

IMITATION OF FILM-MEDIATED AGGRESSIVE MODELS¹

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In a test of the hypothesis that exposure of children to film-mediated aggressive models would increase the probability of Ss' aggression to subsequent frustration, 1 group of experimental Ss observed real-life aggressive models, a 2nd observed these same models portraying aggression on film, while a 3rd group viewed a film depicting an aggressive cartoon character. Following the exposure treatment, Ss were mildly frustrated and tested for the amount of imitative and nonimitative aggression in a different experimental setting. The overall results provide evidence for both the facilitating and the modeling influence of film-mediated aggressive stimulation. In addition, the findings reveal that the effects of such exposure are to some extent a function of the sex of the model, sex of the child, and the reality cues of the model.

Most of the research on the possible effects of film-mediated stimulation upon subsequent aggressive behavior has focused primarily on the drive reducing function of fantasy. While the experimental evidence for the catharsis or drive reduction theory is equivocal (Albert, 1957; Berkowitz, 1962; Emery, 1959; Feshbach, 1955, 1958; Kenny, 1952; Lövaas, 1961; Siegel, 1956), the modeling influence of pictorial stimuli has received little research attention.

A recent incident (San Francisco Chronicle, 1961) in which a boy was seriously knifed during a re-enactment of a switchblade knife fight the boys had seen the previous evening on a televised rerun of the James Dean movie, *Rebel Without a Cause*, is a dramatic illustration of the possible imitative influence of film stimulation. Indeed, anecdotal data suggest that portrayal of aggression through pictorial media may be more influential in shaping the form aggression will take when a person is instigated on later occasions, than in altering the level of instigation to aggression.

In an earlier experiment (Bandura &

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Huston, 1961), it was shown that children readily imitated aggressive behavior exhibited by a model in the presence of the model. A succeeding investigation (Bandura, Ross, & Ross, 1961), demonstrated that children exposed to aggressive models generalized aggressive responses to a new setting in which the model was absent. The present study sought to determine the extent to which film-mediated aggressive models may serve as an important source of imitative behavior.

Aggressive models can be ordered on a reality-fictional stimulus dimension with real-life models located at the reality end of the continuum, nonhuman cartoon characters at the fictional end, and films portraying human models occupying an intermediate position. It was predicted, on the basis of saliency and similarity of cues, that the more remote the model was from reality, the weaker would be the tendency for subjects to imitate the behavior of the model.

Of the various interpretations of imitative learning, the sensory feedback theory of imitation recently proposed by Mowrer (1960) is elaborated in greatest detail. According to this theory, if certain responses have been repeatedly positively reinforced, proprioceptive stimuli associated with these responses acquire secondary reinforcing properties and thus the individual is predisposed to perform the behavior for the positive feedback. Similarly, if responses have been negatively reinforced, response correlated stimuli acquire the capacity to arouse anxiety which, in turn, inhibit the occurrence of the negatively valenced

behavior. On the basis of these considerations, it was predicted subjects who manifest high aggression anxiety would perform significantly less imitative and nonimitative aggression than subjects who display little anxiety over aggression. Since aggression is generally considered female inappropriate behavior, and therefore likely to be negatively reinforced in girls (Sears, Maccoby, & Levin, 1957), it was also predicted that male subjects would be more imitative of aggression than females.

To the extent that observation of adults displaying aggression conveys a certain degree of permissiveness for aggressive behavior, it may be assumed that such exposure not only facilitates the learning of new aggressive responses but also weakens competing inhibitory responses in subjects and thereby increases the probability of occurrence of previously learned patterns of aggression. It was predicted, therefore, that subjects who observed aggressive models would display significantly more aggression when subsequently frustrated than subjects who were equally frustrated but who had no prior exposure to models exhibiting aggression.

METHOD

Subjects

The subjects were 48 boys and 48 girls enrolled in the Stanford University Nursery School. They ranged in age from 35 to 69 months, with a mean age of 52 months.

Two adults, a male and a female, served in the role of models both in the real-life and the human film-aggression condition, and one female experimenter conducted the study for all 96 children.

General Procedure

Subjects were divided into three experimental groups and one control group of 24 subjects each. One group of experimental subjects observed real-life aggressive models, a second group observed these same models portraying aggression on film, while a third group viewed a film depicting an aggressive cartoon character. The experimental groups were further subdivided into male and female subjects so that half the subjects in the two conditions involving human models were exposed to same-sex models, while the remaining subjects viewed models of the opposite sex.

Following the exposure experience, subjects were tested for the amount of imitative and nonimitative aggression in a different experimental setting in the absence of the models.

