forced by compelling circumstances rather than as a personal decision. Even very young children are quite skilled in using mitigating factors to excuse harmdoing (Darley, Klosson, & Zanna, 1978). Children who are ready aggressors are quick to ascribe hostile intent to others, which provides justification for preemptive retaliatory acts (Crick & Dodge, 1994). By fixing the blame on others or on circumstances, not only are one's own injurious actions excusable but one can even feel self-righteous in the process.

The disinhibitory effects of the various forms of moral disengagement have been extensively documented in the perpetration

of large-scale inhumanities (Andrus, 1969; Keen, 1986; Kelman & Hamilton, 1989; Rapoport & Alexander, 1982; Reich, 1990). Laboratory studies have further verified that conditions conducive to disengagement of moral self-sanctions heighten punitive behavior (Bandura et al., 1975; Diener, 1977; Diener et al., 1975; Milgram, 1974; Tilker, 1970; Zimbardo, 1969). However, because of the lack of measures of moral disengagement, the mediation of the effect of the manipulated conditions on punitive behavior through self-exonerative processes has been presumed rather than assessed.

The present research addressed several key issues concerning the exercise of moral agency. Research in this area has been seriously hampered by the lack of measures of moral disengagement. The instrument devised and tested in this program of research is grounded in a sociocognitive theory of moral agency that specifies the different loci in the self-regulatory system where moral self-sanctions can be effectively disengaged. Both the naturalistic and laboratory investigations usually examine only a single or a subset of disengagement mechanisms. The present study investigated how the full set of moral disengagement mechanisms operate in concert on socially injurious and antisocial conduct under naturally occurring conditions.

Moral disengagement can affect detrimental behavior both directly and by its impact on other theoretically relevant determinants. Therefore, this research also tested a conceptual model of the paths of influence through which moral disengagement produces its behavioral effects. The directional paths are specified both by theory (Bandura, 1991) and by empirical tests of particular links in the model (Caprara & Pastorelli, 1993). In the proposed causal structure of the model, which is presented in Figure 2, moral disengagement influences detrimental behavior both directly and through its effects on the following mediating factors. People have little reason to be troubled by guilt or to feel any need to make amends for inhumane conduct if they reconstrue it as serving worthy purposes or if they disown personal agency for it. We therefore predicted that high moral disengagement would be accompanied by low guilt, thus weakening anticipatory self-restraints against engagement in detrimental behavior. We further predicted that self-exoneration for harmful conduct and self-protective dehumanization of others and treating them as blameworthy would spawn a low prosocial orientation. Low prosocialness would, in turn, contribute to detrimental conduct in two ways. Having little sympathy for others would both remove the restraining influence of empathetic considerateness to the mistreatment of others and would activate little anticipatory guilt over such behavior. Effective moral disengagement creates a sense of social rectitude and self-righteousness that breeds ruminative hostility and retaliatory thoughts for perceived grievances. People often ruminate hostilely but do not act on their feelings. However, freed from the restraint of moral self-sanctions, they are more likely to act out their resentments. In this mediated link, moral disengagement fosters aggression proneness indexed by irascibility and hostile rumination which, in turn, heighten the likelihood of aggressive and transgressive behavior. Thus, in the sociocognitive conceptual model, moral disengagement affects aggressive and transgressive conduct both directly and through its influence on anticipatory guilt reactions, prosocial orientation, and cognitive and affective reactions that are conducive to aggression.

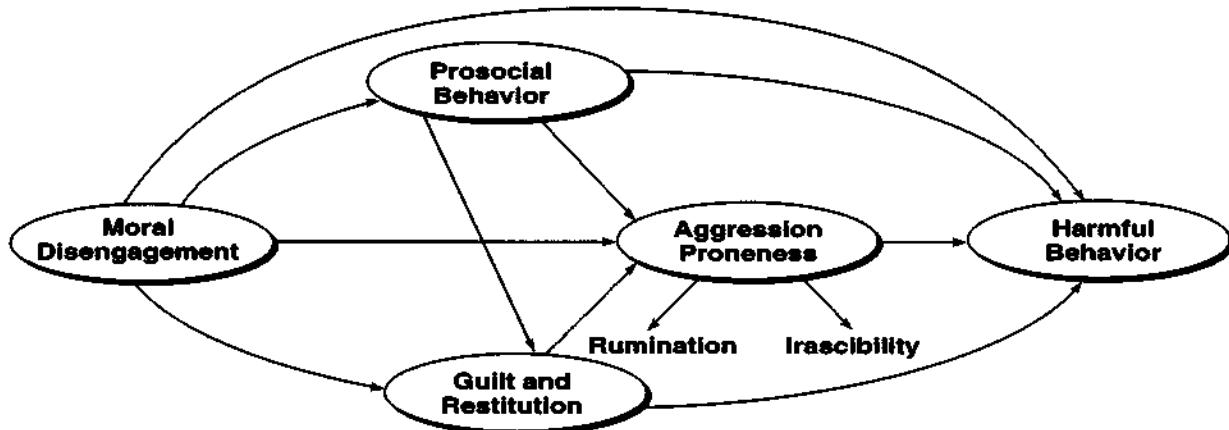


Figure 2. Proposed causal structure of the paths of influence through which moral disengagement affects detrimental conduct.

Method

Participants

The participants in this study were 124 children in the last year of elementary school and 675 junior high school students in Grades 6–8. They ranged in age from 10 to 15 years with a mean age of 11.8 years. There were 438 males and 361 females.

The students were drawn from four public schools: two elementary and two junior high schools in a residential community located near Rome, Italy. This community adheres to a stringent consent procedure for the conduct of research in the schools. A research proposal must gain approval from a school council composed of parent and teacher representatives and student representatives, as well, at the junior high school level. In addition, parents must give consent, and children are free to decline to take part if they choose. The parents not only consented to the study, but the mothers participated in the project themselves. All of the children enrolled in these grades participated in the study unless they happened to be absent from school when the measures were administered. The study was described to the parents and children as a project conducted through the University of Rome to gain better understanding of how children develop.

This community represents a socioeconomic microcosm of the larger society, containing families of skilled workers, farmers, professionals, and local merchants and their service staffs. Socioeconomic status of the family was assessed by father's occupation. Fourteen percent were in professional or managerial ranks, 25% were merchants or operators of other businesses, 31% were skilled workers, 29% were unskilled workers, and 1% were retired. The socioeconomic heterogeneity of the sample adds to the generalizability of the findings.

Children were administered the sets of scales measuring the variables of theoretical interest in their classrooms by two female experimenters. The various measures were administered over a period of several days. To add to the significance of obtained relationships, data for the variables of interest were collected by different methods from parents, teachers, and peers, as well as from the children themselves. The scales were administered individually to the teachers and parents.

Moral Disengagement

Extensive prior psychometric analyses were conducted in the development of the measure of moral disengagement. A large pool of items tapping the different disengagement mechanisms was constructed on

the basis of the guiding conceptual scheme. They were then pretested on 251 elementary school children, 249 junior high students, and 315 high school students. Items were rewritten to remove ambiguities and eliminated if they were not internally consistent within each of the mechanisms. This pilot project revealed that proneness to moral disengagement was positively related to aggressive behavior and negatively related to prosocial behavior across the three age groups regardless of whether the children's behavior was measured by self-ratings, teacher ratings, or sociometric peer ratings.

The final form of the multifaceted scale used in the present study assessed proneness to moral disengagement of different forms of detrimental conduct in diverse contexts and interpersonal relationships (Bandura, 1995). Each of the eight mechanisms of moral disengagement was represented by a subset of 4 items. The full set of 32 items is presented in the Appendix. The items tapped children's readiness to resort to moral justification, euphemistic labeling, advantageous comparison, displacement and diffusion of responsibility, distortion of consequences, dehumanization, and attribution of blame for different forms of transgressive conduct. The transgressive activities involved physically injurious and destructive conduct, verbal abuse, deceptions, and thefts. The social contexts encompassed educational, familial, community, and peer relations. For each of the items, children rated on a 3-point Likert-type scale their degree of acceptance of moral exonerations for such conduct on an agree-disagree continuum. A principal-components factor analysis with varimax orthogonal rotation revealed a single factor structure. It accounted for 16.2% of the variance. Because no subfactors emerged, we summed the responses to the set of items to provide the composite measure of moral disengagement. The alpha reliability coefficient for this measure is .82.

Aggressive and Prosocial Behavior

We obtained data regarding children's prosocial, aggressive, and transgressive behavior from different sources, using diverse methods of assessment. The sources included the children themselves, their parents, teachers, and peers. The methods of measurement included personality questionnaires and peer sociometric ratings. To avoid possible response biases, several control items were included in each of the questionnaires.

The children completed two scales developed by Caprara and his colleagues to measure prosocial behavior and interpersonal aggression (Caprara, Barbaranelli, Pastorelli, & Perugini, 1994). A 3-point re-

sponse format was used throughout. The measure of *physical and verbal aggression*, containing 15 items, assessed the frequency with which children fought with others, hurt them, and verbally disparaged them. *Pro-social behavior* was assessed by 10 items in terms of helpfulness, sharing, kindness, and cooperativeness.

Teachers rated the children in their classes for physical and verbal aggression and prosocial behavior using the scales administered to the children but shortened to six items each and cast in a third-person format. The mothers also rated the frequency with which their children exhibited prosocial and aggressive forms of behavior, using the same set of scales as administered to the children. We computed internal consistency reliabilities using Cronbach's alpha. For the 16 sets of scores, except for an alpha of .61 for peer ratings of prosocial behavior, the reliability coefficients for the four sources of data (self, parents, teachers, peers) across the two educational levels for aggressiveness and prosocialness were virtually all in the .80s and .90s. The concurrent validity of these measures has been corroborated in studies relating children's ratings of their behavior to level of prosocialness and aggressiveness as rated by parents and teachers and by peers' sociometric nominations (Caprara & Pastorelli, 1993).

Sociometric peer nominations served as another source of assessment of prosocial and aggressive behavior. Children were presented with a booklet containing the names of children in their class along with 10 items, 3 of which measured aggressive and prosocial behavior and 4 of which measured peer popularity and rejection. Specifically, in the aggression domain peers circled the names of three classmates who fight a lot, insult other children, and often hurt them. For prosocial behavior, the peers circled the names of three classmates who help others, share things, and try to make sad people happier.

We measured *peer popularity* by having peers select the three classmates with whom they would like to play and to study. To distinguish between children who were disliked by their peers and those who were simply ignored or regarded indifferently, peers selected three classmates with whom they would neither want to play nor study as a measure of *peer rejection*. The two aspects of peer popularity were positively correlated ($r = .68, p < .001$), as were the two aspects of peer rejection ($r = .83, p < .001$). Popularity and rejection were negatively related ($r = -.42, p < .001$). The multidimensional assessment of both positive and negative status regarding both social and academic activities provided a good basis for gauging the impact of moral disengagement on quality of peer relations.

Affective and Cognitive Aspects of Aggression

Students at the junior high school level were administered two additional scales that measured the affective and cognitive aspects of aggressive and transgressive conduct for matters especially relevant for older children. The *hostile rumination* measure assessed with 15 items the level of preoccupation with personal grievances and retaliatory action. The *irascibility* measure, comprising 14 items, tapped petulance in social transactions and weak restraint over anger even to slight provocations. The alpha reliability coefficients were .86 for hostile rumination and .84 for irascibility. The predictive validity of these measures has been corroborated experimentally under simulated conditions in which participants can inflict shocks of varying intensity on a provocateur. Individuals who have a low threshold for anger arousal and are prone to hostile rumination behave more punitively than those who are slower to anger and disinclined to dwell on grievances and possible retaliations (Caprara, Coluzzi, Mazzotti, Renzi, & Zelli, 1985; Caprara, Renzi, Alcini, D'Imperio, & Travaglia, 1983; Caprara, Renzi, Amolini, D'Imperio, & Travaglia, 1984; Caprara et al., 1986).

Self-Sanctions for Transgressive Behavior

The scale measuring *guilt and restitution*, which included 15 items, dealt with the self-regulation of transgressive conduct by anticipatory

self-sanctions. It assessed the degree of guilt, remorsefulness, and self-criticism anticipated for transgressive conduct and the need to make restitution if it were carried out. Factor analysis of the items revealed a single factor. The alpha reliability coefficient for this scale was .79.

Delinquent Behavior

Delinquent behavior was measured by the relevant items from the Child Behavior Checklist developed by Achenbach and Edelbrock (1978). Both the reliability and predictive validity of this measure of problem behavior are well established (Achenbach, McConaughy, & Howell, 1987). The Delinquency subscale, comprising 22 items for males and 19 items for females, covers a wide range of transgressive behaviors, including theft, cheating, lying, destructiveness, truancy, and use of alcohol and drugs. The Parental scale includes 12 items, which overlap with the children's version. Both the mothers and the children themselves recorded whether they engage in such antisocial activities and, if they do, whether they do so only occasionally or often. The reliability coefficients were .77 for parents, .77 for females, and .85 for males.

Results

Children's proneness to moral disengagement was unrelated to familial socioeconomic status, and it did not differ as a function of age. However, males exhibited higher moral disengagement than did females, $F = 22.17, p < .0001$. The major sources of this difference were the males' greater readiness to provide moral justifications for detrimental conduct, $F = 45.81, p < .0001$; to mask it in euphemistic language, $F = 33.81, p < .0001$; to minimize its injurious effects, $F = 6.14, p < .025$; and to dehumanize victims, $F = 26.60, p < .0001$, and attribute blame to them, $F = 9.92, p < .002$. The degrees of freedom for these analyses are $df = 1, 789$.

Although the analyses indicate that the various mechanisms of moral disengagement operate in concert in the self-regulatory process, they varied somewhat in degree of enlistment. Construing injurious behavior as serving righteous purposes, disowning responsibility for harmful effects, and devaluing those who are maltreated were the most widely used modes of exonerative disengagement of self-sanctions. Masquerading censurable activities in palliative language or rendering them benign by advantageous comparison, both of which require dexterous cognitive skills, were used less often.

Pattern of Relationships

Table 1 presents the relationships between moral disengagement and prosocial and detrimental conduct. The correlations are highly consistent across different sources of data, and the correlates did not differ significantly on any of the measures across the two educational levels. Compared to individuals who maintain a high level of moral agency, those who are highly prone to moral disengagement tend to be more irascible, ruminate about perceived grievances, and are neither much troubled by guilt nor feel the need to make amends for harmful conduct. They also engage in a higher level of interpersonal aggression and delinquent behavior.

Moral disengagement is related to prosocial behavior as well as to transgressive activities. High moral disengagers are less prosocially oriented and more likely to be rejected by peers.

Table 1
*Relationship of Moral Disengagement to Prosocial,
 Aggressive, and Delinquent Behavior*

Social and transgressive behavior	Moral disengagement	
	Elementary	Junior high
Self-ratings		
Physical and verbal aggression	.52***	.36***
Prosocial behavior	-.40***	-.28***
Irascibility	—	.36***
Hostile rumination	—	.38***
Guilt and restitution	—	-.18***
Delinquency	—	.45***
Teacher ratings		
Physical and verbal aggression	.22**	.06***
Prosocial behavior	-.30***	-.18***
Peer ratings		
Physical and verbal aggression	.46***	.29***
Prosocial behavior	-.16*	-.17***
Popularity	-.04	-.07*
Rejection	.23**	.22***
Parent ratings		
Physical and verbal aggression	.38***	.29***
Prosocial behavior	-.17*	-.11***
Delinquency	.20*	.27***

Note. Dashes indicate data that were not collected for this sample of children.

* $p < .05$. ** $p < .01$. *** $p < .001$.

However, there is no consistent relationship between moral disengagement and peer popularity. One can be rejected by prosocial peers and gravitate toward, and gain acceptance from, dissocial or deviant peers (Cairns, Cairns, Neckerman, Gest, & Gariépy, 1988; Dishion, 1990).

The correlations among the other set of variables were similar in direction and magnitude across the two educational levels. Except for one correlation, which will be noted in the text as significant beyond the .01 level, all of the relationships among the different variables are significant beyond the .001 level. Participants who are prosocially oriented anticipate guilt reactions for detrimental acts ($r = .32$), exhibit low aggression proneness as reflected in irascibility ($r = -.13$) and ruminate hostility ($r = -.19$), and are disinclined to behave aggressively ($r = -.27$) or transgressively ($r = -.32$).

Participants who experience guilt over detrimental conduct cannot stop thinking about their troublesome experiences and perceived grievances ($r = .09$, $p < .01$) and refrain from aggressive behavior ($r = -.15$) or engagement in delinquent activities ($r = -.25$). Those who ruminate hostilely behave more aggressively ($r = .32$) and transgressively ($r = .29$). Irascibility is similarly related to aggressive behavior ($r = .42$) and pursuit of delinquent activities ($r = .30$).

Although the various mechanisms of moral disengagement operate interrelatedly as a single factor, there is some indication that they differ in their relative contribution to detrimental behavior. The various disengagement mechanisms were grouped into the subsets depicted in Figure 1 depending on whether they operated on reconstruing the conduct, obscuring personal responsibility, misrepresenting injurious consequences, and vilifying the victims. Responses to items were summed within sub-

sets and correlated separately with aggressive and delinquent behavior. For delinquent behavior, the correlates were $r = .42$ for moral reconstrual of harmful behavior, $r = .19$ for obscuring responsibility, $r = .21$ for misrepresenting harmful consequences, and $r = .39$ for vilifying the victims by blaming and dehumanizing them. For aggressive behavior, the correlates were $r = .34$ for moral reconstrual, $r = .16$ for obscuring responsibility, $r = .15$ for misrepresenting consequences, and $r = .33$ for vilifying the victims. Each of these correlations was significant beyond the .0001 level. Thus, across both classes of detrimental activities, the reconstrual of injurious behavior as serving worthy purposes and vilifying the victim exerted the greater disinhibitory impact. It is easy to hurt others when such conduct is viewed as doing worthy things with unworthy people.

Paths of Influence

The posited causal structure was tested with data from the junior high students because they provide the full set of theoretically relevant variables. The factors in the hypothesized model included moral disengagement, prosocialness, anticipatory guilt and restitutive reactions for harmful conduct, and a latent factor labeled Aggression Proneness. This factor was composed of the measured variables of hostile rumination and irascibility, which heighten propensity to detrimental action. The high loadings of .71 and .72, respectively, for the model concerning delinquency, and .67 and .76 for the model concerning aggression, show it to be a well-defined latent construct. The outcome variables in the structural model were physical and verbal aggression and engagement in delinquent activities. Delinquent acts, involving as they do more serious offenses than expression of verbal or physical aggression, require a greater exercise of moral disengagement. Hence, we conducted separate analyses on impact of moral disengagement on these two classes of behavior. Socioeconomic level was not included as a control variable because it was related neither to the predictive factors nor to the outcome variables. We tested the conceptual model on the covariance matrices using the EQS program (Bentler, 1989).

The results of the structural equation modeling for delinquent behavior are presented in Figure 3. The goodness of fit of the model to the data was corroborated by all of the fit indices considered. The tests yielded a nonsignificant $\chi^2(3, N = 659)$ of 3.29, $p = .35$, a Normed Fit Index (NFI) of .996, a Non-Normed Fit Index (NNFI) of .998, and a Comparative Fit Index (CFI) of 1.00. T tests revealed each of the constituent paths to be an essential part of the model.

In accord with the posited model, moral disengagement influenced delinquent behavior both directly and by reducing prosocialness and anticipatory guilt over transgressions and by fostering aggression proneness. Prosocialness and anticipatory guilt reactions influenced delinquency through their restraining effect on such conduct and by their impact on aggression proneness. Prosocialness increased feelings of guilt and counteracted propensity to aggression, whereas guilt roused ruminations about perceived grievances and irascibility. Heightened aggression proneness, in turn, increased the level of delinquent behavior. The full set of sociocognitive factors accounted for 31% of the variance in delinquent behavior. The direct (.20) and medi-

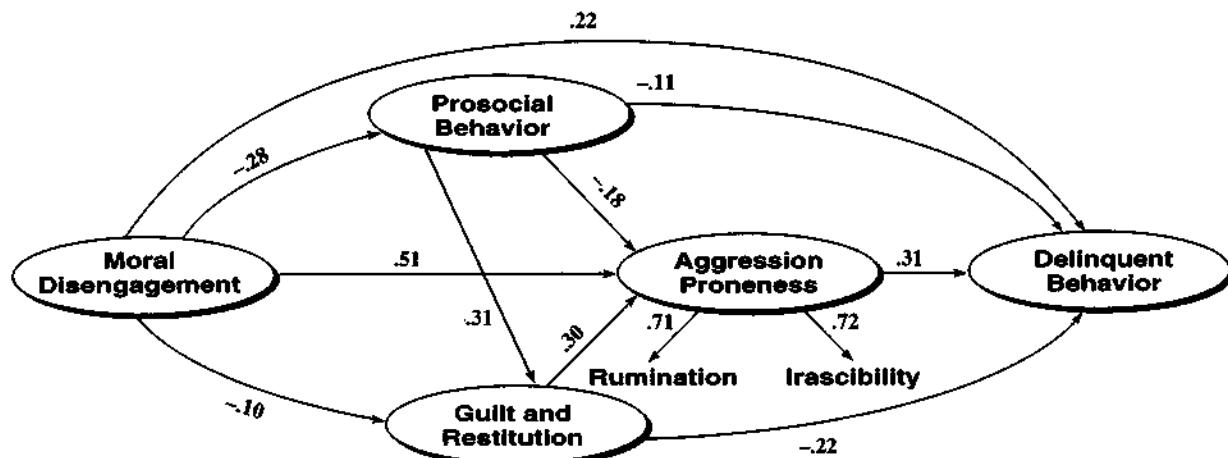


Figure 3. Contribution of moral disengagement to the multivariate determination of delinquent behavior.
All paths of influence are significant at $p < .05$ or less.

ated (.23) effects of moral disengagement combined for a high total impact (.45) on delinquent behavior.

All but one of the posited paths of influence on aggressive behavior were significant. No direct link was found between moral disengagement and aggressive behavior. The various indexes of goodness of fit showed a good fit of the model to the data—an NFI of .982, an NNFI of .928, and a CFI of .986—but a significant $\chi^2(3, N = 666) = 13.37, p < .01$ was obtained. However, the dependence of this statistic on sample size makes it a less sensitive test with a large sample. Figure 4 presents the results of the structural equation modeling for aggressive behavior with the one nonsignificant path removed.

The influence of moral disengagement on aggressive behavior was mediated through prosocialness, guilt, and aggression proneness. High moral disengagement reduced prosocialness and guilt reactions and promoted cognitive and affective reactions that are conducive to aggression. The three mediating factors operated in the same way as they did in delinquent behavior, with prosocialness and anticipatory moral self-sanctions curb-

ing aggression and aggression proneness heightening it. The set of factors in the model accounted for 34% of the variance in aggressive behavior.

Several alternative causal models also were tested. One such model assumes that weak prosocialness, low guilt, moral disengagement, and detrimental behavior are all simply coeffects of aggression proneness. This causal structure provides a very poor fit to the empirical data. The tests for goodness of fit for delinquent behavior yielded a highly significant $\chi^2(9, N = 659) = 215.54, p < .001$, and an NFI of .71, an NNFI of .52, and a CFI of .71. The results of the corresponding tests for aggressive behavior are $\chi^2(9, N = 666) = 130.35, p < .001$, NFI = .74, NNFI = .58, and CFI = .75.

Another alternative model posits that aggression proneness affects detrimental behavior both directly and through the mediation of prosocialness, guilt reactions, and moral disengagement. This causal structure also provides a poor fit to the empirical data. The fitness tests for delinquent behavior yielded a highly significant $\chi^2(6, N = 659) = 152.49, p < .001$, and an

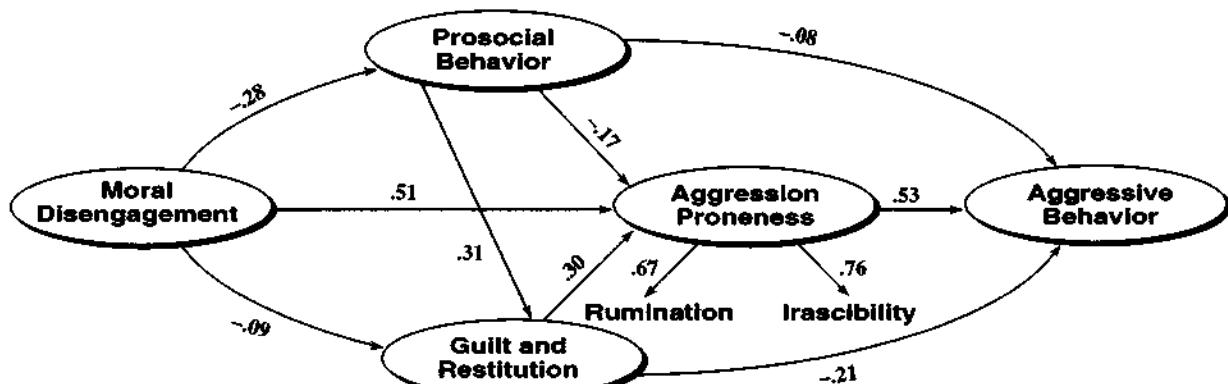


Figure 4. Contribution of moral disengagement to the multivariate determination of aggressive behavior.
All paths of influence are significant at $p < .05$ or less.

NFI of .79, an NNFI of .49, and a CFI of .80. The results of the tests for aggressive behavior are $\chi^2(6, N = 666) = 163.99, p < .001$, NFI = .78, NNFI = .45, and CFI = .78.

Discussion

The findings of the present study lend considerable support to the influential role played by mechanisms of moral disengagement both in detrimental and prosocial conduct. In accord with prediction, high moral disengagers are more readily angered and behave more injuriously than those who apply moral self-sanctions to detrimental conduct. Ready moral disengagers are also more prone to engage in thought patterns that are conducive to aggression. They ruminate about perceived grievances and dwell on punitive retaliations. By contrast, when self-reproach remains engaged to detrimental conduct, adolescents are quicker to forgive and forget. Cognitive self-arousal through vengeful rumination perpetuates a high level of anger long after social slights or other provocations have ceased (Bandura, 1973). Anger arousal primes one for vindictive action (Berkowitz, 1990; Zillman, 1983). Both the findings of the present naturalistic study and laboratory tests of heightened punitiveness over a prolonged time span (Caprara et al., 1985; Zelli, 1984) corroborate the link between hostile rumination and interpersonal aggression.

Whereas moral disengagement weakens self-restraints over injurious conduct, adherence to moral self-sanctions fosters prosocial relations. It is difficult to hurt others who are humanized and not blamed entirely for their life predicaments. Adherence to self-sanctions against injurious conduct is strengthened not only by a sense of empathy but also by assuming personal responsibility for one's actions and not minimizing their injurious effects. The obtained relationship between low moral disengagement and prosocial behavior is consistent with evidence from controlled experiments in which personal responsibility and humanization are systematically varied (Bandura et al., 1975). People refuse to behave cruelly, even under high instigation to do so, if they act under personalized responsibility and recipients are humanized. Prosocialness increases anticipatory self-reproach for injurious conduct and attempts at restitution should self-restraint temporarily fail.

Psychological theorizing and research tend to emphasize how easy it is to bring out the worst in people through dehumanization and other self-exonerative means. Thus, for example, the aspect of Milgram's (1974) research on obedient aggression that is widely cited is the evidence that good people can be coerced into performing cruel deeds. However, to get people to carry out punitive acts, the overseer had to be physically present, repeatedly ordering them to act injuriously and absolving them of any responsibility for the effects of their actions as they voiced their mounting concerns and objections. Orders to escalate punitiveness to more intense levels are largely ignored or subverted when remotely issued by verbal command. As Helm and Morelli (1979) noted, this is hardly an example of blind obedience triggered by an authoritative mandate. Moreover, what is rarely noted is the equally striking evidence that most people steadfastly refuse to behave punitively, even in response to incessant authoritarian commands, if the situation is personalized by having them see their victim or requiring them to in-

flict pain directly rather than remotely (Milgram, 1974). The concern with suspension of self-restraints over detrimental behavior is understandable considering the prevalence of people's inhumanities to one another. However, the power of humanization to counteract human cruelty is of considerable theoretical and social significance, but it continues to receive comparatively little attention. Increased research efforts are needed to clarify how the affirmation of common humanity can bring out the best in others.

If moral standards are disengaged from transgressive conduct it can be carried out free from restraints of anticipatory self-censure. Through cognitive reconstruals and disownment of a sense of personal agency, negative self-sanctions are unlikely to be activated. There is little reason to engage in self-reproach for behavior that has been rendered acceptable or for which one professes no responsibility. Indeed, the findings confirm that the better the moral disengagement the weaker the felt guilt and the less the need to undo any harm caused by detrimental behavior.

So far the discussion has centered on aggressive and destructive conduct. Self-regulatory mechanisms preside over transgressive activities as well as interpersonal aggression. High moral disengagers were much more inclined to engage in delinquent pursuits than those who adhered to self-regulatory standards under conditions that lend themselves easily to self-exoneration. High moral disengagers were also less prosocial, less troubled by anticipatory feelings of guilt, and more prone to resort to vengeful ruminations and irascible reactions. These factors were, in turn, related to delinquent behavior. The use of these mechanisms is by no means confined to habitual freelancing delinquents. Gabor (1994) documented in considerable detail the widespread illegalities and inhumanities committed in all walks of life by ordinary citizens with self-exonerative justifications.

Analysis of the pattern of influences on delinquent behavior reveals that the proposed conceptual model provides an excellent fit to the empirical data. The model not only fits the data well, but it also yields a better fit than alternative causal structures. Moral disengagement affects delinquent behavior both directly and indirectly through its influence on prosocial behavior, level of guilt, and aggression proneness. Moral disengagement operates through essentially the same paths of influence on aggressiveness except that it involves no direct link. High moral disengagers are less prosocial and less guilty over detrimental conduct—both of which, in turn, lessen restraints over aggressive actions. Aggression proneness, of course, bears a close resemblance to aggressive action, which gives it a larger mediational role. This most likely accounts for a major share of the difference in its strength of influence across the two classes of detrimental behavior.

A number of features of the present research add to the reliability and generalizability of the obtained relationships between moral disengagement and detrimental conduct. It is replicated across diverse sources of data, different methods of measurement, distinct forms of detrimental conduct, and variant sociodemographic characteristics of the participants. Moreover, the predictiveness of proneness to moral disengagement is not confounded by socioeconomic factors. The causal analyses should be interpreted with some caution, however, because of the cross-sectional design of the research. However, the findings

of experimental investigations involving the key variables attest to the direction of causality posited in the guiding causal structure. On the moral disengagement side, controlled variations in displacement and diffusion of responsibility, dehumanization, and euphemistic labeling lead people to behave more aggressively (Bandura, 1991; Diener, 1977; Milgram, 1974; Zimbardo, 1969). With regard to the mediational paths, hostile rumination and irascibility have been shown to heighten aggressiveness (Caprara et al., 1985). Hence, there are experimentally validated bases for the posited paths of influence. The present study is part of a larger longitudinal project. The causal influence of moral disengagement will be further tested longitudinally in a multiple-panel design.

A recently completed study by Elliott and Rhinehart (1995) of serious assaults and transgressions with American youths attests to the generalizability of the theory of moral disengagement. In accord with the findings from the present study, males exhibit higher levels of moral disengagement than do females. The cross-cultural replication indicates that some of the gender differences in aggression may reside in differential proclivity to disengage moral self-sanctions from injurious conduct. Moral disengagement also differs by age, with older youths being more prone to adopt self-exonerative devices in regard to serious offenses. There were no significant differences in moral disengagement by race or by socioeconomic level. The latter finding also concurs with that obtained in the present study. Proclivity to moral disengagement predicted both felony and misdemeanor assaults and thefts. Ready moral disengagement retained high predictiveness regardless of age, sex, race, religious affiliation, and social class. This high predictive consistency attests to the pervading role of the self-regulatory system in detrimental behavior.

The differences between attribution theory and social cognitive theory regarding the mechanism of victim blaming warrants some comment. In attribution theory (Weiner, 1986), ascriptions of responsibility affect behavior through the mediation of emotional reactions. For example, blaming victims for their plight arouses anger toward them, whereas placing the blame on situational causes arouses pity (Zucker & Weiner, 1993). This interpretation begs the question of the mechanism governing when and how emotion gets translated into action. Sometimes people act on their anger, but oftentimes they go to great lengths to conceal how they feel and are not about to vent their anger in action. The differential reactions to anger indicate that emotion is linked to action through a self-regulatory mechanism. Moreover, many transgressive situations are not emotionally arousing, but they lend themselves readily to self-exoneration for transgressive acts. Consider, for example, the moral disengagement item "If people are careless where they leave their things it is their own fault if they get stolen." In this situation, transgressors do not have to arouse themselves to a state of anger to pilfer desired goods. They exempt themselves from restraining self-sanction for transgressive conduct by contending that, through their negligence, victims have only themselves to blame. This analysis indicates that emotional arousal may be facilitatory, but it is neither necessary nor sufficient for the perpetration of transgressive conduct.

In the social cognitive theory of moral agency (Bandura, 1991), moral conduct is motivated and regulated mainly by the

ongoing exercise of self-reactive influence. The major self-regulatory mechanism, which is mobilized in concert with situational factors, operates through three main subfunctions. These include self-monitoring of conduct, judgment of the culpability of conduct in relation to personal standards and environmental circumstances, and affective self-reaction. In this conceptual scheme, ascription of blame to victims functions as a disengager of moral self-sanctions. Indeed, the findings of the present research reveal that the disengagement mechanisms operate in concert on detrimental behavior both directly and by their effects on anticipatory guilt, prosocialness, and emotion-arousing ideation.

Theories of aggression typically characterize influences that reduce restraints over aggression as disinhibitory. *Disinhibition* describes a process but does not specify the mechanisms governing the behavioral effects. In social cognitive theory (Bandura, 1986), transgressive conduct is regulated by two major sources of sanctions: social sanctions and internalized self-sanctions. Both control mechanisms operate anticipatorily. In control arising from social sanctions, people refrain from behaving transgressively because they anticipate that such conduct will bring them social censure or other forms of punishing outcomes. In control rooted in self-sanctions, people behave prosocially because it brings self-satisfaction and self-respect, and they refrain from detrimental behavior because it will give rise to self-censure. What is called disinhibition largely reflects the disengagement of controlling self-sanctions from detrimental conduct. Understanding of the nature of disinhibition can, therefore, be advanced by increasing knowledge of self-regulatory disengagement.

The discussion thus far has centered on the role of disengagement mechanisms in the regulation of one's own injurious conduct. These mechanisms also affect how the inhumanities perpetrated by others are viewed. For example, displacement of responsibility not only weakens restraints over one's own detrimental actions but also diminishes concern over the suffering of those mistreated by others (Tilker, 1970). Collective moral disengagement can have widespread societal and political ramifications by supporting, justifying, and legitimizing inhumane social practices and policies.

Psychological theorizing and research on aggression has focused heavily on impulsive aggression. The massive threats to human welfare stem mainly from deliberate acts of principle rather than from unrestrained acts of impulse. It is the morally justified and principled resort to destructiveness that is of greatest social concern but is largely ignored in psychological analyses of inhumanities. Over the years, much reprehensible and destructive conduct has been perpetrated by ordinary, otherwise considerate people in the name of religious principles, righteous ideologies, nationalistic imperatives, and ruthless social policies (Bandura, 1986; Rapoport & Alexander, 1982; Sanford & Comstock, 1971). There is much to be gained from understanding how the facility for moral disengagement develops and how institutional justificatory strategies are used to enlist people for exploitative and destructive purposes.

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Appendix

Mechanisms of Moral Disengagement

1. It is alright to fight to protect your friends.
2. Slapping and shoving someone is just a way of joking.
3. Damaging some property is no big deal when you consider that others are beating people up.
4. A kid in a gang should not be blamed for the trouble the gang causes.
5. If kids are living under bad conditions they cannot be blamed for behaving aggressively.
6. It is okay to tell small lies because they don't really do any harm.
7. Some people deserve to be treated like animals.
8. If kids fight and misbehave in school it is their teacher's fault.
9. It is alright to beat someone who bad mouths your family.
10. To hit obnoxious classmates is just giving them "a lesson."
11. Stealing some money is not too serious compared to those who steal a lot of money.
12. A kid who only suggests breaking rules should not be blamed if other kids go ahead and do it.
13. If kids are not disciplined they should not be blamed for misbehaving.
14. Children do not mind being teased because it shows interest in them.
15. It is okay to treat badly somebody who behaved like a "worm."
16. If people are careless where they leave their things it is their own fault if they get stolen.
17. It is alright to fight when your group's honour is threatened.
18. Taking someone's bicycle without their permission is just "borrowing it."
19. It is okay to insult a classmate because beating him/her is worse.
20. If a group decides together to do something harmful it is unfair to blame any kid in the group for it.
21. Kids cannot be blamed for using bad words when all their friends do it.
22. Teasing someone does not really hurt them.
23. Someone who is obnoxious does not deserve to be treated like a human being.
24. Kids who get mistreated usually do things that deserve it.
25. It is alright to lie to keep your friends out of trouble.
26. It is not a bad thing to "get high" once in a while.
27. Compared to the illegal things people do, taking some things from a store without paying for them is not very serious.
28. It is unfair to blame a child who had only a small part in the harm caused by a group.
29. Kids cannot be blamed for misbehaving if their friends pressured them to do it.
30. Insults among children do not hurt anyone.
31. Some people have to be treated roughly because they lack feelings that can be hurt.
32. Children are not at fault for misbehaving if their parents force them too much.

Note. The following items correspond to the various mechanisms of moral disengagement. *Moral justification:* 1, 9, 17, 25. *Euphemistic language:* 2, 10, 18, 26. *Advantageous comparison:* 3, 11, 19, 27. *Displacement of responsibility:* 5, 13, 21, 29. *Diffusion of responsibility:* 4, 12, 20, 28. *Distorting consequences:* 6, 14, 22, 30. *Attribution of blame:* 8, 16, 24, 32. *Dehumanization:* 7, 15, 23, 31.

Received August 28, 1995
 Revision received November 20, 1995
 Accepted November 22, 1995 ■

Personal and collective efficacy in human adaptation and change

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Perceived self-efficacy operates as a central self-regulatory mechanism of human agency. People's beliefs that they can produce desired effects by their actions influence the choices they make, their aspirations, level of effort and perseverance, resilience to adversity, and vulnerability to stress and depression. This chapter addresses the origins of efficacy beliefs, the processes through which they operate, their diverse effects, and the modes by which they can be modified. Human adaptation and change are rooted in social systems. Personal agency through efficacy belief operates within a broad network of sociostructural influences. In these agentic transactions, people are producers as well as products of social systems. People often have to work together to shape their social future. Self-efficacy theory, therefore, extends the conception of agent causality to people's beliefs in their collective efficacy to produce desired outcomes. With growing transnational interdependencies, life in the societies of today is now shaped by events in distant places. The globalization of human interconnectedness presents new challenges for people to exercise some control over their personal destinies and national life.

La perception qu'un individu a de sa propre efficacité agit comme un mécanisme autorégulateur de l'action humaine. La croyance qu'ont les gens de pouvoir produire des effets désirés par l'entremise de leurs actions exerce une influence sur les choix qu'ils font, sur leurs aspirations, sur leur niveau d'effort et de persévérence, sur leur résistance dans l'adversité et sur leur vulnérabilité face au stress et à la dépression. Ce chapitre traite des origines des croyances dans l'efficacité personnelle, du processus de leur action, de leurs effets variés et des façons dont elles peuvent être modifiées. L'adaptation et le changement de l'être humain sont ancrés dans les systèmes sociaux. Par l'intermédiaire de la croyance en l'efficacité, l'action personnelle agit à l'intérieur d'un vaste réseau d'influences socio-structurelles. Dans ces transactions, les individus sont des producteurs ainsi que des produits des systèmes sociaux. Les gens doivent souvent travailler ensemble pour forger leur avenir social. Par conséquent, la théorie de l'efficacité personnelle étend la conception d'un lien causal entre agents, aux croyances des individus dans leur

efficacité collective pour la production des résultats désirés. Avec l'accroissement d'interdépendances entre nations, la vie dans les sociétés d'aujourd'hui est maintenant moulée par des événements dans des endroits lointains. La globalisation des liens entre humains présente aux gens de nouveaux défis les obligeant à exercer un certain contrôle sur leur destin personnel et leur vie nationale.

People have always striven to control events that affect their lives. Control is sought because it provides countless personal and social benefits. By influencing events over which they have some control, people are better able to realize desired futures and to forestall undesired ones. Growth of knowledge has greatly increased people's ability to predict events and to control them. By applying this knowledge, people built physical technologies that transformed how they live their lives. They developed biological technologies to alter the genetic makeup of plants and animals. They created medical and psychosocial technologies to improve the quality of their physical and psychosocial lives. They devised social systems with entitlements and institutional protections against tyrannical control that expanded freedom of belief and action.

The enhanced human power to transform the environment is not an unmixed blessing. Control wielded for short-run benefits can have pervasive harmful consequences on current life and on how future generations live their lives. There is growing public concern over where some of the technologies we are creating are leading us.

The accelerated pace of informational, social and technological evolution has placed a premium on people's capabilities to exert a strong hand in their own development throughout the life course. Under rapidly changing environments, skills that were functional are quickly outmoded requiring continual self-renewal.

SELF-EFFICACY IN THE EXERCISE OF HUMAN AGENCY

Because of the centrality of control in people's lives many theories about it have been proposed. Much of this research is tied to general measures of perceived control and search for their correlates. In social cognitive theory, perceived efficacy is embedded in a theory of human agency. People make causal contribution to their lives through mechanisms of personal agency. Among the mechanisms of agency, none is more central or pervasive than people's judgments of their efficacy. Unless people believe they can produce desired effects by their actions they have little incentive to act. Efficacy belief is, therefore, the foundation of action.

Theorizing and research address each of the various facets of this self-regulative mechanism. These include: the nature and structure of efficacy beliefs; their origins; the diverse ways in which they affect psychosocial functioning; the intervening processes through which they exert their effects; and the modes by which they can be instilled and strengthened to enhance human functioning. The vast literature and wide-ranging applications of self-efficacy theory to different

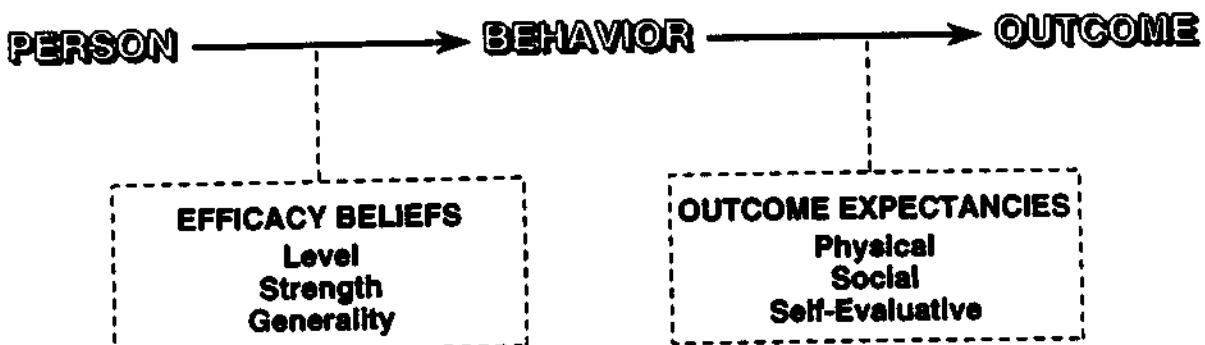


FIG. 3.1 Diagrammatic representation of the conditional relations between efficacy beliefs and outcome expectancies. In given domains of functioning, efficacy beliefs vary in level, strength and generality. The outcomes that flow from a given course of action can take the form of positive or negative physical, social, and self-evaluative effects.

spheres of life are reviewed in *Self-Efficacy: The Exercise of Control* (Bandura, 1997).

Perceived efficacy refers to beliefs in one's capabilities to organize and execute the courses of action required to produce given levels of attainments. The events over which influence is exercised vary widely, however. They may entail regulating of one's own motivation, thought processes, affective states and actions or changing environmental conditions, depending on what one seeks to manage.

People's judgments of how well they will be able to perform largely determine what outcomes they expect their actions to produce. The causal relation between efficacy beliefs and outcome expectations is shown in Fig. 3.1. Perceived self-efficacy is a judgment of one's capabilities. An outcome expectation is what people expect their actions to produce. The outcomes may be physical, social or self-evaluative.

NATURE AND STRUCTURE OF EFFICACY BELIEFS

Human competencies are developed and expressed in many different forms. Thus, the efficacy belief system is not an omnibus trait. It is a differentiated set of self-beliefs linked to distinct realms of functioning. Comparative studies show that domain-linked measures of perceived efficacy are good predictors of motivation and action (Bandura, 1997). General measures of perceived control are weak predictors or are nonpredictive. Global all-purpose tests are measures of convenience rather than of explanatory and predictive power.

SOURCES OF PERCEIVED SELF-EFFICACY

People's beliefs in their efficacy can be enhanced in four principal ways. The most effective way of instilling a strong sense of efficacy is through *mastery experiences*. Successes build a robust sense of efficacy. Failures undermine it, especially if failures occur before a sense of efficacy is firmly established. If people experience only easy successes, they come to expect quick results and

are easily discouraged by failure. A resilient sense of efficacy requires experience in overcoming obstacles through perseverant effort. By sticking it out through tough times people emerge more able and stronger from adversity.

The second way of creating, and strengthening self-efficacy is by social *modeling*. Models are a source of aspiration, competencies, and motivation. Seeing people similar to oneself succeed by perseverant effort raises observers' beliefs in their own abilities. The failures of others instill self-doubts about one's own ability to master similar activities.

Social persuasion is the third mode of influence. Realistic boosts in efficacy can lead people to exert greater effort. This increases their chances of success. But effective efficacy builders do more than convey positive appraisals. They structure situations for others in ways that bring success and avoid placing them, prematurely, in situations where they are likely to fail. They measure success by self-improvement rather than by triumphs over others.

People also rely partly on their *physical and emotional states* in judging their capabilities. They read their emotional arousal and tension as signs of vulnerability to poor performance. In activities involving strength and stamina, people interpret their fatigue, aches and pains as indicators of low physical efficacy. Mood also affects how people judge their efficacy. Positive mood enhances a sense of efficacy; depressed mood diminishes it. The fourth way of modifying efficacy beliefs is to reduce people's stress and depression, build their physical strength and change misinterpretations of their physical states. Mastery experiences produce stronger and more generalized efficacy beliefs than the other modes of influence.

COGNITIVE PROCESSING OF EFFICACY INFORMATION

Information for judging self-efficacy, whether conveyed enactively, vicariously, persuasively or somatically is not inherently informative. It is only raw data. Experiences become instructive through cognitive processing of efficacy information and reflective thought. One must distinguish between information conveyed by events and information as selected and integrated into self-efficacy judgments.