The control group subjects had no exposure to

the aggressive models and were tested only in the generalization situation.

Subjects in the experimental and control groups were matched individually on the basis of ratings of their aggressive behavior in social interactions in the nursery school. The experimenter and a nursery school teacher rated the subjects on four five-point rating scales which measured the extent to which subjects displayed physical aggression, verbal aggression, aggression toward inanimate objects, and aggression inhibition. The latter scale, which dealt with the subjects' tendency to inhibit aggressive reactions in the face of high instigation, provided the measure of aggression anxiety. Seventy-one percent of the subjects were rated independently by both judges so as to permit an assessment of interrater agreement. The reliability of the composite aggression score, estimated by means of the Pearson product-moment correlation, was .80.

Data for subjects in the real-life aggression condition and in the control group were collected as part of a previous experiment (Bandura et al., 1961). Since the procedure is described in detail in the earlier report, only a brief description of it will be presented here.

Experimental Conditions

Subjects in the Real-Life Aggressive condition were brought individually by the experimenter to the experimental room and the model, who was in the hallway outside the room, was invited by the experimenter to come and join in the game. The subject was then escorted to one corner of the room and seated at a small table which contained potato prints, multicolor picture stickers, and colored paper. After demonstrating how the subject could design pictures with the materials provided, the experimenter escorted the model to the opposite corner of the room which contained a small table and chair, a tinker toy set, a mallet, and a 5-foot inflated Bobo doll. The experimenter explained that this was the model's play area and after the model was seated, the experimenter left the experimental room.

The model began the session by assembling the tinker toys but after approximately a minute had elapsed, the model turned to the Bobo doll and spent the remainder of the period aggressing toward it with highly novel responses which are unlikely to be performed by children independently of the observation of the model's behavior. Thus, in addition to punching the Bobo doll, the model exhibited the following distinctive aggressive acts which were to be scored as imitative responses:

The model sat on the Bobo doll and punched it repeatedly in the nose.

The model then raised the Bobo doll and pommelled it on the head with a mallet.

Following the mallet aggression, the model tossed the doll up in the air aggressively and kicked it about the room. This sequence of physically aggressive acts was repeated approximately three times,

interspersed with verbally aggressive responses such as, "Sock him in the nose . . .," "Hit him down . . .," "Throw him in the air . . .," "Kick him . . .," and "Pow."

Subjects in the Human Film-Aggression condition were brought by the experimenter to the semi-darkened experimental room, introduced to the picture materials, and informed that while the subjects worked on potato prints, a movie would be shown on a screen, positioned approximately 6 feet from the subject's table. The movie projector was located in a distant corner of the room and was screened from the subject's view by large wooden panels.

The color movie and a tape recording of the sound track was begun by a male projectionist as soon as the experimenter left the experimental room and was shown for a duration of 10 minutes. The models in the film presentations were the same adult males and females who participated in the Real-Life condition of the experiment. Similarly, the aggressive behavior they portrayed in the film was identical with their real-life performances.

For subjects in the Cartoon Film-Aggression condition, after seating the subject at the table with the picture construction material, the experimenter walked over to a television console approximately 3 feet in front of the subject's table, remarked, "I guess I'll turn on the color TV," and ostensibly tuned in a cartoon program. The experimenter then left the experimental room. The cartoon was shown on a glass lens screen in the television set by means of a rear projection arrangement screened from the subject's view by large panels.

The sequence of aggressive acts in the cartoon was performed by the female model costumed as a black cat similar to the many cartoon cats. In order to heighten the level of unreality of the cartoon, the floor area was covered with artificial grass and the walls forming the backdrop were adorned with brightly colored trees, birds, and butterflies creating a fantasyland setting. The cartoon began with a close-up of a stage on which the curtains were slowly drawn revealing a picture of a cartoon cat along with the title, *Herman the Cat*. The remainder of the film showed the cat pommeling the Bobo doll on the head with a mallet, sitting on the doll and punching it in the nose, tossing the doll in the air, and kicking it about the room in a manner identical with the performance in the other experimental conditions except that the cat's movements were characteristically feline. To induce further a cartoon set, the program was introduced and concluded with appropriate cartoon music, and the cat's verbal aggression was repeated in a high-pitched, animated voice.

In both film conditions, at the conclusion of the movie the experimenter entered the room and then escorted the subject to the test room.

Aggression Instigation

In order to differentiate clearly the exposure and test situations subjects were tested for the amount

of imitative learning in a different experimental room which was set off from the main nursery school building.

The degree to which a child has learned aggressive patterns of behavior through imitation becomes most evident when the child is instigated to aggression on later occasions. Thus, for example, the effects of viewing the movie, *Rebel Without a Cause*, were not evident until the boys were instigated to aggression the following day, at which time they re-enacted the televised switchblade knife fight in considerable detail. For this reason, the children in the experiment, both those in the control group, and those who were exposed to the aggressive models, were mildly frustrated before they were brought to the test room.

Following the exposure experience, the experimenter brought the subject to an anteroom which contained a varied array of highly attractive toys. The experimenter explained that the toys were for the subject to play with, but, as soon as the subject became sufficiently involved with the play material, the experimenter remarked that these were her very best toys, that she did not let just anyone play with them, and that she had decided to reserve these toys for some other children. However, the subject could play with any of the toys in the next room. The experimenter and the subject then entered the adjoining experimental room.

It was necessary for the experimenter to remain in the room during the experimental session; otherwise, a number of the children would either refuse to remain alone or would leave before the termination of the session. In order to minimize any influence her presence might have on the subject's behavior, the experimenter remained as inconspicuous as possible by busying herself with paper work at a desk in the far corner of the room and avoiding any interaction with the child.

Test for Delayed Imitation

The experimental room contained a variety of toys, some of which could be used in imitative or nonimitative aggression, and others which tended to elicit predominantly nonaggressive forms of behavior. The aggressive toys included a 3-foot Bobo doll, a mallet and peg board, two dart guns, and a tether ball with a face painted on it which hung from the ceiling. The nonaggressive toys, on the other hand, included a tea set, crayons and coloring paper, a ball, two dolls, three bears, cars and trucks, and plastic farm animals.

In order to eliminate any variation in behavior due to mere placement of the toys in the room, the play material was arranged in a fixed order for each of the sessions.

The subject spent 20 minutes in the experimental room during which time his behavior was rated in terms of predetermined response categories by judges who observed the session through a one-way mirror in an adjoining observation room. The 20-minute session was divided in 5-second intervals by means

TABLE 1
MEAN AGGRESSION SCORES FOR SUBGROUPS OF EXPERIMENTAL AND CONTROL SUBJECTS

Response category	Experimental groups					Control group	
	Real-life aggressive		Human film-aggressive		Cartoon film-aggressive		
	F Model	M Model	F Model	M Model			
Total aggression							
Girls	65.8	57.3	87.0	79.5	80.9	36.4	
Boys	76.8	131.8	114.5	85.0	117.2	72.2	
Imitative aggression							
Girls	19.2	9.2	10.0	8.0	7.8	1.8	
Boys	18.4	38.4	34.3	13.3	16.2	3.9	
Mallet aggression							
Girls	17.2	18.7	49.2	19.5	36.8	13.1	
Boys	15.5	28.8	20.5	16.3	12.5	13.5	
Sits on Bobo doll*							
Girls	10.4	5.6	10.3	4.5	15.3	3.3	
Boys	1.3	0.7	7.7	0.0	5.6	0.6	
Nonimitative aggression							
Girls	27.6	24.9	24.0	34.3	27.5	17.8	
Boys	35.5	48.6	46.8	31.8	71.8	40.4	
Aggressive gun play							
Girls	1.8	4.5	3.8	17.6	8.8	3.7	
Boys	7.3	15.9	12.8	23.7	16.6	14.3	

* This response category was not included in the total aggression score.

of an electric interval timer, thus yielding a total number of 240 response units for each subject.

The male model scored the experimental sessions for all subjects. In order to provide an estimate of interjudge agreement, the performances of 40% of the subjects were scored independently by a second observer. The responses scored involved highly specific concrete classes of behavior, and yielded high interobserver reliabilities, the product-moment coefficients being in the .90s.

Response Measures

The following response measures were obtained:

Imitative aggression. This category included acts of striking the Bobo doll with the mallet, sitting on the doll and punching it in the nose, kicking the doll, tossing it in the air, and the verbally aggressive responses, "Sock him," "Hit him down," "Kick him," "Throw him in the air," and "Pow."

Partially imitative responses. A number of subjects imitated the essential components of the model's behavior but did not perform the complete act, or they directed the imitative aggressive response to some object other than the Bobo doll. Two responses of this type were scored and were interpreted as partially imitative behavior:

Mallet aggression. The subject strikes objects other than the Bobo doll aggressively with the mallet.

Sits on Bobo doll. The subject lays the Bobo doll on its side and sits on it, but does not aggress toward it.