The cognitive processing of efficacy information involves two separate functions. The first is the types of information people attend to and use as indicators of personal efficacy. The theory specifies the set of efficacy indicators that are distinctive for each of the four major modes of influence. These are summarized in Table 3.1. For example, judgments of efficacy based on performance attainments may vary depending on people's interpretive biases, the difficulty of the task, how hard they worked at it, how much help they received, the conditions under which they performed, their emotional and physical state at the time, their rate of improvement over time, and biases in how they monitor and recall their attainments.

TABLE 3.1
**The distinctive sets of factors within each of the four modes of influence
 that can affect the construction of efficacy beliefs**

<i>Enactive efficacy information</i>	<i>Vicarious efficacy information</i>
Interpretive biases	Model attribute similarity
Perceived task difficulty and diagnosticity	Model performance similarity
Effort expenditure	Model historical similarity
Amount of external aid received	Multiplicity and diversity of modeling
Situational circumstances of performance	Mastery or coping modeling
Transient affective and physical states	Exemplification of coping strategies
Temporal pattern of successes and failures	Portrayal of task demands
Selective bias in self-monitoring of performance	
Selective bias in memory for performance attainments	
<i>Persuasory efficacy information</i>	<i>Somatic and affective efficacy information</i>
Credibility	Degree of attentional focus on somatic states
Expertness	Interpretive biases regarding somatic states
Consensus	Perceived source of affective arousal
Degree of appraisal disparity	Level of arousal
Familiarity with task demands	Situational circumstances of arousal

The indicators people single out provide the information base on which the self-appraisal process operates. The second function in efficacy judgment involves the combination rules or heuristics people use to integrate efficacy information from different sources. There is much work to be done in the integrative aspect of the efficacy judgment process.

VERIFICATION OF CAUSATION

A central question in any theory of cognitive regulation of motivation and action concerns the issue of causality. Do efficacy beliefs operate as causal factors in human functioning? This issue has been examined by a variety of experimental strategies. In some studies perceived self-efficacy is raised to differential levels through vicarious modes of influence (Bandura, Reese, & Adams, 1982). In others, perceived efficacy is altered by comparison of personal attainments with those presented in bogus peer norms (Bouffard-Bouchard, 1990; Jacobs, Prentice-Dunn, & Rogers, 1984; Litt, 1988). Some studies bias self-efficacy judgment with anchoring influences using arbitrary reference points (Cervone & Peake, 1986; Peake & Cervone, 1989). Still other approaches to the verification of causality employ a contravening design in which a procedure that can impair functioning is applied but in ways that raise beliefs of personal efficacy (Holroyd et al., 1984). In each case, perceived self-efficacy is systematically varied by non-performance influences and the effects of efficacy on performance are measured.

These divergent experimental procedures provide convergent evidence that perceived self-efficacy contributes independently to motivation and performance accomplishments regardless of the activity in both children and adults alike (Bandura, 1997).

Numerous multivariate investigations have been conducted using panel designs in which efficacy beliefs, along with other possible determinants and performance attainments, are measured on two or more occasions. In some of these studies, efficacy beliefs are altered by naturally occurring influences during the intervening period. More often, efficacy beliefs are modified experimentally. The temporal ordering and systematic variation of efficacy beliefs antecedently to the predicted behavior helps to remove ambiguities about the source and direction of causality. In addition to controlled induction and temporal priority of efficacy change, multiple controls are applied for other potentially influential factors. The results of such studies reveal that efficacy beliefs make substantial independent contribution to variations in motivation and performance attainments (Bandura & Jourden, 1991; Dzewaltowski, 1989; Locke, Frederick, Lee, & Bobko, 1984; Ozer & Bandura, 1990; Wood & Bandura, 1989). The causal contribution of efficacy beliefs to human functioning is further documented in comparative tests of the predictive power of social cognitive theory and alternative conceptual models (Dzewaltowski, Noble, & Shaw, 1990; Lent, Brown, & Larkin, 1987; McCaul, O'Neill, & Glasgow, 1988; Siegel, Galassi, & Ware, 1985; Wheeler, 1983).

BENEFITS OF OPTIMISTIC SELF-EFFICACY BELIEF

It is widely believed that misjudgment breeds dysfunction. Certainly, gross misjudgments can get one into trouble, but optimistic appraisals of efficacy can be advantageous. Veridical judgments can be self-limiting. When people err in their self-appraisal they tend to overestimate their abilities.

The realities of everyday life are strewn with difficulties. They are full of disappointments, impediments, adversities, failures, setbacks, frustrations and inequities. Optimistic self-efficacy is, therefore, an adaptive judgmental bias not a cognitive failing to be eliminated. Evidence shows that human accomplishments and positive well-being require an optimistic sense of personal efficacy to override the numerous impediments to success. Indeed, the striking characteristic of people who have achieved success in their fields is an inextinguishable sense of efficacy and a firm belief in the worth of what they are doing (Shepherd, 1995; White, 1982).

Early rejection is the rule, rather than the exception, in virtually all innovative and creative endeavors. A resilient self-belief enables people to override repeated early rejections of their work. People who are successful, innovative, sociable, nonanxious, nondepressed, and effective social reformers take an

optimistic view of their efficacy to influence events that affect their lives. If not unrealistically exaggerated, such self-beliefs raise aspirations, and enhance and sustain the level of motivation needed for personal and social accomplishments.

There is a controversy in the literature over whether people are better served by veridical or by optimistic self-belief. These debates fail to make important distinctions that specify when optimistic judgment of capabilities is beneficial. Tenacious strivers should be differentiated from wistful dreamers. Wistful optimists lack the efficacy strength to put up with the uncertainties, disappointments and drudgery that are required for high accomplishments. Tenacious strivers believe so strongly in themselves, that they are willing to exert extraordinary effort and suffer countless reversals in pursuit of their vision. They abide by objective realism about the normative reality but subjective optimism about their chances of success. They do not delude themselves about the tough odds of high attainments but they believe they have what it takes to beat those odds.

The functional value of veridical self-appraisal also depends on the nature of the activity. In activities where the margins of error are narrow and missteps can produce costly or injurious consequences, people had better be accurate in judging their efficacy. It is a different matter where difficult accomplishments can produce substantial personal or social benefits. The personal costs involve time, effort and resources. Individuals have to decide for themselves which abilities to cultivate, whether to invest their efforts in ventures that are difficult to fulfill, and how much hardship they are willing to endure in pursuits strewn with obstacles and uncertainties. Societies enjoy the considerable benefits of the accomplishments in the arts, sciences and technologies of its persisters and risk takers. To paraphrase the astute observation of George Bernard Shaw: since reasonable people adapt to the world and unreasonable ones try to alter it, human progress depends on the unreasonable ones.

We study extensively the costs of mistaken actions that are taken, but we ignore the costs of promising actions not taken because of underconfidence. Yet, people have greater regrets about the career opportunities not pursued, personal relationships not cultivated and risks not taken than regrets about the actions they have taken. Preoccupation with the risks of optimistic efficacy reflects a pervasive conservative bias in psychology.

EFFICACY-ACTIVATED PROCESSES

Efficacy beliefs regulate human functioning through four major processes. They include cognitive, motivational, emotional and selection processes.

Cognitive processes

Efficacy beliefs affect thought patterns that can enhance or undermine performance. These cognitive effects take various forms. People who have a high sense of efficacy take a future time perspective in structuring their lives. Much human

behavior is regulated by forethought in the form of goals. The stronger the perceived efficacy, the higher the goals people set for themselves and the firmer their commitment to them (Bandura, 1991). Challenging goals raise motivation and performance attainments (Locke & Latham, 1990).

People's beliefs in their efficacy also influence the anticipatory scenarios and visualized futures they construct and rehearse. Those of high efficacy visualize success scenarios that provide positive guides for performance. Those who doubt their efficacy visualize failure scenarios that undermine performance by dwelling on how things will go wrong.

A major function of thought is to enable people to predict events and to exercise control over those that are important to them. People of high efficacy show greater cognitive resourcefulness and strategic flexibility. Rapid discovery of predictive and operative rules enables them to manage their environment more effectively and productively (Wood & Bandura, 1989).

Motivational processes

Efficacy beliefs play a central role in the self-regulation of motivation. Most human motivation is cognitively generated. One can distinguish three forms of cognitive motivators around which different theories have been built. These include *causal attributions*, *outcome expectancies* and *cognized goals*. The corresponding theories are attribution theory, expectancy-value theory and goal theory. Figure 3.2 summarizes these theories of cognitive motivation.

Much human motivation and behavior is regulated anticipatorily by the outcomes expected for given actions. The capacity to exercise self-influence by personal challenge through goal setting and evaluative reaction to one's own performances provides another major cognitive mechanism of motivation and self-directedness. Once people commit themselves to valued goals, they seek self-satisfaction from fulfilling them and intensify their efforts by discontent with substandard performances. The causal attributions people make for their performances also affect their motivation.

The effects of goals, outcome expectations and causal attributions on motivation are partly governed by beliefs of personal efficacy. There are many activities

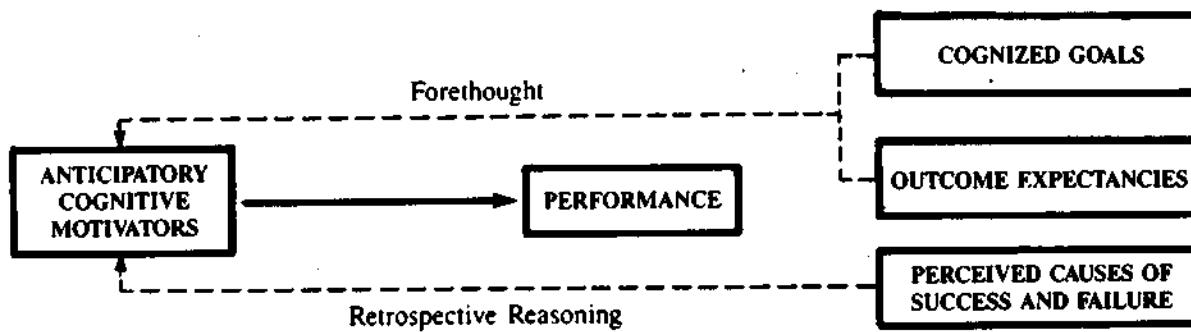


FIG. 3.2 Schematic representation of conceptions of cognitive motivation based on cognized goals, outcome expectancies and causal attributions.

which, if done well, produce valued outcomes, but they are not pursued by people who doubt they can do what it takes to succeed. They do not regard options in domains of low perceived efficacy worth considering whatever benefits they may hold. Such exclusions of large classes of options are made rapidly on efficacy grounds with little thought of costs and benefits. Rational models of decision making that exclude efficacy judgment sacrifice explanatory and predictive power.

It is partly on the basis of efficacy beliefs that people choose what goal challenges to undertake, how much effort to invest and how long to persevere in the face of difficulties (Bandura, 1997; Locke & Latham, 1990). When faced with obstacles, setbacks and failures, those who doubt their abilities slacken their efforts, give up or settle for mediocre solutions. Those who have strong belief in their abilities exert greater effort to master the challenges.

Efficacy beliefs also influence causal attributions. The influence of efficacy beliefs on causal attributions is highly reproducible across cognitive attainments (Matsui et al., 1988; Silver, Mitchell, & Gist, 1995), interpersonal transactions (Alden, 1986), physical performances (Courneya & McAuley, 1993; McAuley, Duncan, & McElroy, 1989), and management of health habits (Grove, 1993). People who regard themselves as highly efficacious ascribe their failures to insufficient effort, inadequate strategies or unfavorable circumstances. Those of low efficacy attribute their failures to low ability. The effects of causal attributions on achievement strivings are mediated almost entirely through efficacy beliefs (Relich, Debus, & Walker, 1986; Schunk & Gunn, 1986; Schunk & Rice, 1986).

Affective processes

People's beliefs in their coping capabilities also affect how much stress and depression they experience in threatening or difficult situations. There are four major ways in which efficacy beliefs regulate emotional states (Bandura, 1997). They do so through cognitive processing of threats, transformational actions, exercise of thought control, and regulation of affective states.

Efficacy beliefs influence how threats are perceived and cognitively processed. If people believe they can manage threats they are not distressed by them; but if they believe they cannot control them they experience high anxiety, dwell on their coping deficiencies, view many aspects of their environment as fraught with danger, magnify possible risks and worry about perils that rarely happen. By such thinking they distress themselves and impair their functioning.

People who have a high sense of coping efficacy adopt strategies that change threatening environments into safe ones. In this mode of emotion regulation, efficacy beliefs reduce stress and anxiety through their impact on coping behavior. The stronger the sense of efficacy the bolder people are in tackling the problems that breed stress and anxiety, and the greater is their success in shaping the environment to their liking (Bandura, 1988).

People have to live with a psychic environment that is largely of their own making. Many human distresses result from failures to control disturbing thoughts. Control of one's thought processes is, therefore, a key factor in self-regulation of emotional states. The process of efficacious thought control is summed up well in the proverb: *You cannot prevent the birds of worry and care from flying over your head, but you can stop them from building a nest in your hair.* Research shows that it is not the sheer frequency of disturbing thoughts but the perceived helplessness to turn them off that is the major source of distress (Kent, 1987; Kent & Gibbons, 1987). Hence, the frequency of aversive cognitions is unrelated to anxiety level when the influence of perceived thought control efficacy is removed, whereas perceived thought control efficacy is strongly related to anxiety level when extent of aversive cognitions is removed.

In addition, people can exercise control over their affective states in palliative ways without altering the causes of their emotional arousal. Self-relaxation, engrossment in diversionary reactional activities, calming self-talk and seeking the solace of social support are examples of palliative ways for reducing stress and anxiety. Belief that one can relieve unpleasant emotional states when they arise makes them less aversive (Arch, 1992a; 1992b). These alternative paths of affect regulation must be considered in analyzing the role of perceived coping efficacy in human stress and anxiety.

Efficacy and depression Perceived inefficacy to control things one values also produces depression. A theory must specify when perceived inefficacy will generate anxiety or depression. The nature of the outcomes over which personal control is sought is an important differentiating factor. Attenuation or control of injurious events is central to anxiety. Irreparable loss and perceived inefficacy to gain highly valued outcomes figures prominently in despondency. Human distress does not come packaged in neatly separable forms, however. When losses of what one values highly produce aversive outcomes, as when loss of a job jeopardizes one's livelihood, a sense of powerlessness to control vital aspects of one's life is both distressing and depressing.

As in the case of anxiety arousal, perceived inefficacy contributes to depression in varied ways. One route is through unfulfilled aspirations. People who impose on themselves standards of self-worth which they judge they cannot attain drive themselves to depression (Bandura, 1991; Kanfer & Zeiss, 1983). Depression, in turn, weakens people's beliefs in their efficacy, creating a downward cycle (Kavanagh & Bower, 1985).

A second route to depression is through a low sense of social efficacy to develop social relationships that bring satisfaction to one's lives and cushion the adverse effects of chronic stressors. A low sense of social efficacy contributes to depression both directly and by curtailing development of social support. Perceived efficacy and social support operate bidirectionally in human adaptation and change. Social support is not a self-forming entity waiting around to

buffer harried people against stressors. Rather, people have to go out and find or create supportive relationships for themselves. Individuals of high perceived social efficacy create more supportive environments for themselves than those who have a low opinion of their social capabilities (Holahan & Holahan, 1987a; 1987b). Supportive relationships, in turn, can enhance personal efficacy (Cutrona & Troutman, 1986; Major, Mueller, & Hildebrandt, 1985). Supporters can raise efficacy in others in several ways. They can model effective coping attitudes and strategies for managing problem situations, demonstrate the value of perseverance, and provide positive incentives and resources for efficacious coping. Mediational analyses reveal that social support has beneficial effects to the extent that it raises perceived coping efficacy.

The third route to depression is through thought control efficacy. Much human depression is cognitively generated by dejecting ruminative thought (Nolen-Hoeksema, 1991). A low sense of efficacy to control ruminative thought contributes to the occurrence, duration, and recurrence of depressive episodes (Kavanagh & Wilson, 1989).

Selection processes

The preceding discussion documents how efficacy beliefs enable people to create beneficial environments and to control them. People are partly the product of their environment. By choosing their environments they can have a hand in what they become. Efficacy beliefs can, therefore, play a key role in shaping the courses lives take by influencing the types of activities and environments people choose to get into. In self-development through choice processes, destinies are shaped by selection of environments known to cultivate valued potentialities and lifestyles.

The power of efficacy beliefs to affect life paths through selection processes is most clearly revealed in studies of career choice and development (Lent, Brown, & Hackett, 1994). The stronger people believe in their efficacy, the more career options they consider possible, the greater the interest they show in them, the better they prepare themselves educationally for different occupational careers, and the greater their staying power in the chosen pursuits.

The diverse effects of perceived self-efficacy on human well-being and functioning can be summarized as follows:

People who have a low sense of efficacy in a given domain of life: shy away from difficult tasks which they perceive as personal threats; have low aspirations and weak commitment to the goals they choose; maintain a self-diagnostic focus rather than concentrate on how to perform successfully; dwell on personal deficiencies, obstacles and adverse outcomes; attribute failures to deficient capability; slacken their efforts or give up quickly in the face of difficulties; are slow to recover their sense of efficacy after failures or setbacks; and are prone to stress and depression.

People who have a strong sense of efficacy: approach difficult tasks as challenges rather than as threats; set challenging goals and sustain strong commitment to their goals; maintain a task-diagnostic focus that guides effective performance; attribute failures to insufficient effort; heighten effort in the face of difficulties; display low vulnerability to stress and depression; and quickly recover their sense of efficacy after failures or setbacks. Success usually comes through renewed effort after failed attempts. It is resiliency of personal efficacy that counts.

INTERDEPENDENCE OF PERSONAL AGENCY AND SOCIAL STRUCTURE

In social cognitive theory (Bandura, 1986), human agency operates in an interdependent causal structure involving triadic reciprocal causation (see Fig. 3.3). In this transactional view of self and society, personal factors in the form of cognitive, affective and biological events, behavior, and environmental influences all operate as interacting determinants that influence each other bidirectionally.

Human adaptation and change are rooted in social systems. Personal agency, therefore, exerts its effects within a broad network of sociostructural influences. In these agentic transactions, people are producers as well as products of social systems. Social structures are created by human activity to organize, guide and regulate human affairs in given domains by authorized rules and sanctions. The structural practices, in turn, impose constraints and provide resources and opportunity structures for personal development and functioning. Given this bidirectionality of influence, social cognitive theory rejects a dualism between social structure and personal agency.

Sociostructural theories and psychological theories are often regarded as rival conceptions of human behavior or as representing different levels of causation. Human behavior cannot be fully understood solely in terms of sociostructural factors or psychological factors. A full understanding requires an integrated

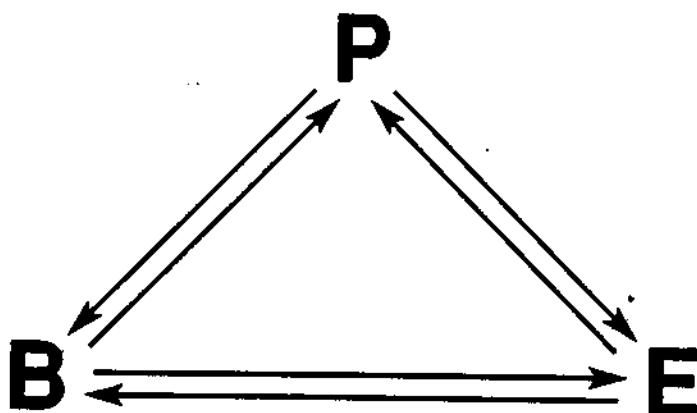


FIG. 3.3 Schematization of the relations between the three major classes of determinants in triadic reciprocal causation. *B* represents behavior; *P* the internal personal factors in the form of cognitive, affective and biological events; and *E* the external environment (Bandura, 1986).

perspective in which social influences operate through psychological mechanisms to produce behavioral effects. However, the self-system is not merely a conduit for external influences. The self is socially constituted; but by exercising self-influence human agency operates generatively and proactively rather than just reactively. Thus, in the theory of triadic reciprocal causation, sociostructural and personal determinants are treated as cofactors within a unified causal structure.

Different lines of research lend support to this interdependent multicausality. Consider some examples. Elder and Ardelt (1992) have shown that economic hardship by itself has no direct influence on parental efficacy. Rather, financial hardship creates subjective strain (see Fig. 3.4). In intact households, subjective strain impairs parental efficacy by creating marital discord. A supportive marital relationship enables parents to withstand poverty without its undermining belief in their ability to guide their children's development. For single parents, financial strain weakens parents' efficacy both directly and by instilling depression. Regardless of family structure, parents who have a high sense of efficacy are active in promoting their children's competencies.

The study of children's academic development provides further evidence that psychosocial processes mediate the influence of sociostructural conditions. Our discipline went through a period of austere, insulated cognitivism in which the

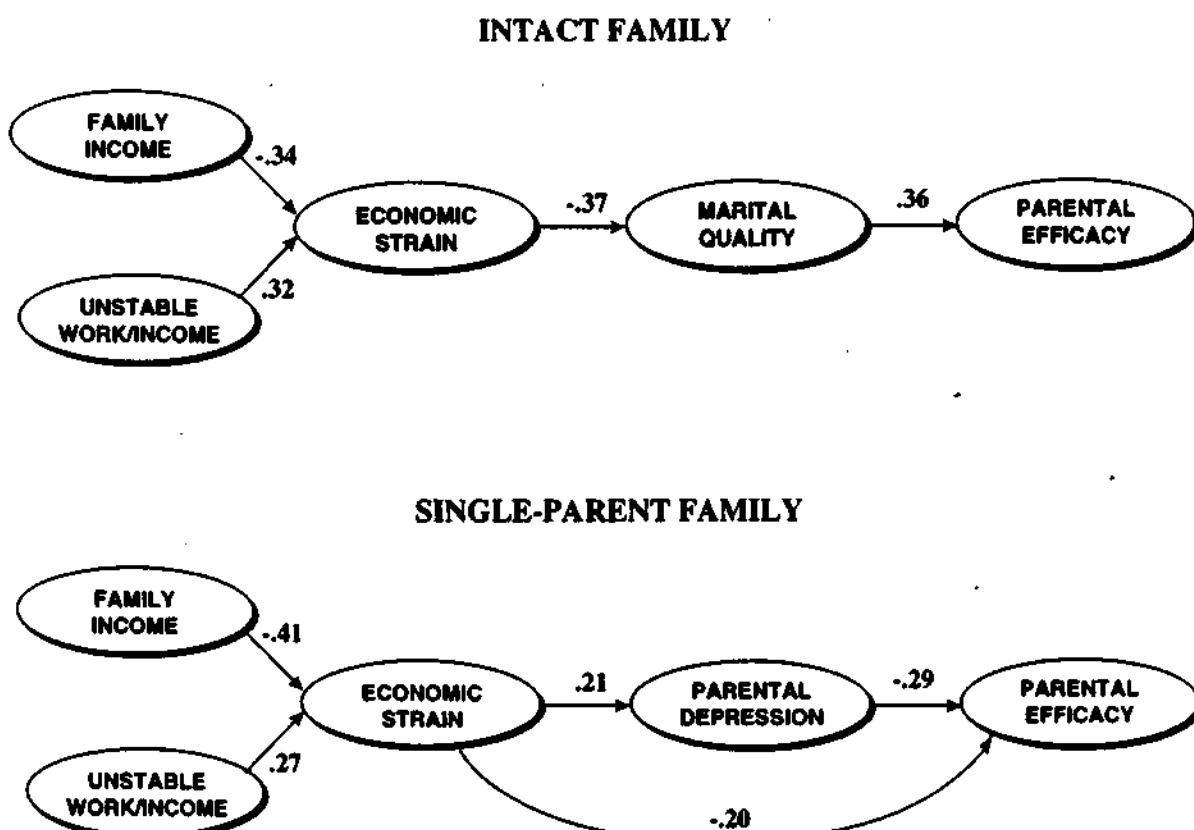


FIG. 3.4 Path analysis showing that the effect of objective economic hardship on parents' sense of efficacy to guide their children's development operates through psychosocial processes rather than directly. Marital discord is the mediator in intact households, and depression is the mediator in single parent households (Elder & Ardelt, 1992).

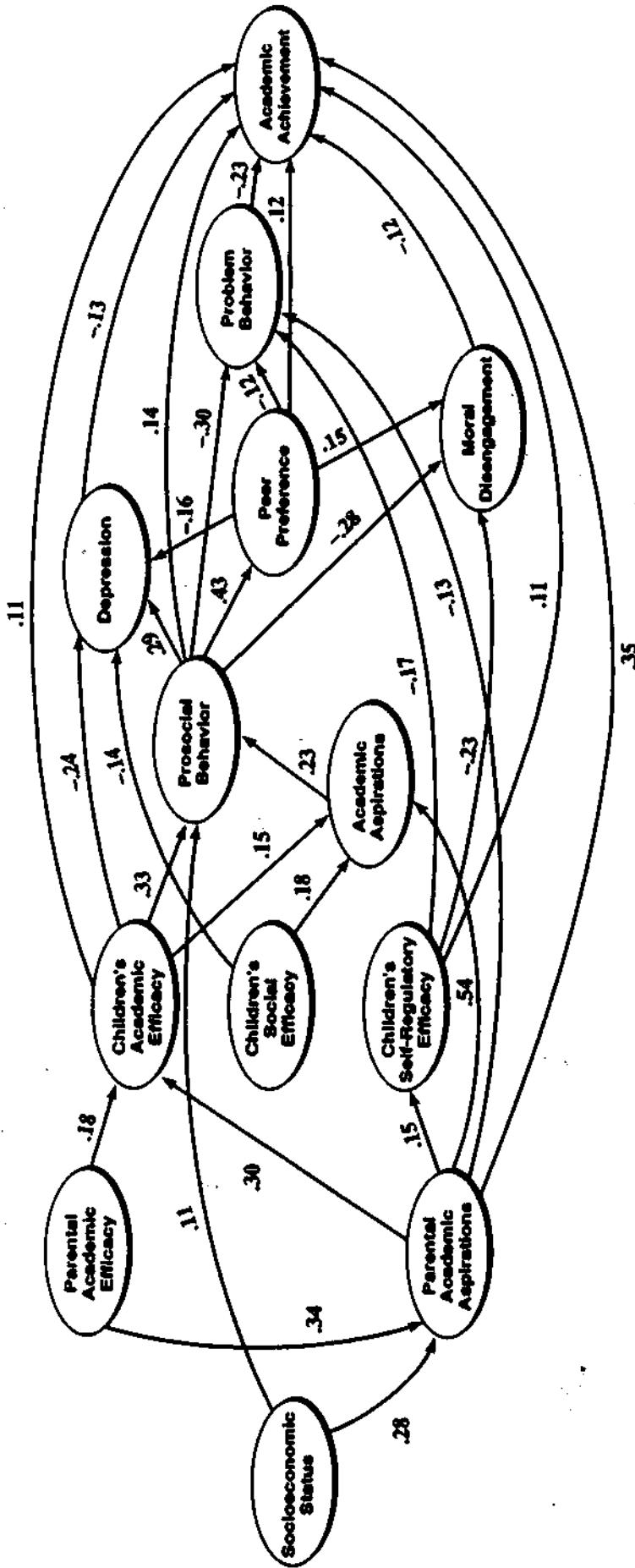


FIG. 3.5 Path analysis of the pattern of influence through which parental and children's efficacy beliefs and academic aspirations promote children's academic achievement. All of the path coefficients are significant beyond the $p < .05$ level (Bandura, Barbaranelli, Caprara, & Pastorelli, 1996).

mechanics of how the mind works in processing, representing, organizing and retrieving information was intensively studied but the social nature of cognitive development was largely ignored. Children's intellectual development cannot be isolated from the social relations within which it is imbedded and from its interpersonal effects: it must be analyzed from a social perspective. A secure sense of intellectual and self-regulatory efficacy not only promotes academic successes, but supportive social relationships and positive emotional development that are conducive to learning. Social cognitive theory adopts an ecological perspective to the contribution of efficacy beliefs to cognitive and social development. Socio-economic, familial, peer and self-processes operate in concert to shape the course of academic development. Figure 3.5 summarizes the intricate causal structure.

The impact of the socioeconomic status of the families on children's academic achievement is entirely mediated through parental academic aspirations and children's prosocial behavior. The higher the families' socioeconomic status, the higher the academic and occupational aspirations parents have for their children and the greater is their children's prosocialness. In this network of influences, parents' beliefs in their efficacy to promote their children's intellectual development and the educational aspirations they hold for them raise children's beliefs in their efficacy and academic aspirations. Children's perceived efficacy, in turn, affects their academic achievement both directly and by its effects on their social behavior and emotional well-being.

PERCEIVED EFFICACY IN COLLECTIVE AGENCY

Conceptions of human agency have been confined to individual agency. However, people do not live their lives as isolates. They work together to produce the results they desire. Social cognitive theory extends the analysis of mechanisms of human agency to collective agency. People's shared beliefs in their collective power to produce desired outcomes is a crucial ingredient of collective agency. Group performance is the product of interactive and coordinative dynamics of its members. Therefore, perceived collective efficacy is not simply the sum of the efficacy beliefs of individual members. It is an emergent group-level attribute.

Personal and collective efficacy differ in the unit of agency, but in both forms efficacy beliefs serve similar functions and operate through similar processes. People's beliefs in their collective efficacy influence the type of futures they seek to achieve; how well they use their resources; how much effort they put into their group endeavor; their staying power when collective efforts fail to produce quick results or meet forcible opposition; and their vulnerability to discouragement.

Some writers inappropriately equate self-efficacy with individualism and pit it against collectivism (Schooler, 1990). In fact, a high sense of personal efficacy contributes just as importantly to group-directedness as to self-directedness. To

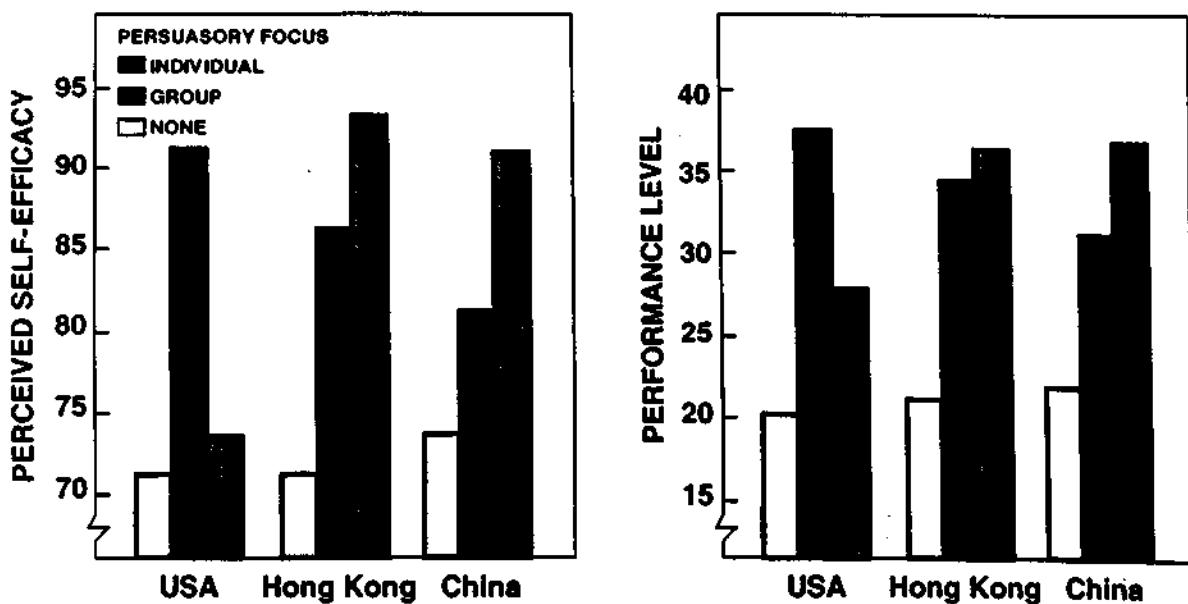


FIG. 3.6 The differential effect of efficacy-boosting influences on the perceived efficacy and productivity of managers in individualistic and collectivistic cultures depending on whether the social influence was individually oriented or group oriented (plotted from data of Earley, 1994).

work together successfully members have to perform their roles with a high sense of efficacy. Chronic self-doubters are not easily formed into a collective efficacious force. Personal efficacy is valued, not because of reverence for individualism, but because a strong sense of efficacy is vital for successful functioning regardless of whether it is achieved individually or by group members working together.

Group achievements and social change are rooted in self-efficacy. The cross-cultural research conducted by Earley (1993; 1994) on organizational functioning confirms the universal functional value of efficacy beliefs. In these cross-cultural studies, efficacy beliefs contribute to productivity by members of collectivist cultures just as they do by those raised in individualistic cultures. But cultural values shape how efficacy beliefs are developed, the purposes to which they are put, and the social arrangements through which they are best expressed. As shown in Fig. 3.6, people from the United States, an individualistic culture, feel most efficacious and perform best under an individually oriented system, whilst those from collectivistic cultures, namely Hong Kong and China, judge themselves most efficacious and work most productively under a group-oriented system. However, the critical factor is not collectivism *per se*. Collectivists display lower personal and group efficacy and low productivity when they have to perform in a culturally mixed group.

Cultures are not as homogeneous as the stereotypic portrayals would lead one to believe. Collectivistic systems, such as East Asian ones founded on Confucianism or Buddhism, favor a communal ethic. But they differ from each other in the values, meanings and customs they promote (Kim et al., 1994). Nor are so-called individualistic cultures a uniform lot. Americans, Italians, Germans,

and the British differ in their particular brands of individualism. Even within the individualistically oriented culture of the United States, the New England brand of individualism is quite different from the Californian version or that of the Southern region of the nation.

There are collectivists in individualistic cultures and individualists in collectivistic cultures. Regardless of cultural background, people achieve the greatest personal efficacy and productivity when their personal orientation is congruent with the social system. For example, American collectivists do better under a group-oriented system and Chinese individualists do better under an individually-oriented system. The personal orientation rather than the cultural orientation is a major carrier of the effects. Both at the societal and individual level of analysis, strong efficacy fosters high group effort and performance.

UNDERMINERS OF COLLECTIVE EFFICACY IN CHANGING SOCIETIES

The growing interdependence of social and economic life requires effective collective action at both local and transnational levels. As the need for efficacious collective effort grows, so does the sense of collective powerlessness. Many of the contemporary conditions of life undermine the development of collective efficacy. Life in the societies of today is increasingly shaped by transnational interdependencies. What happens economically and politically in one part of the world can affect the welfare of vast populations elsewhere. The transnational forces, which are hard to disentangle let alone control, challenge the efficacy of governmental systems to exert a determining influence on their own economic and national life.

Global market forces are restructuring national economies and shaping the social life of societies. There are no handy social mechanisms or global agencies through which people can shape transnational practices that affect their lives. As nations wrestle with the loss of control, the public expresses disillusionment and cynicism over whether their leaders and institutions can work for them to improve their lives. The crisis of leadership and governmental efficacy affects most nations nowadays. People strive to regain some control over their lives by seeking to shape their local circumstances over which they have some influence. The retreat to localism, fueled by public disillusionment with its national systems, ironically comes at a time calling for strong national leadership to manage powerful influences from abroad to shape their nation's own destiny.

Under the new realities of growing transnational control, nation states increase their controlling leverage by merging into larger regional units such as the European Union. Other regional nation states will be forced to merge into larger blocks, otherwise they will have little bargaining power in transnational relations. These regional marriages do not come without a price. Paradoxically, to gain international control, nations have to negotiate reciprocal pacts that

require some loss of national autonomy and changes in traditional ways of life. Some members of the society gain from the agreements others lose. This creates disputes within nations between the winners and losers. The major challenge to leadership is to build a national sense of efficacy to take advantage of the opportunities of globalization while minimizing the price that the changes extract from local cultures.

Modern life is increasingly regulated by complex technologies that most people neither understand nor believe they can do much to influence. The very technologies that people create to control their life environment can become a constraining force that, in turn, controls how they think and behave. As an example of such paradoxical consequences, the citizens of nations that are heavily dependent on deteriorating atomic plants for their energy feel powerless to remove this catastrophic hazard from their lives even though they acknowledge the grave danger. The devastating consequences of mishaps do not respect national borders.

The social machinery of society is no less challenging. Bureaucracies thwart effective social action. Many of the bureaucratic practices are designed more to benefit the people who run the social systems than to serve the public. Long delays between action and noticeable results discourage efforts at change. Most people relinquish control in the face of bureaucratic obstacles.

Social efforts to change lives for the better require merging diverse self-interests in support of common core values and goals. Disagreements among different constituencies create additional obstacles to successful collective action. The voices for parochial interests are usually much stronger than those for collective responsibility. It requires efficacious, inspiring leadership to create unity within diversity.

The recent years have witnessed growing social fragmentation into separate interest groups, each exercising its own power. Pluralism is taking the form of antagonistic factionalism. In the more extreme forms of social fragmentation, countries are being dismantled with a vengeance along racial, religious, and ethnic lines. While some forces are creating social fragmentation, others are breaking down national identities. Advanced telecommunications technologies are spreading ideas, values and styles of behavior transnationally at an unprecedented rate. The symbolic environment feeding off communication satellites is supplanting national cultures and homogenizing collective consciousness. With further development of the computerized Web world, people will be heavily embedded in global symbolic environments. In addition, mass migration of people fleeing tyranny or seeking a better life is changing cultural landscapes. As migration changes the ethnic composition of populations, societies are becoming less distinctive. Cultures are no longer insular. These new realities will transform the agendas of cross-cultural research.

The magnitude of human problems also undermines perceived efficacy to find effective solutions for them. Profound global changes are destroying the

ecosystems that sustain life. These changes are creating new realities requiring transnational remedies. Worldwide problems of growing magnitude instill a sense of paralysis that there is little people can do to reduce such problems. Global effects are the products of local actions. The strategy of *Think globally, act locally* is an effort to restore in people a sense of efficacy that they can make a difference.

The psychological barriers created by beliefs of collective powerlessness are more demoralizing, and debilitating than are external impediments. The less people bring their influence to bear on conditions that affect their lives the more control they relinquish to others. People who have high collective efficacy will mobilize their efforts and resources to surmount the obstacles to the changes they seek. But those convinced of their collective powerlessness will cease trying, even though changes are attainable through perseverant collective effort. As a society, we enjoy the benefits left by those before us who collectively fought inhumanities and worked for social reforms that permit a better life. Our own collective efficacy will, in turn, shape how future generations will live their lives. The times call for social initiatives that build people's sense of collective efficacy to influence conditions that shape their lives and that of future generations.

ACKNOWLEDGEMENTS

Preparation of this chapter and some of cited research were supported by grants from the Spencer Foundation and the Johann Jacobs Foundation. Some sections of this chapter include revised and expanded material from the book, *Self-Efficacy: The Exercise of Control*, Freeman, 1997.

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Self-Efficacy Pathways to Childhood Depression

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This prospective research analyzed how different facets of perceived self-efficacy operate in concert within a network of sociocognitive influences in childhood depression. Perceived social and academic inefficacy contributed to concurrent and subsequent depression both directly and through their impact on academic achievement, prosocialness, and problem behaviors. In the shorter run, children were depressed over beliefs in their academic inefficacy rather than over their actual academic performances. In the longer run, the impact of a low sense of academic efficacy on depression was mediated through academic achievement, problem behavior, and prior depression. Perceived social inefficacy had a heavier impact on depression in girls than in boys in the longer term. Depression was also more strongly linked over time for girls than for boys.

Childhood depression is a matter of major concern because of its prevalence and impairment of functioning. Moreover, it often is not a transient phenomenon that children outgrow. Depressive episodes are recurrent if the contributing factors remain unabated. Early depressive vulnerability is, therefore, predictive of frequency and severity of depression in adulthood (Petersen et al., 1993). Rates of depression vary by ethnicity and culture, but women are generally more prone to depression than men. However, gender differences do not begin to emerge until late adolescence (Culbertson, 1997; Nolen-Hoeksema & Girgus, 1994). Gender differences in susceptibility to depression have been attributed to a variety of factors, including sex role socialization, more stressors in women's lives, negatively biased self-systems, use of ruminative rather than active coping strategies, neurobiologic dysfunctions, and sociostructural constraints and impediments (Hammen, 1990; Nolen-Hoeksema, 1991; Petersen et al., 1993; Rehm, 1988).

Although theories of depression differ in the particular determinants they feature, they generally subscribe to the diathesis-stress model as the guiding metatheory. Within this

conceptual framework, external stressors constitute risk factors that act on personal predispositions to produce bouts of depression. Depending on theoretical orientation, the diathesis or predispositions may be primarily cognitive, constitutional, or a blend of these different types of susceptibilities. The diathesis-stress model is often combined with epidemiological risk-buffer models. Protective factors are posited as conditions that can buffer the adverse effects of stressors. This metatheory is heavily cast in reactive terms.

Social cognitive theory posits an agentic model of depression in which individuals play a proactive role in their adaptation rather than simply undergo experiences through environmental stressors acting on their personal vulnerabilities. Within an agentic perspective, positive contributors to successful adaptation represent enablement factors that operate proactively rather than just protective or sheltering factors. Protectiveness shields individuals from harsh realities or weakens their impact. Enablement equips them with the personal resources to select and structure their environments in ways that cultivate competencies and set a successful course for their lives. This is the difference between proactive recruitment of positive guidance and support for shaping one's life circumstances and reactive adaptation to them. At the intraindividual level, people are enabled rather than merely buffered by competencies and beliefs of personal efficacy.

Among the mechanisms of human agency, none is more central or pervasive than people's beliefs in their efficacy to regulate their own functioning and to exercise control over events that affect their lives (Bandura, 1997). *Perceived self-efficacy* refers to beliefs in one's capabilities to produce given attainments. A sense of personal efficacy is the foundation of human agency. Unless people believe they can produce desired effects by their actions, they have little incentive to act or to persevere in the face of

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The research reported in this article was supported by grants from the Grant Foundation, the Spencer Foundation, and the Johann Jacobs Foundation.

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difficulties. Adolescents have to manage major biological, educational, and social role transitions concurrently. The success with which the risks and challenges of adolescence are managed depends, in no small measure, on the strength of adolescents' perceived self-efficacy. Children who enter adolescence beset by a disabling sense of inefficacy transport their vulnerability to stress and dysfunction to the new environmental demands and to the pervasive biopsychosocial changes they find themselves undergoing in this transitional phase of their lives (Allen, Leadbeater, & Aber, 1990; Bandura, 1997).

The findings of diverse lines of research show that efficacy beliefs regulate human functioning and emotional well-being through four major processes (Bandura, 1997): cognitive, motivational, affective, and selective processes. The present multifaceted longitudinal study centers on the impact of perceived self-efficacy on the affective aspects of functioning; specifically, it examined the direct and mediated impact of different facets of perceived self-efficacy on childhood proneness to depression.

A low sense of efficacy to exercise control over things one values can give rise to feelings of futility and despondency in at least three different ways. One pathway is through unfulfilled aspirations. The satisfactions people derive from what they do are largely determined by the standards against which they evaluate their attainments (Bandura, 1991; Locke & Latham, 1990). Depression is most likely to arise when personal standards of merit are set well above one's perceived efficacy to attain them (Kanfer & Zeiss, 1983). A sense of inefficacy to fulfill the valued standards gives rise to self-devaluation and depression. Indeed, perceived self-efficacy predicts the directional effects of failure experiences in valued cognitive activities that figure in academic pursuits (Bandura, 1991). Failure produces high motivation and low despondent mood when people believe they have the efficacy to fulfill difficult performance standards and continue to strive for them. In contrast, failure diminishes motivation and generates despondent mood when people judge they lack the efficacy to attain difficult standards but continue to demand those attainments of themselves for any sense of satisfaction and self-worth.

A second pathway to depression is through a low sense of social efficacy to develop social relationships that bring satisfaction to people's lives and enable them to manage chronic stressors. A secure sense of social efficacy fosters positive social relationships, whereas perceived social inefficacy tends to breed socially alienating behaviors (Bandura, Barbaranelli, Caprara, & Pastorelli, 1996b). Social support reduces vulnerability to stress, depression, and physical illness, but social support is not a self-forming entity waiting around to buffer harried people against stressors. People have to go out and find, create, and maintain supportive relationships for themselves. These interpersonal attainments require a strong sense of social efficacy. The Holahans (Holahan & Holahan, 1987) showed that a low sense of social efficacy contributes to depression both directly and by curtailing development of social supports. Moreover, evidence indicates that supportive relationships reduce vulnerability to depression only to the extent that they raise perceived coping efficacy (Cutrona & Troutman, 1986; Major, Mueller, & Hildebrandt, 1985; Mueller & Major, 1989; Olioff & Aboud, 1991). An enhanced sense of coping efficacy is accompanied by low depressive reactions to taxing role demands and interpersonal strains. Perceived self-efficacy sim-

ilarly operates as the mediating mechanism in the beneficial effects of social support on other aspects of functioning (Duncan & McAuley, 1993).

Another efficacy pathway to depression is through the exercise of control over depressing thoughts themselves. All people experience despondency from time to time in response to rejections, losses, failures, and setbacks, but they vary in how quickly they get over them. Most rebound rapidly, whereas some sink into a deepening despondency that lasts for a long time. Nolen-Hoeksema (1990, 1991) has demonstrated, in a series of laboratory and field studies, that ruminative reactions to adversity and negative mood partly determine the severity and duration of depressive episodes. Recurrent rumination about dejecting life events and one's despondent state amplifies and prolongs depressive reactions, whereas engrossment in activities that command attention or improve one's life terminates depressive episodes. Research on enhancing perceived efficacy to control dejecting thought processes by cognitive restructuring showed that a low sense of efficacy to regulate ruminative thought contributed to the occurrence of depressive episodes, how long they lasted, and how often they recurred following treatment (Kavanagh & Wilson, 1989). Rumination may be a process through which depressive mood is converted to more pervasive depressive disorders in adolescence through its impairment of functioning and attendant aversive effects (Compas, Ey, & Grant, 1993).

Empirical tests of the contribution of perceived self-efficacy to depression have been essentially confined to adults. Few studies have examined the impact of perceived self-efficacy on childhood proneness to depression and the paths of influences through which it exerts its effects. McFarlane, Bellissimo, and Norman (1995) provided some evidence that perceived social efficacy plays a significant role in adolescent depression. As noted in the preceding discussion, depression can arise from diverse sources of perceived self-inefficacy and therefore requires multifaceted analyses. Moreover, beliefs of personal inefficacy contribute to the depression not only directly but also through their impact on other determinants in the multifaceted model posited by social cognitive theory (Bandura, 1986, 1997). The present prospective research was designed to further understanding of how different facets of perceived self-efficacy operate in concert within a network of sociocognitive influences in childhood depression. The proposed causal structure of the model is presented in Figure 1.

The roles of two factorially verified facets of perceived efficacy in depression were examined. They include perceived academic self-efficacy and social self-efficacy, both of which address important aspects of children's lives. Academic self-efficacy, which centers on perceived capability to fulfill academic demands, comprised children's beliefs in their efficacy to manage their own learning activities; to master different academic subjects; and to fulfill personal, parental, and teachers' academic expectations. Children's social efficacy included perceived capabilities to develop and maintain social relationships, work collegially with others, and manage socially conflictual situations.

In the conceptual model guiding this research, perceived academic efficacy affects depression both directly and through its effects on prosocial behavior, engagement in problem behavior, and academic achievement. Children who are assured in their academic efficacy would be less vulnerable to depression because they anticipate fewer academic stressors and substandard perfor-

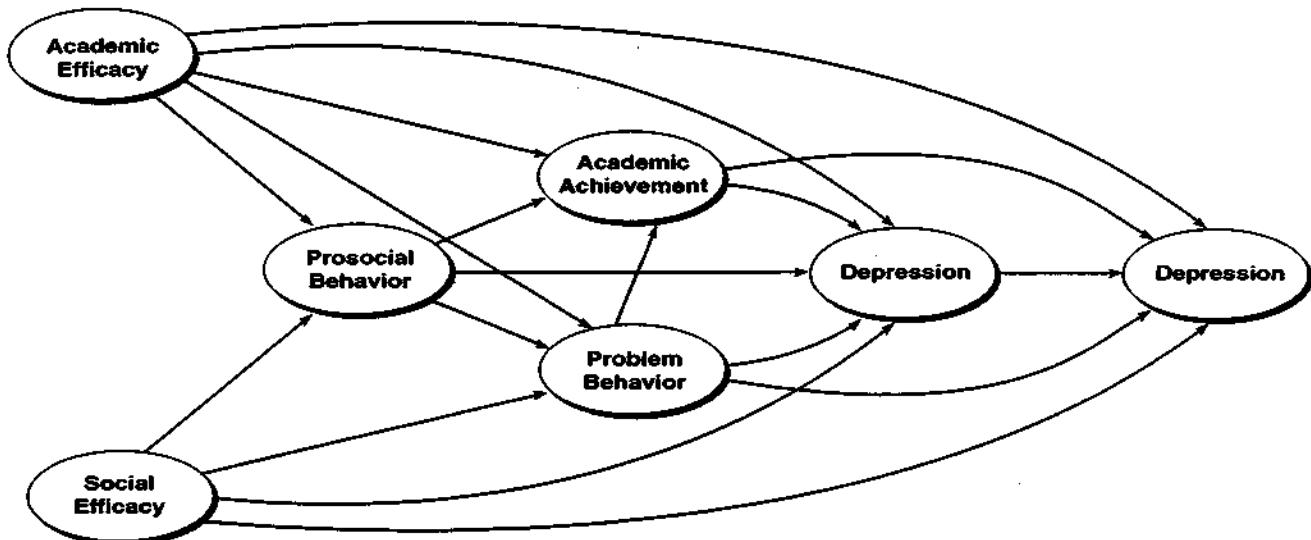


Figure 1. Posited causal structure of the paths of influence through which beliefs of personal efficacy operate in concert with sociocognitive factors to affect childhood depression.

mances. Moreover, for those who have a high sense of academic efficacy, failures, setbacks, and obstacles are viewed as surmountable and therefore spark redoubled effort rather than discouragement and despondency (Bandura, 1997; Schunk, 1989; Zimmerman, 1995). Perceived academic efficacy fosters not only engagement in academic pursuits but also involvement in a constellation of prosocial activities. Indeed, a secure sense of academic self-efficacy promotes academic attainments and prosocial relations and reduces involvement in problem behavior (Bandura et al., 1996b).

For reasons discussed earlier, a strong sense of social efficacy reduces vulnerability to depression both directly and by fostering supportive prosocial relationships and curtailing problem behavior. The following paths of influence were posited for the mediating factors in the conceptual model. Through a prosocial orientation of helpfulness, sharing, and cooperativeness, children bond themselves to their peers and are preferred by them in social and academic pursuits (Ladd & Price, 1987; Ladd, Price, & Hart, 1988). Such mutually supportive relationships create a more favorable school environment for academic attainment than if children behave in socially alienating ways that bring repeated rejection by their peers (Austin & Draper, 1984; Bandura, 1993; Caprara, Barbaranelli, Pastorelli, Bandura, & Zimbardo, 1998).

The final pattern of influences in the conceptual model links the relevant mediating factors to depression. The enablement and supportive function of prosocial relationships has already been discussed. Schools operate as a primary setting for the development and social validation of cognitive competencies. It is here that children are continually tested, evaluated, and socially compared (Rosenholz & Rosenholz, 1981). Academic activities are infused with expectations and performance demands that beget self-devaluations, lowered peer status, and despondency if they are not fulfilled. Like academic failure, problem behavior can be a source of social devaluation and distress that gives rise to bouts of

depression. A secure sense of efficacy that promotes supportive relationships, academic accomplishments, and unencumberance with problem behavior not only reduces the likelihood of dejecting, self-deprecatory thoughts but also makes it easier to dismiss them should they occur (Bandura, 1997). Prior depression was also included as a contributor to variance in subsequent depression in the structural model that we evaluated.

In this longitudinal test of the proposed pattern of influences through which perceived self-efficacy affects childhood depression, the different facets of perceived efficacy, the relevant socio-cognitive factors, and prior depression served as predictors of level of depression measured 1 year and 2 years later.

Method

Participants

The participants in this study were 282 children with a mean age of 11.5 years in the initial phase of this longitudinal study. There were 148 males and 134 females.

The participants were drawn from two middle schools in a residential community located near Rome, Italy. This community represents a microcosm of the larger society, containing families of skilled workers, farmers, professionals, and local merchants and their service staffs. Fourteen percent were in professional or managerial ranks, 36% were merchants or operators of other businesses, 15% were skilled workers, 33% were unskilled workers, and 2% were retired. The socioeconomic diversity of the sample adds to the generalizability of the findings.

This community adheres to a stringent consent procedure for the conduct of research in the schools. A research proposal must gain approval from a school council composed of parent and teacher representatives as well as student representatives at the junior and high school levels. In addition, parents must give consent, and children are free to decline to take part if they so choose. Informed consent was obtained from 92% of the families.

The study was presented to the parents and children as a project designed to gain better understanding of how children develop. All of the children in two staggered cohorts, enrolled in the sixth grade in these schools, as well

as their teachers and peers, participated in the study. The severity of children's level of depressive reactions was reassessed 1 and 2 years later, with 93% of the children participating at this second time point.

Children were administered the sets of scales measuring the variables of theoretical interest in their classrooms by two female experimenters. The various sociocognitive measures were administered over a period of several days. In addition, data for the variables of interest were collected from the children's teachers and peers.

Perceived Self-Efficacy

Children's beliefs in their efficacy were measured by 37 items representing seven domains of functioning. For each item children rated, using a 5-point response format, their belief in their level of capability to execute the designated activities.

We assessed perceived self-efficacy for academic achievement by measuring the children's beliefs in their capabilities to master different areas of coursework, including mathematics, science, and reading and writing language skills. A second set of scales measured children's perceived self-efficacy for regulating their own learning (Zimmerman, Bandura, & Martinez-Pons, 1992). These scales assessed children's efficacy to structure environments conducive to learning, to plan and organize their academic activities, to use cognitive strategies to enhance understanding and memory of the material being taught, to obtain information and get teachers and peers to help them when needed, to motivate themselves to do their schoolwork, to get themselves to complete scholastic assignments within deadlines, and to pursue academic activities when there are other interesting things to do. The item "How well can you get teachers to help you when you get stuck on schoolwork?" measured perceived self-efficacy to enlist enabling social resources, and the item "How well can you study when there are other interesting things to do?" measured children's perceived efficacy to motivate themselves for academic pursuits in the face of competing attractions.

A third set of scales assessed efficacy for leisure and extracurricular activities involving mainly group activities. A fourth set of scales assessed children's self-regulatory efficacy to resist peer pressure to engage in high-risk activities involving alcohol, drugs, and transgressive behavior that can get them into trouble. For example, the following item assessed perceived self-regulatory efficacy to rebuff pressures exerted by peers to drink alcoholic beverages: "How well can you resist peer pressure to drink beer, wine or liquor?"

We assessed perceived social self-efficacy by measuring children's beliefs in their capabilities to form and maintain social relationships, work cooperatively with others, and manage different types of interpersonal conflicts. We assessed self-assertive efficacy by measuring children's beliefs in their capabilities to voice their opinions, stand up to mistreatment or harassment, and refuse unreasonable requests. "How well can you express your opinions when other classmates disagree with you?" is one of the items that assessed perceived self-assertive efficacy. We assessed perceived self-efficacy to meet others' expectations by examining children's beliefs in their capabilities to fulfill what their parents, teachers, and peers expect of them and to live up to what they expect of themselves. "How well can you live up to what your parents expect of you?" typifies items in the perceived-efficacy domain to fulfill others' expectations.

A principal-components factor analysis with varimax orthogonal rotation revealed a three-factor structure. The first factor, Perceived Academic Self-Efficacy, included high loading on items measuring perceived capability to manage one's own learning; to master academic subjects; and to fulfill personal, parental, and teachers' academic expectations. The predictive validity of this aspect of children's beliefs in their efficacy is supported by findings of prior research (Bandura et al., 1996b; Zimmerman et al., 1992). Perceived Social Self-Efficacy constituted the second factor. The items loading on this factor included perceived capability for peer relationships, for self-assertiveness, and for leisure-time social activities. The

third factor, Perceived Self-Regulatory Efficacy, was represented by items measuring perceived capability to resist peer pressure to engage in high-risk activities. The findings of previous research corroborate the predictiveness of the last two aspects of perceived efficacy as well (Bandura, Barbaranelli, Caprara, & Pastorelli, 1996a; Bandura et al., 1996b; Caprara et al., 1998). These three factors constituted 15%, 10%, and 6% of the variance, respectively. This factor structure has been replicated cross-nationally with Italian, Hungarian, and Polish children (Pastorelli et al., 1998).

We assessed the reliability of the factors of perceived self-efficacy with squared multiple correlations of factor scores. Coefficients of .70 or better are indicators of stable factors (Tabachnik & Fidell, 1989). The estimated reliabilities were .89 for academic self-efficacy, .78 for social self-efficacy, and .75 for self-regulatory efficacy. Perceived academic and social self-efficacy were selected for the purposes of the present study because they have the most direct bearing on depressive reactions to stressors.

Social behavior. We obtained data on children's social behavior from different sources, using diverse methods of assessment. The sources included the children themselves, their teachers, and their peers. A total of 22 teachers rated the children who were enrolled in their classrooms. The methods of measurement included personality questionnaires, behavior ratings, and peer sociometric ratings.

Children rated their prosocial behavior on a scale containing 10 items developed by Caprara and his colleagues (Caprara & Pastorelli, 1993). The scale assessed degree of helpfulness, sharing, kindness, and cooperativeness. "I try to help others" is a sample item. To avoid a possible response bias, several control items were included in the scale. The factor structure and concurrent validity of this measure have been verified in studies relating children's self-ratings to level of prosocialness rated by parents, teachers, and peers (Caprara & Pastorelli, 1993). Children's level of prosocial behavior was rated by teachers on a subsample of 6 items drawn from the larger scale. Sociometric peer nominations served as another source of assessment of prosocial behavior. The children made their nominations from the roster of classmates in their particular classroom. Because this is a highly stable community, the children were thoroughly acquainted with each other. Children were presented with a booklet containing the names of children in their class. Each child selected three classmates who often share things, help others, and try to comfort them when they are sad. The alpha reliability coefficients were .80, .89, and .78 for self, teacher, and peer ratings, respectively. Because the different sets of scores were positively intercorrelated, we standardized, averaged, and aggregated them to provide a composite measure of prosocial behavior.

Problem behavior. Problem behavior was measured with 85 items from the Child Behavior Checklist developed by Achenbach and Edelbrock (1978). Both the reliability and predictive validity of this widely used measure of problem behavior are well established (Achenbach, McCoaughy, & Howell, 1987). We deleted the items concerned with depression to eliminate the presence of depression items in the measure of problem behavior as a predictor of depression. The items dealt with a wide range of problem behaviors, including hyperactivity, aggressiveness, inattentiveness, transgressive conduct, anxiety and withdrawal, somatic complaints, and obsessiveness. The children rated which of the various problem behaviors they exhibit and, if they do, whether they do so only occasionally or often. The reliability coefficient for the total score was .89.

Academic achievement. The children were graded by their teachers for their level of academic achievement in the various subject matters both at mid-year and at the end of the academic term. The assessment comprised five gradations of academic achievement corresponding to academic grade levels. The two sets of academic grades were combined to provide a composite measure of academic achievement.

Depression. Children rated the severity of depression on the 27-item Children's Depression Inventory developed by Kovacs (1985). The items measure the constellation of features that characterize depression, such as despondency, hopelessness, loss of appetite and interest in pleasurable

activities, self-deprecation, and suicidal ideation. Children rated the degree to which they experienced the various aspects of depression using a 3-point response format. The alpha reliability coefficient was .84.

Teachers and peers also were included in the assessment. The children's depression was rated by teachers on a 10-item scale and assessed sociometrically by peers on a 3-item scale developed by Caprara. These scales measured children's depressive mood, disconsolateness, and hopelessness. Cronbach's alphas for the two scales were .88 and .86, respectively. Depression assessed 1 year and 2 years later served as the predicted variable. This interval was selected because it involved an important transition from elementary school to junior high school. The reliability coefficients for this second assessment were .88 for children, .92 for teachers, and .91 for peers. The three sets of Depression 1 scores were positively intercorrelated ($r = .30, p < .001$). The ratings of depression correlated more highly between teachers and peers ($r = .43, p < .001$) than between the children and their peers ($r = .29, p < .001$) and teachers ($r = .20, p < .001$). The pattern of relationships was similar for the Depression 2 and Depression 3 scores. The measures were taken as indexes of children's proneness to depressive reactions rather than as psychopathologic forms of depression.

Results

Table 1 presents the means and variances for the different sets of variables. It also includes the matrix of relationships among the various sociocognitive factors and depression at both longitudinal time periods. Significant sex differences were obtained on several of the assessed factors. Compared to boys, girls had a higher sense of academic efficacy, $F(1, 280) = 17.52, p < .0001$, but lower perceived social efficacy, $F(1, 280) = 5.78, p < .05$. They were also more prosocial, $F(1, 280) = 20.61, p < .0001$; exhibited fewer problem behaviors, $F(1, 280) = 13.86, p < .001$; and surpassed their male counterparts in scholastic attainments, $F(1, 280) = 10.86, p < .01$. Although girls were somewhat more depressed than boys in the second time period, the difference was small, and neither the main effect of age or sex, nor their interaction, attained significance. The emergence of gender differences in depression is more commonly found in late adolescence than in mid-adolescence (Nolen-Hoeksema & Girgus, 1994).

Network of Relationships

The patterns of relationships among the variables are described briefly and then we report the results of testing for the goodness of fit between the hypothesized causal structure and the empirical findings. In accord with prediction, children's beliefs in their academic and social efficacy were accompanied by prosocialness, high scholastic achievement, and low levels of depression at all three time periods. Those of high perceived academic efficacy were also less inclined to engage in problem behaviors.

Children who were high in prosocialness were more academically achieving, exhibited low problem behaviors, and were less prone to depression at the different time points. Success in academic activities was accompanied by low depression, whereas involvement in problem behaviors was accompanied by high depression. Prior depression was moderately related to level of depression 1 and 2 years later.

Paths of Influence

Accessibility to children's depressive reactions varied across informants because some of the affective and cognitive aspects of

Table 1
Correlation Matrix for Perceived Self-Efficacy, Sociocognitive Factors, and Depression at Three Time Points

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9	10	11	12
1. Academic efficacy	3.81	0.65	—	.11	.32**	.44**	.48**	-.30**	-.43**	-.44**	-.42**	-.46**	-.32**	-.28**
2. Social efficacy	4.17	0.56	—	—	.27**	.21**	.24**	-.08	-.30**	-.31**	-.30**	-.32**	-.25**	-.33**
3. Prosocial behavior	24.60	3.72	—	—	—	.73**	.31**	—	.32**	.36**	.29**	.37**	.26**	-.28**
4. Standardized aggregate	3.08	0.79	—	—	—	.52**	.22**	—	.33**	.51**	.29**	.48**	.33**	-.39**
5. Academic achievement	53.85	16.74	—	—	—	.18*	—	—	.34**	.49**	.31**	.47**	.31**	-.38**
6. Problem behavior	Depression 1	9.68	6.53	—	—	—	—	—	.40**	.43**	.43**	.24**	.38**	.23**
7. Self-report	Depression 2	8.61	6.75	—	—	—	—	—	—	.64**	.62**	.44**	.46**	.47**
8. Standardized aggregate	Depression 3	9.15	7.47	—	—	—	—	—	—	—	.73**	.73**	.36**	.59**
9. Self-report	11. Self-report	—	—	—	—	—	—	—	—	—	.63**	.55**	.40**	.47**
10. Standardized aggregate	12. Standardized aggregate	—	—	—	—	—	—	—	—	—	—	—	.64**	.64**

* $p < .05$. ** $p < .001$.

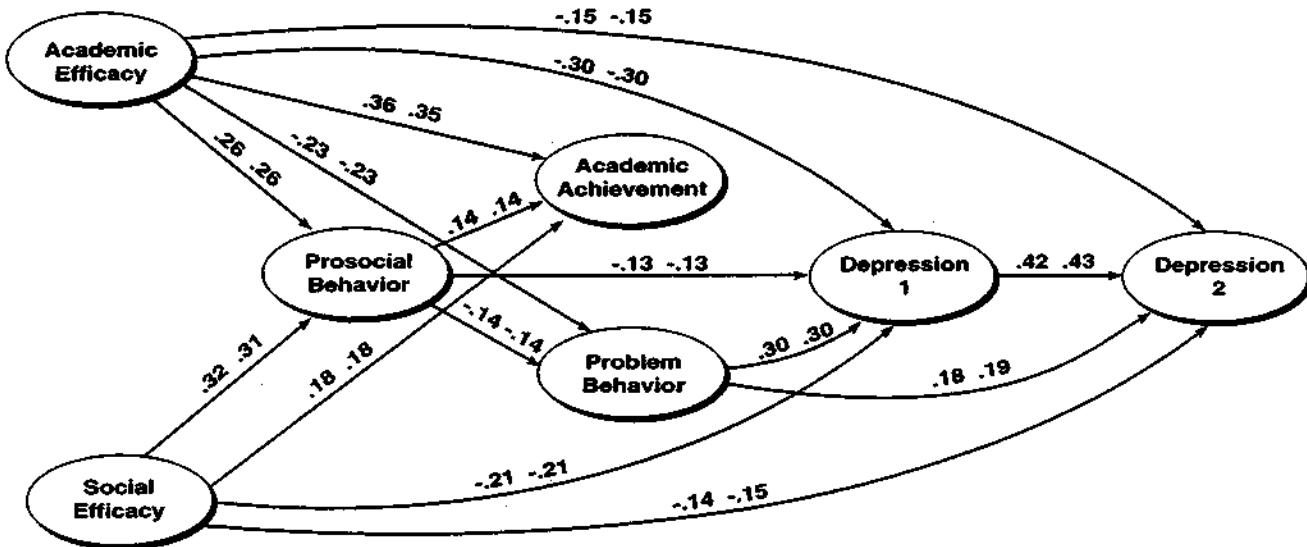


Figure 2. Path analysis of the direct and mediated paths of influence through which efficacy beliefs affect level of depression 1 year later. The first path coefficient on each of the structural links is for boys; the second coefficient is for girls. The causal structure was comparable across gender. All of the path coefficients are significant beyond the $p < .05$ level.

depression are accessible only to the child experiencing them. Some of the affective, behavioral, and verbalized features of depression are observable to teachers and peers, but the particular settings in which they routinely observe a given child's behavior are more circumscribed. Because children preside over their depressive reactions across all settings, modes of experience, and expression, we used their ratings of depression in the primary analysis. We tested the posited structural model on the covariance matrix using the EQS program (Bentler, 1995). Level of depression at Time 2 and Time 3 were the distal outcome variables. Although depression did not differ across sex in the age range studied, boys and girls differed on some of the variables, so gender was considered in the analysis.

We conducted analyses of the structural model using the multiple groups model approach, which estimated simultaneously the same pattern of relationships among variables in the two samples of boys and girls. In this approach, equivalence among different samples is evaluated by constraints that impose identical estimates for the model's parameters (Byrne, 1994; Scott-Lennox & Scott-Lennox, 1995). In EQS the plausibility of these equality constraints is examined by the Lagrange Multipliers (LM) test (Bentler, 1995). For each of the constraints specified, the LM test provides evidence that the constraint applies to the populations involved. In the present study the equality constraints were imposed on path coefficients across the gender groups.

Figure 2 presents the results of the path analysis using Time 1 predictors of Time 2 depression. All the posited structural links were verified except the direct link from academic achievement to depression at both time points and the paths linking problem behavior to perceived social efficacy and academic achievement. The link between perceived social efficacy and academic achievement, which was shown to be significant by the LM test, was added.

The path coefficients that are significant beyond the $p < .05$ level are shown in Figure 2. The results were equivalent across gender. A low sense of social self-efficacy and academic self-efficacy was accompanied by high depression both concurrently and 1 year later. The two forms of perceived self-efficacy also contributed to depression through their impact on prosocialness and problem behavior.

Children with strong beliefs in their efficacy to regulate their learning activities and to master their academic coursework achieved high academic performances, behaved prosocially toward others, and exhibited low levels of problem behaviors. Children of high perceived social efficacy also behaved prosocially, were academically achieving, and exhibited low levels of problem behaviors through the mediation of prosocialness. It is interesting that it was children's perceived academic self-efficacy rather than their actual academic achievement that accounted for depression both concurrently and over time. Perceived academic efficacy also contributed to depression through its impact on prosocial behavior and problem behavior. Some of the effect of perceived social efficacy on depression is similarly mediated through its impact on prosocial behavior. In addition, problem behavior contributed independently to depression 1 year later. Finally, Time 1 depression was linked to Time 2 depression.

The revised model provided an excellent fit to the data as revealed by all the fit indexes considered. These tests yielded a nonsignificant $\chi^2(23, N = 257) = 14.10$, a normed fit index (NFI) of .97, a non-normed fit index (NNFI) of 1.04, and a comparative fit index (CFI) of 1.0. The model accounted for 37% of the variance in Time 1 depression and 44% of the variance in Time 2 depression for boys, and 38% of the variance in Time 1 depression and 45% of the variance in Time 2 depression for girls. Figure 3 summarizes the results of the path analysis using Time 1 predictors of Time 3 depression.

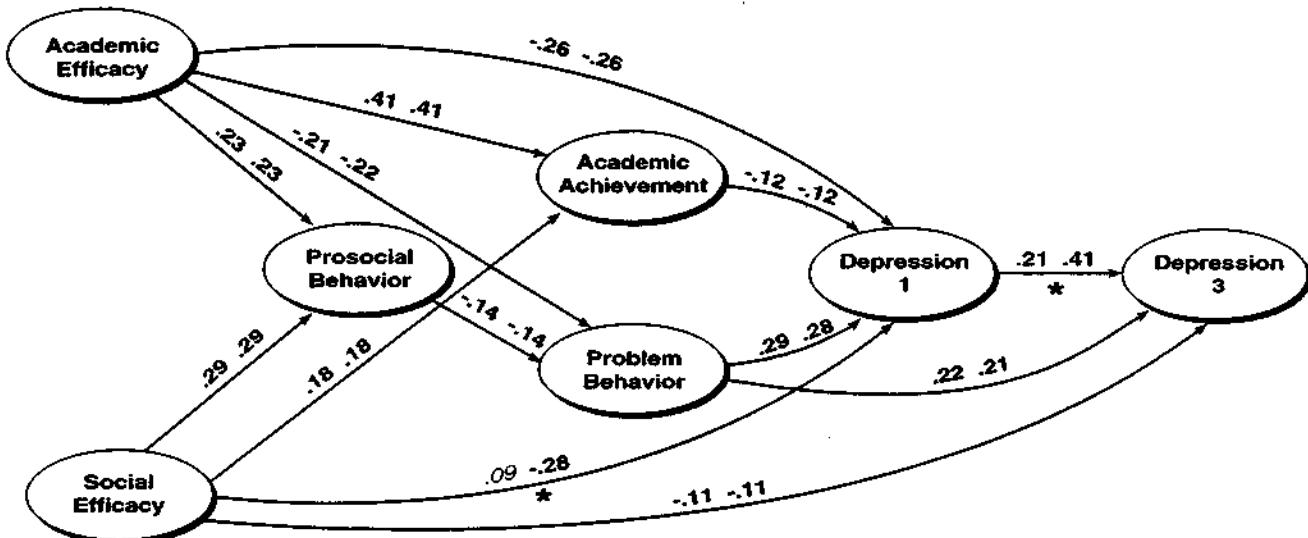


Figure 3. Path analysis of the direct and mediated paths of influence through which efficacy beliefs affect level of depression 2 years later. The first path coefficient on each of the structural links is for boys; the second coefficient is for girls. All of the path coefficients are significant beyond the $p < .05$ level, except that perceived social ineffectiveness is unrelated to Time 1 depression for boys. The coefficients with an asterisk on the paths differ significantly across gender.

The path coefficients in Figure 3 were equivalent across gender except two. A low sense of social efficacy was accompanied by high depression at Time 1 for girls but was nonsignificant for boys. The link between depression at Time 1 and Time 3 was significantly stronger for girls than for boys. The constraint related to these paths was relaxed, and the model was re-estimated. The goodness of fit of the revised model to the empirical data yielded a nonsignificant $\chi^2(23, N = 257) = 14.10$, an NFI of .99, an NNFI of 1.04, and a CFI of 1.0.

The pattern of relations among the sociocognitive factors in the structural model is the same as in the analysis of Time 2 depression except that prosocial behavior is linked to Time 1 depression through the mediation of problem behavior rather than directly. Perceived academic self-efficacy is linked to Time 1 depression directly and through its effects on academic achievement, prosocial behavior, and problem behavior. However, girls were more depressed over their beliefs of academic inefficacy than were the boys.

The impact of perceived academic self-efficacy and level of academic achievement on Time 3 depression is mediated through Time 1 depression. As in the analysis of Time 2 depression, problem behavior contributes to variance in Time 3 depression both directly and through Time 1 depression. A low sense of social efficacy contributes directly to Time 3 depression regardless of gender. However, two interesting gender differences emerge in the structural links at this more distal period. A low sense of social efficacy was accompanied by depression concurrently for girls but was unrelated for boys. In addition, the link between Time 1 and Time 3 depression was stronger for girls than for boys. The model accounted for 30% of the variance in boys' level of Time 1 depression, and 39% of the variance in girls, and 22% of the variance in Time 3 depression for boys and 43% for girls.

These are stringent tests of the structural model, because per-

ceived self-efficacy and the other sociocognitive factors account for some of the variance in prior depression. Thus, an unadjusted measure to control for prior depression also removes some of the effects of perceived self-efficacy and the other sociocognitive factors on subsequent depression.

We also conducted the multiple groups model analysis on depression aggregated across the child, peer, and teacher ratings. The scores were standardized, aggregated, and averaged to create a composite measure of depression at each of the three time points. Except for a few links, which are described below, the analyses using the aggregate measure replicated the pattern of relations among the sociocognitive variables that was obtained with self-reported depression. The significant direct and mediated paths from perceived social self-efficacy to depression at the three time points replicated those obtained with self-reported depression. The differential gender link from perceived social ineffectiveness to concurrent depression was similarly replicated; however, problem behavior was unrelated to depression 2 years later. Perceived social ineffectiveness had a direct impact on depression a year later only for girls, but it predicted depression 2 years later for both boys and girls. The strength of the link between prior and subsequent depression did not differ by gender either over the 1-year or 2-year interval.

The revised model for Time 2 depression fits the data very well, as corroborated by the various fit indexes considered. These tests yielded a nonsignificant $\chi^2(21, N = 256) = 14.97$, an NFI of .97, an NNFI of 1.02, and a CFI of 1.0. The model accounted for 39% of variance in Time 1 depression for boys, and 52% of the variance for girls, and 50% of the variance in Time 2 depression for boys and 61% of the variance for girls.

The corresponding fit tests for Time 3 depression yielded a nonsignificant $\chi^2(21, N = 282) = 22.46$, an NFI of .96, an NNFI of 0.99, and a CFI of .99. The model accounted for 35% of

variance in Time 1 depression for boys and 48% of the variance for girls, and 35% of the variance in Time 3 depression for boys and 40% of the variance for girls.

Discussion

The findings of this longitudinal research both verify the influential role played by beliefs of personal efficacy in childhood depression and clarify the paths through which they exert their effects. Perceived social and academic inefficacy contributed to concurrent and subsequent depression both directly and through their impact on academic achievement, prosocialness, and problem behaviors. The analysis of direct and mediated effects within the multivariate causal structure clarifies the paths of influence through which substandard academic performances with low perceived control (Hilsman & Garber, 1995) give rise to depression in children. In the shorter run, children were depressed over beliefs in their academic inefficacy rather than over their actual academic performances. In the longer run, however, the impact of a low sense of academic efficacy on depression was mediated through academic achievement, problem behavior, and prior depression. The contribution of problem behavior to depression also increased over the longer term.

Perceived social inefficacy contributed more heavily to depression in girls than in boys in the longer term. Although there was no gender difference in the direct link to distal depression at the two time points, a sense of social inefficacy was accompanied by depression concurrently in girls but not in boys. Moreover, girls' concurrent depression was more heavily linked to depression 2 years later. Research by Leadbeater, Blatt, and Quinlan (1995) provides supportive evidence for a greater role of social factors in depression in girls. Boys and girls both show some similar paths to depression, but it is more likely to arise from interpersonal estrangement for girls.

Two of the posited links involving the sociocognitive mediators in the structural model turned out to be mediated rather than direct. Perceived social self-efficacy was linked to problem behavior through prosocialness rather than directly. Children with a high sense of social efficacy were more prosocially oriented, which in turn was accompanied by low involvement in problem behavior. Apparently, it is mainly by fostering a contravening social style of behavior that a strong sense of social efficacy attenuates problem behaviors. Prosocialness was accompanied by low depression at both time points to the extent that it promoted avoidance of, or disengagement from, troublesome behavior.

In accord with a well-established finding (Clarizio, 1994), low to moderate relationships were obtained between ratings from different sources. This is hardly surprising given the number of dimensions on which the assessments differ. To begin with, they vary in the scope of depressive features assessed. Teachers and peers rated only expressions of dejection, whereas the children rated not only their depressive mood but also the full constellation of depressive manifestations, including self-deprecation, loss of interest, suicidal ideation, and vegetative disorders. The greater overlap in the facets of depression rated by teachers and peers yielded the higher correlation. The assessments also vary in the social contexts in which children's depression is observed. Teachers are most familiar with children's depressive reactions from classroom activities, and peers from social interactions both in and

outside the school setting, but children themselves have access to their depressive states in daily activities across all settings and time periods.

Raters vary as well in degree of accessibility to the different aspects of depression. Teachers and peers have access to children's overt manifestations of depressed mood, verbalized self-deprecation, and retardation in mental and physical activity. Although vegetative disorders, such as appetite loss and sleep disturbances, also are observable, teachers and peers have little opportunity to see these types of somatic manifestations. However, the children have continuous direct access not only to their own affective, cognitive, motivational, and vegetative disturbances but also to self-devaluations and preoccupation with morbid ideations that they may never voice. Moreover, raters differ in self-evaluative involvement in the assessment itself. Finally, the various measures of depression differ in the number of raters. The teacher's and children's assessments involve only a single rater, whereas the peer assessments represent the aggregate judgments of multiple raters.

The analyses based on the aggregate measure of depression essentially replicate the findings obtained with self-reported depression, including the mediational links in the structural model, the differential gender link of perceived social inefficacy to concurrent depression, and the robustness of the direct perceived social inefficacy link to subsequent depression. However, heavy involvement in problem behaviors had no effect on depression in the shorter run, and the link between prior and subsequent depression did not differ in strength between girls and boys in the longer run. The causal structure yielded by the aggregate measure of depression is disparate with what is known about the impact of these factors on depression as revealed by the children's ratings of their depressive moods and reactions. The fact that others lack access to the private aspects of depression may account, in large part, for the difference.

The present analysis of the self-efficacy pathways to depression was confined to children's beliefs in their capabilities to manage academic demands and interpersonal relationships. An extension of efforts to articulate the different ways in which beliefs of personal efficacy may contribute to depression centers on perceived efficacy for the self-regulation of affect. Affect regulation is an important aspect of people's emotional lives (Carstensen, 1992; Gross, 1998; Lazarus, 1991; Wegner & Pennebaker, 1993). Broadening the self-efficacy analysis to affect regulation may account for additional variance in depression.

In research now in progress, we have devised and tested scales measuring perceived self-efficacy to manage both positive and negative affect. The negative affect is linked to situations involving anxiety arousal, anger, rejection, embarrassment, and humiliation. The perceived self-efficacy to calm oneself in the face of provocations is included as part of the self-management of negative affect. The self-management of positive affect concerns perceived self-efficacy to express liking and affection toward others, to experience empathy and joy, and the efficacy to cheer oneself under discouraging circumstances.

The first validation attempt has yielded interesting findings (Caprara et al., in press). Emotional self-regulatory efficacy contributes to variance in depression and prosocial behavior independently of perceived social self-efficacy. A strong sense of efficacy to manage positive emotions is accompanied by high prosocialness

similarly for males and females. In contrast, a low sense of efficacy to manage negative emotions is highly depressing for females but not for males. An appropriate next phase for research in this area is to examine how perceived efficacy for the self-management of affect operates in concert with the other facets of self-efficacy and sociocognitive factors in the causal structure of depression.

The finding that perceived inefficacy to manage negative affect is depressing for females but not for males suggests another possible source of gender differences of depression. The heavier involvement of social and affective facets of perceived self-efficacy for girls may help to explain their greater proneness to depression in late adolescence and adulthood. Pre-existing perceived self-inefficacy in more aspects of their lives makes it more difficult to manage heightened transitional stressors and new role demands without experiencing despondency. Indeed, Nolen-Hoeksema and Girkus (1994) built a strong case that the interaction of pre-existing gender differences in sociocognitive depressogenic factors with more stressors linked to the female role accounts for the emergence of gender differences in late adolescence.

Nolen-Hoeksema's (1990) response styles theory of depression explains the self-perpetuation of depression and gender differences in depression in terms of ability to use engrossing action to turn off depressive rumination. Males are prone to work their way out of depressive episodes by immersing themselves in activities that distract them from their problems or alter them for the better. Women are more inclined to engage in ruminative thinking about their depressive condition that sustains or exacerbates it. It would be of interest to explore how perceived affective self-regulatory efficacy, as well as the social and academic facets of personal efficacy, are linked to proneness for ruminative or action-oriented models of reactions to depressive episodes. An agentic proactive style of coping, which requires a resilient sense of personal efficacy, would enable adolescents to manage difficult life events without suffering lingering bouts of depression.

In the present study we tested the structural model of the sociocognitive factors governing the severity of children's depressive reactions rather than clinical depression. Depressive reaction to stressors is, of course, a phenomenon of importance in its own right. Both children and adults commonly suffer bouts of depression from time to time, although not of the intensity and duration that the clinical forms take. Because this affective condition can impair psychological well-being and quality of functioning, there is much to be gained from a better understanding of its determinants, prevention, and reduction. Unlike anxiety, aggression, and other psychosocial dysfunctions, depression has become psychopathologized to the point where use of the term *depression* is considered inappropriate unless the affective condition is certified by clinical interview (Fristad, Emery, & Beck, 1997). The prescription of multiple diagnostic tools linked to clinical criteria is certainly warranted in research on clinical depression. However, psychopathology should not pre-empt the term *depression* for the less severe forms. It also has been suggested that nonclinical depression be labeled *distress* rather than *depression*. The nondescript term *distress* does not signify the explicit facets of depression that were measured. Children rated the extent to which they felt dejected, hopeless, and worthless; had lost their appetite; no longer found interest in things; and thought about killing them-

selves. Distress commonly implies agitation rather than dejection, self-deprecation, and psychomotor retardation.

The perceived inability to exercise control over events that affect one's life has been posited as a source of anxiety as well as depression. Studies in which self-beliefs of coping efficacy are systematically varied show that perceived inefficacy in managing potential threats is accompanied by subjective anxiety, autonomic arousal, and catecholamine and opioid activation (Bandura, Cioffi, Taylor, & Brouillard, 1988; Bandura, O'Leary, Taylor, Gauthier, & Gossard, 1987; Bandura, Reese, & Adams, 1982; Ozer & Bandura, 1990; Wiedenfeld et al., 1990). A low sense of perceived control over potentially injurious events has similarly been shown to be anxiety provoking (Geer, Davison, & Gatchel, 1970; Glass, Singer, Leonard, Krantz, & Cummings, 1973; Sanderson, Rapee, & Barlow, 1989).

A theory must specify when perceived inefficacy will produce anxiety and when it will produce depression. The nature of the outcomes over which personal control is sought is an important differentiating factor. People become anxious when they perceive themselves as ill equipped to manage potentially injurious events. Attenuation or control of harmful outcomes is central to anxiety. People are saddened and depressed by their perceived inefficacy to gain highly valued outcomes. Irreparable loss or failure to secure desired rewarding outcomes figures prominently in despondency.

Neither perturbing environmental events nor emotional states come packaged in neatly separable forms. Perceived inefficacy to secure and maintain what one values highly is often anxiety provoking, because a lack of control can have injurious effects. For example, when loss of a valued job has aversive consequences in one's everyday livelihood, a sense of powerlessness to control a vital aspect of one's life is both alarming and depressing. Because privation and threat commonly occur together, both anxiety and depression often accompany perceived inefficacy to exercise control over perturbing life circumstances.

Evidence verifying explanatory mechanisms of depression carries implications for how to prevent the development of depressive proclivities as well as how to alleviate suffering from it. Separate etiological theories and therapeutic approaches have been built around different sets of causal processes. Some of these approaches focus on interpersonal competencies (Coyne, 1990; Gotlib & Colby, 1987; Lewinsohn, Antonuccio, Steinmetz, & Teri, 1984), others on depressogenic styles of thinking (Alloy, 1988; Beck, 1984), and still others on dysfunctions in the evaluative self-system (Rehm, 1981). These different types of interventions have been adapted for the prevention and treatment of depression in young children and adolescents (Clarke, Lewinsohn, & Hops, 1990; Gillham, Reivich, Jaycox, & Seligman, 1995; Rehm, 1987; Stark, Rouse, & Krouskis, 1994). The more cognitively oriented theories share a common emphasis on the influential role of impairing self-referent cognitions in depression.

Research with clinically depressed individuals attests to the continuity of self-efficacy effects across levels of severity of depression (Cutrona & Troutman, 1986; Kavanagh & Wilson, 1989; Olioff & Aboud, 1991; Teti & Gelfand, 1991). Successful modification of depression requires people to engage in enabling styles of thinking and self-rewarding activities. This presents unique challenges, however, because a strong sense of inefficacy extends to the very skills taught in treatments to reduce proclivity to depression. The interventions include skills in how to identify

faulty thinking and supplant it with beneficial thinking, increase engagement in self-rewarding activities, and adopt ways of behaving that disconfirm faulty beliefs and provide accomplishments for enhancing personal efficacy and positive self-evaluation. At the outset of treatment, depressed people are beset by self-doubts in their ability to do the very things therapists are trying to persuade them to do (Ross & Brown, 1988). The deeper the despair, the lower the sense of efficacy to learn skills for alleviating depression. Therefore, before any progress can be achieved, therapists must alter clients' self-immobilizing beliefs about their ability to carry out the necessary therapeutic tasks. Otherwise, they will keep reaffirming their ineffectualness for the treatment itself. Mastery experiences are usually more persuasive than talk alone in eliminating ineffectacious thinking. Guided mastery experiences can provide confirmatory self-efficacy tests that show that what seemed hopelessly difficult is quite achievable (Kavanagh & Wilson, 1989).

The structure of the obtained relationships suggests that efforts to reduce proneness to depression would do well to center on enhancing perceived self-efficacy and skill in academic and social domains, both in their own right, and as a way of abating dissociation, academic underachievement, and other problem behaviors that breed despondency. In the academic source of depression, the problem is not just academic achievement but children's beliefs about their academic capabilities. This is especially true for girls who, in the aggregate analysis, were more likely than boys to get depressed over beliefs of academic inefficacy, even though they surpassed boys in actual academic achievement. A firm sense of intellectual efficacy creates resilience to the adverse effects of failure and sustains a high level of performance motivation (Bandura, 1991). Self-belittling habits in judging one's attainments can be altered through cognitive restructuring and mastery-oriented programs (Bandura, 1997). However, heightened vulnerability to depression is a social problem, not just a personal one. The solution partly lies in changing educational practices that undermine the perceived efficacy and aspirations of children (Levin & Lockheed, 1993; Rosenholz & Rosenholz, 1981). Diverse lines of research provide converging evidence of societal practices that undermine women's senses of efficacy in academic domains requiring quantitative skills (Bussey & Bandura, in press; Eccles, 1989; Hackett & Betz, 1981).

Reduction of depressive proclivities through the interpersonal source must also be extended beyond building social skills to the cognitive aspects. Social facility is not simply a matter of training in social skills. Schwartz and Gottman (1976) showed that the socially timid know what to do in social transactions, but they lack the efficacy to translate their knowledge into action. In semistructured situations, the socially anxious and nonanxious differ little in their actual social skills, but they differ substantially in their beliefs about their social efficacy (Glasgow & Arkowitz, 1975). Similarly, in some studies depressed and nondepressed people do not differ in social skills, but the nondepressed view themselves as much more adroit than they really are (Lewinsohn, Mischel, Chaplin, & Barton, 1980).

Efficacy beliefs affect not only the implementation of social skills but also how social successes and missteps are cognitively processed. People who doubt their social efficacy are more likely to view repeated successes as the product of favorable circumstances than as indicants of their capabilities, whereas those of

high perceived efficacy believe even more strongly in their capabilities following similar successes (Alden, 1987). Moreover, those of low perceived social efficacy readily accept failures as evidence of their personal deficiencies. Perceived self-efficacy predicts the level of aversive emotional arousal experienced and manifested in interpersonal transactions (Alden, 1986). Children at risk for depression that is due to perceived social inefficacy need to change their way of thinking about their capabilities and how they read their social experiences. Self-efficacy theory provides explicit guidelines on how to structure mastery experiences to enhance both social skills and resilient self-beliefs (Bandura, 1997).

Children should not be the sole locus of intervention in either the prevention or treatment of depression. Parental depression increases the likelihood of depression in offspring (Gotlib & Goodman, 1998; Hammam, 1991). The relative contributions of genetic predisposition, emotional and functional unresponsiveness of parents to their children, and impairment of family relationships by parental dejection have yet to be disentangled. Here, too, self-efficacy theory sheds some light on a possible mechanism underlying the observed relationship. Not all children of depressed parents suffer bouts of depression (Beardslee & Podorefsky, 1988). The source of this variability and resilience requires explanation. Observational studies by Teti and Gelfand (1991) of clinically depressed mothers interacting with their infants reveal that the adverse effects of depression on caretaking activities are mediated through mothers' beliefs in their parenting efficacy. Similarly, the effects of infants' temperamental difficulty and social support affects mothers' postpartum depression and are mediated entirely through their impact on perceived parenting efficacy (Cutrona & Troutman, 1986). The converging evidence from these diverse lines of research suggests that a persistent sense of personal inefficacy operates as a common contributor to both clinical and less severe forms of depression.

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Received August 11, 1997

Revision received May 29, 1998

Accepted May 30, 1998 ■



Evidence Suggesting That a Chronic Disease Self-Management Program Can Improve Health Status While Reducing Hospitalization: A Randomized Trial

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Source: *Medical Care*, Vol. 37, No. 1, (Jan., 1999), pp. 5-14

Published by: Lippincott Williams & Wilkins

Stable URL: <http://www.jstor.org/stable/3767202>

Accessed: 19/06/2008 07:19

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Evidence Suggesting That a Chronic Disease Self-Management Program Can Improve Health Status While Reducing Hospitalization

A Randomized Trial

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OBJECTIVES. This study evaluated the effectiveness (changes in health behaviors, health status, and health service utilization) of a self-management program for chronic disease designed for use with a heterogeneous group of chronic disease patients. It also explored the differential effectiveness of the intervention for subjects with specific diseases and comorbidities.

METHODS. The study was a six-month randomized, controlled trial at community-based sites comparing treatment subjects with wait-list control subjects. Participants were 952 patients 40 years of age or older with a physician-confirmed diagnosis of heart disease, lung disease, stroke, or arthritis. Health behaviors, health status, and health service utilization, as determined by mailed, self-administered questionnaires, were measured.

RESULTS. Treatment subjects, when compared with control subjects, demonstrated

improvements at 6 months in weekly minutes of exercise, frequency of cognitive symptom management, communication with physicians, self-reported health, health distress, fatigue, disability, and social/role activities limitations. They also had fewer hospitalizations and days in the hospital. No differences were found in pain/physical discomfort, shortness of breath, or psychological well-being.

CONCLUSIONS. An intervention designed specifically to meet the needs of a heterogeneous group of chronic disease patients, including those with comorbid conditions, was feasible and beneficial beyond usual care in terms of improved health behaviors and health status. It also resulted in fewer hospitalizations and days of hospitalization.

Key words: chronic disease; self-management; patient education; cost; utilization. (Med Care 1999;37:5-14)

As the average age of our population increases, so does the prevalence of chronic disease. It is now estimated that people aged 60 years and older have, on average, 2.2 chronic conditions.¹ Chronic disease is responsible for almost 70% of health care expenditures.²

There are many examples of how patient education programs for specific chronic conditions have increased healthful behaviors, improved health status, and/or decreased health care costs of their participants. An excellent bibliography of more than 400 such patient education studies has

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Supported by the University of California Tobacco-Related Disease Research Program grant no. TR156 and AHCPR grant no. 5 RO1 HS06680.

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Received December 23, 1997; initial review completed February 3, 1998; accepted May 26, 1998.

been published recently.³ To date, few of the studies have dealt with more than one disease or with the problems of comorbidity. Rather, each patient education intervention has been disease-specific.

With the emergence of chronic disease as the largest threat to health status and the largest cause of health care expenditures, the potential role of patient self-management assumes increased importance. If benefits can be shown from an inexpensive, replicable self-management program, such programs might be a useful part of a therapeutic regime. Our study explored this possibility. It differed from previous self-management studies in that it: (1) placed subjects with different chronic diseases and different combinations of comorbid diseases in the same program at the same time; (2) utilized a randomized, controlled design; and (3) measured outcomes in terms of behaviors, health status, and health service utilization. Although former patient self-management education studies had one or more of these attributes, none have had all three.

The objectives of the study were to evaluate the effectiveness (changes in health behaviors, health status, and health service utilization) of a self-management program for chronic disease designed for use with a heterogeneous group of chronic disease patients and to explore the differential effectiveness of the intervention for subjects with specific diseases and comorbidities. The experience during 6 months with the 952 patients with heart disease, lung disease, stroke, or arthritis is reported here.