Nonimitative aggression. This category included acts of punching, slapping, or pushing the doll,

physically aggressive acts directed toward objects other than the Bobo doll, and any hostile remarks except for those in the verbal imitation category; for example, "Shoot the Bobo," "Cut him," "Stupid ball," "Knock over people," "Horses fighting, biting."

Aggressive gun play. The subject shoots darts or aims the guns and fires imaginary shots at objects in the room.

Ratings were also made of the number of behavior units in which subjects played nonaggressively or sat quietly and did not play with any of the material at all.

RESULTS

The mean imitative and nonimitative aggression scores for subjects in the various experimental and control groups are presented in Table 1.

Since the distributions of scores departed from normality and the assumption of homogeneity of variance could not be made for most of the measures, the Friedman two-way analysis of variance by ranks was employed for testing the significance of the obtained differences.

Total Aggression

The mean total aggression scores for subjects in the real-life, human film, cartoon film, and the control groups are 83, 92, 99, and 54,

respectively. The results of the analysis of variance performed on these scores reveal that the main effect of treatment conditions is significant ($\chi^2 = 9.06, p < .05$), confirming the prediction that exposure of subjects to aggressive models increases the probability that subjects will respond aggressively when instigated on later occasions. Further analyses of pairs of scores by means of the Wilcoxon matched-pairs signed-ranks test show that subjects who viewed the real-life models and the film-mediated models do not differ from each other in total aggressiveness but all three experimental groups expressed significantly more aggressive behavior than the control subjects (Table 2).

Imitative Aggressive Responses

The Friedman analysis reveals that exposure of subjects to aggressive models is also a highly effective method for shaping subjects' aggressive responses ($\chi^2 = 23.88, p < .001$). Comparisons of treatment conditions by the Wilcoxon test reveal that subjects who observed the real-life models and the film-mediated models, relative to subjects in the control group, performed considerably more imitative physical and verbal aggression (Table 2).

Illustrations of the extent to which some of the subjects became virtually "carbon copies" of their models in aggressive behavior are presented in Figure 1. The top frame shows the female model performing the four novel aggressive responses; the lower frames depict a male and a female subject reproducing

the behavior of the female model they had observed earlier on film.

The prediction that imitation is positively related to the reality cues of the model was only partially supported. While subjects who observed the real-life aggressive models exhibited significantly more imitative aggression than subjects who viewed the cartoon model, no significant differences were found between the live and film, and the film and cartoon conditions, nor did the three experimental groups differ significantly in total aggression or in the performances of partially imitative behavior (Table 2). Indeed, the available data suggest that, of the three experimental conditions, exposure to humans on film portraying aggression was the most influential in eliciting and shaping aggressive behavior. Subjects in this condition, in relation to the control subjects, exhibited more total aggression, more imitative aggression, more partially imitative behavior, such as sitting on the Bobo doll and mallet aggression, and they engaged in significantly more aggressive gun play. In addition, they performed significantly more aggressive gun play than did subjects who were exposed to the real-life aggressive models (Table 2).

Influence of Sex of Model and Sex of Child

In order to determine the influence of sex of model and sex of child on the expression of imitative and nonimitative aggression, the data from the experimental groups were combined and the significance of the differences between groups was assessed by *t* tests for

TABLE 2
SIGNIFICANCE OF THE DIFFERENCES BETWEEN EXPERIMENTAL AND CONTROL GROUPS
IN THE EXPRESSION OF AGGRESSION

Response category	χ^2	<i>p</i>	Comparison of treatment conditions*					
			Live vs. Film <i>p</i>	Live vs. Cartoon <i>p</i>	Film vs. Cartoon <i>p</i>	Live vs. Control <i>p</i>	Film vs. Control <i>p</i>	Cartoon vs. Control <i>p</i>
Total aggression	9.06	<.05	ns	ns	ns	<.01	<.01	<.005
Imitative aggression	23.88	<.001	ns	<.05	ns	<.001	<.001	<.005
Partial imitation								
Mallet aggression	7.36	.10 > .05	ns	ns	ns	ns	<.05	<.005
Sits on Bobo doll	8.05	<.05	ns	ns	ns	ns	<.05	<.005
Nonimitative aggression	7.28	.10 > .05	ns	ns	ns	ns	<.05	ns
Aggressive gun play	8.06	<.05	<.01 ^b	ns	ns	ns	<.05	ns

* The probability values are based on the Wilcoxon test.

^b This probability value is based on a two-tailed test of significance.