Methods

The Chronic Disease Self-Management Program (CDSMP) is a community-based patient self-management education course. Three principal assumptions underlie the CDSMP: (1) patients with different chronic diseases have similar self-management problems and disease-related tasks; (2) patients can learn to take responsibility for the day-to-day management of their disease(s); and (3) confident, knowledgeable patients practicing self-management will experience improved health status and will utilize fewer health care resources. Other assumptions that shaped the program were that: (1) patient self-management education should be inexpensive and widely available; (2) trained lay persons with chronic conditions could effectively deliver a structured patient education program; and (3)

such lay instructors would be acceptable to both patients and health professionals. There is research evidence that positive role models (in this case, lay leaders with similar backgrounds and disease problems) increase patients' self-efficacy or confidence in their ability to manage their disease.⁴

Needs Assessment

The content and methodology of the CDSMP were based on two needs assessments. The first was a literature review of existing chronic disease patient education programs.⁵ The purpose of this review was to identify common topics taught across chronic disease courses. In a review of more than 70 articles, the authors found 12 common tasks: recognizing and acting on symptoms, using medication correctly, managing emergencies, maintaining nutrition and diet, maintaining adequate exercise, giving up smoking, using stress reduction techniques, interacting effectively with health care providers, using community resources, adapting to work, managing relations with significant others, and managing psychological responses to illness.

The second needs assessment sought information from 11 focus groups.⁶ Participants included people older than 40 years with chronic diseases. Participants were invited to: (1) describe their disease(s) and what they thought caused them; (2) explain their feelings and beliefs about getting older; (3) describe the physical, social, and emotional impacts of chronic disease on their lives and the lives of their families; (4) describe how they coped with the problems caused by their disease(s); and (5) elaborate on their fears, hopes, and wishes for the future. Theme analysis from these groups' responses was used to shape both the content of the CDSMP and the process of instruction.

Chronic Disease Self-Management Program Design

The topics covered in the CDSMP included: exercise; use of cognitive symptom management techniques; nutrition; fatigue and sleep management; use of community resources; use of medications; dealing with the emotions of fear, anger, and depression; communication with others including health professionals; problem-solving; and decision-making. The content of the course

has been published as Living a Healthy Life with Chronic Conditions.⁷ This book was used as a text for course participants.

The process of teaching the course is based on Self-Efficacy Theory. It incorporates strategies suggested by Bandura to enhance self-efficacy.⁸ These include weekly action planning and feedback, modeling of behaviors and problem-solving by participants for one another, reinterpretation of symptoms by giving many possible causes for each symptom as well as several different management techniques, group problem-solving, and individual decision-making. The leaders act more as facilitators than as lecturers. For example, rather than prescribing specific behavior changes, they assist participants in making management choices and achieving success in reaching self-selected goals. The process is documented in a detailed protocol, Chronic Disease Self-Management Leader's Manual.⁹

Each course had 10 to 15 participants of mixed ages and diagnoses, including family members if they wished to attend. Each course was taught by a pair of trained, volunteer lay leaders. The 87 leaders received 20 hours of training with the detailed teaching manual. They ranged in age from 21 to 80 years (82% were older than 40).⁹ Seventy-one percent of the leaders had one or more chronic diseases, 23% were health professionals, and 15% were students. Few had previous experience in health education. On average, leaders taught 2.4 courses. The program was given in seven weekly 2.5-hour sessions.

Entry Criteria

To enter the study, subjects had their physician confirm a diagnosis of chronic lung disease (asthma, chronic bronchitis, or emphysema), heart disease (coronary artery disease or congestive heart failure), stroke (completed cerebrovascular accident with neurologic handicap and normal mentation), or chronic arthritis. In addition to at least one of the above conditions, they could have other conditions. Patients with compromised mentation, cancer patients who received chemotherapy or radiation within the past year, and persons younger than 40 years of age were excluded. Subjects' physicians and hospitals were not informed as to their study status (treatment or control).

Recruitment and Randomization

Subjects were recruited using public service announcements in the mass media, referrals from flyers left in physicians' offices and community clinics, posters at senior citizen centers, announcements in health maintenance organization (HMO) patient newsletters, and referrals from county government employers. Before filling out their initial questionnaire and before randomization, all subjects were told they would either receive the course immediately or after serving as a control for 6 months.

To assure that the program would be easily accessible to patients, it was held in multiple community sites in a four county area. Programs were held in churches, senior and community centers, public libraries, and health care facilities. In addition, programs were planned at varied times for the convenience of patients including late mornings, early afternoons, evenings, and Saturday mornings. The project was approved by the Institutional Committee for the Protection of Human Subjects in Research. All participants gave written informed consent. After each subject's physician(s) had supplied a diagnosis and after each subject had completed a consent form and baseline questionnaire, participants were randomized to treatment or control status. Randomization was conducted serially. After all subjects had applied to a specific site, typically 16 to 30 subjects, the randomization ratio (treatment versus controls) was determined so as to assure no fewer than 10 and no more than 15 treatment subjects. Thus, in some sites the ratio of treatment-to-control subjects was 4:6, whereas in others it was 7:3. This randomization method resulted in an overall 6:4 ratio.

Outcome Measures

There were three primary classifications of outcome variables: health behaviors, health status, and health service utilization. Data were collected by previously tested self-administered, mailed questionnaires. To minimize acquiescent response, data collection was completely separate from the intervention and carried out by persons who did not know the subjects or their treatment status. Measures included the self-rated health scale used in the National Health Interview Survey and a modified version of the Health Assessment Questionnaire (HAQ) disability scale.^{10,11} The psychological

well-being scale, also known as the MHI-5, which is part of the SF-36, as well as the SF-20, was used.^{12,13} The pain and physical discomfort scale was an adaptation of the Medical Outcomes Study (MOS) pain scale; it was modified to include physical discomfort.¹⁴ The energy/fatigue scale was the scale used in the long-form MOS, and the health distress scale was a slightly modified version of the MOS health distress scale.¹⁵ The remaining measures (ie, duration of exercise, use of cognitive symptom management, communication with physicians, social/role activity limitations, shortness of breath, and utilization measures) were developed and tested for this study. Definitions of all measures and information on their reliability and validity are presented elsewhere.⁶ The magnitude of the correlations among the health status scales ranged from 0.14 to 0.60 (median, 0.43). The highest correlation was between psychological well-being and health distress (0.60).

Subjects were assessed for three types of health utilization: visits to physicians, including visits to the emergency room (ER), visits to hospitals during the past 6 months, and the number of nights spent in a hospital. For each category, they reported how often they used these health services. The self-reported data for 200 subjects who were HMO members were validated against automated medical records. Outpatient self-reported visits were associated with the medical record visits ($r = 0.64$) and ER visits ($r = 0.60$). We found that patients often included urgent care and after-hour visits with ER visits instead of counting these as outpatient visits. Thus, the data for all subjects' ER visits were combined with data for outpatient physician visits. When combined, the self-reported data for outpatient visits correlated ($r = 0.70$) with medical records. We found errors made both by patients and by the automated record system. Patients tended to underreport recorded visits by approximately 17%. Conversely, the system sometimes overreported visits. For example, a subject who received numerous allergy injections from a nurse was reported by the system to have had a physician visit for each injection. For days in hospital, medical records correlated with patient self-report ($r = 0.83$).

Analyses

The primary analysis compared 6-month outcomes between the treatment and control groups

on each outcome variable using analysis of covariance on endpoint scores, controlling for the baseline value of the study variable, as well as age, sex, education, and marital status. The endpoint data were examined by analysis of covariance for variation among the 108 CDSMP programs in which participants were taught; between-program variation in effects was found to be minimal and did not influence overall conclusions. Therefore, treatment and control data were aggregated across programs of instruction.

The secondary analyses determined if the intervention had different outcomes for those with different diseases. Two-way analyses of variance were utilized, testing for the interaction of disease by treatment status (treatment/control).

Results

Primary Results

Of the 1,140 subjects who entered the study (ie, were randomized to treatment [$n = 664$] or to control status [$n = 476$]), 952 [83%] completed the 6-month study. Of the treatment subjects, 84% completed 6 months compared with 82% of the control subjects. Treatment subjects completing 6-month data attended an average of 5.5 of the seven program sessions. Of those treatment subjects not completing 6-month data, 1.2% had died, 3.4% were too ill to continue, and 11.4% had unknown reasons. For the control subjects, the respective percentages were 0.81, 7.8, and 9.4. Comparing baseline data for subjects who completed 6-month data with those who did not, the noncompleters had significantly fewer minutes of aerobic exercise per week and higher levels of activity limitation, pain/physical discomfort, fatigue, and health distress than did those who completed the 6 months ($P < 0.05$); however, there were no statistically significant differences between the treatment and control subjects at study entry on any variable. Table 1 presents the demographic and disease characteristics of study participants completing the study. Only marital status was significantly different ($P < 0.05$). Table 2 gives baseline data and mean 6-month uncorrected change scores for the CDSMP treatment subjects and the control subjects. As compared with controls, the treatment group demonstrated significant improvement in all four health behavior variables ($P < 0.01$; number of minutes per week of stretching/strengthening and aerobic exercise; in-

TABLE 1. Subject Characteristics

	Treatment (n = 561)	Control (n = 391)
Mean age (years)	65.6	65.0
Age range	40-90	40-89
Median/Mode	65.5/71	65.5/71
% Female	65	64
Mean education (years)	15	15
% ≤ 12 yrs	27	27
% 13-15 yrs	28	25
% 16 yrs	16	21
% > 16 yrs	29	27
% Married	54.1	59.1*
% White	91.4	88.8
Diseases		
% Heart disease	31	35
% Lung disease	46	43
% Arthritis	56	53
% Stroke	10	12
Mean number diseases	2.2	2.3
Provider		
% Covered by HMO	57	55
% Private fee for service	35	35
% Govt. only (Medicare, Medical, and CHAMPUS VA)	8	10

* χ^2 . P < 0.05.

creased practice of cognitive symptom management; and improved communication with their physician). They also demonstrated significant improvement in five of the health status variables (self-rated health, disability, social/role activities limitation, energy/fatigue, and health distress; $P < 0.02$). No significant differences were demonstrated for pain and physical discomfort, shortness of breath, or for psychological well-being. The treatment group, as compared with the control group, had fewer hospitalizations ($P < 0.05$) and spent, on average, 0.8 fewer nights in the hospital ($P = 0.01$). There were no significant differences in visits to physicians ($P = 0.11$).

An intent to treat analysis also was conducted that included 1,128 subjects. Baseline (entry) data were used at 6 months for the 176 subjects (drop outs) who did not complete 6-month data. (The eight treatment and four control subjects who died were excluded.) In this analysis, all prob-

ability values remained unchanged, although the change scores were reduced slightly for both the treatment and control groups. For example, the changes in communication with physicians were 0.22 for treatment subjects compared with 0.09 for controls, health distress was -0.20 for the treatment subjects compared with -0.06 for controls, and nights in hospital was -0.22 for treatment subjects compared with 0.46 for controls.

Of the 391 control subjects who completed the 6-month randomized study, 283 (72%) chose to take the CDSMP. Of these, 237 provided 6-month post-CDSMP endpoint data. Using matched pair t tests comparing data before starting the CDSMP and 6 months after starting the program, this group increased their aerobic exercise and use of coping strategies ($P < 0.05$). They also decreased their disability and health distress while increasing their social and role activities ($P < 0.05$). Visits to physicians decreased by 0.98 ($P < 0.05$). The group had fewer visits to hospitals and 0.65 fewer days in hospital ($P < 0.05$). Changes in other study variables listed in Table 2 were not significant, although all demonstrated a trend toward improvement. Thus, it appears that by taking the CDSMP, control subjects reversed many of the trends toward worsening health demonstrated during the 6-month randomized trial.

Secondary Results

Tables 3 and 4 present baseline data and 6-month change scores for treatment and control subjects in the various disease categories: those whose only disease was arthritis, heart disease, or lung disease, and those with comorbidities. Subjects who only had a stroke were not included in this analysis because of small numbers. A two-way analysis of covariance, controlling for baseline status, examined main treatment effects and interactions among the four disease categories and found no significant interactions for any of the 20 outcome variables. Examination of the 6-month change scores confirmed the tendency for the change scores to reflect program effects similarly across all four diagnostic subgroups.

Program costs versus savings also were examined. Although the treatment group reduced their visits to physicians slightly more than did the control group, the difference was not significant. The decrease in the number of hospitalizations and in the number of nights of hospitalization were significant ($P < 0.05$, Table 2). Assuming a

TABLE 2. Baseline and Six-Month Changes for Treatment and Control Subjects: Health Behaviors, Health Status, and Health Service Utilization

	Baseline		Six-Month Change		Significance P*
	Treatment Mean (SD) (n = 561)	Control Mean (SD) (n = 391)	Treatment Mean (SD of Δ)	Control Mean (SD of Δ)	
Health behaviors					
Stretching & strengthening	40 (54)	37 (54)	13 (56.7)	5 (54.6)	0.005
Exercise (minutes/week)					
Aerobic exercise (minutes/week)	95 (97)	93 (83)	16 (94.5)	-2 (87.0)	0.0003
Cognitive symptom	1.3 (0.88)	1.3 (0.94)	0.38 (0.77)	.07 (0.73)	0.0001
Mgmt. (0-5, ↑ = better)					
Communication w/MD (0-5, ↑ = better)	3.0 (1.2)	3.0 (1.2)	0.26 (0.98)	.11 (0.96)	0.006
Health status					
Self-rated health (1-5, ↓ = better)	3.4 (0.88)	3.3 (0.93)	-0.09 (0.72)	0.02 (0.69)	0.02
Disability (0-3, ↓ = better)	0.78 (0.59)	0.85 (0.63)	-0.02 (0.32)	.03 (0.36)	0.002
Social/Role activities	1.8 (1.1)	1.8 (1.1)	-0.07 (0.92)	.08 (0.87)	0.0007
Limitations (0-4, ↓ = better)					
Pain/Physical discomfort (0-100, ↓ = better)	58 (22.6)	59 (23.6)	-2.6 (19.4)	-2.2 (17.6)	0.27
Psychological well-being (0-5, ↑ = better)	3.4 (0.88)	3.4 (0.98)	0.09 (0.69)	0.04 (0.67)	0.10
Energy/Fatigue (0-5, ↑ = better)	2.2 (1.1)	2.2 (1.1)	0.14 (0.79)	0.02 (0.75)	0.003
Health distress (0-5, ↓ = better)	2.1 (1.2)	2.1 (1.2)	-0.24 (0.98)	-0.07 (0.97)	0.001
Shortness of breath (0-4, ↓ = better)	1.3 (1.1)	1.4 (1.2)	0.02 (0.87)	-0.02 (0.78)	0.56
Health service utilization					
MD & ER visits (times past 6 months)	6.1 (5.7)	6.4 (6.1)	-0.77 (5.6)	-0.54 (6.3)	0.11
Number of hospital stays (past 6 months)	0.24 (0.69)	0.30 (0.98)	-0.07 (0.69)	-0.05 (1.1)	0.047
Nights in hospital (past 6 months)	1.1 (4.1)	1.0 (4.1)	-0.28 (5.2)	0.56 (7.0)	0.01

*Analysis of covariance on 6 month post-test scores controlling for treatment status, age, sex, education, marital status, and baseline status.

(Two-tailed P values.)

cost of \$1,000 per day of hospitalization, the 6-month health care costs for each control participant in this study were \$820 greater than for each treatment subject. The costs of providing the pro-

gram for treatment subjects who completed the 6-month study were calculated to be \$70 per participant. This includes \$26 for training leaders (assuming two leaders teach each course and that

TABLE 3. Baseline Scores for Treatment and Control Subjects By Disease: Health Behaviors, Health Status, and Health Service Utilization

	Arthritis Only		Heart Disease Only		Lung Disease Only		Comorbid Conditions	
	Treatment Mean (SD) (n = 86)	Control Mean (SD) (n = 62)	Treatment Mean (SD) (n = 45)	Control Mean (SD) (n = 31)	Treatment Mean (SD) (n = 107)	Control Mean (SD) (n = 60)	Treatment Mean (SD) (n = 311)	Control Mean (SD) (n = 225)
Health behaviors								
Stretching/Strengthening	42.4 (56.6)	48.8 (62.9)	47 (61.1)	25.2 (36.2)	30.4 (50.7)	23.8 (45.0)	39.9 (52.4)	37.1 (53.4)
Exercise (minutes/week)	107.4 (103.4)	89.5 (85.2)	122.3 (104.2)	126.8 (80.0)	80.2 (91.2)	67.5 (72.0)	89.1 (91.5)	94.5 (81.6)
Aerobic exercise (minutes/week)	1.2	1.6	1.3	1.2	1.3	1.1	1.4	1.2
Cognitive symptom Mgmt. (0–5, ↑ = better)	(0.88)	(1.1)	(0.78)	(0.96)	(0.91)	(0.82)	(0.88)	(0.91)
Communication with MD (0–5, ↑ = better)	3.0 (1.2)	3.0 (1.2)	2.9 (1.1)	3.0 (1.0)	2.9 (1.2)	2.8 (1.2)	3.1 (1.2)	3.1 (1.2)
Health status								
Self-rated health (1–5, ↓ = better)	3.1 (0.91)	3.0 (1.0)	3.2 (6.3)	3.2 (0.87)	3.3 (0.90)	3.4 (0.89)	3.5 (0.88)	3.4 (0.91)
Disability (0–3, ↓ = better)	0.98 (0.63)	0.90 (0.55)	0.24 (0.37)	0.34 (0.46)	0.57 (0.48)	0.63 (0.55)	0.87 (0.57)	0.94 (0.61)
Social/Role activities								
Limitations (0–4, ↓ = better)	1.8 (1.0)	1.9 (1.2)	1.1 (1.0)	1.0 (1.1)	1.8 (1.1)	1.6 (1.1)	1.9 (1.1)	1.9 (1.1)
Pain/Physical discomfort (0–100, ↓ = better)	68.6 (18.7)	70.3 (17.8)	40.9 (18.5)	40.2 (22.0)	50.4 (19.2)	50.6 (23.6)	60.8 (22.7)	61.5 (22.8)
Psychological well-being (0–5, ↑ = better)	3.5 (0.92)	3.5 (0.90)	3.3 (0.90)	3.3 (0.78)	3.5 (0.89)	3.5 (0.89)	3.5 (0.87)	3.3 (0.87)
Energy/Fatigue (0–5, ↑ = better)	2.1 (1.2)	2.4 (1.1)	2.6 (1.0)	2.6 (1.1)	2.3 (1.1)	2.3 (1.0)	2.1 (1.0)	2.0 (1.1)
Health distress (0–5, ↓ = better)	2.1 (1.2)	2.0 (1.2)	1.7 (1.1)	1.9 (1.2)	2.0 (1.1)	2.0 (1.1)	2.2 (1.1)	2.2 (1.2)
Shortness of breath (0–4, ↓ = better)	0.48 (0.69)	0.37 (0.73)	0.94 (0.94)	1.0 (0.97)	2.2 (0.94)	2.3 (0.97)	1.3 (0.97)	1.6 (1.2)
Health service utilization								
MD and ER visits (times past 6 months)	4.97 (4.32)	5.37 (5.61)	5.02 (4.51)	5.00 (3.49)	5.98 (5.68)	5.95 (4.63)	6.51 (6.12)	7.08 (6.82)
Number of hospital stays (past 6 months)	0.14 (0.47)	0.13 (0.38)	0.42 (0.84)	0.52 (0.85)	0.19 (5.2)	0.28 (1.1)	0.26 (0.75)	0.31 (1.1)
Nights in hospital (past 6 months)	0.66 (0.26)	0.13 (0.38)	1.2 (2.9)	1.5 (3.6)	0.69 (2.3)	1.3 (7.2)	1.0 (4.9)	1.0 (3.1)

TABLE 4. Six-Month Changes for Treatment and Control Subjects By Disease: Health Behaviors, Health Status, and Health Service Utilization

	Arthritis Only		Heart Disease Only		Lung Disease Only		Comorbid Conditions	
	Treatment Mean Δ (SD)	Control Mean Δ (SD)						
Health behaviors								
Stretching/Strengthening	16.4 (60.5)	5.3 (55.5)	5.7 (47.6)	2.9 (51.4)	10.9 (46.1)	13.2 (56.2)	3.3 (60.6)	3.3 (52.2)
Exercise (minutes/week)	24.1 (120.9)	11.4 (96.8)	3.3 (92.8)	-21.3 (67.8)	21.9 (85.4)	11.1 (82.5)	-6.5 (89.3)	-6.5 (86.5)
Aerobic exercise (minutes/week)								
Cognitive symptom Mgmt. (0-5, ↑ = better)	0.57 (0.81)	0.03 (0.64)	0.29 (0.85)	-0.01 (0.91)	0.33 (0.81)	0.17 (0.73)	0.07 (0.73)	0.07 (0.74)
Communication w/MD (0-5, ↑ = better)	0.34 (1.2)	-0.03 (1.1)	0.30 (1.2)	0.19 (0.79)	0.26 (0.89)	0.24 (0.89)	0.10 (0.91)	0.10 (0.91)
Health status								
Self-reported health (1-5, ↓ = better)	-0.08 (0.80)	0.02 (0.67)	-0.20 (0.59)	-0.06 (0.63)	-0.11 (0.83)	0.08 (0.56)	-0.08 (0.68)	0.04 (0.73)
Disability (0-3, ↓ = better)	-0.05 (0.38)	0.00 (0.42)	0.06 (0.35)	0.10 (0.34)	-0.04 (0.29)	0.09 (0.32)	-0.01 (0.30)	0.02 (0.34)
Social/Role activities Limitations (0-4, ↓ = better)	-0.13 (0.97)	-0.13 (0.78)	-0.15 (0.93)	0.19 (0.87)	-0.17 (1.0)	0.22 (0.85)	0.08 (0.86)	0.08 (0.89)
Pain/Physical discomfort (0-100, ↓ = better)	-5.4 (15.9)	-7.5 (15.2)	-4.8 (17.0)	2.7 (18.5)	-4.3 (20.7)	-3.4 (20.5)	-1.0 (20.1)	-0.89 (17.1)
Psychological well-being (0-5, ↑ = better)	0.08 (0.73)	0.09 (0.60)	0.36 (0.76)	-0.04 (0.66)	0.05 (0.70)	0.07 (0.68)	0.07 (0.67)	0.03 (0.69)
Energy/Fatigue (0-5, ↑ = better)	0.31 (0.82)	-0.04 (0.74)	0.22 (0.74)	-0.08 (0.95)	0.1 (0.92)	0.13 (0.66)	0.08 (0.73)	0.02 (0.75)
Health distress (0-5, ↓ = better)	-0.30 (1.1)	-0.27 (0.96)	-0.20 (0.84)	0.04 (0.70)	-0.26 (0.92)	0.01 (0.76)	-0.23 (0.97)	-0.07 (1.1)
Shortness of breath (0-4, ↓ = better)	0.12 (0.59)	0.00 (0.57)	0.06 (0.87)	0.11 (0.78)	-0.18 (0.93)	-0.19 (0.77)	0.04 (0.91)	-0.02 (0.83)
Health service utilization								
MD & ER visits (times past 6 months)	-0.67 (4.14)	-1.69 (5.51)	-0.89 (3.82)	-0.52 (3.45)	-1.44 (5.77)	-0.17 (5.04)	-0.55 (6.10)	-0.21 (7.24)
Number of hospital stays (past 6 months)	-0.04 (0.57)	-0.03 (0.48)	-0.20 (0.63)	-0.23 (0.76)	-0.04 (0.68)	-0.15 (1.2)	-0.07 (0.73)	0.02 (1.2)
Nights in hospital (past 6 months)	-0.44 (2.8)	0.21 (1.9)	-0.60 (2.5)	-0.71 (3.4)	0.19 (3.4)	0.23 (11.0)	-0.25 (6.3)	1.1 (6.8)

each leader teaches only one course), \$14 for volunteer leader stipend (assuming \$100 per leader per course of 15 participants), \$15 for course materials (book and audio tape), and \$15 administrative costs. This analysis does not take into account the cost of space (which was donated for this study) or indirect costs. Assuming that these figures reflect current costs, the health care expenditure savings (savings in hospital nights minus program costs) approximated \$750 per participant, more than 10 times the cost of the intervention.

Discussion

This study was an evaluation of a self-management education intervention for persons with one or more different conditions. The format of the intervention had the attributes of medium-sized classes, lay leaders, and heterogeneity of participants in terms of type and severity of disease(s). Overall, the intervention was successful in increasing healthful behaviors, maintaining or improving health status, and decreasing rates of hospitalization (Table 2). These results indicate that it is possible to educate patients with different chronic diseases successfully in the same intervention at the same time. Because most chronic disease patient education programs have not been formally evaluated, it is difficult to determine if heterogeneous educational interventions such as the CDSMP are more or less effective than homogeneous, single disease-oriented programs. Because people 60 years of age and older have, on average, two or more chronic conditions, it would seem that a program focused on the problems common to the various comorbidities would be a reasonable substitute for, or adjunct to, the more traditional single disease programs.

One key question concerns the generalizability of the findings. As in nearly all such studies, the subjects self-selected to be in the study and may have been more motivated than most chronic disease patients. From past arthritis self-management studies, we have evidence that when patients in a closed HMO rheumatology practice were repeatedly offered an opportunity to participate in an intervention similar to the CDSMP, 47% chose to do so.¹⁶ Men and non-English speakers were less likely to attend. Glasgow and Litzelman^{17,18} have found similar participation in a diabetes self-management intervention. Studies now being conducted with the Kaiser system and

with Latinos should offer more information about the generalizability of CDSMP.

The subjects in our study had a high mean level of education. It is noteworthy that approximately 27% of the subjects had 12 years of education or less and 29% had 16 years or more. When education was entered into the analysis as a covariate of outcomes, however, it did not affect them.

Because of the heterogeneous mix of patients, not all patients had the same symptoms, nor did they all need to change the same behaviors. Thus, the results of the primary analysis of specific outcomes may have underestimated somewhat the individual improvements because they contained data from subjects who either did not have a target symptom or who already had achieved acceptable levels on that outcome. Although we do not have a definitive answer about clinical significance, activity limitation, health distress, and disability were all improved. This suggests that the CDSMP affected important physical and mental aspects of participants' lives.

Tables 3 and 4 explore the effectiveness of the intervention for various subsets of patients. Because these are secondary analyses, we cannot draw definitive conclusions from these data. The findings, however, may be helpful in guiding future studies. Although all of the subgroups appear to have made changes in healthful behaviors, these changes varied by group, as might be expected. For example, the group with heart disease reported the most aerobic exercise at baseline (122.3 and 126.8 minutes/week for the treatment and control groups, respectively), the lung disease group reported the least (80.2 and 67.5), and the arthritis group was intermediate (107.4 and 89.5; Table 4). The treatment participants with arthritis and those with lung disease increased their exercise more than the control subjects did (Table 4). The treatment group with heart disease remained the same, and the control group decreased their exercise. Thus, for patients with low baseline activity levels, the intervention increased activity, whereas for patients with relatively high activity level, this level was maintained. The results concerning the practice of cognitive symptom management techniques and communication with their physicians were uniform across all subgroups.

That the intervention had some differential effects on different subsets of patients is not surprising. Although chronic diseases create similar problems, these problems are more or less salient

for an individual patient at different times across diseases. The CDSMP was designed to meet such a challenge by aiding patients to identify their own individual needs and problems and then assisting them to work most intensively in those areas. In addition, it was designed to meet the needs of the many older patients who have more than one chronic condition.

It is important to note that participants in this study were volunteers, recruited largely by word of mouth and by various forms of public announcement. Although their physicians confirmed their diagnoses and knew of their participation, there was no linkage between the CDSMP content and the individual treatment plans. The CDSMP did not alter participants' treatment. Therefore, the benefits that were achieved were additional to those achieved by usual care. Conceivably, integration of a CDSMP with usual care, perhaps at the outset of a chronic disease, would further enhance the benefits.

Conclusion

The Chronic Disease Self-Management Program is a program designed specifically to meet the needs of a heterogeneous group of chronic disease patients, including those with comorbid conditions. The results of this study suggest that such an intervention is feasible, is beneficial beyond usual care in terms of improved health status, and can decrease hospitalization with a potential of substantial savings in health care costs. If replicated in similar studies, a program such as the CDSMP deserves a place in the treatment regime of patients with chronic disease.

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Psychological Aspects of Prognostic Judgments

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It is now widely acknowledged that the level of health functioning is governed by biopsychosocial processes rather than solely by biological factors (Bandura 1997; Engle 1977). Psychological determinants contribute to physical and functional status by their impact on habits that impair or enhance health and on biological systems that mediate health and physical dysfunction. Because psychosocial factors account for some of the variability in health functioning their inclusion in prognostic schemes can enhance their predictive power. Prognostic judgments activate psychosocial processes that can influence health outcomes rather than simply serve as nonreactive forecastings. This chapter examines some of the psychological mechanisms through which prognostic judgments and clinical interventions can alter the probabilities of health outcomes.

Psychosocial determinants of health status operate largely through the exercise of personal agency. Among the mechanisms of personal agency, none is more central or pervasive than people's beliefs in their ability to exercise some control over their own health. This self-belief of personal control is called perceived self-efficacy, and is the foundation of human agency. Unless people believe that they can produce desired results by their actions they have little incentive to act or to per-

severe in the face of difficulties. Evidence from diverse lines of research shows that perceived self-efficacy operates as a common psychological mechanism through which psychosocial influences affect physical and functional status (Bandura 1997).

Perceived self-efficacy has diverse effects, each of which can influence health outcomes and how well people use their physical and cognitive capabilities (Bandura 1997, 1998). Such self-beliefs affect what people choose to do. They avoid activities they believe exceed their capabilities and as a result fail to develop competencies or experience declines through disuse. However, they readily undertake activities they judge themselves capable of handling. Self-efficacy beliefs also play a central role in the self-regulation of motivation. They determine how much effort people will exert in an endeavor, how long they will persevere in the face of difficulties and setbacks, and their resilience to adversity. The stronger the belief in one's efficacy, the greater and more persistent are the efforts. When faced with obstacles and disabilities, people who are beset by self-doubts about their capabilities slacken their efforts or give up quickly. A resilient sense of personal efficacy thus provides the needed staying power for surmounting difficulties that inevitably

arise in any undertaking. People's beliefs in their efficacy also affect how much stress and depression they experience in taxing situations as well as their level of motivation. Stress and depression take their toll on the quality of health functioning.

Impact of Perceived Self-Efficacy on Health Functioning

There are two major lines of research on the psychosocial determinants of health outcomes in which perceived self-efficacy plays an influential role. The more basic level of research examines how psychosocial factors affect biological systems that mediate health and susceptibility to disease through the self-efficacy mechanism. Stress has been implicated as an important contributing factor to many physical dysfunctions. Controllability appears to be a key organizing principle regarding the nature of these biological stress effects. Exposure to stressors with a concomitant strong sense of coping efficacy has no adverse physiological effects. Exposure to the same stressors with weak coping efficacy, however, activates autonomic arousal and catecholamine and endogenous opioid systems (Bandura 1997).

Biological systems are highly interdependent. The types of physiological reactions that have been shown to accompany weak coping efficacy are involved in the regulation of immune systems. Hence, exposure to uncontrollable stressors tends to impair the function of the immune system in ways that can increase susceptibility to illness (Cohen et al. 1991; Herbert and Cohen 1993a; Kiecolt-Glaser and Glaser 1987; Maier et al. 1985; Shavit and Martin 1987). Lack of behavioral or perceived control over stressors increases susceptibility to bacterial and viral infections, contributes to the development of physical disorders, and accelerates the rate of progression of disease (Schneideman et al. 1992). Building people's capabilities to manage acute and chronic stressors increases immune functioning (Antoni et al. 1990; Gruber et al. 1988; Kiecolt-Glaser et al. 1985; Wiedenfeld et al. 1990). Depression has also been shown to reduce immune function (Herbert and Cohen 1993b). Depression is associated with increased infectious disease, development and spread of malignant tumors, and faster tumor cell growth. The effect of perceived efficacy on infectious disease may be partly mediated through its effects on depression.

Lifestyle habits can enhance or impair health. This enables people to exert some behavioral control over their vitality and quality of health. The second level of research is concerned with modifying habits that enhance or impair health and functional status. Self-efficacy beliefs affect every phase of behavioral change (Bandura 1997). They determine whether people even consider changing their health-related behavior, whether they enlist the motivation and perseverance needed to succeed should they choose to do so, and how well they maintain the changes they have achieved. Each of these change processes are discussed briefly in the sections that follow.

People's beliefs that they can exercise some control over their health determine whether they consider changing their health habits or pursuing rehabilitative activities. Those who believe they lack what it takes to succeed see little point in even trying (Beck and Lund 1981) or, if they make an attempt, give up easily in the absence of quick results. Effective self-regulation of health behavior is not achieved through an act of will. It requires development of self-regulatory skills. To build a sense of controlling efficacy, people must develop skills to influence their own motivation and behavior. In such programs, they learn how to monitor the behavior they seek to change, how to set short-range, attainable subgoals to motivate and direct their efforts, and how to enlist incentives and social supports to sustain the effort needed to succeed (Bandura 1986). Once equipped with skills and belief in their capabilities, people are better able to adopt behaviors that promote health and to eliminate those that impair it. They benefit more from treatments for physical disabilities and their psychological well-being is less adversely affected by chronic impairments.

A growing body of evidence reveals that the impact of different therapeutic interventions on health outcomes is partly mediated through their effects on perceived self-efficacy. The stronger the perceived efficacy they instill, the more likely are people to enlist and sustain the effort needed to adopt and maintain health-promoting behavior. This has been shown in such diverse areas of health as level of postcoronary recovery (Ewart et al. 1983; Schröder et al. 1997; Taylor et al. 1985); recovery from coronary artery surgery (Allen et al. 1990; Bastone and Kerns 1995; Jensen et al. 1993; Mahler and Kulik 1998; Oka et al.

1996; Sullivan et al. 1998); coping with cancer (Berkham et al. 1997; Cunningham et al. 1991; Merluzzi and Martinez-Sanchez 1997) and end-stage renal disease (Devins et al. 1982); adherence to immunosuppressive medication in renal transplantation (Brus et al. 1999; DeGeest et al. 1995); coping with oral surgery (Litt et al. 1995) and gastrointestinal endoscopy (Gattuso et al. 1992); enhancement of pulmonary function in patients suffering from chronic pulmonary disease (Kaplan et al. 1984); countering the debilitating and distressing effects of chronic fatigue syndrome (Findley et al. 1998); decreasing the risk of osteoporosis through physical activity and calcium intake (Haran et al. 1998); reduction in pain and dysfunction in rheumatoid arthritis (Holman and Lorig 1992; Schiaffino et al. 1991); reduction of the pain of childbirth and electing vaginal over repeat cesarean delivery (Dilles and Beal 1997; Manning and Wright, 1983); elimination of tension headaches (Holroyd et al. 1984; Martin et al. 1993); management of chronic low back, neck, and leg pain and impairment (Council et al. 1988; Dolce 1987; Kawanto et al. 1995); modification of eating habits and disorders (Desmond and Price 1988; Glynn and Ruderman 1986; Love et al. 1985; Schneider et al. 1987); reduction of cholesterol through dietary means (McCann et al. 1995); adherence to medication and prescribed rehabilitative activities (Clark and Dodge 1999; Ewart et al. 1986b); adoption and adherence to programs of physical exercise (Desharnais et al. 1986; McAuley 1992; Oman and King 1998; Sallis et al. 1986); self-management of diabetes (Grossman et al. 1987; Hurley and Shea 1992); regulation of sexual erectile functioning (Bach et al. 1999) control of sexual practices that pose high risk for transmission of AIDS (Bengel et al. 1996; McKusick et al. 1989; Walsh and Foshee 1998; Witte 1992); and control of addictive habits that impair health (DiClemente et al. 1995; Marlatt et al. 1995; Stephens et al. 1995). Meta-analyses confirm the influential role of self-efficacy beliefs across diverse domains of health functioning (Gilles 1993; Holden 1991).

Habit changes are of little value unless they endure. It is one thing to get people to change their health-related behavior; it is another thing to maintain those changes over time. People preside constantly over their own behavior, so they are in the best position to exercise influence over it.

Maintenance of habit change relies heavily on self-regulatory capabilities and the functional value of the behavior. This requires instilling a resilient sense of efficacy as well as imparting skills. Experiences in overcoming troublesome situations serve as efficacy builders. This is an important aspect of self-management because, if people are not fully convinced of their personal efficacy, they rapidly abandon the skills they have been taught when they fail to get quick results or suffer reverses. Studies of habit change show that a low sense of perceived self-efficacy increases vulnerability to relapse (Bandura 1997; DiClemente et al. 1995; Marlatt et al. 1995). Efforts at relapse prevention must be extended beyond personal change to provision of social support and guidance during difficult times. The strategies for strengthening perceived self-efficacy to enhance maintenance of health-promoting behavior and to reduce vulnerability to relapse will be considered later.

Self-Efficacy as a Prognostic Indicator

As the above research amply documents, health outcomes are not governed solely by biologically rooted factors. Psychological determinants are also contributors through their impact on both health-related behavior and biological systems that mediate health functioning. Perceived personal efficacy is a psychological prognostic indicator of the course that health outcomes are likely to take. Results of a program of research on enhancement of perceived physical and cardiac efficacy for postcoronary recovery may serve to illustrate several general issues regarding prognosis of health outcomes and the course they are likely to take.

About half the patients who experience myocardial infarctions have uncomplicated ones (DeBusk et al. 1983). The heart heals rapidly, and they are physically capable of resuming an active life. However, the psychological and physical recovery is slow for patients who believe they have an impaired heart. They avoid physical exertion; they fear that they cannot handle the strains in their vocational and social life; they give up recreational activities; and they fear that sexual activities will do them in. The recovery problems stem more from patients' beliefs that their cardiac system has been impaired than from physical

debility. The rehabilitative task is to convince patients that they have a sufficiently robust cardiovascular system to lead productive lives.

The initial study in this program of research demonstrated that having patients master increasing workloads on the treadmill strengthen patients' beliefs in their physical capabilities (Ewart et al. 1983). The stronger their perceived physical efficacy, the more active they become in their everyday life. Maximal treadmill attainment, itself, is a weak predictor of patients' level and duration of activity. Treadmill experiences exert their influence indirectly, facilitating recovery by raising patients' beliefs about their physical and cardiac capabilities. Enhanced perceived efficacy, in turn, fosters more active pursuit of everyday activities.

Ewart and his colleagues have further shown that patients' beliefs about their physical efficacy predicts compliance with prescribed exercise programs, whereas actual physical capability does not (Ewart et al. 1986a). This corroborates the earlier findings that the effect of treadmill experiences on activity level is largely mediated by changes in perceived self-efficacy. Patients who have a high sense of efficacy tend to overexercise, whereas those who doubt their physical efficacy underexercise at levels that provide little cardiovascular benefit.

Psychological recovery from a heart attack is a social, rather than solely individual, matter. The patients in the study illustrating this point were males. The wives' judgments of their husbands' physical and cardiac capabilities can aid or retard the recovery process. The direction that social support takes is partly determined by perceptions of efficacy. Spousal support is likely to be expressed in curtailment of activity if the husband's heart function is regarded as impaired, but as encouragement of activity if his heart function is judged to be robust. In the program designed to enhance postcoronary recovery (Taylor et al. 1985), the treadmill was used to raise and strengthen spousal and patients' beliefs in their cardiac capabilities.

Several weeks after patients had a heart attack their beliefs about how much strain their heart could withstand were measured. They then performed a symptom-limited treadmill, mastering increasing workloads with three levels of spouse involvement in the treadmill activity. The wife

was either uninvolved in the treadmill activity; she was present to observe her husband's stamina as he performed the treadmill under increasing workloads; or she observed her husband's performance, whereupon she performed the treadmill exercises herself to gain firsthand information of the physical stamina required. We reasoned that having the wives personally experience the strenuousness of the task, and seeing their husbands match or surpass them, would convince them that their husband has a robust heart.

After the treadmill activities, couples were fully informed by the cardiologist about the patients' level of cardiac functioning and their capacity to resume activities of daily life. If the treadmill is interpreted as an isolated task, its impact on perceived cardiac and physical capability may be limited. To achieve a generalized impact of enhanced self-efficacy on diverse spheres of functioning in daily life, the stamina on the treadmill was presented as a generic indicant of cardiovascular capability. The patients were informed that their level of exertion exceeded whatever strain everyday activities might place on their cardiac system. This would encourage them to resume activities in their everyday life that place weaker demands on their cardiac system than the heavy workloads on the treadmill. The patient's and spouse's beliefs concerning his physical and cardiac capabilities were measured before and after the treadmill activity and again after the medical counseling.

Figure 2-1 shows the patterns of change in perceptions of the patients' physical and cardiac capabilities at different phases of the experiment under varying degrees of spousal involvement in the treadmill activity. Treadmill performances increased patients' beliefs in their physical and cardiac capabilities. Initially, the beliefs of wives and their husbands were highly discrepant—husbands judged themselves moderately hearty, whereas wives judged their husbands' cardiac capability as severely impaired and incapable of withstanding physical and emotional strain. Spouses who were either uninvolved in, or merely observers of, the treadmill activity, continued to believe that their husbands' physical and cardiac capabilities were severely impaired. Even the detailed medical counseling by the cardiology staff did not alter their pre-existing beliefs of their husbands' cardiac debility. However, wives

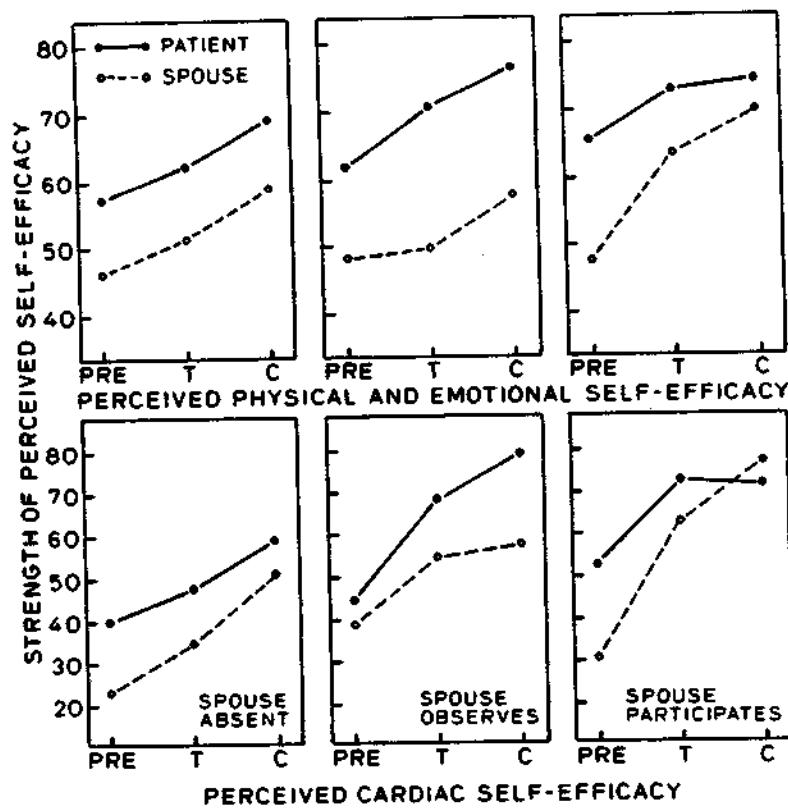


Figure 2-1. Changes in perceived physical and cardiac efficacy as a function of level of spouse involvement in the treadmill activity, patients' treadmill exercises, and the combined influence of treadmill exercises and medical counseling. Perceived efficacy was measured before the treadmill activity (*Pre*), after the treadmill activity (*T*), and after the medical counseling (*C*). One set of efficacy scales measured beliefs about the patient's capability to bear physical stressors (e.g., physical exertion, sexual activity) and strain of emotional stressors (e.g., anger arousal, social discord); cardiac efficacy measured beliefs about how much strain the patient's heart could withstand. (From Taylor et al. 1985).

who had personally experienced the strenuousness of the treadmill were persuaded that their husbands had a sufficiently robust heart to withstand the normal strains of everyday activities. The participant experience apparently altered spousal cognitive processing of treadmill information, giving greater weight to indicants of cardiac robustness than to symptomatic signs of cardiac debility. The change in perceived efficacy made the wives more accepting of the medical counseling. Following the medical counseling, couples in the participant spouse group had congruently high perceptions of the patients' cardiac capabilities.

The findings further show that beliefs of cardiac capabilities can affect the course of recovery from myocardial infarction. The higher the patients' and the spouses' beliefs in the patients' cardiac capabilities, the greater was the patients'

cardiovascular functioning as measured by peak heart rate and maximal workload achieved on the treadmill 6 months later. The joint belief in the patients' cardiac efficacy proved to be the best predictor of cardiac functional level. Initial treadmill performance did not predict level of cardiovascular functioning in the follow-up assessment when the influence of perceived efficacy is removed. But perceived cardiac efficacy predicted level of cardiovascular functioning when initial treadmill performance was partialled out.

Wives who believe that their husbands have a robust heart are more likely to encourage them to resume an active life than those who believe their husbands' heart is impaired and vulnerable to further damage. The positive relation between the wife's perceptions of her husband's cardiac capability and his treadmill accomplishments months

later is, in all likelihood, partly mediated by spousal encouragement of activities during the interim period. Pursuit of an active life improves the patient's physical capability to engage in activities without overtaxing their cardiovascular system.

Coronary artery bypass surgery improves physical capacity; however, for some patients it produces little improvement or even deterioration in physical and social functioning. Studies of these diverse outcomes reveal that preoperative belief in one's physical efficacy is a good predictor of engagement in everyday physical and social activities, whereas physiological capacity, pre-operative severity of cardiac disability, number of coexisting medical problems, number of bypass grafts, age, or perceived exertion are nonpredictive (Allen et al. 1990; Oka et al. 1996). Intervention studies further corroborate that perceived self-efficacy is a common pathway through which psychosocial influences affect health outcomes across diverse types of diseases (Holman and Lorig 1992; Kaplan et al. 1984; O'Leary et al. 1988).

Prognostic judgments are not simply nonreactive forecasts of a natural history of a disease. Except in extreme pathologies that may be overwhelmingly determined by biological factors, the nature and course of clinical outcomes is partly dependent on psychological sources of influence. Strong belief in one's capability to exercise some control over one's physical condition serves as a psychological prognostic indicator of the probable level of health functioning. Thus, people with similar levels of physical impairment can achieve different functional outcomes depending on their self-beliefs of efficacy (Kaplan et al. 1984; Lorig et al. 1989; O'Leary et al. 1988). Even in the case of severe permanent impairment, where only partial recovery is possible, psychosocial factors will affect how much of the remaining functional capacity is realized. Because prognostic information can affect patients' beliefs in their physical efficacy, diagnosticians not only foretell but may partly influence the course of recovery from disease. This effect will be examined shortly in greater detail.

Mode of Conveying Prognostic Information

Another important issue in the clinical management of patients concerns the way in which prognostic information is conveyed to them. This is

usually done by describing possible outcomes and the probabilities associated with them. However, verbal prognostications alone may not have the intended impact, especially when they run counter to strong pre-existing beliefs, as is often the case. This is true even for positive prognostications if patients invest the medically prescribed restorative activities with grave risks. For example, in the study of postcoronary rehabilitation, wives were not in the least reassured of their husbands' cardiovascular hardiness by the positive prognostic judgments of the medical staff unless they had the benefit of direct confirmatory experiences.

To increase their persuasive influence, clinicians may have to convey positive prognostic information to their patients not only by word but also by structuring performance tasks for them that provide self-convincing experiences. This is an issue that will be explored later when discussing strategies for instilling a sense of personal efficacy and reducing vulnerability to relapse.

Psychological Impact of Diagnostic Procedures

The manner in which diagnostic tests are conducted also can influence patients' beliefs about their efficacy, as in the cognitive processing of somatic information from the treadmill test. Treadmill activity produces a multitude of negative signs, such as fatigue, pain, shortness of breath, and other exercise-induced symptoms, which mount as the task continues. Patients who focus on their physical stamina as they master increasing workloads will judge their cardiac system as more robust than those who selectively attend to and remember the negative somatic signs. Positive indicants of capability can be made more salient by providing patients with ongoing feedback of their performance attainments as they master heavier workloads. Judgment of cardiac efficacy will vary depending on how this diverse symptom information and the indicants of cardiac robustness are weighted and integrated.

This is shown in a study with a group of healthy men and women who completed a symptom-limited treadmill before entering an exercise program (Juneau et al. 1986). Half the participants received concurrent feedback of the increasing workload they were attaining during the course of the treadmill task. The other half received the

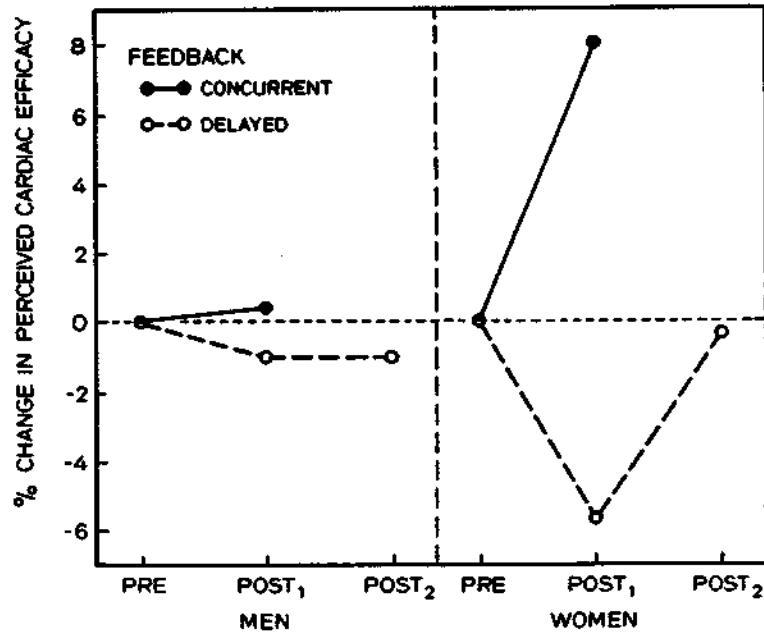
feedback about the workloads they attained just after they had completed the treadmill task. Their perceived cardiac efficacy was measured before and after the treadmill performance. They also recorded the physical signs they recall having experienced during the treadmill activity. Figure 2-2 shows how treadmill performances with and without concurrent feedback affect self-beliefs of cardiac capabilities.

In the absence of feedback of positive indicants of physical capability, exercise-induced symptoms completely dominate attention and memory representation of the treadmill experience. For healthy men, who generally have a more resilient conception of their cardiac capabilities, a taxing treadmill test without concurrent feedback did not alter their beliefs that they have a robust cardiac system. However, positive feedback that makes physical attainments on the treadmill more noticeable raised women's judgments of their cardiac capabilities. In the absence of such feedback, women read the mounting negative somatic sensations accompanying increasing exertion on the treadmill as indicants of cardiac deficiencies and lowered their judgments of their cardiac capabilities. Women did not experience any more nega-

tive somatic sensations than did men. The adverse impact of treadmill experiences without positive feedback stemmed from negative cognitive processing of symptom information rather than from greater amounts or salience of such symptoms.

Preconceptions tend to bias how information is weighted and integrated (Bandura 1986; Nisbett and Ross 1980). A similar process is indicated in women's reactions to delayed positive feedback regarding their treadmill performances. When told of their notable physical attainments, they raised their perceived cardiac efficacy to their pretreadmill level, but they achieved no net gain from the treadmill experience. Positive signs of cardiac capability are difficult to assimilate after conceptions of one's efficacy have already been formed under conditions in which negative signs clearly predominate. A coronary can markedly undermine beliefs concerning one's cardiac efficacy. A strong preconception of physical impairment makes negative physiological reactions to performance tests highly salient and recallable. Therefore, concurrent positive feedback of physical stamina would be especially important in countering beliefs of a frail cardiac capability in postcoronary patients who have not suffered clinical complications.

Figure 2-2. Impact of treadmill diagnostic performances on judgment of cardiac efficacy under conditions in which participants received concurrent feedback of the workloads they mastered or the feedback about their attainments was delayed until after the treadmill test was completed. (From Juneau et al. 1986.)



Any diagnostic procedure that gauges impairments and capabilities by testing the upper limits of performance will create a pattern of experiences reflecting both strengths and deficiencies. Patients who selectively notice and recall their performance deficiencies will judge their capabilities to be lower than those who notice their strengths as well. As shown in the preceding treadmill experiment, the adverse impact on perceived cardiac efficacy of diagnostic procedures that generate negative experiences can be reduced or counteracted by structuring performance tests in ways that give salience to one's remaining strengths. In addition to the type and timing of verbal feedback given to patients, there is some evidence to suggest that diagnostic tasks that create mounting failure by an ascending order of difficulty produce more adverse effects than if tasks of different levels of difficulty are intermixed to maintain a sense of attainment (Zigler and Butterfield 1968). Analysis of how the structure of diagnostic procedures and preconceptions of personal efficacy bias attention to, and cognitive processing of, somatic and behavioral information is of considerable clinical import as well as of theoretical interest (Cioffi 1991). The knowledge gained from these types of microanalytic studies would add greatly to our understanding of the psychological impact of experiences occasioned by diagnostic procedures.

Scope of Prognostic Schemes

Another issue regarding prognosis concerns the range of factors included in a prognostic scheme, specifically whether health outcomes are viewed solely from a biomedical perspective or from a broader biopsychosocial perspective. As will be recalled from the earlier discussion, level of health functioning and quality of life are determined not only by the patients' physical status but also by a system of social influences that can enhance or impede the progress they make. For example, in the study of recovery from uncomplicated myocardial infarction, wives' beliefs in their husbands' cardiac robustness were better predictors of level of recovery of cardiac function than were physical indices of cardiovascular status as measured by the treadmill.

To the extent that the interpersonal influences contribute to health outcomes, giving these factors some weight in prognostic schemes will en-

hance their predictive utility. If no notice of them is taken, one is left with puzzling variability in the courses that health changes take and the unexplained differences in functional attainments of people who are equally physically impaired.

Self-Validating Potential of Prognostic Judgments

Because prognostic information can affect patients' beliefs in their personal efficacy, diagnosticians not only foretell but may partly influence the course of recovery from disease. Health outcomes are related to predictive factors in complex, multidetermined, and probabilistic ways. Prognostic judgments, therefore, involve some degree of uncertainty. The predictiveness of a given prognostic scheme will depend on the number of relevant predictors it encompasses, the relative validities and interrelations of the predictors, and the adequacy with which they are measured. There is always leeway for expectancy effects to operate because prognostic schemes rarely include all of the relevant biological and psychosocial predictors and even the predictors that are singled out usually have less than perfect validity. Based on selected sources of information, diagnosticians form expectations about the probable course of a disease. The more confident they are in the validity of their prognostic scheme, the stronger are their prognostic expectations.

Prognostic expectations are conveyed to patients by attitude, word, and the type and level of care provided them. As alluded to earlier, prognostic judgments have a self-confirming potential. Expectations can alter patients' beliefs about their capabilities and their behavior in ways that confirm the original expectations. Evidence indicates that the self-efficacy mechanism operates as one important mediator of self-confirming effects. This is most clearly revealed in laboratory studies in which arbitrary information of personal capabilities is conveyed to people and its effects on their perceived self-efficacy and behavior are then measured. Self-management of pain provides a relevant example.

There are several ways by which perceived coping efficacy can facilitate the personal management of pain. People can exercise some control over their level of experienced pain through attentional and other cognitive activities that re-

duce consciousness of pain sensations or alter their aversiveness by how they are construed. People who believe they can alleviate pain enlist whatever ameliorative skills they have learned and persevere in their efforts. Those who judge themselves as ineffectual make no effort to do so or give up readily in the absence of quick relief. A sense of coping efficacy also reduces distressing anticipations that create aversive reactions and bodily tension, which only exacerbate pain sensations and discomfort.

Consciousness has a very limited capacity. It is hard to keep more than one thing in mind at the same time. If pain sensations are supplanted in consciousness, they are felt less. Dwelling on pain sensations only makes them more noticeable and thus more difficult to bear, whereas people can become oblivious to their bodily sensations when deeply engrossed in activities that command their attention. Perceived self-efficacy can lessen the extent to which painful stimulation is experienced as conscious pain by supporting engrossment in activities of high interest that can occupy one's consciousness for hours on end (Bandura 1997; McCaul and Malott 1984). Findings of studies of chronic clinical pain accord with this view (Jensen et al. 1991). Perceived self-regulatory efficacy predicts the use of behavioral and cognitive strategies to relieve pain after controlling for pain severity and outcome expectations. Lin and Ward (1996) provide further evidence that perceived efficacy can relieve pain by supporting palliative coping activities and creating the motivation to stick to them. People's beliefs in their pain-management efficacy reduced the intensity of low back pain and how much it interfered with daily life both directly and by fostering the use of cognitive and behavioral strategies that help to relieve pain.

The causal contribution of perceived efficacy to the self-management of pain has been verified experimentally. People given bogus feedback that they are good pain controllers raised their perceived self-efficacy and tolerance of cold pressor pain. In contrast, those led to believe that they were poor pain controllers lowered their perceived efficacy and found it hard to bear pain (Litt 1988). Instated perceived efficacy was a better predictor of pain tolerance than was past level of actual pain tolerance. A low sense of efficacy constrained efforts to ameliorate pain even when the opportunity to exercise some personal control ex-

isted. Arbitrarily altered efficacy beliefs also affected preference for personal or external control of pain. Those whose efficacy was raised preferred a strong personal role in the management of their pain; those whose efficacy was lowered wanted external interventions to stop their pain.

People who believe they can exercise some pain control are also likely to interpret unpleasant bodily sensations and states more benignly than those who believe them to be nothing they can do to alleviate pain (Cioffi 1991). Focusing attention on the sensory, rather than the affective, aspects of pain also reduces distress and raises pain tolerance (Ahles et al. 1983). Even at an early age, some children discover effective pain control strategies on their own (Ross and Ross 1984). They often rely on engrossing attentional strategies when pain sensations are hard to displace from consciousness or they make them easier to bear by transforming their meaning.

Perceived efficacy mediates the analgesic potency of various psychological procedures. Cognitive techniques for alleviating pain, self-relaxation, and placebos all increase perceived efficacy both to endure and to reduce pain (Bandura et al. 1987; Reese 1983; Williams and Kinney 1991). The more self-efficacious people judge themselves to be, the less pain they experience in later cold pressor tests, and the higher is their pain threshold and pain tolerance.

Holroyd and his colleagues (1984) demonstrated with sufferers of recurrent tension headaches that the benefits of biofeedback training stem more from boosts in perceived coping efficacy than from the muscular exercises themselves. Perceived self-efficacy, created by bogus feedback that one is a skilled relaxer for controlling pain, predicted reduction in tension headaches, whereas the actual amount of change in muscle activity achieved in treatment was unrelated to the incidence of subsequent headaches.

Research on mechanisms governing self-management of pain focus heavily on ability to endure or alleviate experienced pain. Lackner and his associates extended the analysis to beliefs in efficacy to perform physical activities essential for everyday functioning that generate pain (Lackner et al. 1996). The patients were chronic pain sufferers with low back pain. Occupationally injured patients judged their efficacy for lifting, bending, carrying, pushing, and pulling objects. To test al-

ternative regulatory mechanisms, the patients also rated their expectations that these physical activities would cause pain and reinjury. Perceived efficacy predicted performance of physical activities after controlling for pain and reinjury expectations. Neither expectations of pain intensity nor reinjury predicted level of physical function when the effects of efficacy beliefs were removed.

That perceived efficacy makes pain easier to manage is further corroborated by other studies of acute and chronic clinical pain (Council et al. 1988; Dolce 1987; Manning and Wright 1983; Holman and Lorig 1992). Treatment gains in perceived efficacy to control pain not only reduce intensity of experienced pain in long-term assessments but also increase physical functioning as measured by trunk strength and range of motion and flexion-extension movements in patients suffering from degenerative disc disease (Altmaier et al. 1993; Kaivanto et al. 1995). Belief that one can exercise some control over pain and one's physical functioning is also accompanied by fewer pain behaviors, less mood disturbance, better psychological well-being, and more active involvement in everyday activities (Affleck et al. 1987; Buescher et al. 1991; Buckelew et al. 1994; Jensen and Karoly 1991). Perceived coping efficacy predicts level of pain after controlling for disease severity, demographic factors, and depression. A strong sense of postoperative efficacy to manage pain similarly predicts use of pain medication during recovery from coronary artery surgery (Bastone and Kerns 1995).

The findings of experiments in which efficacy beliefs are raised or lowered by bogus feedback should not be taken to mean that arbitrary persuasive influence is a good way of enhancing beliefs of personal efficacy to reduce functional impairments associated with clinical conditions. Rather, such studies have special bearing on the self-Confirming potential of prognostic judgments because efficacy beliefs are altered independently of actual physical status. In clinical practice, personal efficacy is strengthened by providing patients with the knowledge, coping skills, and self-assurance to make optimal use of their capabilities.

The preceding experimental analyses of self-Confirming processes focused solely on how people's self-beliefs of efficacy and behavior are affected by what they are told about their capabilities. Other evidence suggests that prognostic

judgments may bias how people are treated as well as what they are told. In these experiments, instructors are arbitrarily led to form either high or low expectations for those they serve. The studies generally reveal that instructors treat others differently under high than under low expectations in ways that tend to confirm the original expectations (Jones 1977; Jussim 1986). Although there is some variation in results, the findings generally show that under induced positive expectations instructors pay more attention to those in their charge, provide them with more emotional support, create greater opportunities for them to build their competencies, and give them more positive feedback than under induced low expectations.

Differential care that promotes in patients different levels of personal efficacy and skill in managing health-related behavior can exert stronger impact on the trajectories of health functioning than simply conveying prognostic information. The effects of verbal prognostications alone may be short-lived if they are repeatedly disconfirmed by personal experiences due to deficient capabilities. However, a sense of personal efficacy rooted in enhanced competencies fosters functional attainments that create their own experiential validation. Clinical transactions operate bidirectionally to shape the course of change. The functional improvements in patients fostered by positive expectancy influences further strengthen clinicians' beneficial expectations and their sense of efficacy to aid progress. In contrast, negative expectations that breed functional declines can set in motion a downward course of mutual discouragement.

Conception of Ability

In recent years, major changes have occurred in the conception of human ability (Bandura 1990; Sternberg and Kolligian 1990). Ability is not a fixed entity that one does or does not have in one's behavioral repertoire. Rather, it involves a generative capability in which cognitive, social, emotional, and motivational factors govern the translation of knowledge and skills into performance attainments. There is a marked difference between possessing subskills and being able to integrate them into appropriate courses of action for varied purposes and to execute them well under difficult circumstances. Thus, with the same set of

skills people may perform poorly, adequately, or extraordinarily depending on their thinking patterns, emotional states, and level of motivation.

The variable utilization of capabilities is illustrated in research on the impact of self-efficacy beliefs on level of memory functioning with advancing age (Bandura 1989; Berry 1987; Berry et al. 1989; Lachman et al. 1987). Human memory is an active constructive process in which information is semantically elaborated, transformed, and reorganized into meaningful cognitive representations that aid recall. People differ in how they construe memory and its changes with age (Lachman et al. 1995). Some view memory as a biological capacity that inevitably shrinks with age and is not personally controllable. Others view it as a set of cognitive skills that can be developed and maintained with effort. Those different conceptions of memory affect memory performance, with belief in memory as an improvable cognitive skill facilitating memory performance and belief in memory as a shrinking capacity impairing it. The stronger people believe in their memory capabilities, the more time they devote to cognitively processing memory tasks. Higher processing effort, in turn, produces better memory performance. Perceived self-efficacy affects actual memory performance both directly and indirectly through level of cognitive effort. Those who regard memory as simply a biologically shrinking capacity have little reason to try to exercise any control over their memory functioning. They are quick to read instances of normal forgetting as indicants of declining cognitive capacity. The more they disbelieve their memory capabilities, the poorer use they make of their cognitive capabilities.

The undermining efforts of disbelief in one's capabilities may also be mediated through depression. A low sense of personal efficacy to fulfill desired goals and to secure things that bring satisfaction to one's life creates depression. Despondent mood further diminishes beliefs in one's capabilities (Kavanagh and Bower 1985) in ways that can debilitate memory functioning. Indeed, West et al. (1983) found that depression is accompanied by a low sense of memory efficacy which, in turn, is associated with deficient memory performances.

Perceived memory efficacy predicts degree of improvement in memory performance following training in mnemonic aids (Rebok and Balcerak

1989). Self-efficacy retains its predictiveness when prior level of memory performance is controlled (Bandura 1989). However, young adults are more likely than older adults to raise their beliefs in their memory efficacy and to use the memory aids they have been taught in other types of memory tasks. Memory training in the elderly clearly requires more persuasive demonstrations that they can exercise some control over their memory in their everyday life by using cognitive strategies. This can be achieved by efficacy demonstration trials in which the elderly perform memory tasks with and without cognitive aids and observe that their memory improves when they use them. Modeling influences can be used to demonstrate how others have been able to improve their memory by habitual use of mnemonic aids. Persuasory influences that instill beliefs conducive to the use of memory skills can also help to raise elderly people's beliefs in their memory capabilities.

There are different types of memory. Significant advances in understanding memory functioning, therefore, require multifaceted measures of people's beliefs in their memory efficacy rather than a general measure. Evidence from diverse lines of research are consistent in showing that global measures sacrifice explanatory and predictive power (Bandura 1997).

Efficacy beliefs similarly contribute to level of physical functioning. This is most strikingly revealed in experiments in which beliefs of physical efficacy are raised in some people and lowered in others by bogus information unrelated to their actual physical capabilities (Weinberg et al. 1979). The higher the induced beliefs in one's physical efficacy, the greater are the physical attainments. Deficient performances spur those with a high sense of efficacy to even greater physical effort, but further impair the performances of those whose efficacy had been undermined. Self-beliefs of physical efficacy arbitrarily heightened in females and arbitrarily weakened in males obliterate large pre-existing sex differences in physical strength. As in the cognitive domain, viewing physical ability as an inherent attribute lowers perceived self-efficacy, retards skill development, and saps interest in such activities (Jourden et al. 1991). The nonability determinants of functional attainments have now been amply documented in diverse domains of activity (Bandura 1990).

Ways of Instilling Resilient Self-Efficacy

People's beliefs about their efficacy can be developed and strengthened in four principal ways (Bandura 1986, 1997a): The most effective means is through *mastery experiences*. Successes build a robust sense of efficacy. Failures undermine it, especially if failures occur often early in the course of developing competencies. Self-efficacy is best developed by tackling challenges in successive attainable steps that serve to expand competencies. Subgoal attainments provide indicants of mastery for enhancing a sense of personal efficacy and help to sustain motivation along the way. If subgoal challenges are set too high, most performances prove disappointing and reduce motivation to continue the pursuit. People who have a low sense of efficacy are especially easily discouraged by failure and are quick to attribute it to personal incapacities.

Neurological injuries that produce severe permanent impairments can be devastatingly demoralizing to patients and their families. Patients have to reorganize their perspective to learn alternative ways of regaining as much control as possible over their life activities. Goals need to be restructured in ways that capitalize on remaining capacities. Ozer (1988) illustrates effective ways of structuring goals couched in functional terms to minimize disabilities created by chronic neurological impairment. Focus on achievement of functional improvements rather than on degree of organic impairments helps to counteract self-demoralization. Making difficult activities easier by breaking them down into graduated attainable steps helps to prevent self-discouragement of rehabilitative efforts.

Development of resilient self-efficacy requires some experience in mastering difficulties through perseverant effort. If people experience only easy successes they come to expect quick results. Their sense of efficacy is easily undermined by failure. Some setbacks and difficulties in human pursuits serve a useful purpose in teaching that success usually requires sustained effort. People develop resilience by learning how to manage failure, how to recover from failed attempts and setbacks, and how to enlist social support for their efforts. After they become convinced they have what it takes to succeed, they persevere in the face of adversity and quickly rebound from setbacks. By

sticking it out through tough times, they emerge from adversity with a stronger sense of efficacy.

The second way of enhancing personal efficacy is through *social modeling*. People partly judge their capabilities in comparison with others (Bandura 1991). Seeing people similar to oneself regain, by perseverant effort, some control over their life activities despite impairment raises observers' beliefs about their own capabilities to lessen their disabilities. The failures of others coping with similar problems instill self-doubts about one's own ability to manage similar tasks. Having ex-patients exemplify the active lives they are leading can be especially influential in strengthening beliefs that functional improvements are realizable. Seeing how others manage difficult conditions can alter beliefs of personal efficacy through ways other than social comparison. Efficacious models can teach competencies and effective strategies for dealing with taxing situations. Adoption of serviceable strategies raises perceived self-efficacy. People also draw inspiration from seeing others change their lives for the better.

Social persuasion is the third mode of influence. People try to talk others into believing they possess the capabilities to achieve what they seek. Realistic boosts in efficacy can lead people to exert greater effort, which increases their chances of success. However, to raise unrealistic beliefs of personal capability runs the risk of inviting failure. Successful efficacy builders, however, do more than express faith in people's capabilities. They structure tasks for them in ways that are likely to bring improvements and avoid placing them prematurely in situations where they are likely to fail. By maintaining an efficacious attitude that functional gains are attainable when patients are beset with self-doubts, clinicians can help them to sustain their coping efforts in the face of reverses and discouraging obstacles. Through these various means clinicians can help patients to make the best use of their capacities.

People also rely partly on their physiological state in judging their capabilities. They read their anxiety arousal and tension as signs of vulnerability to dysfunction. In activities involving strength and stamina, people interpret their fatigue, aches, and pains as indicants of physical ineffectiveness. The fourth way of modifying personal efficacy is to equip patients with skills to reduce aversive phys-

iological reactions or alter how they interpret somatic information. The meanings assigned to bodily sensations and states can have significant health consequences (Bandura 1991; Cioffi 1991).

The health benefits of a sense of personal efficacy do not arise simply from the incantation of capability. Saying something should not be confused with believing it to be so. Simply saying that one is capable is not necessarily self-convincing, especially when it contradicts firm pre-existing beliefs. No amount of declaration that one can fly, will persuade one that he or she has the efficacy to become airborne. Self-efficacy beliefs are the product of a complex process of self-persuasion that relies on cognitive processing of diverse sources of efficacy information conveyed behaviorally, vicariously, socially, and physiologically. Their strength is affected by the authenticity of the efficacy information on which they are based. Self-efficacy beliefs that are firmly established are resilient to adversity. In contrast, weakly held self-beliefs are highly vulnerable to change and negative experiences readily reinstate disbelief in one's capabilities.

Reduction of Vulnerability to Relapse

Each of the methods for enhancing efficacy can be used to develop the resilient sense of perceived efficacy needed to override difficulties that inevitably arise from time to time. With regard to the performance mode, a resilient belief in one's personal efficacy is built through repeated demonstration trials in the exercise of control over progressively more difficult tasks. For example, as part of instruction in cognitive pain control strategies, arthritic patients were given efficacy demonstration trials in which they performed pain-producing activities with and without cognitive control and rated the level of pain they experienced (O'Leary et al. 1988). Explicit evidence that they achieved substantial reduction in experienced pain by cognitive means provided persuasive demonstrations that they could exercise some control over pain by enlisting cognitive-control strategies. Efficacy validating trials not only serve as efficacy builders, but put to trial the value of the techniques being taught.

Modeling influences, in which other patients demonstrate how to cope with difficulties and setbacks and show that success usually requires

tenacious effort, can further strengthen perceived self-efficacy. Moreover, modeled perseverant success can alter the diagnosticity of failure experiences. Eventual accomplishments indicate that earlier failures partly reflect difficult task and situational factors rather than solely inherent personal deficiencies. Under this cognitive set, difficulties and setbacks prompt redoubling of efforts rather than breed self-discouraging doubts about one's capabilities. For example, pain threshold and tolerance is affected by modeling influences (Craig 1983). Thus, people who have seen others persevere despite pain function much more effectively when they themselves are in pain than if they had seen others give up quickly (Turkat and Guise 1983; Turkat et al. 1983).

Persuasory influences that instill self-beliefs conducive to optimal utilization of skills can also contribute to staying power. As a result, people who are persuaded they have what it takes to succeed and are told that the gains they achieved in treatment verify their capability are more successful in sustaining their altered health habits over a long time than those who undergo the same treatment without the efficacy-enhancing component (Blittner et al. 1978).

Concluding Remarks

The present analysis addressed the issue of prognosis from a biopsychosocial perspective on health and human agentic capability. Converging lines of evidence indicate that perceived self-efficacy operates as an important prognostic indicator of level of functioning. Strength of perceived self-efficacy can influence the course of health outcomes and functional status through its intervening effects on cognitive, motivational, affective, and biological processes. In social cognitive theory (Bandura 1986, 1997), perceived efficacy is part of a larger set of sociocognitive factors that regulate human motivation, action, and well-being. People also motivate and guide their behavior by the physical, social, and self-evaluative effects they expect their efforts to produce. Personal goals and aspirations about the future one seeks to achieve and the intermediate plans and strategies for realizing that vision operate as another motivating force. Once people commit themselves to valued goals, they mount the effort needed to fulfill them. Perceived impediments, in

the form of personal, social, and institutional barriers, further affect self-motivation and emotional well-being. Efficacy beliefs play a pivotal role in the exercise of personal agency because they not only operate on behavior in their own right, but through their impact on these other determinants. People's belief in their personal efficacy influence the goals and challenges they set for themselves, the outcomes they expect their actions to produce, and whether they view impediments as surmountable or as daunting obstacles over which they can exert little control.

Prognostic schemes that encompass sociocognitive determinants will have greater predictive power than those that ignore them. Moreover, prognostic evaluations have a self-confirming potential. Whether patients are expected to do well or to do poorly can affect their clinical management and beliefs in their capabilities in ways that confirm the original expectations. Patients are best served by prognosticians that enable them to realize their potential.

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Impact of Guided Exploration and Enactive Exploration on Self-Regulatory Mechanisms and Information Acquisition Through Electronic Search

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Following instruction in basic skills for electronic search, participants who practiced in a guided exploration mode developed stronger self-efficacy and greater satisfaction than those who practiced in a self-guided exploratory mode. Intrinsic motivation was not affected by exploration mode. On 2 post-training tasks, guided exploration participants produced more effective search strategies, expended less effort, made fewer errors, rejected fewer lines of search, and achieved higher performance. Relative lack of support for self-regulatory factors as mediators of exploration mode impacts was attributed to the uninformative feedback from electronic search, which causes most people to remain at a novice level and to require external guidance for development of self-efficacy and skills. Self-guided learning will be more effective on structured tasks with more informative feedback and for individuals with greater expertise on dynamic tasks.

With the accelerated growth of computerized information sources, electronic search is rapidly becoming critical in the acquisition of information for decision making. Increasingly, information is being stored and presented in electronic rather than in print form. Some experts estimate that more than half of the world's information is available only by electronic access (e.g., Cook, 1995), thus underscoring the need to master electronic information technologies to ensure maximum access to needed information.

The capability to explore electronic information sources may be increasingly important in many domains of human functioning, but novices typically invest as little as 30 min on learning the basic competencies of electronic search (Borgman, 1989). This is particularly limiting because task-generated feedback from electronic search is not highly informative regarding the effectiveness of strategies. For the nonexpert, there is often no way of knowing how many relevant records there are on the database being searched or if the records retrieved are the most relevant. Unless a person is motivated to continually develop and test alternative strategies to see how they influence the records retrieved, the basic electronic search competencies that they develop during their initial exposure will not improve with experience. One aim in our

study was to test the relative effects of introducing guided versus self-directed (enactive) modes of exploration immediately following the development of basic competencies for electronic inquiry.

The exploration and testing of strategies needed for the development of search competencies through experience is often undermined by the fact that many people feel overwhelmed and distrust their ability to conduct electronic search activities (Kuhlthau, 1991). Our second aim, therefore, was to test the impacts of the different modes of exploration on the self-regulatory processes of participants, and whether the emergent differences in the self-regulatory mechanisms produced subsequent differences in strategies and performance of electronic inquiries.

Electronic Search

Although electronic search tasks can vary in the degree of complexity and how quickly they converge to the desired information set, the structuring of interrogations and search strategies is very similar across the whole domain. Search strategies are built by using keywords and other terms and Boolean connectors (*and*, *or*, etc.), which determine the pathways that get explored and the information retrieved on each pathway. This language has remained fairly stable for the past 2 decades and is used in a wide range of electronic search tasks (library databases, Web pages, Internet searches, etc.). Except for minor variations in the protocols attached to different commercial products, the basic processes of conducting electronic searches, described in more detail below, generalize across all types of electronic inquiry tasks and different search engines.

The search for information is often a cyclical, exploratory process. People make inquiries, receive feedback, evaluate the outcomes of their inquiries, and alter their search activities accord-

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ingly. On simple retrieval tasks, search sequences may comprise only one or two steps. On more complex tasks, the process becomes more convoluted and demanding, with each inquiry providing important input for constructing further inquiries. Success in obtaining the needed information will be strongly influenced by the exploration process, including the scope of search activities, the quality of the sources used, and the sequencing of search (Wood, George-Falvy, & Debowski, *in press*). Effort can also be wasted in redundant, nonproductive inquiries. For many problems, an effective sequence is to search broadly to identify a range of options in the initial steps of the process and then to search the options in greater depth (Payne, Bettman, & Johnson, 1993).

Modes of Exploration

Instruction in the use of the technology, the basics of the search language, and the development of strategies for electronic search can be covered in 30 min, but practice in the construction of search strategies is needed to consolidate that knowledge. When left to their own devices, novices may follow many different modes of exploration during their practice sessions. However, we were interested in the potential impacts of interventions that shaped the exploration mode adopted during practice, and with this aim in mind, we focused on two modes of exploration that have been described and applied in different domains of functioning. One is enactive exploration, based on process models of human exploration (Greif & Keller, 1990; Condry, 1977) and error management (Frese & Altmann, 1989), which have been shown to influence intrinsic motivation, learning, and performance. The second is guided exploration, based on the guided mastery model of training outlined in social cognitive theory, which has been shown to be highly effective in transmitting knowledge, competencies, and self-beliefs conducive to cognitive, motivational, and affective self-regulation (Bandura, 1986, 1997).

In *enactive exploration*, individuals are provided with unstructured opportunities to explore and discover effective strategies either from the outcomes of their trial and error actions or from external sources of advice, such as on-line help functions for electronic inquiry (Frese & Altmann, 1989; Greif & Keller, 1990; Wood, Kakebeeke, Debowski, & Frese, 2000). Enactive exploration is guided by the emerging problems and interests of the individual and is not predetermined or imposed by a trainer or training program. Decisions about what to explore and when to seek guidance are made by individuals, giving them total control and responsibility for their own learning. Self-guided exploration is supplemented with the positive framing of the errors that are typically encountered in practice as opportunities for learning (Wood, Kakebeeke, et al., 2000). People are encouraged to expect mistakes and to learn from them rather than to fear them or view them as evidence of a lack of capability. This reduces the likelihood of novices attributing difficulties in practice to a lack of skill and undermining their perceived efficacy.

The self-guided nature of enactive exploration has been identified as producing greater intrinsic motivation in learning endeavors than approaches that provide high levels of external guidance and stress the avoidance of errors (Deci & Ryan, 1980; Dormann & Frese, 1994), but exploratory modes of learning have several potential limitations. Without guidance, the mistakes and errors that often accompany self-guided exploration on complex tasks

may undermine the achievements needed to develop a robust self-efficacy for the task and create feelings of dissatisfaction with the lack of progress. Learners may also develop metaphors and analogies to describe their understanding of electronic inquiry processes, which limit the development of more effective strategies (Allwood & Kalen, 1993; Gay & Mazur, 1989). An example of a commonly used metaphor that is associated with superficial but wide-ranging electronic search is "surfing the net" (Wood, Atkins, & Tabernero, 2000).

For the nonexpert, the potential benefits of enactive exploration may be further limited by the low fidelity of feedback from electronic search tasks. Enactive exploration modes of learning have been shown to be effective for tasks that provide clear feedback on the adequacy of responses (Frese et al., 1991; Robert, 1987). On electronic search tasks, novice searchers are often unable to accurately judge their progress or the adequacy of their responses, and they will continue with suboptimal strategies or make strategic shifts for reasons that are unrelated to the adequacy of existing strategies.

Self-guided exploration without any encouragement to frame errors positively typifies the natural learning processes of most novice electronic searchers (Borgman, 1989) and may partially explain the poor electronic search strategies of nonexperts identified in other descriptions of the task (Brown, 1995; Collantes, 1995; Harter & Cheng, 1996; Wildemuth, de Blieck, Friedman, & File, 1995). The manipulation of enactive exploration, described later, was intended to be a stronger form of self-guided exploration than that which is typically used by novices, who may be more prone to dissatisfaction and to drops in efficacy as a result of problems encountered in practice.

In *guided exploration*, the sequencing of search activities and responses to problematic situations are predetermined according to a set of principles that have been found to strengthen the self-efficacy beliefs of trainees (Bandura, 1997) and are not left to the preferences and ad hoc responses of the novice. The principles are progressive achievement and cognitive modeling, which includes demonstrations of responses to problems encountered in practice and the verbalization of the thought processes that guide the choice of responses (Gist, 1989; Meichenbaum, 1977; Schunk, 1989). In guided exploration, practice sessions are used to explore the task in a systematic and preplanned manner. Tasks are completed in an assigned order that provides practice on tasks of increasing difficulty. The guided enactments of practice tasks ensure that the novice has a progressive sense of achievement, which strengthens perceived efficacy for the more demanding forms of the task and satisfaction with progress (Bandura, 1997). Guidance in the sequencing of practice tasks is supplemented with guidance in the choice of responses to problems, through cognitive modeling of responses from among those taught in the introductory training session. This further strengthens perceived self-efficacy for using and refining strategies (Latham & Saari, 1979).

Modeling of responses to problems also augments the less informative task feedback from electronic search by providing trainees with a signal regarding the adequacy of their response plus an immediate description of a standard with which they can compare their own action. The combination of an implicit feedback-standard comparison and demonstration of a response for removing the identified gap facilitates a motivated task focus, a condition under which feedback is most likely to enhance learn-

ing and performance (Kluger & DeNisi, 1996). The augmented feedback received under guided exploration can be contrasted with that received from enactive exploration, in which the only feedback is the list of records retrieved by the search statement, which the searcher may scan for their relevance to the search task. To compare their strategy with the standards covered in the instructional phase of their learning, self-guided explorers must either recall those standards or refer to the available instructional information. There is no direct feedback from the task or any external source regarding the adequacy of the search strategy used or the standards for judging the outcomes.

Self-Regulatory Mechanisms

Acquiring information through electronic search requires more than the mechanical application of rules to a database. For a person with basic operational competencies, the effective use of search skills is a challenging process, which requires a robust belief in one's capability to master the task, positive affective reactions to progress achieved, and a sustained interest in the task (Bandura, 1997). The impacts of the progressive mastery and modeling components of guided exploration on posttraining performance have been found to be mediated through perceived self-efficacy and affective self-reactions (Bandura, 1997; Gist, 1989; Gist, Schwoerer, & Rosen, 1989; Williams, 1990). Enactive exploration has been shown to lead to increased intrinsic motivation (Wood, Kakebeeke, et al., 2000).

Performance of complex activities that have extensive exploratory requirements is strongly influenced by beliefs of personal efficacy. Perceived efficacy affects problem-solving performance, both directly and by its impact on other self-regulatory determinants (Bandura, 1997). Such beliefs influence the choices people make, their goal aspirations, how much effort they mobilize in a given endeavor, how long they persevere in the face of difficulties, their vulnerability to stress and depression in coping with taxing demands, and their resilience to adversity. With regard to cognitive functioning, people of high efficacy display strategic flexibility, are quicker to discard faulty strategies in search of better ones, are less inclined to prematurely discard good solutions, use good time management, and interpret deficient performance in informative rather than in self-debilitating ways (Bandura, 1997; Bouffard-Bouchard, Parent, & Larivee 1991; Wood & Bandura, 1989).

Affective reactions to the task will also influence the behavioral and cognitive functioning required for effective electronic search. If successful performance is obtainable solely by enhanced effort, then level of dissatisfaction raises performance accomplishments (Bandura & Cervone, 1983, 1986). As tasks become more complex and performance is more strongly determined by strategies, self-dissatisfaction may initially spur increased effort but undermine subsequent motivation and strategic thinking (Bandura & Jourden, 1991; Cervone, Jiwani, & Wood, 1991). Negative affect can interfere with the higher level cognitive processing required for generating options, interpreting feedback, and adapting strategies accordingly.

Intrinsic motivation can also affect search performance through several different pathways (Bandura, 1997; Deci & Ryan, 1980; Dormann & Frese, 1994). Intrinsic motivation is typically associated with freedom from distracting negative self-evaluations and a strong task focus, both of which can benefit performance on

complex cognitive tasks. Enjoyment of an intrinsically motivating task can also lead to persistence and a greater willingness to explore and experiment with alternative strategies. When tasks are experienced as boring or frustrating, individuals are more likely to become distracted, to spend less energy exploring options, and to look for opportunities to quit (Deci & Ryan, 1980; Dormann & Frese, 1994).

Figure 1 presents a path diagram of the relationships between the variables mentioned in the preceding discussion. On the basis of the arguments presented, the following specific hypotheses were advanced for the impacts of the exploration mode used in practice, following instruction in the basic competencies of search.

Hypothesis 1: Guided exploration will produce stronger self-efficacy and greater satisfaction following practice than enactive exploration.

Hypothesis 2: Enactive exploration will produce greater intrinsic motivation following practice than guided exploration.

Hypothesis 3: Enactive exploration will produce greater wasted effort in the form of errors, repetition of search lines, and incomplete development of search statements in posttraining tasks than guided exploration.

Hypothesis 4: Guided exploration will lead to higher quality strategies and higher performance in posttraining tasks than in enactive exploration.

Hypothesis 5: The impacts of exploration mode on wasted effort, strategy, and performance in posttraining tasks will be mediated through the intrinsic motivation, self-efficacy, and satisfaction levels of participants.

Method

The 2×2 experimental design included mode of exploration (guided vs. enactive) as a between-participants factor and two posttraining search tasks (Task 1 and Task 2) as a within-participant factor. Records of the searches conducted on the two posttraining tasks provided measures of effort, strategy quality, and performance. Self-regulatory measures were collected pre- and posttraining and after each of the posttraining search tasks. During training, all participants received the same instructional segment covering the basic competencies of electronic search. A practice segment that included the manipulations of exploration modes followed. All participants were novices in electronic search.

Participants

The participants were 48 university students undertaking an introductory economics subject. Prior testing established that all participants had little or



Figure 1. Schematic diagram of the hypothesized relationships between exploratory mode, self-regulatory reactions, effort, strategy quality, and performance on electronic search tasks.

no prior experience in the conduct of electronic searches (Internet, etc.), and no participant had ever conducted an electronic search of library records, which was the task used in this study. The sample included 25 male and 23 female students with a mean age of 19 years. They were randomly assigned to treatment conditions balanced for sex.

Electronic Search Tasks

One form of electronic search that is of growing importance to a wide range of decision making is the interrogation of bibliographic databases. The records stored in bibliographic databases include published journal articles, unpublished papers, books, technical reports, videos, and movies. Each record within a database is indexed under a range of keywords. Participants were assigned problems containing sets of concepts for which they had to find the relevant records from a bibliographic database.

To search the database, participants had to construct search statements that contained terms, known as keywords and connectors. The terms used to define the concepts in a search problem can be obtained from personal knowledge, the database keyword index, the thesaurus, or interim feedback from inquiries. The number of keywords for a concept will depend on the number of subconcepts and indicators encompassed by the concept. A search that incorporates keywords listed in the database index is more likely to retrieve relevant records, but personal judgment in the indexing process can provide an unpredictable element in the relevance of search outcomes. The thesaurus can be used to expand and redefine concepts, and it is therefore of greater value when the concept can be defined in a number of ways. However, it also requires more cognitive effort to identify keywords by using the thesaurus than the keyword index. More sophisticated searchers will review records in the interim feedback for relevant keywords and then use the thesaurus to link these to other keywords.

The keywords or terms included in a search statement are linked together with Boolean connectors, including the words *and* and *or*. The *and* connector narrows the scope of the search to those records that are indexed under all of the connected terms. The more keywords connected, the more focused the inquiry becomes and the fewer the records likely to be retrieved. The *or* connector broadens the focus of the search to retrieve all records that are indexed under any of the connected terms. This can produce a large number of records, depending on the diversity of the included concepts.

Each search statement retrieves a certain number of records from the database. These records can be inspected on the computer screen and assessed for their relevance. On the basis of these assessments, searchers can then modify their inquiry and interrogate the database further to increase the number of relevant records and reduce the number of irrelevant ones. The inquiry process can proceed through a number of iterations until the searcher retrieves an appropriate set of information.

Modes of Exploration

The training that included the manipulation of the exploration modes was conducted in two segments: an instructional segment followed by a practice segment. The format of a brief instruction segment followed by practice opportunities was similar to that used in other studies of computer software training (e.g., Martocchio & Dulebohn, 1994). All aspects of the instructional segment of the training were the same in both conditions and provided participants in both conditions with the same information. The manipulations of enactive exploration and guided exploration modes were introduced in the practice segment. The instruction and practice segments each took 30 min and were administered to individual participants by a female librarian who was highly experienced in CD-ROM searching and training.

In the common instructional segment, all participants were provided with an overview of the CD-ROM database, descriptions of the most effective search strategies for retrieving documents, and instruction in the

use of the various computer operations and their functions. The search tools were described, and the instructor demonstrated how to use the Quick Reference Guide, the Thesaurus, the Keyword Index, and the On-Line Help and Guide services for the CD-ROM database. The phases of inquiry in an effective search strategy were described and demonstrated through an example search for information regarding the effects of *mass media* on *violent behavior*. The sequential strategy presented to participants was taken from the supporting documentation for the Silverplatter search service, which was the source for the CD-ROM databases searched by participants in this study. The basics of the strategy presented were the same as those presented in the search documentation for most commercially available databases.

Each of the prescribed eight steps in the strategy were described and then demonstrated by the instructor. The eight steps were as follows: Step 1: Select a concept; Step 2: Identify several correct terms to describe the concept, using self-selected keywords, the index, or the thesaurus; Step 3: Link these with *or*; Step 4: Repeat Steps 1 to 3 for additional concepts until all are defined; Step 5: Link groups of terms for each concept with *and* to find the common records; Step 6: Evaluate the suitability of the records obtained; Step 7: Rework any inappropriate concept terms by repeating Steps 2 and 3; and Step 8: Repeat Steps 5 and 6 and continue until most of the records retrieved are related to the assigned topic.

At each step, the instructor demonstrated alternative actions and then highlighted the relevant aspects of the outcomes for the participant. The participant was then asked to repeat the actions. For example, at Step 2, the instructor would say, "I can just think of some words to use as terms for the mass media concept, such as . . ." which she would write down. Then she would ask the participant to do the same for the violent behavior concept. Next, she would say, "I can also use the keyword index to find some terms that I might not have thought about," and she would then demonstrate the use of the keyword index by locating several terms and writing them down. The participant would do the same for the violent behavior concept. Finally, the instructor would say, "I can also use the thesaurus to identify related words that are not obvious from the keyword index," and she would locate two different synonyms in the thesaurus and write down the related terms. The participant would then do the same for the violent behavior concept. For Steps 3 to 5, the instructor entered some search statements into the computer and drew the participant's attention to the salient aspects of the output. The participant then repeated the process. All participants were given a one-page summary of the eight-step strategy process, which they were able to refer to at any stage during the practice segment and the performance tasks.

Following the instructional segment, participants completed a practice segment under either enactive or guided exploration instructions. Participants in both conditions explored the same five practice topics. They were (a) the effects of *alcohol use* on *academic performance*, (b) the effects of *child care* on *social skills*, (c) issues related to *migrants learning another language*, (d) the link between *physical activity* and *personality development*, and (e) the impact of *computer technologies* on the design of *buildings*.

Enactive exploration included instructions that covered self-guided exploration, the use of an on-line help facility that provided documentation of strategies and responses to problems, and the positive framing of errors (Frese et al., 1991; Wood, Kakebeke, et al., 2000). Participants were told they could complete their inquiries on the five practice topics in any order or practice on topics of their own devising, as they would do if they were learning how to conduct searches by themselves. They were encouraged to explore and to practice, using the competencies they had learned in the instructional segment. The sequencing of tasks, the steps in the strategy process practiced, and the responses to problems were left to the discretion of the individual participant.

Enactive exploration participants had access to an on-line help facility with supporting printed information. The help facility was demonstrated so that participants knew how to access information, and they were reminded

of its availability when they encountered problems. They also had the summary sheet, which described the eight-step strategy that had been presented in the instructional segment. The on-line help facility and strategy summary sheet, which are commonly available to people who conduct electronic searches, meant that participants in the enactive exploration condition had available to them the same information that was provided to guided exploration participants through the modeling of responses. However, the decision to refer to them during practice was at the discretion of the individuals in the enactive exploration mode.

To encourage exploration during practice, we gave the enactive exploration participants instructions to frame errors and problems positively. These error management instructions were adopted from Frese et al. (1991) and were summarized in two signs that were placed on top of the computer in the participants' line of sight. The first sign stated the following: "If you strike a problem, regard it as a learning opportunity; I have made an error: Great! There is a way to solve this problem. I can learn from this error." The second sign stated the following: "Don't forget to watch the screen; view the screen and see what is changing." These principles were stated by the experimenter at the start of the practice session and whenever participants encountered problems.

Before commencing the practice segment, participants were asked if they understood that they could work through the tasks in whatever order suited them, and they all said yes. All participants also indicated that they knew how to use the on-line help facility. The participants were asked to read the error management signs, and the instructor reinforced the error management message during the practice session. If participants in the enactive exploration mode could not solve a problem after 3 min, then the instructor corrected the error and reminded them of the on-line help facility but did not explain the solution. Only 2 participants required this assistance, each on one occasion. In one case, the person continually omitted the symbol used to identify lines of search. In the second case, the person continually left no spaces between keywords. On all other occasions, participants in the enactive exploration condition corrected errors well within 3 min. The number of practice tasks completed varied according to the exploration interests of the individual.

Guided exploration included instructions on the order for completing the practice tasks, reminders of the steps to follow in developing a strategy for each task, and modeling of responses that followed problems or mistakes in the use of strategies during practice. All guided exploration participants completed the five practice topics in the same assigned order, progressing from the easiest to the more difficult searches, and they were instructed to work sequentially through the eight steps of the prescribed strategy for each topic. If the participant did not follow the prescribed strategy or made a mistake, then the instructor would model a response for that step, including a statement of the rationale that guided the selection. For example, if the participant simply started entering keywords on Step 2 for the first topic, then the instructor would say, "Drinking is one of the terms I have identified for alcohol use, but I know I will have more success if I find some other related keywords from the thesaurus." She would then open the thesaurus and point to some relevant keywords. If participants skipped a step, then the instructor would draw their attention to the strategy summary sheet and remind them of the benefits of following the prescribed sequence. The modeled responses by the instructor only demonstrated points that had previously been covered in the common instruction segment, and they followed scripted procedures taken from the on-line help facility that was available to the enactive exploration participants during the practice segment.

In summary, the sequencing of tasks, the steps in the strategy process practiced, and the responses to problems were externally directed in the guided exploration mode but were left to the discretion of the individual searcher in the enactive exploration mode. Participants in the two exploration modes received the same information and level of instruction during the instructional segment, and no new information was introduced in the practice segment of the training program. The information on responses to

problems encountered in practice was, however, presented differently in the two exploration modes. The experimenter modeled this in the guided exploration condition, whereas participants in the enactive exploration condition had to either refer to the on-line help facility (which was also available as a written document on their desk) or rely on recall of information from the instruction segment.

Postinstruction Performance Assessment

Following the practice session, participants completed inquiries on two different tasks. One inquiry asked for information on the effects of *television watching on teenagers* in references published since 1988, and the other one asked about the impacts of *technology on teacher satisfaction and performance*. Half of the participants in each exploration condition completed the television effects task first and the technology effects task second. The other half of the participants completed the two searches in the reverse order.

Personal Variables

At the outset of the study, background information was collected on participants' age; year of study; and previous computing, library, and electronic search experiences. Background measures also assessed the participants' experience in searching library databases and manual indexes. The perceived effectiveness of the instructional programs and intrinsic motivation were assessed at the end of the practice segments of the training program. Perceived self-efficacy and self-satisfaction were assessed at four points: at the beginning of the study, at the end of the practice segment, and after each of the two searches in the postinstruction assessment phase.

Self-efficacy was measured with a 27-item scale, which covered the diverse activities in the four subfunctions of the electronic search process: problem definition, keyword identification, use of connectors and the construction of search statements, and participants' beliefs in their expected search capabilities to achieve different levels of performance. The activities were obtained through observations of professional CD-ROM operators, conducting searches and a review of the literature on successful electronic search strategies (e.g., Michel, 1994; Quint, 1991). "I can identify the major requirements of the search from the initial statement of the topic" is a sample item. For each item, participants first recorded whether they could perform the activity described ("yes" or "no") and then recorded their confidence in their capabilities on a 10-point scale, with 1 representing *very low confidence* and 10 representing *very high confidence*. Reliability estimates for each of the four assessments of self-efficacy were high ($\alpha > .95$).

Satisfaction was assessed with six items in which participants rated their level of satisfaction with their search skills and performance. The scale included items such as "At this point in time, how satisfied are you with your skill in conducting CD-ROM searches?" Participants rated their satisfaction on a 10-point scale ranging from 1 (*not at all satisfied*) to 10 (*highly satisfied*). The reliability estimates for each of the four assessments were at acceptable levels ($\alpha > .77$).

Intrinsic motivation was assessed with seven items, including four items from the measure developed by Mossholder (1980) and three items from Daniel and Esser (1980). Mossholder's (1980) items assessed participants' desire to continue working on the task, their level of interest in the activity, their perceived degree of challenge, and their satisfaction with the task. The items were anchored with 1 (*not at all*) and 7 (*to a large degree*). Daniel and Esser's (1980) items were 7-point semantic differential scales with the following anchors: *monotonous-exciting*, *boring-interesting*, and *stimulating-dull*. Principal-components factor analysis revealed that the seven items from the combined scales loaded on a single factor with high interitem reliability ($\alpha = .94$).

Perceived training effectiveness was participants' ratings of the modes instructions. Participants rated whether they found the process easy to

understand, whether too much information was provided, and whether they could easily recall the procedural strategy steps. They recorded their judgments on a 7-point scale, anchored by 1 (*totally disagree*) and 7 (*totally agree*). The reliability coefficient for the three-item scale was acceptable ($\alpha = .80$).

Search Activity and Performance Attainment

Printouts of the search records were used to assess effort, strategy quality, and performance levels.

Total effort in electronic search is reflected in the number of search statements developed and how extensively they are used. A search statement consists of keywords, other terms, and connectors; and it can be linked to other search statements by using additional connectors. The identification of terms and connectors requires significant cognitive effort. Thus, one indicator of effort is the number of terms and connectors included in search statements (Salterio, 1996). Time spent on the task is another indicator of effort. Participants had a maximum of 30 min to search for each of the problems in the testing phase, but they could spend less time if they wished. An additional effort indicator is the number of different lines of inquiry produced by the participant and integrated into the search. The computational lines of inquiry generated by the operating system and not developed directly by the participant were not included in this measure of effort. An aggregate index of total effort was created by summing the standardized scores for the three components of effort, which had acceptable levels of internal reliability for both the first and second tasks ($\alpha_1 = .83$, $\alpha_2 = .81$).

Wasted effort was measured in three ways: the number of repetitive or redundant lines of search generated, the lines of inquiry developed and rejected by the searcher in the process of developing the final search statement, and the number of errors. An aggregate measure of wasted effort was created from the standardized scores of these three components for the two tasks ($\alpha_1 = .70$, $\alpha_2 = .83$). Wasted effort is a component of total effort. Any increase in wasted effort due to rejected lines of search inputs must be associated with an increase in the number of lines and terms used to calculate total effort, as both measures are drawn from the same lines of search inputs. However, the reverse is not true. A searcher could input large numbers of search statements without rejecting any lines of search. The other components of the two effort measures are not directly related by source of measurement.

Strategy quality was a composite measure of the depth, breadth, sequencing, and sources used in the searches for the two tasks. Strategies were extracted from the printouts of search statements used to explore each of the assigned tasks. The expert librarian who conducted the training later scored each of the search strategies on the four properties, as described below. Hard copies of the 96 search records (two search tasks per subject) were given to the librarian 2 weeks after all the training was completed. No information on the searches identified the participant or the condition in which the search was completed. Randomization of the order also meant that any 2 consecutive searches were not necessarily from the same participant. To establish the reliability of the scores, a second librarian scored a 20% random sample of the search printouts. A common scoring checklist was used to ensure the same method of assessment throughout the scoring processes of both raters. This scoring sheet was tested in a prior pilot study, and it had been compiled from an analysis of 40 earlier searches. The interrater reliability across both tasks for the overall strategy score was $r = .95$.

Depth of search was calculated from the number of different keyword terms used to describe each concept that was linked with the *or* connector. The more keywords used for each concept in the search process, the greater the depth of search for that concept. The depth score for each search ranged from 0 to 12.

Breadth of search was a measure of the number of concepts covered by

terms included in search statements and correctly linked by using either the *and* connector or other concept refinement strategies such as field limiters, truncation, and the *not* connector. Points were allocated for each of these elements of breadth. The more concepts effectively linked in a search, the greater the breadth of the search. The scores ranged from 0 to 12 on each of the assigned topics.

Search sequence was operationalized as the degree to which the searcher combined the different steps into a coherent sequence, proceeding from exploration of single concepts in depth to a broader search of multiple concepts. This measure identified the degree to which the adopted search matched the procedural strategy outlined earlier, which has been demonstrated to be a highly effective search strategy (Michel, 1994; Quint, 1991). Participants had a description of the optimal sequence to refer to during practice. The scores for quality of search sequence on each search problem ranged from 0 to 12.

Sources of terms included in the search statement were the fourth component of strategy. Terms could be obtained from four different sources that varied in the difficulty of their use and the quality of terms. They included the initial search statement; the thesaurus; the keyword index; and other sources, such as the searchers' own knowledge and retrieved records. Thesaurus keywords are the most accurate in their detailed depiction of the topic, but they are also the potentially most difficult to use in search statements. The extent of thesaurus usage provided an operationalization of quality of sources.

The standardized scores for depth, breadth, sequence, and sources were combined to create an aggregate score for search strategy. The internal reliabilities for the strategy composites on the first and second tasks were acceptable ($\alpha_1 = .89$, $\alpha_2 = .71$).

Performance was the number of relevant records retrieved by the final search statement for each task. A record was categorized as relevant if terms for concepts from the assigned topic were included in the descriptors or the abstract. The librarians who scored strategy also scored performance. The search outputs were scored randomly and contained no information to identify the participant or the condition in which the search was conducted. A 20% random sample of search outputs was scored by the second librarian, yielding an interrater reliability across both test tasks of $r = .97$.

Results

Before we examined the pattern of relationships between study variables or tested the study hypotheses, we conducted analyses to test for potential differences in responses that were due to properties of the two performance tasks, the order in which the tasks were completed, or participant characteristics. All participants in both exploratory mode conditions completed the same two tasks, but the order was counterbalanced so that in each condition half of the participants completed the television effects task first and the other half completed the technology effects task first. With task and order of completion coded as dummy variables, there were no differences for task or order in which the two tasks were completed for any of the self-regulatory or outcome measures. The scores for the two performance tasks were standardized and combined for all analyses of the first (Task 1) and second (Task 2) tasks completed after the training.

Analyses of variance showed that the groups were comparable in age, level of prior search familiarity, and previous exposure to CD-ROM instruction. Although all participants were recruited from the same cohort and were randomly assigned to conditions, the guided exploration group was found to have more years of academic study than the enactive exploration group, $F(1, 46) = 9.10$, $p < .01$, $\eta^2 = .02$, and reported greater prior expe-

rience with computers, $F(1, 46) = 4.79, p < .05, \eta^2 = .09$. These two personal variables were included as covariates in all reported analyses of covariance (ANCOVAs), unless specifically noted otherwise. All other variables were comparable for both groups, including CD-ROM experience, $F(1, 45) = 2.93, ns$, which was the most relevant demographic factor. The groups did not differ in self-efficacy or satisfaction at the outset, $Fs(1, 46) < 1.0, ns$.

Table 1 presents the means, standard deviations, and correlation matrix for the study variables. The overall pattern of correlations was generally consistent with the relationships proposed in Figure 1, although the strength and significance of some relationships varied between Task 1 and Task 2. Some of the correlations in Table 1 were contrary to our expectations and require noting. Intrinsic motivation was not significantly related to exploration mode or to any of the effort, strategy, or performance measures. Total effort correlated highly with wasted effort on both tasks but not with strategy quality.¹ Those who worked harder were more likely to waste their effort in errors, incomplete searches, and redundancies. Another interesting result was the lack of a relationship between Task 1 and Task 2 performance ($r = .02$). The issues raised by these results are addressed in the Discussion section.

Effects of Exploration Mode on Self-Regulatory Factors

Hypothesis 1 was supported. ANCOVAs showed that guided exploration was more effective in developing posttraining self-efficacy, $F(1, 45) = 19.15, p < .001, \eta^2 = .30$, and satisfaction, $F(1, 45) = 27.38, p < .001, \eta^2 = .37$, than enactive exploration (Figure 2). The self-efficacy of those who had practiced under guided exploration remained stronger than that of their enactive exploration counterparts after the first, $F(1, 47) = 23.32, p < .001, \eta^2 = .34$, and second performance tasks, $F(1, 47) = 19.78, p < .001, \eta^2 = .30$. In a similar manner, the greater satisfaction of guided exploration participants was still evident after the first, $F(1, 47) = 33.75, p < .001, \eta^2 = .43$, and second tasks, $F(1, 47) = 23.16, p < .001, \eta^2 = .35$.

Hypothesis 2 was not supported. Intrinsic motivation did not differ significantly between the two modes of exploration. This unexpected result was somewhat contrary to impressions gained from direct observation of participants' behavior during the practice segment. During their practice searches, the enactive exploration participants often asked questions of themselves such as "How did I do that?" "What do I do now?" "What happens if I do this?" and "Let's see what else I can do." They moved freely between practice problems and appeared to be highly engaged in the process. Despite an apparent enjoyment of the process, enactive exploration participants evaluated the experience as less effective than guided exploration participants, $F(1, 46) = 23.56, p < .001$.

Effects of Exploration Mode on Search Effort

Hypothesis 3 was supported. ANCOVAs revealed that the enactive exploration participants wasted more effort across the two tasks, $F(1, 45) = 13.55, p < .001, \eta^2 = .23$ (Figure 3). They rejected more lines of inquiry, $F(1, 45) = 7.83, p < .01, \eta^2 = .15$, and they were more prone to errors, $F(1, 45) = 17.93, p < .001, \eta^2 = .28$. An analysis of variance without the two personal covariates showed that the enactive exploration participants also engaged in more redundancies than did their counterparts in

guided exploration, $F(1, 45) = 4.55, p < .05, \eta^2 = .09$. However, this result was not significant in the ANCOVA with prior computer experience and years of academic study included as covariates, $F(1, 43) = 3.38, ns, \eta^2 = .07$.

Effects of Exploration Mode on Strategy Quality and Performance

Hypothesis 4 was supported for both strategy quality and performance. Repeated measures ANCOVAs showed that guided exploration participants demonstrated better quality search strategies, $F(1, 44) = 46.45, p < .001, \eta^2 = .51$, and retrieved more relevant records, $F(1, 44) = 6.53, p < .05, \eta^2 = .13$, across the two tasks than did the enactive exploration participants (Figure 4). The interaction terms for exploration mode by tasks were not significant for either strategy quality or performance.

More detailed analyses of the strategy components revealed that the guided exploration participants conducted a broader search on the first task, $F(1, 46) = 11.32, p < .001, \eta^2 = .20$, but, with experience, the enactive exploration group matched them in their search breadth on the second task, $F(1, 46) = 0.02, ns$. Guided exploration participants conducted searches of greater depth, $F(1, 46) = 23.96, p < .001, \eta^2 = .34$, and better sequencing, $F(1, 46) = 44.34, p < .001, \eta^2 = .49$, across both tasks. They also used more informational sources, relying more heavily on the thesaurus for their keyword selection, whereas their enactive exploration counterparts made limited use of this important source of key words, $F(1, 46) = 54.28, p < .001, \eta^2 = .54$.

The results of the quantitative analyses for the components of wasted effort and strategy quality were supported by qualitative assessments of the search records. The librarian who scored the participants' search strategies was instructed to review the search records a second time and to identify an example of the most common search behaviors from each search record. This review resulted in two examples for each participant. A review of these examples revealed that the enactive exploration participants often used the same terms repetitively, experimenting with different links and combinations, but not adding new terms that increased the depth of search for concepts. The other common enactive exploration strategy was to use different terms, only to discard them in favor of new terms, rather than to develop a coherent line of inquiry by adding the terms together in a single search statement. By this approach, they used many terms, but there was little strategy refinement or integration despite high effort. Guided exploration participants drew terms from the thesaurus and the index and, as shown in the results of the quantitative analyses, more effectively integrated these terms in their search statements than their enactive exploration counterparts.

Mediating Role of Self-Regulatory Factors

Hypothesis 5 received very limited support. The predicted mediation roles of self-efficacy, satisfaction, and intrinsic motivation for differences in wasted effort, strategy quality, and performance

¹ With rejected lines of work excluded from the wasted error measure, the correlations between total effort and wasted effort for Tasks 1 and 2, respectively, were $r_1 = .48, p < .01$, and $r_2 = .59, p < .01$.

Table 1

Alpha Coefficients, Means, Standard Deviations, and Correlation Matrix for First and Second Posttraining Performance Tasks

Variable	1	2	3	4	5	6	7	8
1. Exploration mode	—							
2. Age	.27	—						
3. Years of study	.16	.36*	—					
4. Prior computer experience	-.39**	.15	.29*	—				
5. Perceived training effectiveness	.48**	-.04	.19	.09	—			
6. Self-Efficacy 1	.02	.11	.12	.28	.18	(.95)		
7. Self-Efficacy 2	.55**	-.14	.28	.43**	.64**	.33*	(.97)	
8. Self-Efficacy 3	.58**	-.12	.22	.30*	.60**	.20	.86**	(.98)
9. Self-Efficacy 4	.55**	-.14	.15	.38**	.58**	.28	.81**	.92**
10. Satisfaction 1	.14	.07	.30*	.48**	.17	.45**	.26	.21
11. Satisfaction 2	.61**	-.04	.36*	.43**	.70**	.35*	.82**	.70*
12. Satisfaction 3	.65**	-.01	.29*	.23	.65**	.15	.64**	.82**
13. Satisfaction 4	.59**	-.06	.31*	.42**	.61**	.34*	.71**	.71**
14. Intrinsic motivation	.18	-.03	.04	.18	.41**	-.16	.39**	.42**
15. Total effort Task 1	-.26	-.08	-.13	.14	-.01	.20	.13	-.03
16. Wasted effort Task 1	-.38**	-.02	-.03	.08	-.25	.09	-.12	-.29*
17. Strategy quality Task 1	.74**	.12	.35*	.49**	.37**	.01	.52**	.62**
18. Performance Task 1	.28†	-.19	.03	-.14	.17	-.24	.14	.26
19. Total effort Task 2	-.30*	-.25	-.21	-.02	-.07	.09	-.06	.03
20. Wasted effort Task 2	-.52**	-.13	-.13	-.23	-.05	-.06	-.22	-.19
21. Strategy quality Task 2	.60**	.03	.17	.27	.28	-.04	.40**	.54**
22. Performance Task 2	.32*	.22	.21	.39*	.10	.32*	.32*	.35*
Total								
Ms	0.50	19.40	2.04	8.57	5.64	3.16	5.96	6.18
SDs		1.22	0.54	2.03	1.21	1.46	2.02	2.10
Enactive exploration								
Ms	0.00	19.21	1.83	7.96	5.06	3.12	4.86	4.97
SDs		1.06	0.56	1.68	1.26	1.44	1.75	1.68
Guided exploration								
Ms	1.00	19.58	2.25	9.22	6.21	3.19	7.05	7.39
SDs		1.35	0.44	2.19	0.83	1.51	1.67	1.79
Guided vs. enactive		0.37	0.95**	1.26*	1.15**	0.07	2.19**	2.42**

Note. Alpha coefficients are shown in parentheses on the diagonal. Exploration mode was dummy coded so that enactive exploration = 0 and guided exploration = 1. For guided vs. enactive, *F*s are from 1×2 analysis of variance for each study variable.

† $p < .06$. * $p < .05$. ** $p < .01$.

by participants in the two exploration modes were tested separately, using the three-step hierarchical regression procedure recommended by Baron and Kenny (1986). The results of these analyses, which are shown in Table 2, revealed no significant mediation effects on Task 1 and partial support for the mediation of performance differences on Task 2. The significant effect for exploration mode on Task 2 performance ($\beta = .31, p < .05$) was reduced to nonsignificance ($\beta = .14, ns$) with the introduction of self-efficacy, satisfaction, and intrinsic motivation into the regression equation. However, the reduction in the standardized beta for exploration mode did not reach significance ($t = 1.0, ns$).

The regression analyses for the mediation hypothesis did reveal that the effects of exploration mode on wasted effort and strategy quality were independent of participants' motivational reactions to the tasks. With self-efficacy, satisfaction, and intrinsic motivation included as predictors in the regression models, exploration mode (dummy coded as enactive exploration = 0 and guided exploration = 1) was a significant negative predictor of wasted effort ($\beta_1 = -.53, p < .01; \beta_2 = -.53, p < .01$) and a positive predictor of strategy quality ($\beta_1 = .59, p < .01; \beta_2 = .38, p < .05$), on both Task 1 and Task 2.

Discussion

As we hypothesized, practice under guided exploration produced higher levels of perceived self-efficacy, satisfaction, strategy quality, and performance and lower levels of wasted effort on electronic search tasks than self-guided, enactive exploration. Following instruction in the basic competencies, participants who had the benefit of guided exploration during practice worked smarter and more efficiently and exhibited less wasteful effort on later performance tasks. They spent less time on the tasks, developed better strategies, and reduced the amount of effort they needed to acquire the required information for assigned topics. These differences are especially noteworthy because participants in the enactive exploration condition were instructed in the effective strategy steps at the outset and had a description of these steps to refer to throughout the performance of the search tasks. This is a considerable aid if the person chooses to use it. The enhanced levels of self-efficacy and satisfaction produced by guided exploration in practice remained when participants conducted their searches for the performance tasks without any guidance.

An important feature of the electronic search task used in this study is that the natural task feedback provides little direct guid-

9	10	11	12	13	14	15	16	17	18	19	20	21	22
(.98)													
.25	(.77)												
.69**	.37*	(.94)											
.74**	.28	.75**	(.95)										
.79**	.37*	.79**	.77**	(.96)									
.40**	-.01	.38**	.41**	.41**	(.94)								
-.01	.06	.10	-.17	-.09	.18	—							
-.26	.09	-.07	-.34*	-.26	.05	.67**	—						
.57**	.32*	.61**	.63**	.56**	.12	-.05	-.31*	—					
.15	-.01	.14	-.32*	.13	-.09	-.05	-.14	.36*	—				
.02	.18	.06	.05	-.01	.07	.55**	.44**	-.03	.07	—			
-.17	.10	-.13	-.16	-.18	.01	.36*	.53**	-.28	-.06	.61**	—		
.52**	.23	.49**	.57*	.52**	.13	-.11	-.22	.67**	.37*	.08	-.26	—	
.33*	.43**	.34*	.34*	.35*	.02	-.05	-.28	.50**	.02	-.13	-.19	.35*	—
6.70	3.27	6.14	6.54	7.01	4.89	53.92	24.60	3.47	2.63	50.47	25.17	3.65	3.23
2.10	1.18	1.71	1.77	1.77	0.97	22.53	26.80	2.03	2.61	25.89	37.98	1.57	7.01
5.56	3.12	5.10	5.38	5.95	4.72	59.71	32.96	1.97	1.92	58.39	42.39	2.71	1.04
2.01	0.97	1.48	1.47	1.74	0.81	24.25	24.22	0.81	2.14	32.61	48.26	1.10	1.55
7.83	3.44	7.17	7.68	8.02	5.07	48.12	16.25	5.00	3.33	42.88	8.67	4.59	5.42
1.49	1.38	1.25	1.23	1.09	1.10	19.48	27.13	1.76	2.87	14.17	8.76	1.76	9.38
2.27**	0.32	2.07**	2.30**	2.07**	0.35	11.59	16.71**	3.03**	1.41†	15.51*	33.72*	1.88**	4.38*

ance for the novice in regard to the efficacy of strategies. Although they can inspect the records they retrieve with each inquiry and judge their relevance for the problem being explored, the novices often lack the knowledge needed to categorize records and have no way of knowing whether there are other relevant records that they have not retrieved. The lack of both clear standards and directive task feedback contributes to unsystematic variations in performance by novices, which can weaken the relationship between performance scores on different tasks. The nature of the task feedback will also weaken the relationship between self-regulatory reactions and task performance, as discussed below.

Contrary to our prediction, enactive exploration did not produce greater intrinsic motivation for electronic inquiry. Encouraging people to explore and to make errors can lead to heightened interest, persistence, and better performance on tasks where self-guided exploration quickly leads to discoveries that can be used to improve performance (Dormann & Fresc, 1994). However, self-guided exploration by novices is less effective when feedback does not facilitate learning or positive motivation. Moreover, intrinsic motivation did not contribute to the prediction of strategy quality or performance. Intrinsically motivated interest in a task will not necessarily be translated into superior performance on tasks where

working harder and longer is no guarantee of success (Bandura & Jourden, 1991; Wood, Kakebeeke, et al., 2000).

The very limited support for the hypothesized mediating functions of the self-regulatory reactions may also be due to the nature of task feedback from electronic search. When standards are unclear and feedback does not provide a clear indication of progress, self-regulatory reactions are less reliably related to future performance (Bandura, 1997; Cervone et al., 1991). Even if novices set goals based on the records retrieved, they may be using totally different standards from those used by experts to categorize records as relevant. In the absence of interpretable and reliable evidence regarding their progress on the task, participants' efficacy judgments and their feelings of satisfaction were based on self-assessments developed during the instruction and practice segments and were not related to their actual achievements on the performance tasks. The mean levels of self-efficacy and satisfaction increased between the pre- and posttraining measures and then remained relatively stable after each of the performance tasks (Figure 2). The two measures were also strongly autocorrelated across the posttraining assessments (Table 1). Thus, experience on the two tasks did not strongly influence participants' self-regulatory reactions. As individuals became more adept at inter-

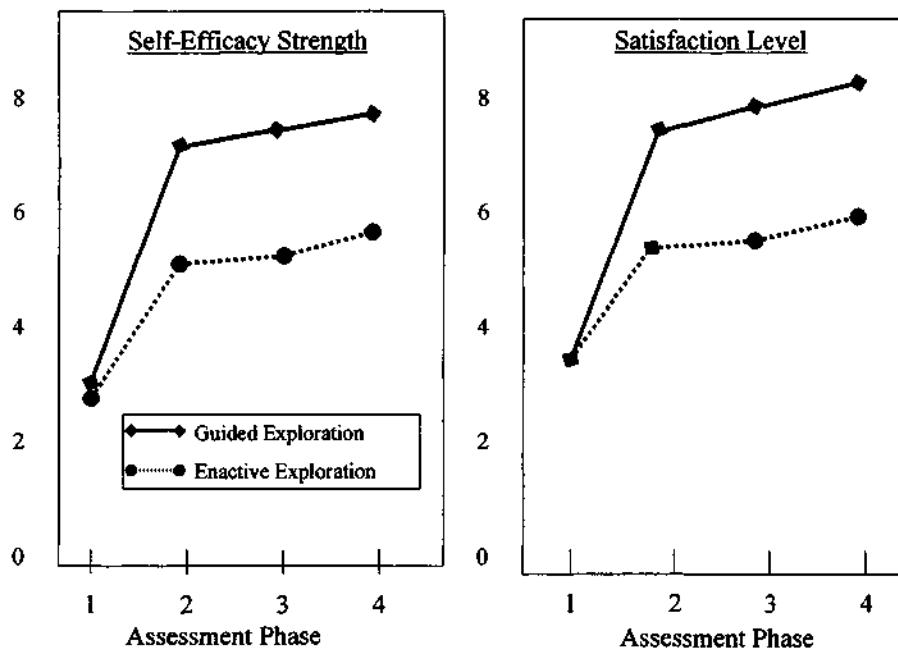


Figure 2. Self-efficacy and satisfaction for guided exploration and enactive exploration groups at pretraining, posttraining, Posttask 1 and Posttask 2 assessment phases.

preting feedback and deriving the connection between their search strategies and records retrieved, self-regulatory reactions should become more closely aligned to strategy quality and performance.

The results of the mediation analyses did show that the search patterns used by the participants during practice were carried over to their searches for the two performance tasks, independently of any motivational effects due to self-regulatory reactions to the search task. The low fidelity of task feedback from electronic

search will often mean that inexperienced searchers will persist with the behaviors that they develop during training and practice. For novices who practice under self-guided exploration, this is more likely to include suboptimal strategies and inefficient behaviors.

The results of this study do not rule out the possibility that self-guided exploration will produce stronger motivation, better task understanding, and more effective strategies under different

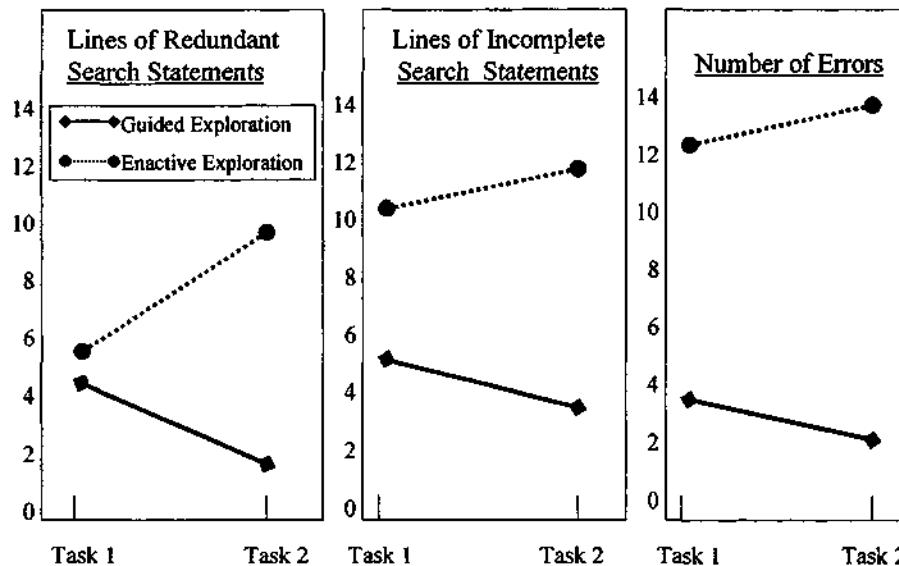


Figure 3. Effects of guided exploration and enactive exploration on level of wasted effort as represented by lines of redundant search statements, lines of incomplete search statements, and number of errors committed for Posttraining Tasks 1 and 2.

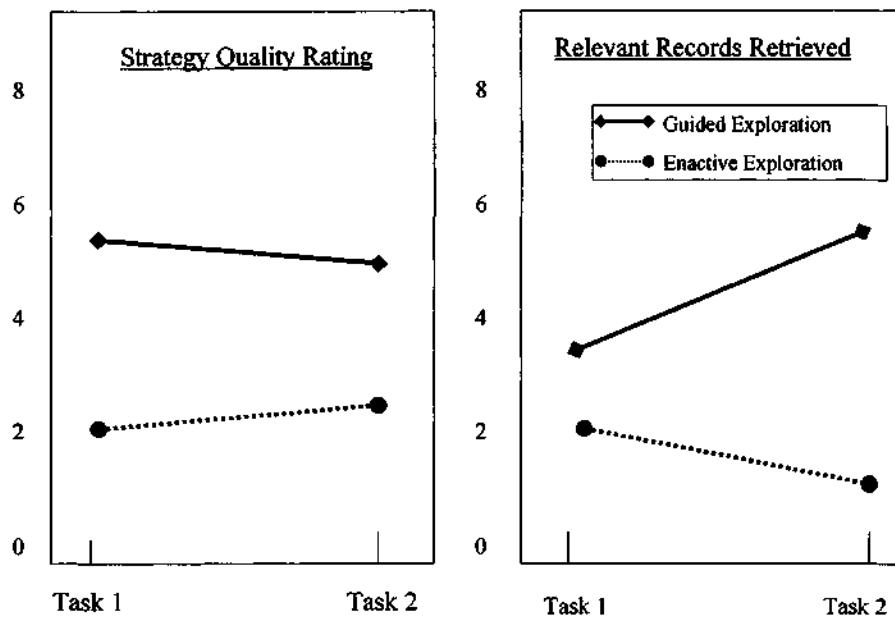


Figure 4. Effects of guided exploration and enactive exploration on strategy quality ratings and numbers of relevant records retrieved for Posttraining Tasks 1 and 2.

circumstances. Enactive exploration may be better suited to tasks that include more informative feedback and to other forms of electronic inquiry, such as "surfing the net" to identify a particular Web site, which requires minimal competency in search procedures and allows superficial processing of interim feedback (Wood, Atkins, & Tabernero, 2000). For complex, ill-structured

tasks that provide low-fidelity feedback, the evidence suggests that guided mastery training plus extended guided exploration during practice is needed to build initial competencies before the benefits of self-guided exploration will be realized. For example, Simon and Werner (1996) found that staff who learned how to use a new software program under a self-guided exploratory mode had still

Table 2
Standardized Betas and Adjusted R²'s for the Three-Step Mediated Regression Analyses With Self-Regulatory Factors as Mediators of the Impacts of Exploration Mode on (a) Wasted Effort, (b) Strategy Quality, and (c) Performance on Posttraining Tasks 1 and 2

Analysis step	Dependent variable	Independent variable	Task 1		Task 2	
			β	Adjusted R ²	β	Adjusted R ²
1	Self-efficacy	Exploration mode	.55**		.58**	
	Self-satisfaction	Exploration mode	.61**		.65**	
	Intrinsic motivation	Exploration mode	.18		.19	
2	Wasted effort	Exploration mode	-.38**	.13**	-.52**	.25**
	Wasted effort	Exploration mode	-.53**	.13*	-.53**	.22**
	Self-efficacy		.34		.21	
3	Strategy quality	Satisfaction	-.10		-.16	
	Strategy quality	Exploration mode	.74**	.54**	.60**	.35**
	Strategy quality	Exploration mode	.59**	.56**	.38**	.38**
2	Performance	Self-efficacy	.00		.14	
	Performance	Satisfaction	-.36		-.21	
	Performance	Exploration mode	.27†	.07†	.31*	.09*
3	Performance	Exploration mode	.28	.04	.14	.08
	Performance	Self-efficacy	.08		.18	
	Performance	Self-satisfaction	.04		.10	

Note. Intrinsic motivation was not related to exploration mode or outcomes, either singly or in combination with the other self-regulatory variables. Therefore, it was not included in the subsequent steps of the mediation analysis.

† $p < .06$. * $p < .05$. ** $p < .01$.

not matched the comprehension or skill levels of those taught by modeling after 1 month of on-the-job experience with the program.

Electronic inquiry is a major element in present-day life, and it is likely to play an even bigger role in the acquisition of information with further advances in electronic technologies. Most people will not receive extended training in electronic search, and experience may prove a poor teacher because of the lack of direction provided by task feedback. Support for self-improvement by people with basic electronic search skills is an important issue that requires further research. One area for future research is the impact of feedback interventions on the self-regulatory mechanisms and skill development of novice electronic searchers. Although the benefits of some feedback interventions have been found to be problematic (Kluger & DeNisi, 1996), those that enhance perceived efficacy and provide a functional task focus will lead to improved understanding and performance on complex tasks (Bandura, 1997; Martocchio & Webster, 1992). For example, Martocchio and Dulebohn (1994) found that augmentation of task feedback with information on factors under the control of the trainee led to greater understanding and better performance of a complex computer software program than supplemental feedback on factors outside the trainees' control. Interventions to augment task feedback from electronic search could include similar types of diagnostics as well as feedback on compliance with strategy steps or redundancies and other forms of wasted error.

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Received March 20, 2000

Revision received January 20, 2001

Accepted January 21, 2001 ■

Health Promotion by Social Cognitive Means

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This article examines health promotion and disease prevention from the perspective of social cognitive theory. This theory posits a multifaceted causal structure in which self-efficacy beliefs operate together with goals, outcome expectations, and perceived environmental impediments and facilitators in the regulation of human motivation, behavior, and well-being. Belief in one's efficacy to exercise control is a common pathway through which psychosocial influences affect health functioning. This core belief affects each of the basic processes of personal change—whether people even consider changing their health habits, whether they mobilize the motivation and perseverance needed to succeed should they do so, their ability to recover from setbacks and relapses, and how well they maintain the habit changes they have achieved. Human health is a social matter, not just an individual one. A comprehensive approach to health promotion also requires changing the practices of social systems that have widespread effects on human health.

Keywords: *social cognitive theory; self-efficacy; self-regulation; collective efficacy; self-management model*

I am deeply honored to be a recipient of the Healthtrac Award. It is a special honor to be recognized by a foundation that promotes the betterment of human health in the ways I value highly. In comparing myself to the figure Larry so generously described, I feel like a Swiss yodeler following Pavarotti.

The field of health is changing from a disease model to a health model. It is just as meaningful to speak of levels of vitality and healthfulness as of degrees of impairment and debility. Health promotion should begin with goals, not means.¹ If health is the goal, biomedical interventions are not the only means to it. A broadened perspective expands the range of health-promoting practices and enlists the collective efforts of researchers and practitioners who have much to contribute from a variety of disciplines to the health of a nation.

The quality of health is heavily influenced by lifestyle habits. This enables people to exercise some measure of control over their health. By managing their health habits, people can live longer and healthier and retard the process of aging. Self-management is good medicine. If the huge health benefits of these few habits were put into a pill, it would be declared a scientific milestone in the field of medicine.

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A major portion of this article was presented as the Healthtrac Foundation Lecture at the convention of the Society for Public Health Education in Philadelphia, November 9, 2002.

Supply-Side Versus Demand-Side Approaches

Current health practices focus heavily on the medical supply side. The growing pressure on health systems is to reduce, ration, and delay health services to contain health costs. The days for the supply-side health system are limited. People are living longer. This creates more time for minor dysfunctions to develop into chronic diseases. Demand is overwhelming supply. Psychosocial factors partly determine whether the extended life is lived efficaciously or with debility, pain, and dependence.^{2,3}

Social cognitive approaches focus on the demand side. They promote effective self-management of health habits that keep people healthy through their life span. Aging populations will force societies to redirect their efforts from supply-side practices to demand-side remedies. Otherwise, nations will be swamped with staggering health costs that consume valuable resources needed for national programs.

SOCIAL COGNITIVE THEORY

This article focuses on health promotion and disease prevention by social cognitive means.^{4,5} Social cognitive theory specifies a core set of determinants, the mechanism through which they work, and the optimal ways of translating this knowledge into effective health practices. The core determinants include *knowledge* of health risks and benefits of different health practices, *perceived self-efficacy* that one can exercise control over one's health habits, *outcome expectations* about the expected costs and benefits for different health habits, the health *goals* people set for themselves and the concrete plans and strategies for realizing them, and the *perceived facilitators* and social and structural *impediments* to the changes they seek.

Knowledge of health risks and benefits creates the precondition for change. If people lack knowledge about how their lifestyle habits affect their health, they have little reason to put themselves through the travail of changing the detrimental habits they enjoy. But additional self-influences are needed for most people to overcome the impediments to adopting new lifestyle habits and maintaining them. Beliefs of personal efficacy play a central role in personal change. This focal belief is the foundation of human motivation and action. Unless people believe they can produce desired effects by their actions, they have little incentive to act or to persevere in the face of difficulties. Whatever other factors may serve as guides and motivators, they are rooted in the core belief that one has the power to produce desired changes by one's actions.

Health behavior is also affected by the outcomes people expect their actions to produce. The outcome expectations take several forms. The physical outcomes include the pleasurable and aversive effects of the behavior and the accompanying material losses and benefits. Behavior is also partly regulated by the social reactions it evokes. The social approval and disapproval the behavior produces in one's interpersonal relationships is the second major class of outcomes. This third set of outcomes concerns the positive and negative self-evaluative reactions to one's health behavior and health status. People adopt personal standards and regulate their behavior by their self-evaluative reactions. They do things that give them self-satisfaction and self-worth and refrain from behaving in ways that breed self-dissatisfaction. Motivation is enhanced by helping people to see how habit changes are in their self-interest and the broader goals they value highly. Personal goals, rooted in a value system, provide further self-incentives and guides for health habits. Long-term goals set the course of personal change. But there are too many competing

influences at hand for distal goals to control current behavior. Short-term attainable goals help people to succeed by enlisting effort and guiding action in the here and now.

Personal change would be easy if there were no impediments to surmount. The perceived facilitators and obstacles are another determinant of health habits. Some of the impediments are personal ones that deter performance of healthful behavior. They form an integral part of self-efficacy assessment. Self-efficacy beliefs must be measured against gradations of challenges to successful performance. For example, in assessing personal efficacy to stick to an exercise routine, people judge their efficacy to get themselves to exercise regularly in the face of different obstacles: when they are under pressure from work, are tired, feel depressed, are anxious, face foul weather, and have more interesting things to do. If there are no impediments to surmount, the behavior can be easy to perform and everyone is efficacious.

The regulation of behavior is not solely a personal matter. Some of the impediments to healthful living reside in health systems rather than in personal or situational impediments. These impediments are rooted in how health services are structured socially and economically.

Primacy of Efficacy Belief in Causal Structures

Self-efficacy is a focal determinant because it affects health behavior both directly and by its influence on the other determinants. Efficacy beliefs influence goals and aspirations. The stronger the perceived self-efficacy, the higher the goals people set for themselves and the firmer their commitment to them. Self-efficacy beliefs shape the outcomes people expect their efforts to produce. Those of high efficacy expect to realize favorable outcomes. Those of low efficacy expect their efforts to bring poor outcomes. Self-efficacy beliefs also determine how obstacles and impediments are viewed. People of low efficacy are easily convinced of the futility of effort in the face of difficulties. They quickly give up trying. Those of high efficacy view impediments as surmountable by improvement of self-management skills and perseverant effort. They stay the course in the face of difficulties.

Figure 1 shows the paths of influence in the posited sociocognitive causal model. Beliefs of personal efficacy affect health behavior both directly and by their impact on goals, outcome expectations, and perceived facilitators and impediments.

Overlap in Health Belief Models

There are many psychosocial models of health behavior. They are founded on the common metatheory that psychosocial factors are heavy contributors to human health. For the most part, the models include overlapping determinants but under different names. In addition, facets of a higher order construct are often split into seemingly different determinants, as when different forms of anticipated outcomes of behavioral change are included as different constructs under the name of attitudes, normative influences, and outcome expectations. Following the timeless dictum that the more the better, some researchers overload their studies with a host of factors that contribute only trivially to health habits because of redundancy. Figure 2 shows the factors the various health models select and their overlap with determinants in social cognitive theory.

Most of the factors in the different models are mainly different types of outcome expectations. Perceived severity and susceptibility to disease in the health-belief model are the expected negative physical outcomes. The perceived benefits are the positive out-

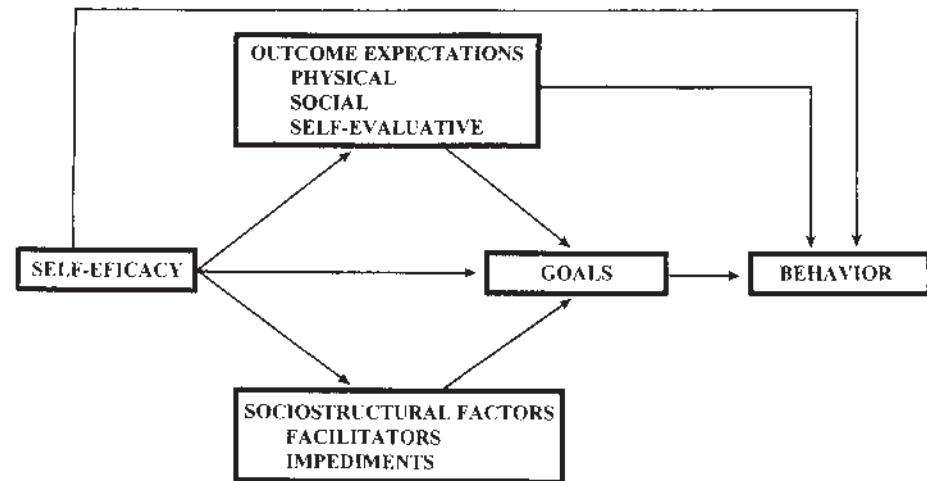


Figure 1. Structural paths of influence wherein perceived self-efficacy affects health habits both directly and through its impact on goals, outcome expectations, and perception of sociostructural facilitators and impediments to health-promoting behavior.

come expectations. In the theory of reasoned action and planned behavior, attitudes toward the behavior and social norms produce intentions that are said to determine behavior. Attitude is measured by perceived outcomes and the value placed on those outcomes. As defined and operationalized, these are outcome expectations, not attitudes as traditionally conceptualized. Norms are measured by perceived social pressures and one's motivation to comply with them. Norms correspond to expected social outcomes for a given behavior. Goals may be distal ones or proximal ones. Intentions are essentially proximal goals. I aim to do *x* and I intend to do *x* are really the same thing. Perceived control in the theory of planned behavior overlaps with perceived self-efficacy. Regression analyses reveal substantial redundancy of predictors bearing different names.⁶ For example, after the contributions of perceived self-efficacy and self-evaluative reactions to one's health behavior are taken into account, neither intentions nor perceived behavioral control add any incremental predictiveness.

Most of the models of health behavior are concerned only with predicting health habits. But they do not tell you how to change health behavior. Social cognitive theory offers both predictors and principles on how to inform, enable, guide, and motivate people to adapt habits that promote health and reduce those that impair it.⁴

Threefold Stepwise Implementation Model

The social utility of health promotion programs can be enhanced by a stepwise implementation model. In this approach, the level and type of interactive guidance is tailored to people's self-management capabilities and motivational preparedness to achieve desired changes. The first level includes people with a high sense of efficacy and positive outcome expectations for behavior change. They can succeed with minimal guidance to accomplish the changes they seek.

PSYCHOSOCIAL DETERMINANTS OF HEALTH BEHAVIOR							
THEORIES	OUTCOME EXPECTATIONS			GOALS		IMPEDIMENTS	
	SELF-EFFICACY	Physical	Social	Self-Evaluative	Proximal	Distal	
Social Cognitive Theory	✓	✓	✓	✓	✓	✓	✓
Health Belief Model	✓	✓			✓		✓
Theory of Reasoned Action	✓	✓		✓			
Theory of Planned Behavior	✓	✓	✓	✓			
Protection Motivation Theory	✓	✓					

Figure 2. Summary of the main sociocognitive determinants and their areas of overlap in different conceptual models of health behavior.

Individuals at the second level have self-doubts about their efficacy and the likely benefits of their efforts. They make halfhearted efforts to change and are quick to give up when they run into difficulties. They need additional support and guidance by interactive means to see them through tough times. Much of the guidance can be provided through tailored print or telephone consultation.

Individuals at the third level believe that their health habits are beyond their personal control. They need a great deal of personal guidance in a structured mastery program. Progressive successes build belief in their ability to exercise control and bolster their staying power in the face of difficulties and setbacks. Thus, in the stepwise model, the form and level of enabling interactivity is tailored to the participants' changeability readiness. The following sections are devoted to a more detailed consideration of how to enable people at these various levels of changeability to improve their health status and functioning.

PUBLIC HEALTH CAMPAIGNS

Societal efforts to get people to adopt healthful practices rely heavily on public health campaigns. These population-based approaches promote changes mainly in people with high perceived efficacy for self-management and positive expectations that the prescribed changes will improve their health. Meyerowitz and Chaiken⁷ examined four possible mechanisms through which health communications could alter health habits: by transmitting information on how habits affect health, by arousing fear of disease, by increasing perceptions of one's personal vulnerability or risk, or by raising people's beliefs in their efficacy to alter their habits. They found that health communications foster adoption of healthful practices to the extent that they raise beliefs in personal efficacy.

To help people reduce health-impairing habits by health communications requires a change in emphasis from trying to scare people into health to enabling them with the self-management skills and self-beliefs needed to take charge of their health habits.

In longitudinal analyses of community-based health campaigns, Rimal^{8,9} found that perceived self-efficacy governs whether individuals translate perceived risk into a search for health information and whether they translate acquired health knowledge into healthful behavioral practices. Those of low self-efficacy take no action even though they are knowledgeable about lifestyle contributors to health and perceive themselves to be vulnerable to disease. Maibach and colleagues¹⁰ found that both people's preexisting self-efficacy beliefs that they can exercise control over their health habits and the self-efficacy beliefs instilled by a community health campaign contributed to adoption of healthy eating habits and regular exercise (Figure 3).

Overprediction of Refractoriness

Our theories overpredict the resistance of health habits to change. This is because they are developed by studying mainly refractory cases but ignoring successful self-changers. For example, smoking is one of the most addictive substances. It is said to be intractable because it is compelled by biochemical and psychological dependencies. Each puff sends a reinforcing nicotine shot to the brain. Prolonged use is said to create a relapsing brain disease.

The problem with this theorizing is that it predicts far more than has ever been observed. More than 40 million people in the United States have quit smoking on their own. Where was their brain disease? How did the smokers cure the disease on their own?

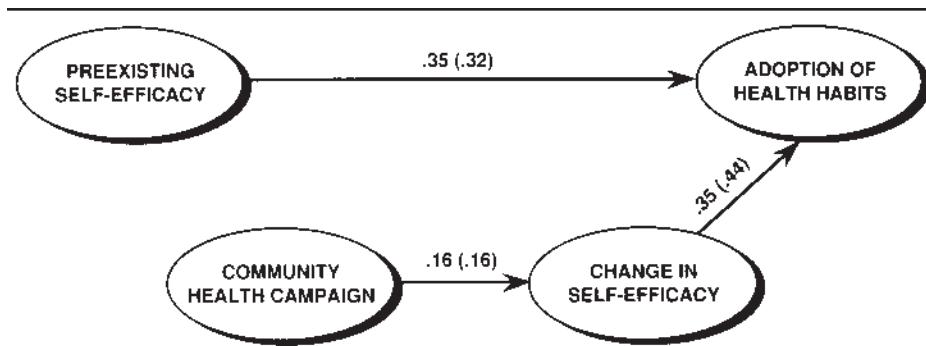


Figure 3. Paths of the influence of perceived self-efficacy on health habits in community-wide programs to reduce risk of cardiovascular disease.

NOTE: The initial numbers on the paths of influence are the significant path coefficients for adoption of healthy eating patterns; the numbers in parentheses are the path coefficients for regular exercise.¹⁰

Superimposed on the 40 million self-quitters, the dismal relapse curves that populate our journals are but a tiny ripple in the vast sea of successes. Carey and his colleagues verified longitudinally that heavy smokers who quit on their own had a stronger belief in their efficacy at the outset than did continuous smokers and relapsers.¹¹ Successful self-changers combine efficacy belief with outcome expectations that benefits will outweigh disadvantages of the lifestyle changes.

The same is true for alcohol and narcotic addiction. Lee Robins¹² reported a remarkably high remission for heroin addiction among Vietnam veterans without the benefit of treatment. Vaillant¹³ has shown that a large share of alcoholics eventually quit drinking without treatment, assistance from self-help groups, or radical environmental change. Granfield and Cloud¹⁴ put it well when they characterized the inattention to successful self-changes in substance abuse as "*the elephant that no one sees.*"

Enhancement of Health Impact by Interactive Technologies

The absence of individual guidance places limits on the power of one-way mass communication. The revolutionary advances in interactive technology can increase the scope and impact of health promotion programs. On the *input side*, health communications can now be personally tailored to factors known to affect health behavior. Tailoring communications does not necessarily guarantee better outcomes. The benefits of individualization will depend on the predictive value of the tailored factors. If weak or irrelevant factors are targeted, individualization will not provide incremental benefits. Development of measures for key social cognitive determinants known to affect health behavior can provide guidance for tailoring strategies.

On the *behavioral adaption side*, individualized interactivity further enhances the impact of health promotion programs. Social support and guidance during early periods of personal change and maintenance increase long-term success. Here, too, the impact of social support will depend on its nature. Converging evidence across diverse spheres of functioning reveals that the social support has beneficial effects only if it raises people's beliefs in their efficacy to manage their life circumstances.¹⁵ If social support is provided in ways that foster dependence, it can undermine coping efficacy. Effective enablers pro-

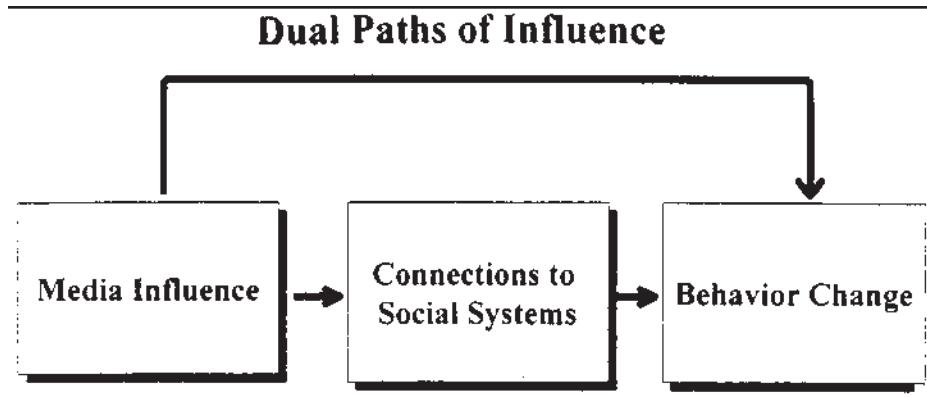


Figure 4. Paths of influences through which mass communications affect psychosocial changes both directly and via a socially mediated pathway by linking viewers to social networks and community settings.

vide the type of support and guidance that is conducive to self-efficacy enhancement for personal success.⁵

Interactive computer-assisted feedback provides a convenient means for informing, enabling, motivating, and guiding people in their efforts to make lifestyle changes. The personalized feedback can be adjusted to participants' efficacy level, the unique impediments in their lives, and the progress they are making. The feedback may take a variety of forms, including individualized print communications, telephone counseling, and linkage to supportive social networks. I shall describe shortly a self-management system that encompasses these various enabling features.

Socially Mediated Pathways of Influence

There is another way in which the power of population-based approaches to health promotion can be strengthened. There is only so much that large-scale health campaigns can do on their own, regardless of whether they are tailored or generic. There are two pathways through which health communication can alter health habits (Figure 4).

In the *direct pathway*, media promote changes by informing, modeling, motivating, and guiding personal changes. In the *socially mediated pathway*, the media link participants to social networks and community settings. These places provide continued personalized guidance, natural incentives, and social supports for desired changes. The major share of behavioral changes is promoted within these social milieus.¹⁶

Psychosocial programs for health promotion will be increasingly implemented via interactive Internet-based systems. People at risk for health problems typically ignore preventive or remedial health services. For example, young women at risk of eating disorders resist seeking help. But they will use Internet-delivered guidance because it is readily accessible, convenient, and provides a feeling of anonymity. Studies by Taylor and colleagues¹⁷ attest to its potential. Through interactive guidance, women reduced dissatisfaction with their weight and body shape, altered dysfunctional attitudes, and rid themselves of disordered eating behavior.

Interactive technologies are a tool, not a panacea. They cannot do much if individuals cannot motivate themselves to take advantage of what they have to offer. These systems need to be structured in ways that build motivational and self-management skills as well

as guide habit changes. Otherwise, those who need the guidance most will use this tool least.

Promoting Society-Wide Changes by Serial Dramas

The social-linking function via the media is illustrated in global applications of serial television dramas founded on social cognitive theory that address some of the most urgent global problems.¹⁸ They include the soaring population growth and transmission of AIDS. Hundred of episodes in these long-running serials get people deeply involved in the lifestyle changes being modeled. The serials dramatize the everyday problems people struggle with, model solutions to them, and provide people with incentives and strategies for bettering their lives. The story lines model family planning, women's equality, environmental conservation, AIDS prevention, and a variety of life skills.

It is of limited value to motivate people to change if they are not provided with appropriate resources and environmental supports to realize those changes. The dramatizations, therefore, link people to community resources where they can receive a lot of continued supportive guidance. Worldwide applications in Africa, Asia, and Latin America are raising people's efficacy to exercise control over their family lives, enhancing the status of women, and fostering the adoption of contraceptive practices to lower the rates of childbearing.

A controlled study in Tanzania compared changes in family planning and contraception use in half the country that received a dramatic series with the rest of the country that did not.¹⁹ Compared to the control region, more families in the broadcast area went to family planning clinics and adopted family planning and contraceptive methods (Figure 5). The dramatic series produced similar changes later, when they were broadcast in the former control region of the country.

Some of the story lines centered on safer sexual practices to prevent the spread of AIDS. Infection rates are high among long-distance truckers and prostitutes at truck stops. The dramatic productions focused on self-protective and risky sexual practices and modeled how to curb the spread of HIV infection. Compared with residents in the control region, those in the broadcast region increased belief in their personal risk of HIV infection through unprotected sexual practices, talked more about HIV infection, reduced the number of sexual partners, and increased condom use.^{20,21} The greater the exposure to the modeled behavior, the stronger the effects on perceived efficacy to control family size and risky sexual practices.

SELF-MANAGEMENT MODEL

Health habits are not changed by an act of will. It requires motivational and self-regulatory skills. Self-management operates through a set of psychological subfunctions. People have to learn to monitor their health behavior and the circumstances under which it occurs, and how to use proximal goals to motivate themselves and guide their behavior. They also need to learn how to create incentives for themselves and to enlist social supports to sustain their efforts.

DeBusk and his colleagues²² have developed a self-management model for health promotion and disease risk reduction founded on the self-regulatory mechanisms of social cognitive theory. This self-management model combines self-regulatory principles with computer-assisted implementation (Figure 6). It includes exercise programs to build car-

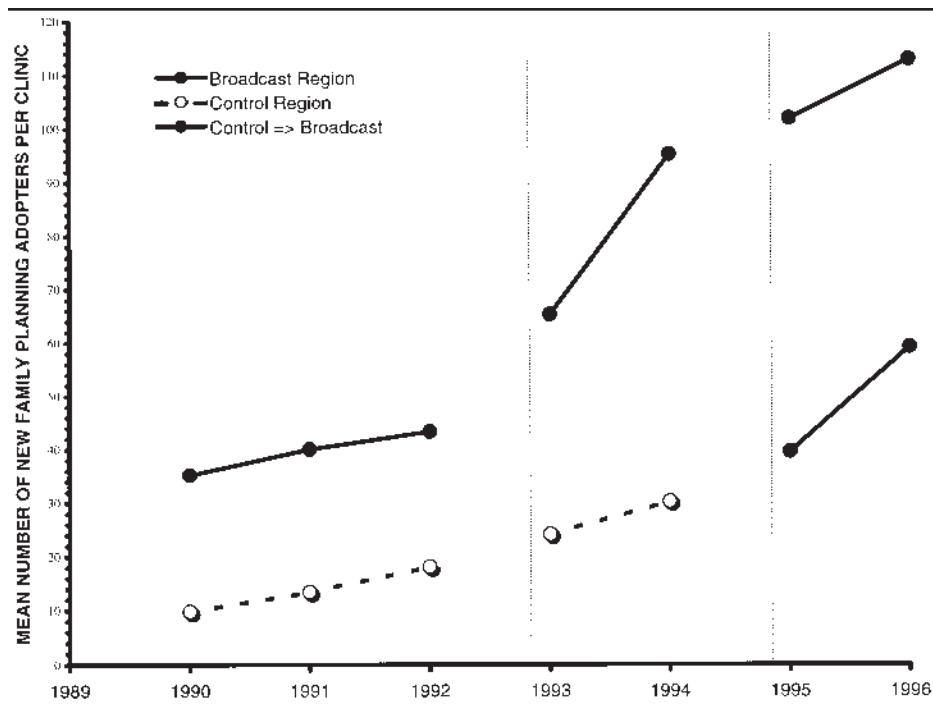


Figure 5. Mean number of new family planning adopters per clinic in the Ministry of Health Clinics in the broadcast region and those in the control region.

NOTE: The period 1990 to 1992 is the prebroadcast baseline. The values for 1993 to 1994 are the family planning adoption levels in the broadcast region (solid line) and the control region (dotted line). The values for 1995 to 1996 are the adoption levels when the serial was aired in the previous control region.²⁰

diovascular capacity, nutrition programs to reduce dietary fat to lower risk of heart disease and cancer, weight reduction programs, and smoking cessation programs.

For each risk factor, people are provided detailed guides on how to improve their health functioning. They monitor their health habits, set themselves short-term goals, and report the changes they are making. The computer mails personalized reports that include feedback of progress toward subgoals. The feedback also provides guides on how to manage troublesome situations and new subgoals to realize. Efficacy ratings identify areas in which self-regulatory skills must be developed if beneficial changes are to be achieved and maintained. A single implementer, assisted with a computerized implementation system, provides intensive, individualized guidance in self-management to large numbers of people.

In tests of the preventive value of this self-management system, employees in the workplace lowered elevated cholesterol by altering eating habits high in saturated fats (Figure 7). They achieved even larger reductions if their spouses took part in the program. The more room for dietary change, the larger the reduction in plasma cholesterol. A single nutritionist implemented the entire program at minimal cost for large numbers of employees.

Nonadherence to drug therapies is a pervasive, serious problem. It worsens health conditions and raises medical costs. Moreover, it may lead physicians to prescribe stronger medications or more drastic interventions in response to the seeming failure of the pre-

SELF-REGULATORY DELIVERY SYSTEM

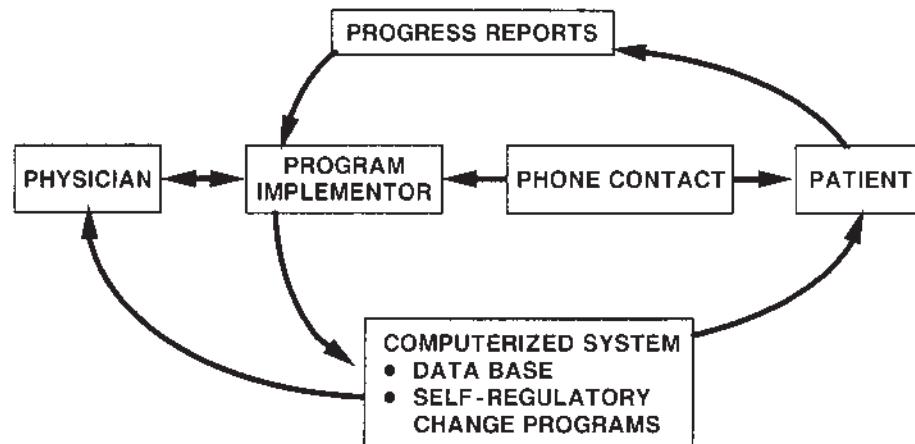


Figure 6. Computer-assisted self-regulatory system for altering health habits.

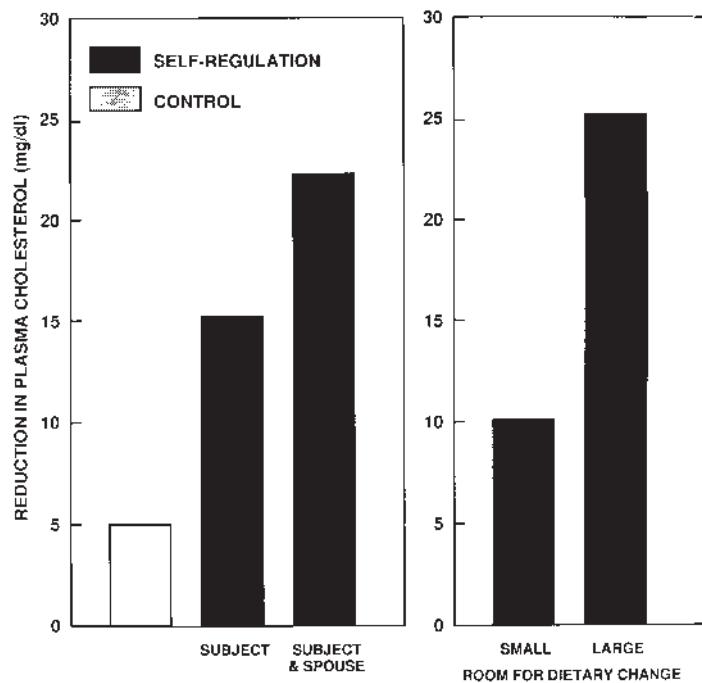


Figure 7. Levels of reduction in plasma cholesterol achieved with the self-regulation system.
NOTE: The panel on the left summarizes the mean cholesterol reductions achieved in applications in the workplace by participants who used the self-management system either by themselves or along with their spouses, or did not receive the system to provide a control baseline. The right panel presents the mean cholesterol reductions achieved with the self-management system by participants whose daily cholesterol and fat intake was high or relatively low at the outset of the program.

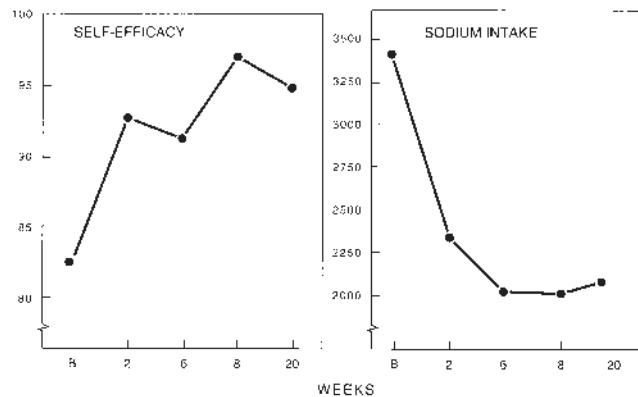


Figure 8. Enhancement of perceived self-regulatory efficacy and reduction of sodium intake through the aid of the self-management system.

scribed treatment. A major public health nightmare is that excessive use of drugs and erratic compliance will breed hardier strains of pathogens that render existing medications ineffective. The success of the self-management system in promoting adherence is shown in a program by West and his colleagues²³ to reduce sodium intake in patients suffering from heart failure (Figure 8). It strengthened patients' efficacy to adhere to a low-sodium diet. They achieved substantial reduction in sodium intake and maintained it during a 6-month period. At each time point, the higher the perceived self-efficacy, the greater the sodium reduction.

Haskell and his associates²⁴ used the self-management system to promote lifestyle changes in patients suffering from coronary artery disease. This places them at high risk of heart attacks. At the end of 4 years, those receiving medical care by their physicians showed no change or they got worse. In contrast, those aided in self-management by nurse implementers achieved big reductions in multiple risk factors: They lowered their intake of saturated fat, lost weight, lowered their bad cholesterol, raised their good cholesterol, exercised more, and increased their cardiovascular capacity (Figure 9).

The program also altered the physical progression of the disease. Those receiving the self-management program had 47% less buildup of plaque on their artery walls (Figure 10). They also had fewer coronary events, fewer hospitalizations, and fewer deaths.

The success of the self-management system has been compared in five hospitals to the standard medical postcoronary care in patients who have already suffered a heart attack. At the end of the 1st year, the self-management system is more effective in reducing risk factors and increasing cardiovascular functioning than the standard medical care.

The self-management system is well received because it is individually tailored to people's needs. It provides continuing personalized guidance that enables people to exercise control over their own change. It is a home-based program that does not require any special facilities, equipment, or group meetings plagued with high drop-out rates. It can serve large numbers of people simultaneously under the guidance of a single implementer. It is not constrained by time and place. It combines the high individualization of the clinical approach with the large-scale applicability of the public health approach. It provides valuable health promotion services at low cost.

In the present applications, the computer is used as a coordinating and mailing system to guide self-directed change and to provide feedback of progress. By linking the interac-

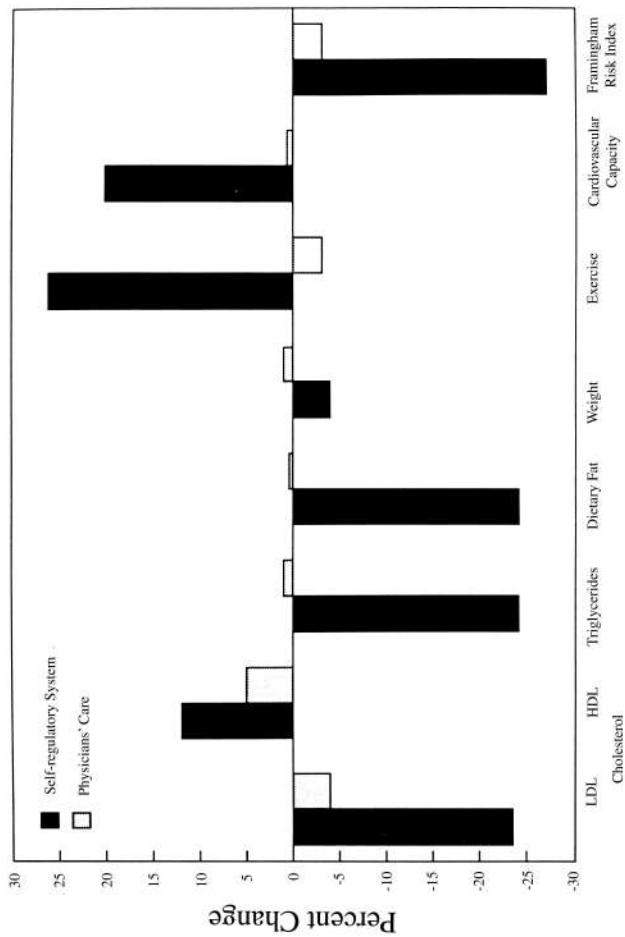


Figure 9. Reduction in multiple risk factors by patients with coronary atherosclerosis depending on whether they received the usual care from their physicians or training in self-management of health habits.
SOURCE: Plotted from data of Haskell et al.²⁴

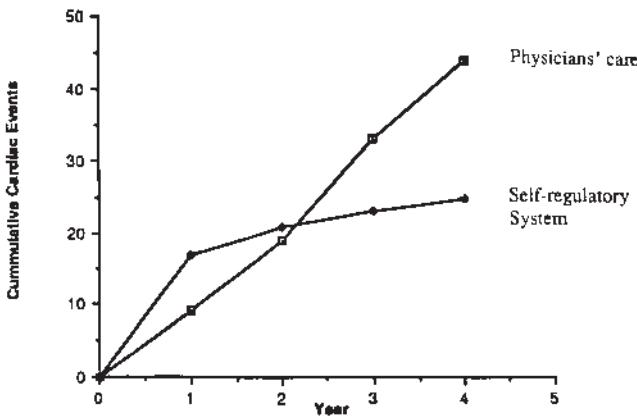


Figure 10. Differences in the number of cardiac deaths, hospitalizations for nonfatal myocardial infarction, and other cardiac events for patients who received the usual care from their physician or training in self-management of health habits.

SOURCE: Plotted from data of Haskell et al.²⁴

tive aspects of the self-management model to the Internet, one can vastly expand its availability to people wherever they may live, at whatever time they may choose to use it.

Health Promotion in Children Through Interactive Media

The interactive capabilities of electronic technologies are beginning to be creatively enlisted for health promotion. A company in Silicon Valley is developing interactive video games that raise children's perceived self-efficacy and enable them to manage chronic health conditions.²⁵

In a role-playing video game for diabetic children, they win points depending on how well they understand the diabetic condition and regulate the diet, insulin, and blood sugar levels of two wacky diabetic pachyderms, *Packy* and *Marlon*. They set out to retrieve the food and diabetes supplies snatched by pesky enemy critters in a diabetes summer camp. To succeed, children have to boost the elephants' health by managing their diabetes as they fight off the pesky critters using their trunks as water cannons and peanut launchers. The better the children manage the meals, blood glucose, and insulin dosage of the pachyderm duo to stay in the safe zone, the more points the children win.

Children love the video game. They quickly become experts in how to manage diabetes (Figure 11). In assessments conducted 6 months later,²⁶ the interactive role playing raises the children's self-care efficacy. They talk more freely about their diabetes and their feelings about it. They adopt dietary and insulin practices to keep their blood sugar level under control. They reduce urgent doctor visits for diabetes emergencies by 77%. Control children who played a video game unrelated to health decreased their self-care and increased emergency doctor visits by 7%.

Asthmatic children learn how to manage their condition by helping an asthmatic dinosaur named *Bronchiasaurus* stay strong and healthy while on a risky mission in an environment riddled with allergens. In the interactive game, children learn how to avoid asthma triggers, to keep the air free of respiratory irritants, to track peak flow, and to take medication. The video game improves knowledge about asthma, enhances perceived effi-

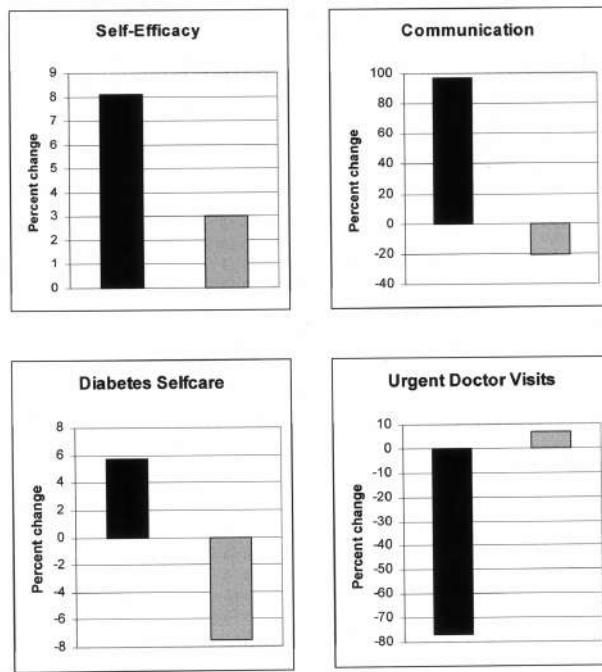


Figure 11. Changes exhibited in a 6-month follow-up in perceived self-efficacy to manage different aspects of diabetes, child-initiated discussions about diabetes, level of diabetes self-care, and number of emergency doctor visits by children who had the benefit of the role-playing video game and diabetic control children who played other entertainment video games.²⁶

cacy to avoid things that trigger asthma attacks, and improves use of emergency medications.²⁷

Children with cystic fibrosis are taught how to deal with their lung problem by using medications and physical therapy to keep the lungs of a virtual puppy clear. Another interactive video game discourages children from smoking promoted by the *Blackburn Tobacco Company*. A daring surgeon enters the body in microscopic size with lasers to repair the damage done by smoking to save the smoker's life. He clears phlegm from the bronchial tubes, removes tar deposits and precancerous cells from the throat and lungs, removes plaque and a deadly blood clot in the arteries, and enters the brain to conquer nicotine addition. The children become experts in the harmful effects of smoking. They lose any appetite for it.

These health-promoting videos are being widely distributed to families by pediatricians. This is but the beginning in the creative use of the interactive video technology to promote childhood health.

Childhood Health Promotion Models

Many of the lifelong habits that jeopardize health are formed during childhood and adolescence. For example, unless youngsters take up the smoking habit in their teens, they rarely become smokers in adulthood. It is easier to prevent detrimental health habits

than to try to change them after they become deeply entrenched as part of a lifestyle. Prevention should be given priority but rarely is.

Health habits are rooted in familial practices. But schools have an important role to play in promoting the health of a nation. This is the only place where all children can be easily reached. It is a natural setting for promoting healthful eating and exercise habits, discouraging smoking and other types of substance abuse, and building generic self-management skills.

An effective preventive program includes four major components. The first component is informational. It informs children of the health risks and benefits of different lifestyle habits. The second component develops the social and self-management skills for translating informed concerns into effective preventive practices. The third component builds a resilient sense of efficacy to support the exercise of control in the face of difficulties and setbacks that inevitably arise. The final component enlists and creates social supports for desired personal changes.

Educational efforts to promote the health of youths usually produce weak results. They provide factual information about health. But they usually do little to equip children with the skills and efficacy beliefs that enable them to manage the emotional and social pressures to adopt detrimental health habits.

Managing health habits involves managing social relationships, not just targeting a specific health behavior for change. Health promotion programs that include the essential elements of the self-management mastery model prevent or reduce injurious health habits. Health knowledge can be conveyed readily, but changes in values, self-efficacy, and health habits require greater effort. The more behavioral mastery experiences provided, the greater the beneficial effect.²⁸ The more intensive the program, and the better the implementation, the stronger the impact.²⁹ Comprehensive approaches that integrate guided mastery health programs with family and community efforts are more successful in promoting health and in preventing detrimental habits than are programs in which the schools try to do it alone.³⁰

Schools are inadequately equipped with the resources, training, and incentives to undertake health promotion and early modification of habits that jeopardize health. As in other social systems, schools focus on areas in which they are evaluated. They are not graded for health promotion. When preventive programs are grudgingly allowed in schools, they try to do too much, with too little, in too short a time, with fitful quality of implementations to achieve much. Such efforts often do more to discredit psychosocial approaches through deficient implementation than to advance the health of youths.

Health promotion must be structured as a part of a societal commitment that makes the health of its youth a matter of high priority. A serious commitment must provide the personnel, incentives, resources, and the operational control needed to do the job well. The programs should be *in* the school, but not *of* the school. New school-based models of health promotion should operate together with the home, the community, and the society at large.

Schools' health-related practices need changing as well. Schools that are provided with a brief health promotion curriculum and encouraged to lower the fat content of their lunch offerings and enhance their physical activity offerings produce lasting improvements in children's eating and exercise habits.³¹ It is the height of irony to strive to promote healthful habits in schoolchildren while schools promote in their lunch program fast foods and house vending machines that dispense sodas and candy in return for substantial payments to schools by commercial enterprises.

Self-Management of Chronic Diseases

The weight of disease is shifting from acute to chronic maladies. The self-management of chronic diseases is another example of the use of self-regulatory and self-efficacy theory to develop cost-effective models with high social utility. Biomedical approaches are ill-suited for chronic diseases because they are devised mainly for acute illness. The treatment of chronic disease must focus on self-management of physical conditions over time.

Holman and Lorig³² devised a generic self-management program in which patients are taught pain control techniques, self-relaxation, and proximal goal setting combined with self-incentives as motivators to increase level of activity. Participants are also taught problem-solving self-diagnostic skills and how to take greater initiative for their health care in dealings with health personnel. These skills are developed through modeling of self-management skills, guided mastery practices, and informative feedback.

In the self-management of arthritis, the program is implemented in groups in community settings by leaders who lead active lives despite their arthritis (Figure 12). A 4-year follow-up with arthritic patients reveals that it retards the biological progression of diseases, raises perceived efficacy, reduces pain, markedly decreases the use of medical services by 43%, and improves the quality of life. Both the baseline efficacy beliefs and the efficacy beliefs instilled by the self-management program predict the health benefits 4 years later.

The self-management approach provides a generic model that can be adapted with supplementary components to different chronic diseases. Indeed, the self-management program produces similar health benefits for people suffering from other types of chronic diseases, such as heart disease, lung disease, stroke, and arthritis.³³

SOCIALLY ORIENTED APPROACHES TO HEALTH

The field of health has been plagued by a contentious dualism. It gets politicized in battles between individualist approaches and structuralist approaches to health. The individualist proponents argue that people can exercise a good deal of control over their health. So it is their responsibility to maintain it. The structuralist proponents argue that health is largely the product of social, environmental, political, and economic conditions, over which individuals have little control. In actuality, health promotion needs both approaches, not contentious debates.

The quality of health of a nation is a social matter, not just a personal one. It requires changing the practices of social systems that impair health rather than just changing the habits of individuals. We do not lack sound policy prescriptions in the field of health. What is lacking is the collective efficacy to realize them. The main focus of a social approach is on collective enablement for changing social, political, and environmental conditions that affect health.⁴ Socially oriented approaches seek to raise public awareness of health hazards, to educate and influence policy makers, to build community capacity to change health policies and practices, and to mobilize the collective citizen action needed to override vested political and economic interests that benefit from existing unhealthful practices.

Social cognitive theory extends the conception of human agency to collective agency.^{34,35} People do not operate as isolates. They work together to improve the quality of their lives. Their shared beliefs in their collective efficacy to accomplish social change

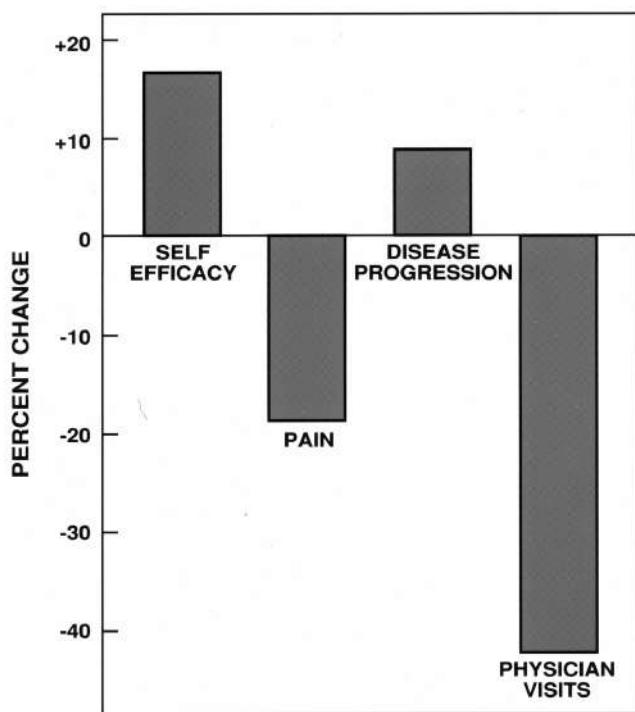


Figure 12. Enduring healthful changes achieved by training in self-management of arthritis as revealed in a follow-up assessment 4 years later.

SOURCE: Plotted from data of Lorig (1990).³⁷

NOTE: The 9% biological progression of the disease is much less than the 20% disease progression one would normally expect during 4 years for this age group.

play a key role in the policy and public health approaches to health promotion and disease prevention. For example, cigarette smoking is the most personally preventable cause of death. People got smoke-free workplaces, restaurants, public buildings, and airliners through their own collective action, not through the governmental agencies with the responsibility to protect national health. Lobbyists get legislators to block tobacco regulation (Figure 13). The more tobacco money the legislators get, the more dutifully they vote against tobacco regulation.

The political impediments to legislative initiatives take the form of the obstructive triad—defeat, defang, and deregulate. The obstructive strategy is to defeat legislative initiatives, preferably in congressional committees, to spare legislators public votes that may be unpopular with their constituents. Laws provide the general guidelines. Congressional staff must convert them into operational regulations. If you cannot defeat the legislation, defang it by translating the law into regulations that circumvent the intent of the legislation. If you cannot defang it, deregulate the regulators to undermine the monitoring and implementation of the legislation. With industry lobbyists and legislators erecting protective barriers, the social battles over health shift increasingly to grassroots initiatives at local levels.

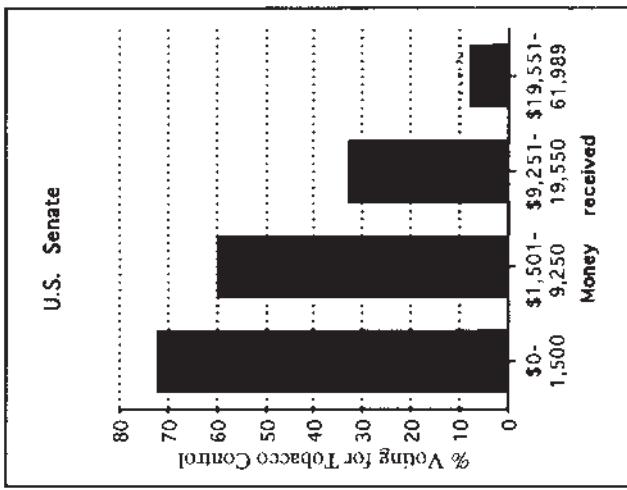
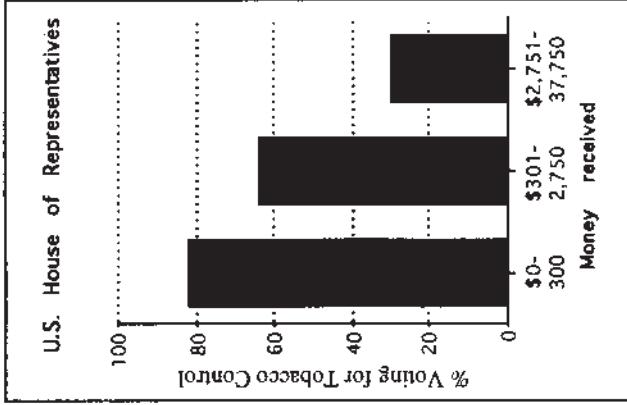


Figure 13. Relationship between the amount of campaign money legislators receive from the tobacco industry and their likelihood of voting against legislation to regulate tobacco products.

SOURCE: Public Citizen Health Research Group, 1993.³⁸

Enablement for Community Self-Help

While collective efforts are made to change unhealthful social practices, people need to improve their current life circumstances over which they have some control. We need to devote more attention to psychosocial models on how best to enable people to work together to improve their health at local levels. The approaches that work best promote community self-help. But people need to be given the necessary resources and enabling guidance to help themselves. Otherwise, simply to tell people with intractable problems to fend for themselves is an evasion of societal responsibility. Unsupported prescription of local self-help can be easily used as a political subterfuge for civic neglect.

A community effort to reduce infant mortality resulting from unsanitary conditions in poor Latino neighborhoods provides one example of effective collective enablement.³⁶ The community was fully informed of the impact of unsanitary conditions on children's health through the local media, churches, schools, and neighborhood meetings conducted by influential persons in the community. The residents were taught how to install plumbing systems, sanitary sewerage facilities, and refuse storage. They were also taught how to secure the financing needed from different local and governmental sources. This enabling self-help program greatly improved sanitation and markedly reduced infant mortality.

Components of Psychosocial Models for Social Change

There are three major components in the social cognitive theory for promoting psychosocial changes society-wide.^{16,18} The first component is a sound *theoretical model* that specifies the determinants of psychosocial change and the mechanisms through which they produce their effects. This knowledge provides the guiding principles. The second component is a *translational and implementational model* that converts theoretical principles into an innovative operational model by specifying the content, strategies of change, and their mode of implementation. The third component is a *social diffusion model* on how to promote adoption of psychosocial programs in diverse cultural milieus. It does so by making functional adaptations of the programs to different sociostructural circumstances, providing enabling guidance, and enlisting the necessary resources to achieve success. We construct theories and clarify how they work. But we do not profit from our successes because we fail to develop effective translational and social diffusion models.

If we are to contribute significantly to the betterment of human health, we must broaden our perspective on health promotion and disease prevention beyond the individual level. This calls for a more ambitious socially oriented agenda of research and practice. We can further amplify our impact on human health by making creative use of evolving interactive technologies that expand the scope and impact of health promotion efforts. But this is another story. And I have come to the end of this one.

As you venture forth to promote your own health and that of others, may the efficacy force be with you.

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CHAPTER

3

Going Global With Social Cognitive Theory: From Prospect to Paydirt

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The present chapter addresses the applications of social cognitive theory to some of the most urgent global problems. These macrosocial applications are rooted in the agentic perspective of social cognitive theory (Bandura, 1986, 2001a). To be an agent, is to influence intentionally one's own functioning and life circumstances. In this view, people are producers of their life circumstances, not just products of them. Social cognitive theory rejects the duality of personal agency and social structure. People create social systems and their lives are, in turn, influenced by them. Human self-development, adaptation, and change thus involve a dynamic interplay between personal and social structural influences within the larger societal context.

Soaring population growth is the most urgent global problem. It is destroying the ecosystems that sustain life, degrading the quality of life, and draining resources needed for national development. The problem is especially severe in less developed nations which are doubling their populations at an accelerating rate. Impoverished populations struggle to survive under scarcities of food, fresh water, medical services, and other necessities of life. Another widespread problem is the pernicious gender inequality in familial, educational, health, occupational, and social life. In these societies women are subjugated and denied their liberty, dignity, and opportunities to develop their talents. The demands of this new information era favor intelligence over brawn. Given that women constitute approximately half the population, societies that marginalize or subjugate women undermine their nation's social, technological, and economic viability. Fostering the

talents and social rights of women provides nations with powerful leverage for national development and renewal. The same is true for ethnic minorities. The spreading AIDS epidemic is another mounting global problem with devastating societal consequences.

Long running serial dramas serve as the principal vehicle for addressing these life conditions. Storytelling, structured along enabling social cognitive lines, is an especially influential vehicle for effecting personal and social changes. It brings life to people's everyday struggles and the consequences of different social practices. It speaks ardently to people's fears, hopes, and aspirations for a better life.

These macrosocial applications inform, enable, motivate, and guide viewers for personal and social changes that can alter the course of their lives. The dramatic productions are not just fanciful stories. They dramatize people's own everyday lives and the problems they have to manage. The enabling dramas help viewers to see a better life and provide the strategies and incentives that enable them to take the steps to achieve it. The story lines model family planning, women's equality, degrading dowry systems, spouse abuse, environmental conservation, AIDS prevention, and a variety of life skills. Some societies present unique problems that require special social themes tailored to their cultural practices. Approximately 130 million women are subjected to the brutal genital mutilation procedure. In Mali, child traffickers trick impoverished parents with large families to give up children under the promise that they will receive good care and send money home. They are then sold for slave labor under inhumane conditions. Orphans of parents who died of AIDS are also sold for slave labor.

To change deeply held beliefs requires strong emotional bonding to enabling models who inspire viewers and provide them with a vision of a better future. Hundreds of episodes get people emotionally engaged in the evolving lives of the models and identify with them. A formerly illiterate college-bound teenager, who was inspired by a lead character to pursue her school, describes the depth and power of emotional bonding, *"There are moments when I feel that Taru is directly talking to me, usually at night. She is telling me, 'Usha, you can follow your dreams.' I feel she is like my elder sister ... and giving me encouragement."*

SOCIAL COGNITIVE THEORY

A comprehensive theory of human behavior must explain how people acquire competencies, attitudes, values, styles of behavior, and how they motivate and regulate their level of functioning. The major principles of social cognitive theory (Bandura, 1986, 1997) provide ~~guidelines~~ for constructing effective media productions. The theoretical principles that are especially relevant for this purpose are discussed briefly in this section.

guidelines

Social Modeling

There are two basic modes of learning. People learn through the direct experience of rewarding and punishing effects of actions, and through the power of social modeling. Modeling enables people to shortcut the tedious and sometimes costly trial-and-error learning by profiting from the successes and mistakes of others. Another major advantage of modeling, especially through the media, is that it can reach vast populations simultaneously in widely dispersed locales. Symbolic modeling has, therefore, become the dominant vehicle for disseminating new ideas, values, and styles of conduct. Modeling influences serve diverse functions in promoting personal and social change. They include instructive, motivational, social prompting, and social construction functions. With regard to the instructive function, models serve as transmitters of knowledge, competencies, values, cognitive skills, and new styles of behavior. Observers also acquire emotional proclivities toward people, places, and things through modeled emotional experiences. Observers learn to fear what frightened or injured models; to dislike what repulsed them; and to like what gratified them. Self-debilitating fears and inhibitions can be eliminated by modeling that depicts effective coping strategies and instills a sense of coping efficacy.

The motivational function operates through the depicted benefits and detriments of modeled courses of action. Seeing others gain desired outcomes by their actions can create outcome expectancies that serve as positive motivators. Observed punishing outcomes can create negative outcome expectancies that function as disincentives for similar courses of action. The behavior of others also serves as social prompts that activate, channel, and support modeled styles of behavior. The types of models who predominate in a social milieu determine which human qualities are promoted from among many alternatives.

Televised portrayals of human nature, social roles, power relations, and the norms and structure of society shape the public consciousness (Gerbner, Gross, Morgan, Signorielli, & Shanahan, 2002) and people's social construction of their reality. It is one thing to learn new styles of behavior. It is another to put them into practice, especially in the face of impediments. Several motivators provide support for adopting new forms of behavior.

Perceived Self-Efficacy

Among the mechanisms of human agency, none is more central or pervasive than beliefs of personal efficacy (Bandura, 1997, 2000). This core belief is the foundation of human agency. Unless people believe they can produce desired effects by their actions, they have little incentive to act or to persevere in the face of difficulties. Whatever other factors serve as guides and

motivators, they are rooted in the core belief that one has the power to effect changes by personal and collective action.

Human well-being and attainments require an optimistic and resilient sense of efficacy. This is because the usual daily realities are strewn with difficulties. They are full of frustrations, conflicts, impediments, inequities, adversities, failures, and setbacks. These are the price of progress. People must have a strong belief in their efficacy to sustain the perseverant effort needed to succeed. The functional belief system combines realism about tough odds, but optimism that one can beat those odds through self-development and perseverant effort.

Efficacy beliefs regulate human functioning through four major processes: cognitive, motivational, emotional, and decisional. Such beliefs influence whether people think pessimistically or optimistically, self-enhancingly or self-hinderingly. Efficacy beliefs play a central role in the self-regulation of motivation through goal challenges and outcome expectations. It is partly on the basis of efficacy beliefs that people choose what challenges to undertake, how much effort to expend in the endeavor, how long to persevere in the face of obstacles and failures, and whether failures are motivating or demoralizing. The likelihood that people will act on the outcomes they expect prospective behaviors to produce depends on their beliefs about whether or not they can produce the required performances. A strong sense of coping efficacy reduces vulnerability to stress and depression in taxing situations and strengthens resiliency to adversity.

Efficacy beliefs also play a key role in shaping the courses lives take by influencing the types of activities and environments people choose. Social influences operating in the chosen environments continue to promote certain competencies, values, and interests. Thus, by choosing and shaping their environments, people can have a hand in what they become.

People's beliefs in their efficacy can be developed in four ways. The most effective way of instilling a strong sense of efficacy is through mastery experiences. Successes build a robust efficacy. Failures undermine it, especially in early phases of efficacy development. If people experience only easy successes, they come to expect quick results, and are easily discouraged by failure. Resilient efficacy requires experience in overcoming obstacles, through perseverant effort. Resilience is also built by training in how to manage failure so it becomes informative rather than demoralizing.

The second way of developing self-efficacy is by social modeling. Models are sources of aspiration, competencies, and motivation. Seeing people similar to oneself succeed by perseverant effort, raises observers' beliefs in their own abilities.

Social Persuasion is the third mode of influence. Realistic boosts in efficacy can lead people to exert greater effort. This increases their chances of success. But effective efficacy builders do more than convey positive

appraisals. They structure situations for others in ways that bring success, and avoid placing them, prematurely, in situations where they are likely to fail.

People also rely partly on their physical and emotional states, in judging their efficacy. They read their emotional arousal, and tension, as signs of personal vulnerability. In activities involving strength and stamina, people interpret their fatigue, aches, and pains, as indicators of low physical efficacy. The fourth way of modifying efficacy beliefs is to reduce people's stress and depression, and build their physical strength. Many of the challenges of life involve common problems that require people to work together with a collective voice to change their lives for the better. People's shared belief in their collective power to realize the futures they seek through collective effort is a key ingredient of collective agency.

Goals and Aspirations

People motivate themselves and guide their behavior by the goals, aspirations, and challenges they set for themselves (Bandura, 1986; Locke & Latham, 1990). Long-term goals set the course of personal change but they are too far removed to overrule competing current influences on behavior. Short-term goals motivate and provide direction for one's efforts in the here and now for incremental change. Goals have little impact unless they are translated into explicit plans and strategies for realizing them. Media productions, therefore, model how to translate a vision of a desired future into a set of achievable subgoals.

Outcome Expectations

Human motivation and behavior are also affected by the outcomes people expect their actions to produce (Bandura, 1986). Outcome expectations can take three major forms. One set of outcomes includes the material pleasurable and aversive effects the behavior produces. Behavior is also partly regulated by the social reactions it evokes. The social approval and disapproval the behavior produces is the second major class of outcomes. People adopt personal standards and regulate their behavior by their self-evaluative reactions. They do things that give them self-satisfaction and self-worth, and refrain from behaving in ways that breed self-dissatisfaction.

Perceived Facilitators and Impediments

Personal and social change would be easy if there were no impediments to surmount. The facilitators and obstacles people see to changing their behavior is another influential determinant. Some of the impediments are personal ones that undermine efforts at change, such as profound self-doubts

that one's efforts would make a difference. Others are situational and structural impediments. Beliefs of personal efficacy affect how formidable the impediments appear.

People who have a resilient sense of efficacy figure out ways to overcome obstacles to change. Those who distrust their efficacy view impediments as insurmountable and are easily convinced of the futility of effort. They quickly abort their effort when they run into difficulties, should they even try. Efforts at socially oriented changes are designed to enhance the enabling aspects of social systems and reduce the impeding aspects.

COMPONENTS OF PSYCHOSOCIAL MODELS FOR SOCIAL CHANGE

There are three major components to this social cognitive approach to fostering society-wide changes (Bandura, 2001b). The first component is a theoretical model. It specifies the determinants of psychosocial change and the mechanisms through which they produce their effects. This knowledge provides the guiding principles. The second component is a translational and implementational model. It converts theoretical principles into an innovative operational model. It specifies the content, strategies of change, and their mode of implementation. The third component is a social diffusion model on how to promote adoption of psychosocial programs in diverse cultural milieus.

Effective psychosocial models of change usually have limited social impact because of inadequate systems for their social diffusion. As a result, we do not profit from our successes. Lack of expertise and resources in host countries further undermine perceived efficacy to produce long-running serials that can capture and hold public attention and change behavior.

Population Communications International (PCI) and the Population Media Center (PMC) remove this impediment by serving as the global diffusion mechanisms (Poindexter, 2004; Ryerson, 1999). These two nonprofit organizations raise funds from various sources to cover production costs. They provide the nations' media personnel with the enabling guidance and technical assistance to create serial dramas tailored to the particular cultural milieus. This creative process involves a close collaborative partnership with the host country's production teams. Funds to cover the production costs are sought from the UN population fund, private foundations, and donors.

PCI and PMC also promote cooperation and collaboration among non-governmental organizations worldwide concerned with population growth, environmental and health problems, and human rights. Such alliances increase the chances of success by mobilizing and focusing people's efforts

to improve the quality of life for themselves and their children. In addition, PCI and PMC work with professionals in the entertainment industry to heighten their sensitivity to ethnic stereotyping, human rights, health, population growth, and environmental degradation in their media productions. They are encouraged to include themes related to these issues in the story lines they create for their fictional dramas.

Major scientific progress and achievement of widespread social changes require pooling the knowledge and innovative expertise of diverse disciplines. In the macrosocial approach under discussion, social cognitive theory provided the theoretical model (Bandura, 1986, 1997). Miguel Sabido, a creative dramatist, devised the generic translational and implemental model (Sabido, 1981, 2002), and Poindexter (2004) and Ryerson (1994) designed the social diffusion model.

CULTURAL AND VALUE ANALYSES

As is true of any intervention, the use of mass communications to foster personal and social change raises ethical issues. Ethical evaluations will depend on who selects the types of changes to be promoted, the agents of change, the means used, and the choice and voluntariness of exposure to the influence. These are not programs foisted on nations by outsiders in pursuit of their self-interest. The dramatic serials are created only on invitation by countries seeking help with intractable problems. The host production team, drawing on a wide variety of sources, including public health systems, religious organizations, women's groups, and other constituencies identify unique cultural life conditions, values, and itemize the types of changes the dramatizations should encourage. Once a program is aired, producers monitor how viewers perceive the characters, with whom they are identifying, how they view the obstacles and the dramatized options, and the types of futures they envision.

Extensive cultural and value analyses are conducted before serial dramas are developed and implemented. In this formative phase, focus groups, representing the various constituencies in the society, identify problems of major concern to them and the obstacles they face. These interviews provide the culturally relevant information for developing realistic characters and engrossing functional plot lines.

Value disputes are often fueled by wrangling over stereotypes with emotive surplus meanings rather than deliberating about changes in real-life terms. The value issues are, therefore, cast in concrete terms of detriments and benefits of particular lifestyles. The tangible values embody respect for human dignity and equitable familial, social, health, and educational opportunities that support common human aspirations. The drama-

tizations are thus grounded in the internationally endorsed human values codified in United Nations covenants and resolutions. The dramatized options and consequences enable people to make informed choices to improve their lives.

ELEMENTS OF DRAMATIC SERIALS

Social Modeling

There are four basic principles guiding the construction of the dramatic serials. The first principle enlists the power of social modeling for personal and social change. Culturally admired television models exhibit the beneficial styles of behavior. Social attraction increases the impact of modeling influences. Characters representing different segments of the population are shown adopting the beneficial attitudes and behavior patterns. Seeing people similar to themselves change their lives for the better not only conveys strategies for how to do it, but raises viewers' sense of efficacy that they too can succeed. Viewers come to admire and are inspired by characters in their likenesses who struggle with difficult obstacles and eventually overcome them.

Three types of contrasting models are used to highlight the personal and social effects of different patterns of behavior. The episodes include positive models portraying beneficial lifestyles. Other characters personify negative models exhibiting detrimental views and lifestyles. Transitional models are shown transforming their lives by discarding adverse styles of behavior in favor of beneficial ones. Viewers are especially prone to draw inspiration from, and identify with, transforming models by seeing them surmount similar adverse life circumstances.

Vicarious Motivators

The second feature of the dramatic productions enlists vicarious motivators as the incentive for change. Unless people see the modeled lifestyle as improving their welfare they have little incentive to adopt it. The personal and social benefits of the favorable practices, and the costs of the detrimental ones are vividly portrayed. Depicted beneficial outcomes instill outcome expectations that serve as positive incentives for change.

Showing models discarding subservient roles and challenging inequitable dated norms requires depiction of some negative reactions to reflect the social reality. These discordant episodes serve to model strategies for managing such events successfully. Viewers come to believe they can improve the quality of their lives by similar means used perseveringly. Many

efficacy-enhancing elements are incorporated in the transactional episodes. For example, in reducing gender inequities, some of the story lines depict women who struggle for more opportunities and rights for women in ways that improve their life conditions. Occasional references to accomplished women worldwide working to raise the status of women provide also a source of inspiration and support.

Efforts at social change typically challenge power relations and entrenched societal practices. Successes do not come easy. To change their lives for the better, people have to contest dated traditions and normative constraints. For example, managing sexual and reproductive life requires managing emotionally charged relationships embedded in power relations (Bandura, 1994). In societies with gendered power imbalances, women who want to limit childbearing have difficulty talking to their husbands about contraceptive methods. The challenge is to enable women to discuss family planning and to provide them with the social supports to do so. However, the major burden for contraception should not fall solely on women.

Efforts at change must address sociocultural norms and practices at the social system level. Because of the centrality of perceived efficacy in people's lives, media productions help to raise people's beliefs that they can have a hand in bringing about changes in their lives. For example, in a radio serial drama in Tanzania, many women believed they had no control over family size. It was predetermined divinely, by fate or by forces beyond their control. The drama raised viewers' perceived efficacy to manage their reproductive life through family planning (Rogers, Vaughan, Swalehe, Rao, Svenkerud, & Sood, 1999).

People must be prepared for the obstacles they will encounter by modeling prototypic problem situations and effective ways of overcoming them. There are several ways of building resilience to impediments through social modeling. People are taught how to manage setbacks by modeling how to recover from failed attempts. They are shown how to enlist guidance and social support for personal change from self-help groups and other agencies in their localities. Seeing others similar to themselves succeed through perseverant effort also boosts staying power in the face of obstacles.

Attentional and Emotional Engagement

To effect changes serial dramas have to attract and maintain regular viewership. A third principle guiding the creation of the dramatic productions concerns the attentional and emotional engagement of viewers. There are several elements that serve this purpose. The most powerful one is functional relevance. The dramas mirror the realities of people's everyday lives, the impediments with which they struggle, and model ways by which they can enhance their personal development and improve their life conditions. Per-

sonally relevant story lines with functional modeling command attention and high interest. Melodramatic embellishments of engrossing plot lines with emotive musical accompaniments give further dramatic intensity to the episodes. Ongoing engagement in the evolving lives of the models provide numerous opportunities to learn from them and to be inspired by them.

Unlike brief exposures to media presentations, that typically leave most viewers untouched, extended dramatizations that reflect viewers' life experiences, get people deeply involved in the lives of the models and attached to them. In India, 400,000 viewers sent letters supporting, advising, or criticizing the various models in the drama. In a serial in Tanzania, women spotted a negative model at a market and drove him out under a rain of tomatoes and mangos. In Brazil, 10,000 people showed up for a virtual filming of a marriage of two of the characters in a serial drama.

Environmental Supports

It is of limited value to motivate people to change if they are not provided with appropriate resources and environmental supports to realize those changes. Enlisting and creating environmental supports is an additional and especially helpful feature for promoting personal and social change. To foster large-scale changes, the dramatic productions are designed to operate through two pathways (Fig. 3.1). In the direct pathway, the serials promote changes by informing, enabling, motivating, and guiding viewers. In the socially mediated pathway, media influences are used to connect viewers to social networks and community settings. These places provide continued personalized guidance, as well as natural incentives and social supports for desired changes. The major share of behavioral and valuational changes are promoted within these social milieus.

People are socially situated in interpersonal networks. When media influences lead viewers to discuss and negotiate matters of import with others

DUAL PATH OF INFLUENCE

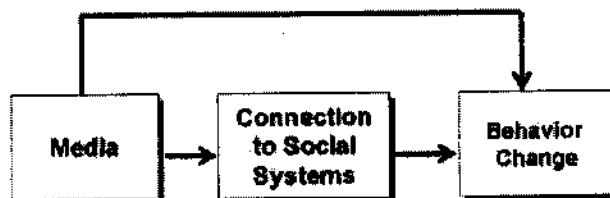


FIG. 3.1. Paths of influences through which communications affect psychosocial changes both directly and via a socially mediated pathway by linking viewers to social networks and community settings. From Bandura (2002a).

in their lives, the media set in motion transactional experiences that further shape the course of change. The socially mediated influences can have a stronger impact than the direct media influence.

Epilogues, often presented by culturally celebrated figures, provide contact information to relevant community services and support groups. For example, women who are challenging stifling traditions are provided with information about service centers and organizations that can help support their efforts. A serial drama in Mexico to promote enrollment in a national literacy program enlisted a popular actor to inform viewers about the program and to encourage them to take advantage of it. On the day after the epilogue about 25,000 people descended on the distribution center in downtown Mexico City to obtain the primers.

These socially enabling dramas are not soap operas in which arrays of characters are endlessly entangled in unseemly conflicts and moral predicaments laced with interpersonal treachery. Nor are they superficial media campaigns marketing quick fixes to intractable social problems. Rather, the sociocognitive genre dramatizes the everyday social problems with which people struggle, models realistic solutions, and provides people with incentives, support, and strategies for bettering their lives. In audience surveys, viewers report the many ways in which the characters in the dramas touch their personal lives. As an Ethiopian viewer explained the relevance and functional value of the realistic dramatizations, "I'm seeing my life in this story. My behavior really changed because of information which is helpful for my life." Functional relevance makes these serials immensely popular. In short, both genres involve storytelling but they tell entirely different types of stories serving markedly different purposes.

The sociocognitive dramatizations are not aimed at simply changing attitudes, which often bear weak relation to behavior. When self-interest conflicts with personal attitudes, people readily find reasons not to act on their attitudes that justify exemptions to them. As previously noted, the dramatizations serve more powerful functions. They inform, enable, guide, and motivate people to effect changes in their lives. The dramatizations further assist people in their efforts at personal and social change by linking them to enabling and supportive subcommunities and beneficial human services.

These serial dramas are also not "family planning" programs foisted on the women of poor nations by powerful outsiders. This communications approach addresses the problem of mounting population growth and possible solutions in broader human terms. In many societies women are treated more like property than persons, denied equitable access to education, forced into prearranged marriages, and granted little say in their reproductive lives. Therefore, one of the central themes in the dramatizations is aimed at raising the status of women so they have equitable access to educational and social opportunities, have a voice in family decisions about

child bearing, and serve as active partners in their familial and social lives. This involves raising men's understanding of the legitimacy of women making decisions regarding their reproductive health and family life. Moreover, the engrossing programs serve as an excellent vehicle for modeling a variety of functional life skills woven into the familial and social transactions.

Model

GLOBAL APPLICATIONS OF THE SOCIOCOGNITIVE

Many worldwide applications of the sociocognitive model in Africa, Asia, and Latin America are promoting personal and society-wide changes that better the lives of millions of people (Bandura, 2002; Singhal, Cody, Rogers, & Sabido, 2004). Some of these applications and formal evaluations of their effects are presented in the section that follows.

Promoting National Literacy

Literacy is vital for personal and national development. To reduce widespread illiteracy, the Mexican government launched a national self-study program. People who were skilled at reading were urged to organize small self-study groups in which they would teach others how to read with primers specifically developed for this purpose. So Sabido created a year-long serial with daily episodes to reach, enable, and motivate people with problems of illiteracy. The main story line in the dramatic series centered on the engaging and informative experiences of a self-study group. The implementation model involved creative translation of social cognitive theory into practice. A popular soap opera performer was cast in the role of the literate model, to take advantage of prestigious modeling. To enhance the impact of modeling through perceived similarity, she recruits a cast of characters who represent the different segments of the population with problems of illiteracy. Showing people similar to themselves mastering linguistic skills helps to persuade viewers that they too possess the capabilities to master the skills that were being modeled. The serial portrayed collective mastery of competencies and the accompanying benefits.

A prior interview survey revealed several personal demotivating barriers that dissuaded people from enrolling in the national literacy program. These impeding beliefs centered on perceived self-efficacy, critical period constraints, and personal worthiness. Many believed that they lacked the capabilities to master such a complex skill. Others believed that reading skills could be acquired only when one is young. Still others felt that they were unworthy of having an educated person devote their time to help them. These self-handicapping misbeliefs were modeled by the various ac-

tors and corrected by the instructor as she persuaded them they possessed the capabilities to succeed. The televised episodes included humor, conflicts, and engrossing discussions of the subjects being read. They portrayed the characters struggling in the initial phases of learning, and then gaining progressive mastery with self-pride in their accomplishments.

To provide vicarious motivators to pursue the self-education program, the dramatic series depicted the substantial benefits of literacy both for personal development and for national efficacy and pride. Melodramatic embellishments and emotive music gave dramatic intensity to the episodes to ensure high viewer involvement.

Epilogues were used to increase memorability of the modeled messages. To facilitate media-promoted changes, the educational agency made the primers easily available. In addition, the series often used real-life settings showing the actors obtaining the primers from an actual distribution center and eventually partaking in a graduation ceremony for actual enrollees. Epilogues also informed the viewers of the national self-study program and encouraged them to take advantage of it. As previously noted, what a powerful motivator it turned out to be.

Millions of viewers watched this series faithfully. Compared to non-viewers, viewers of the dramatic series were much more informed about the national literacy program and expressed more positive attitudes about helping one another to learn. As shown in Fig. 3.2, enrollment in the literacy program was relatively low in the year before the televised series, but rose abruptly during the year of the series.

As people develop a sense of efficacy and competencies that enable them to exercise control over their lives, they serve as models, inspiration, and even tutors for others in the circles in which they travel. This concomitant socially mediated influence can vastly multiply the impact of televised modeling. In the year following the televised series, another 400,000 people enrolled in the self-study literacy program. Through the socially mediated path of influence, televised modeling can set in motion an ever-widening, reverberating process of social change.

The lead model had difficulty getting movie roles because she was considered insufficiently attractive. The serial drama brought her national fame, movie roles, and political power. She became a leading political figure in the more liberally oriented party.

Environmental Sustainability by Stemming Population Growth

Soaring population growth is wreaking havoc with the global environment, depleting natural resources, degrading the quality of life, and overwhelming efforts at social and economic development. The current world

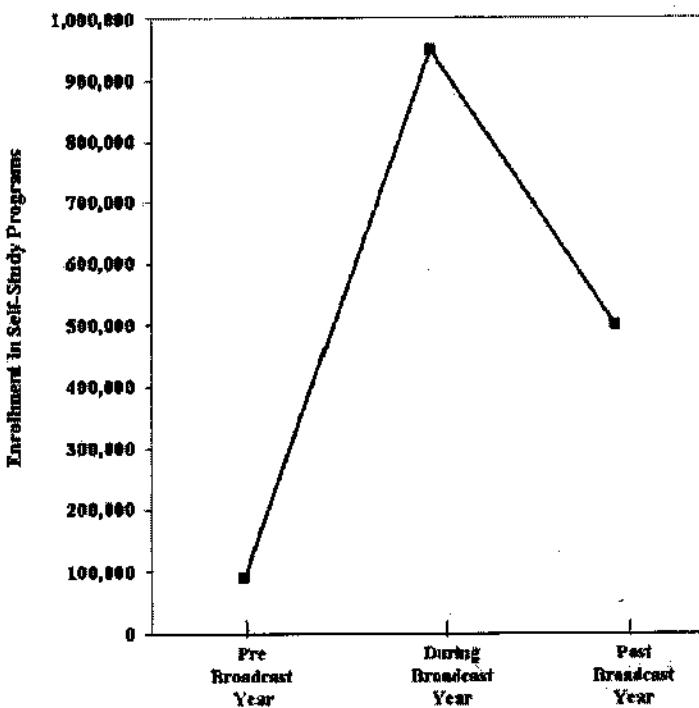


FIG. 3.2. Enrollments in the national literacy program in the year prior to, during, and following the televised serial drama. Drawn from data in Sabido (1981).

population is 6 billion and projected to increase by 50% to 9 billion within the next 50 years. Population growth has stabilized in the more developed nations, but is soaring in the less developed ones (Fig. 3.3). The massive population encumbrance underscores the need to accelerate the types of psychosocial changes that are critical to the reduction of fertility rates and to the promotion of consummatory lifestyles that ensure the sustainability of the environment.

Unless people see family planning as improving their welfare, they have little incentive to adopt it. Sabido (1981) developed a series of serial dramas in Mexico to check the cycle of poverty exacerbated by a high rate of unplanned childbearing. Through modeling with accompanying outcomes, the dramas portrayed the process as well as the personal, social, and economic benefits of family planning. The positive family life of a small family, whose wife worked in a family planning clinic, was contrasted with that of a married sister overburdened with a huge family living in impoverishment and misery.

Much of the drama focused on the married daughter from the huge family, who was beginning to experience severe marital conflicts and distress

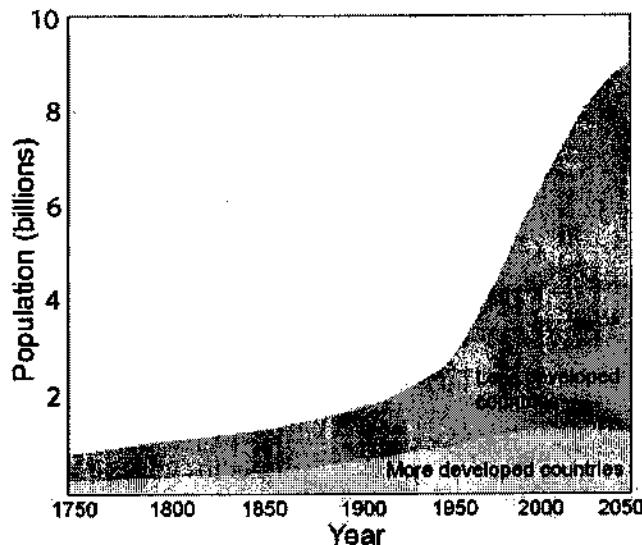


FIG. 3.3. Population growth in developed and less developed countries.

over a rapidly expanding family. She served as the transitional model, living in her parents' despairingly crowded and impoverished environment. In dramatic scenes she expresses emotionally her desire for a voice in her family life, to cease having more babies, and to break the cycle of poverty that will condemn her family to an inner-city slum without ability to care adequately for her children. She turns to her aunt for help, which serves as the vehicle for modeling a great deal of information about how to manage marital discord and machismo behavior, how to deal with male resistance to contraception and family planning, how to communicate openly in the family, and how to escape the many problems caused by a family overburdened with children.

As the drama unfolds, the young couple is shown gaining control over their family life and enjoying the accruing benefits with the help of a family planning center. A priest occasionally appeared in the dramas, emphasizing the need for responsible family planning by limiting the number of offspring to those the family can afford to raise adequately. At the end of some of the programs, viewers were informed in epilogues about existing family planning services to facilitate media-promoted changes.

Compared to nonviewers, heavy viewers of the dramatic serial (Sabido, 1981) were more likely to link lower childbearing to social, economic, and psychological benefits. They also developed a more positive attitude toward helping others plan their family. Records of the family planning centers revealed a 32% increase in the number of new contraceptive users over

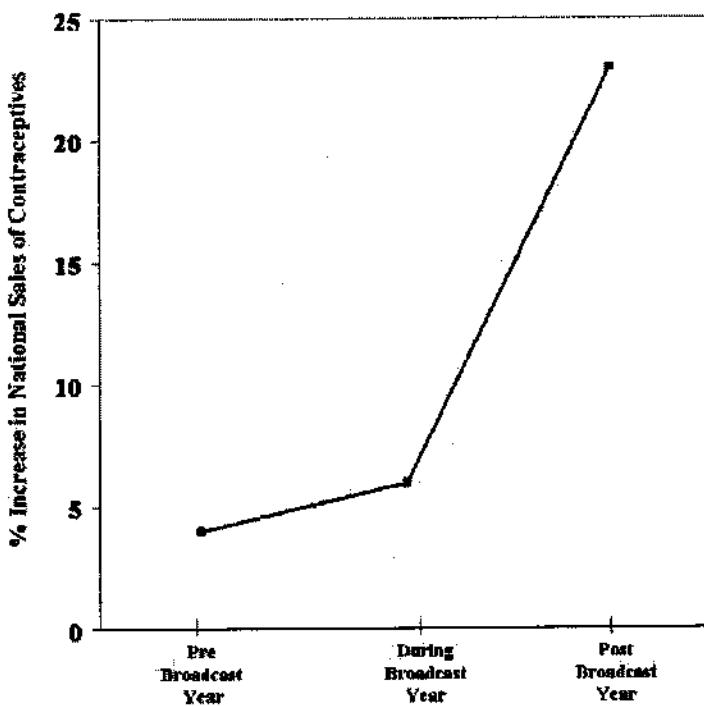


FIG. 3.4. National sales of contraceptives in the two years preceding the serial drama promoting family planning and during the year it was broadcast. Drawn from data in Sabido (1981).

the previous year before the series was televised. People reported that the television portrayal served as the impetus for consulting the health clinics. National sales of contraceptives rose from 4% and 7% in the preceding two baseline years to 23% in the year the program was aired (Fig. 3.4).

Generalization Through Functional Adaptation to Cultural Practices

Applications in India and Kenya illustrate its generalizability of the socio-cognitive model through functional tailoring to diverse cultural practices. Efforts to bring down the rate of population growth must address not only the strategies and benefits of family planning, but also the role and status of women in societies in which they are treated subserviently. In some societies, the equity problems stem from machismo dominance; in others, from marriage and pregnancy at the onset of puberty with no say in the choice of husband or the number and spacing of children; and in still others from dispossession by polygamous marriages. In some societies, women are subju-

gated to the point where they are repeatedly beaten and are not even allowed to turn on a family radio.

The television program in India was designed to raise the status of women, as well as to promote a smaller family norm. It addressed a variety of themes about family life in the context of broader social norms and practices (Singhal & Rogers, 1999). The subthemes devoted particular attention to family harmony amidst differences among family members, elevation of the status of women in family, social, and economic life, educational opportunities, career options for women, son preference, gender bias in child rearing, the detriment of dowry requirement, choice in spouse selection, teenage marriage and parenthood, spousal abuse, family planning to limit family size, youth delinquency, and community development. Some of the characters personified positive role models for gender equality; others were proponents of the traditional subservient role for women. Still others were transitional models. A famous Indian film actor reinforced the modeled messages in epilogues.

The melodramatic series was immensely popular, enjoying top viewership on television and a massive outpouring of letters in the hundreds of thousands from viewers offering advice and support to the characters. A random sample of viewers reported they had learned from the program that women should have equal opportunities and a say in decisions that affect their lives, programs advancing the welfare of women should be encouraged, cultural diversity should be respected, and that family size should be limited. The more aware viewers were of the messages being modeled, the greater was their support of women's freedom of choice in matters that affect them and of planning for small families (Brown & Cody, 1991; Singhal & Rogers, 1999).

Intensive interviews with villagers revealed that dramatizations sparked serious public discussions about the broadcast themes concerning child marriages, dowry requirements, education of girls, the benefits of small families, and other social issues (Papa et al., 2000). These social transactions went beyond talk to collective community action aimed at changing inequitable normative practices and improving their social future. Indeed, one village sent to the broadcast center a large poster letter signed by its inhabitants stating that they will work to eradicate the practice of dowry, child marriages, and support the education of daughters. The enrollment of girls in elementary and junior high schools rose from 10% to 38% in one year of the broadcasts.

There are many impediments to sociocultural change, but their force weakens over time as new practices gain support and collective benefits outweigh the social costs of harmful traditional practices. In another village young boys and girls created a self-help action group to promote the changes modeled in the serial drama (Law & Singhal, 1999). The system-level effects il-

lustrate how dramatizations that address the social problems that people face in enabling ways can spawn the development of collective efficacy.

In a radio serial drama in India, with a listenership of about 25 million, a mother challenges restrictive cultural norms for her daughter Taru and promotes her education, Taru inspired ardent teenage listeners who had no access to education to become avid readers and raise their academic aspirations. Four of the teenage girls started a school for a large group of poor children in classes held regularly around the village water well. One of the mothers of the teenagers also began a school for illiterate women. The teenagers fight against gender and class discrimination and early forced marriages. Their efforts produce changes in community norms. The elders in the community acknowledge the need to alter their social practices to fit the changing times. Parents begin to relax restrictive norms for their daughters. One of the teenagers explained the power of enabling modeling to inspire listeners to work for social change: *"When Taru and her mother can fight harsh circumstances, why can't we?"* Another teenager describes poetically her revered model transformed her life: *"Before Taru there was darkness. Now there is light."*

Land ownership is highly valued in Kenya. A major story line in the serial drama revolved around the inheritance of land and the impoverishing effect of large families. The contrast modeling involves two brothers, one of whom has a wife, a son, and several daughters, whereas the other brother has multiple wives, nine sons, and even more daughters. They squabble over how to pass on the inherited family farm to the next generation. In Kenya, only sons can inherit property. The monogamous brother argues that his lone male heir is entitled to half the land, the polygamous brother insists on dividing the farm into 10 small plots. In another concurrent story line a teacher pleads with parents, who want their young daughter to quit school, be circumcised, and married off to an arranged partner, to allow her to continue her education which she desperately desires.

The serial drama, which was broadcast via radio to reach rural areas, attracted 40% of the Kenyan population each week as the most popular program on the air. Contraceptive use increased by 58%, and desired family size declined 24%. A survey of women who came to health clinics reported that the radio series helped to persuade their husbands to allow them to seek family planning. Quantitative analyses including multiple controls for possible determinants (Westoff & Rodriguez, 1995). These controls include life-cycle status, number of wives and children, and a host of socioeconomic factors such as ethnicity, religion, education, occupation, and urban-rural residence.

The impact of media exposure on adoption and consistent use of new methods of contraception is shown in Fig. 3.5. The media effect remained after applying the multiple controls. Evidence that the social impact of the dramatizations is enhanced with increased exposure to them sheds further

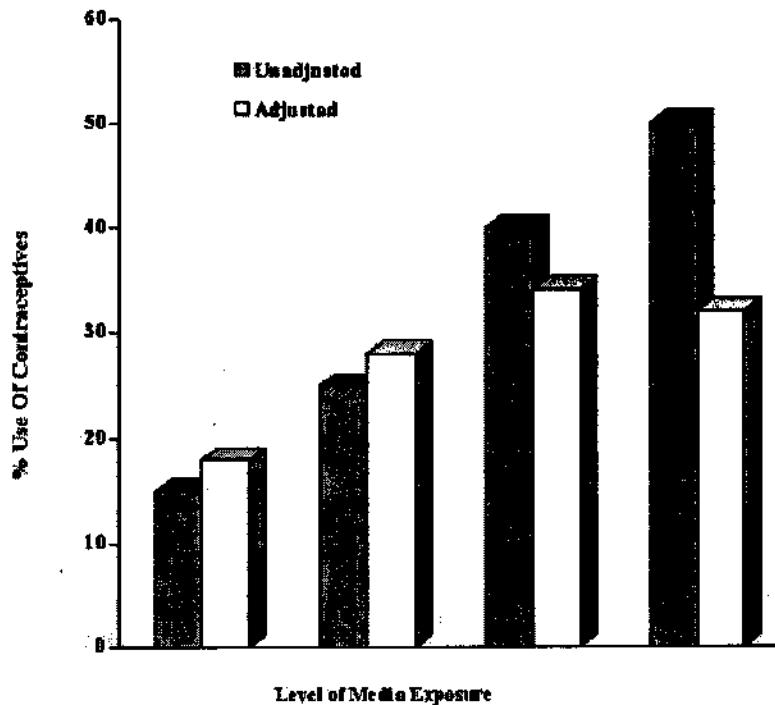


FIG. 3.5. Percentage of women adopting contraceptive methods depending on the amount of exposure to family planning communications in the media. The white bars report the level of contraceptive use after controlling for the women's demographic and socioeconomic characteristics and a host of other potential determinants. From Westoff and Rodriguez (1995).

light on functional efficacy. Internal analyses of evaluation surveys further revealed that the media influence was a major factor in raising motivation to limit birthrate and adopt contraception practices.

Countries containing regions with separate transmitters provide a natural control group. Under these conditions, the serial dramas can be aired in one region with another serving as a control. Following the formal evaluation, the serial can be aired in the control region and its effects measured. Tanzania provided a unique opportunity to conduct this type of field experiment because it contains regions with separate broadcasting transmitters. The population of Tanzania is 36 million, the fertility rate is 5.6 children per woman, and the doubling time for the population at the current rate is 25 years.

The serial drama was broadcast by radio in one major region of the country and the other region served as the control. The program targeted both family planning and sexual practices that increase vulnerability to infection with the AIDS virus. Although, at the outset, the populace was well

informed about contraception and AIDS prevention and were favorably disposed toward such practices, they did not translate these attitudes into action. The problem was neither informational nor attitudinal, but motivational. The dramatic series provided the impetus for change.

Compared to the control region, the serialized dramatizations raised viewers' perceived efficacy to determine their family size, decreased the desired number of children, increased the ideal age of marriage for women, increased approval of family planning methods, stimulated spousal communication about family size, and increased use of family planning services and adoption of contraceptive methods.

Figure 3.6 shows the mean number of adopters of contraceptive methods per clinic over time in the broadcast and control regions. Both regions increased slightly at the same rate during the prebroadcast period. The adoption rate increased only slightly in the control region but at an abrupt pronounced rate in the broadcast region. These effects were replicated when the serial was later broadcast in the control region. The replicated effects

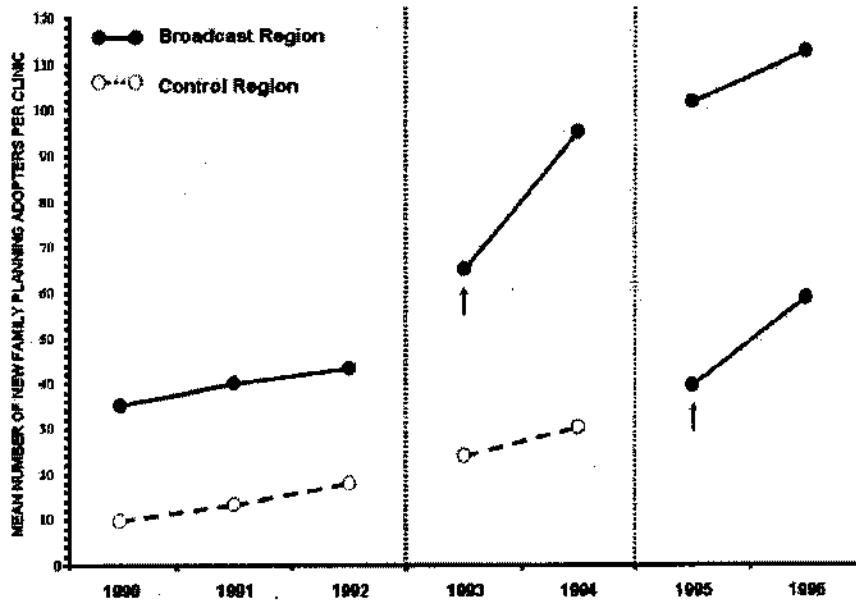


FIG. 3.6. Mean number of new family planning adopters per clinic in the ministry of Health Clinics in the broadcast region and those in the control region. The values left of the dotted line are adoption levels prior to the broadcast; the values between the dotted lines are adoption levels when the serial was aired in the broadcast region but not in the control region; the values to the right of the dotted line are the adoption levels when the serial was aired in both the broadcast region and previous control region. Drawn from data in Rogers et al. (1999).

provide further support for a genuine conditional relation. The fertility rate declined more in the 2-year period of the serial dramas than in the previous 30 years without any change in socioeconomic conditions and little change in death rate (Vaughan, 2003).

As in the Kenya findings, the more often people listened to the broadcasts, the more the married women talked to their spouses about family planning and the higher the rate of adoption of contraceptive methods (Fig. 3.7). These diverse effects remained after multiple controls for other potential determinants, including exposure to other radio programs with family planning and AIDS contents, prebroadcast levels and changes in education, increased access to family planning clinics, radio ownership, and rural-urban differences.

Seventeen segments were included to prevent the spread of the AIDS virus. A particular problem was the transmission of AIDS heterosexually by long-distance truckers at truck stop hubs with hundreds of prostitutes. About 60% of them are infected, and about one third of the truck drivers are also infected. The common belief was that AIDS is transmitted by mosquitoes. Some of the males believed that condoms caused infection and that having sexual intercourse with a virgin would cure AIDS. The program quickly debunked the false beliefs.

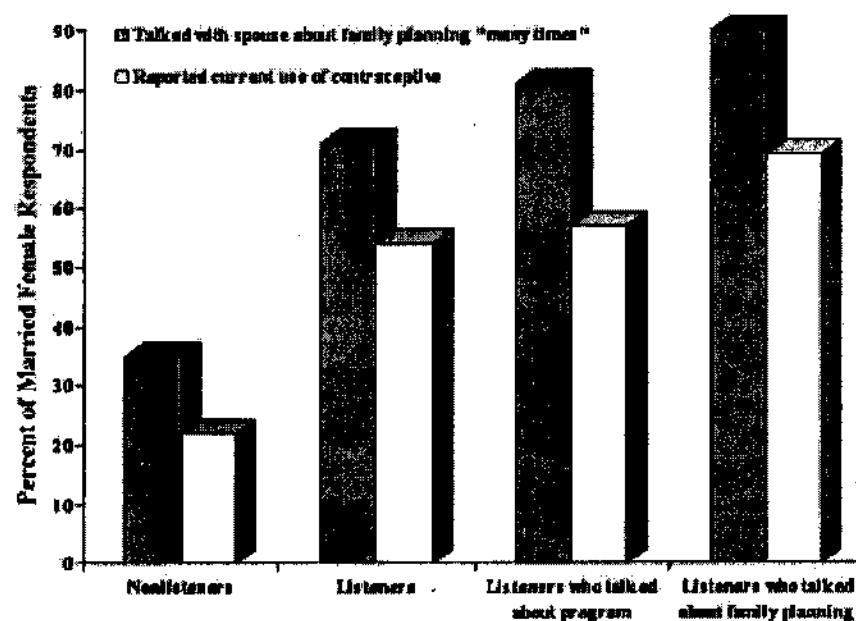


FIG. 3.7. Impact of degree of involvement in the serial drama on women's spousal discussion of family planning and use of contraceptive methods. From Rogers et al. (1999).

helps her to lead work to support her family

In the contrast modeling, the negative trucker engages in risky sex with multiple partners; the positive model adopted safer sex practices and cut back on the number of partners; and a transitional model begins with risky practices but adopts safer ones. The truckers using the safer practices try unsuccessfully to talk their friend into changing his risky ways. He refuses. His wife fears that she will get infected. The community ~~pools its resources~~ to ~~set up the wife in a business~~. She leaves her husband who eventually gets infected and dies of AIDS.

Compared to residents in the control region, those in the broadcast region increased belief in their personal risk of HIV infection through unprotected sexual practices, talked more about HIV infection, reduced the number of sexual partners, and increased condom use (Vaughan, Rogers, Singhal, & Swalehe, 2000). The number of condoms distributed annually by the National AIDS program remained low in the control region, increased substantially in the broadcast region, and increased significantly in the control region after exposure later to the broadcast.

China is the most populous nation in the world facing a projected doubling of its current population to the two billion mark in about 70 years. This enormous population growth will have devastating effects on ecological systems. Urban areas have achieved replacement level fertility, but the inhabitants in rural areas continue to have large families. The Chinese one-child policy heightens the traditional cultural preferences for sons. The serial drama addressed the discriminatory gender bias in the society, and fostered psychosocial changes to supplant coercive institutional controls on fertility with voluntary adoption of contraceptive practices and preferences for small families.

This televised serial drama, that has won numerous prestigious awards, addressed a variety of societal issues. These include, girls' education, arranged marriages, coerced pregnancy, son preference, and women's self-determination. The dramatizations graphically portray the tragedy and injustice of social practices that force women into arranged marriages they do not want and bearing baby girls who are culturally devalued.

The central theme is aimed at altering discriminatory gender norms and practices in the society. Societies are undergoing a historic transition to the information era. It is supplanting brawn with intellect in modern work life. At times of transformative change, there is a mismatch or structural lag between dated normative practices and contemporary social reality. The serial dramas show how educated daughters and not just sons can be productive providers. The drama tries to foster a better normative match to the challenges and opportunities of this new era.

In this drama a father is desperate to receive a dowry payment, so he can buy a bride for his son, his pride and joy. He demands that his daughter agree to an arranged marriage, to an arrogant man of means. She resists be-

cause she is in love with a musician of modest means. But to spare her younger sister, who the father targets next, she eventually agrees to the arranged marriage.

As the wedding procession is going down the river, her boyfriend is running along the river bank shouting to her, and playing a tune he played when they first met. Her husband is enraged by the boyfriend's intrusion. He kicks out the guests after the wedding ceremony and rapes her. She finds herself trapped in a miserable marriage with an abusive husband. As the story unfolds, she gives birth to a female infant. He demands she get pregnant again to bear him a son. She leaves him, remarries, and pursues a successful career.

Viewers were inspired and strengthened by the determination and courage of female characters who challenge the subordinate status of women, and who strive to change detrimental cultural practices. The central figure in this serial has become a highly admired national model for raising the valuation of women and expanding opportunities for them to become active participant in the social and economic life of Chinese society.

Applications of the sociocognitive model have yielded positive results in diverse cultural milieus and across spheres of functioning. The dramatic serials are an extraordinarily effective vehicle for reaching vast numbers of people over a prolonged period. Viewers get deeply involved in the lives of the televised characters and are inspired by them to take steps that can improve their lives. Radio versions of the serial dramas can reach vast rural populations. Airing of the televised serials is typically followed by an increase in the status of women, preference for smaller families, and adoption of contraceptive methods and self-protection against sexually transmitted diseases. The strength of the social impact increases as a function of level of exposure to the broadcasts. The more that people watch a media program, the more they talk about the issues that are aired, the more supportive they are of gender equality, the higher their perceived efficacy to regulate their reproductive behavior, and the more likely they are to adopt contraceptive methods. Societies with a burgeoning population need not, nor can afford to wait until they become economically prosperous to bring birthrates down. Indeed, nations cannot achieve much national progress until they bring their population growth under control.

Extensions of the Sociocognitive Model Through Storytelling

The sociocognitive model using storytelling as the vehicle of change lends itself readily to creative spinoffs and extensions. Diverse modes of influence expand their reach and mutually reinforce their impact. For example, to curtail the transmission of HIV infection spread heterosexually in Ethio-

pia by long-distance truckers, PMC created a 24-episode serial drama centered on this theme. The audiocassettes were distributed to truck drivers and commercial sex workers (Ryerson & Teffera, 2004). Mobile stage dramas, that reach millions of people in all walks of life, reinforce the themes highlighted in the national radio serial. PMC has assisted in creating significant social themes that can be easily incorporated into popular, prime-time telenovas on TV Globo which, dubbed in different languages, reach about 900 million people worldwide. The themes center on diverse issues, such as gender relations, marital conflict, domestic violence, reproductive health, contraception, risky sexual behavior, homosexuality, and adolescent sexuality (Fig. 3.8).

To reach teenagers, PCI created radio minidramas that speak to matters of concern to them. Each program in this radio series, which is aired weekly, begins with a street poll of adolescents that frames the relevant topic. It is then explored in a brief minidrama that helps listeners to make informed choices for healthier and safer lives. The minidrama is followed by listener call-ins where invited guests provide further guidance and referrals on where to go for additional information and help. The programs, which enjoy high popularity, are written, produced, and hosted by youth. The episodes address such issues as drug abuse, teenage sexuality and

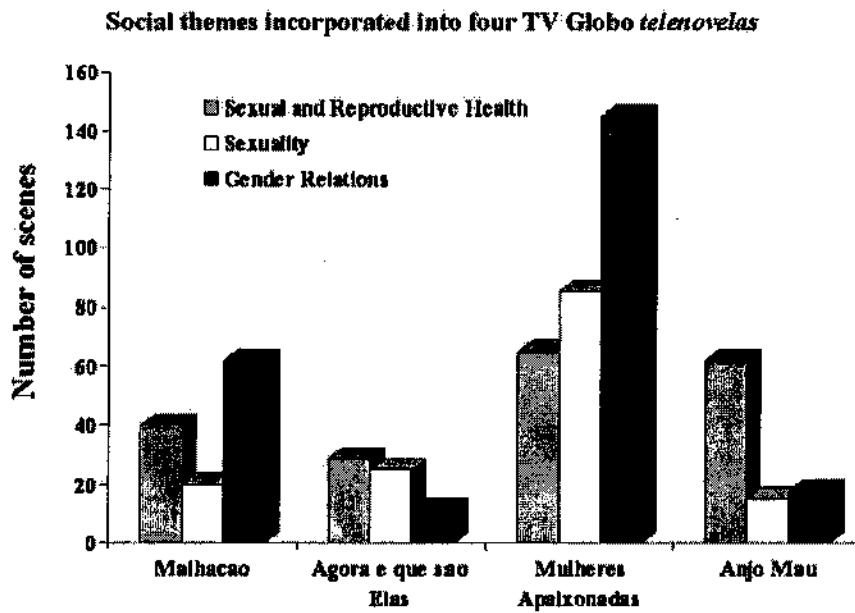


FIG. 3.8. Number of social themes incorporated in prime-time *telenovelas* broadcast by TV Globo aired in Rio de Janeiro. From Ryerson (2004).

pregnancy, disease prevention, violence, and other psychosocial issues of concern to teenagers.

Sabido (2004) has created an Internet-based model to address vexing societal problems in a timely fashion as they appear in national headlines. Brief photo dramas are used as the vehicle for this purpose. They include brief engrossing dramatizations of the problems in still photographs with hyperlinks to the social context of a current problem, its historical roots, current causes, various effects, and possible alternative solutions. For example, in response to a rash of anti-Semitism, the dramatization depicts a woman in deep conflict over her husband's involvement in anti-Semitic activities. She seeks the help of her priest. Viewers are linked to information about the Holocaust, conditions that spawn anti-Semitism, and how to deal with the problem both in the family and at the societal level. This is a highly flexible and convenient vehicle for addressing societal problems as they arise and helping people on how to deal with them.

Modification of Consummatory Lifestyles

Environmental degradation is affected not only by population size, but also by the level of consumption, and the damage to the ecosystem caused by the technologies used to supply the consumable products (Ehrlich, Ehrlich, & Daily, 1995). There are limits to the earth's carrying capacity. The global ecosystem cannot sustain burgeoning populations and high consumption of finite natural resources. The sociocognitive model lends itself readily to other types of lifestyle changes, such as environmental conservation and consummatory practices to promote environmental sustainability. For example, an Indian serial drama, that centered on environment preservation, motivated villagers to take collective action to improve sanitation, reduce potential health hazards, adopt fuel conservation practices to reduce pollution, and launch a tree-planting campaign (Papa et al., 2000). They persuaded other villages to institute similar environmental practices.

If people are to make decisions supportive of sustained development, they need to be informed of the ecological costs of their consummatory practices and enabled and motivated to turn enlightened concern into constructive courses of action. This change is best achieved through multiple modes of communication (Singhal & Rogers, 1999). Many of the lifelong consummatory habits are formed during childhood years. It is easier to prevent wasteful practices than to try to change them after they have become deeply entrenched as part of a lifestyle.

To address the environmental problems created by overconsumption, PCI produced a video, *The Cost of Cool*, for distribution to schools that focuses on the buying habits of teenagers (PCI, 2000). It tracks the ecological costs of the manufacture of everyday items such as T-shirts and sneakers.

Providing teenagers with sound information helps them make informed choices in their buying habits. As one viewer put it, "I'll never look at a T-shirt in the same way." Popular entertainment formats, such as music concerts, recordings, and videos, provide another vehicle for reaching mass youth populations. The themes address critical social issues, substance abuse, violence, teen sexuality, and gender equality. The impact of these complimentary approaches requires systematic evaluation. The increasing magnitude of the environmental problem calls for multifaceted efforts to alter behavioral practices that degrade the ecological supports of life.

Concluding Remarks

The research cited in this chapter provides convergent evidence from diverse cultural milieus, adaptational themes, and domains of functioning, methodologies, multiple controls for a host of other potential determinants, and multifaceted forms of assessments. The findings attest to the social utility of the sociocognitive communication model for effecting personal and social change grounded in internationally endorsed human values with sensitive adaptations to cultural diversity.

We enjoy the benefits left by those before us who collectively fought for social reforms that improved our lives. Our own collective efficacy will shape how future generations live their lives. The times call for social initiatives that enable people to play a part through their collective voice in bettering the human condition.

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