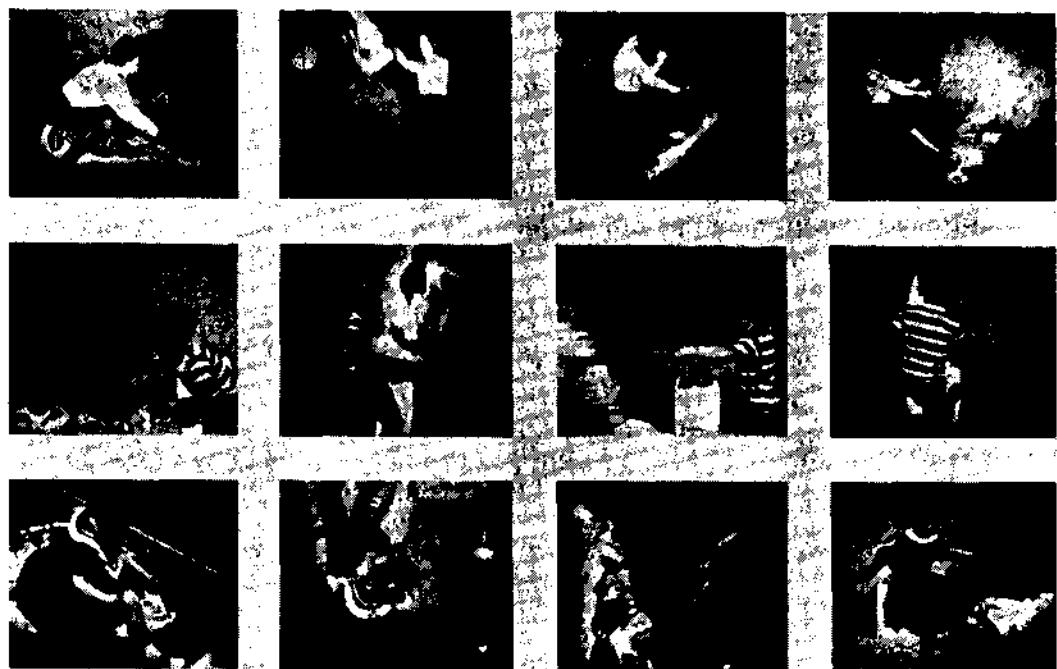


FIG. 1. Photographs from the film, *Social Learning of Aggression through Imitation of Aggressive Models*.

uncorrelated means. In statistical comparisons involving relatively skewed distributions of scores the Mann-Whitney U test was employed.

Sex of subjects had a highly significant effect on both the learning and the performance of aggression. Boys, in relation to girls, exhibited significantly more total aggression ($t = 2.69, p < .01$), more imitative aggression ($t = 2.82, p < .005$), more aggressive gun play ($z = 3.38, p < .001$), and more nonimitative aggressive behavior ($t = 2.98, p < .005$). Girls, on the other hand, were more inclined than boys to sit on the Bobo doll but refrained from punching it ($z = 3.47, p < .001$).

The analyses also disclosed some influences of the sex of the model. Subjects exposed to the male model, as compared to the female model, expressed significantly more aggressive gun play ($z = 2.83, p < .005$). The most marked differences in aggressive gun play ($U = 9.5, p < .001$), however, were found between girls exposed to the female model ($M = 2.9$) and males who observed the male model ($M = 19.8$). Although the overall model difference in partially imitative be-

havior, Sits on Bobo, was not significant, Sex \times Model subgroup comparisons yielded some interesting results. Boys who observed the aggressive female model, for example, were more likely to sit on the Bobo doll without punching it than boys who viewed the male model ($U = 33, p < .05$). Girls reproduced the nonaggressive component of the male model's aggressive pattern of behavior (i.e., sat on the doll without punching it) with considerably higher frequency than did boys who observed the same model ($U = 21.5, p < .02$). The highest incidence of partially imitative responses was yielded by the group of girls who viewed the aggressive female model ($M = 10.4$), and the lowest values by the boys who were exposed to the male model ($M = 0.3$). This difference was significant beyond the .05 significance level. These findings, along with the sex of child and sex of model differences reported in the preceding sections, provide further support for the view that the influence of models in promoting social learning is determined, in part, by the sex appropriateness of the model's behavior (Bandura et al., 1961).

Aggressive Predisposition and Imitation

Since the correlations between ratings of aggression and the measures of imitative and total aggressive behavior, calculated separately for boys and girls in each of the experimental conditions, did not differ significantly, the data were combined. The correlational analyses performed on these pooled data failed to yield any significant relationships between ratings of aggression anxiety, frequency of aggressive behavior, and the experimental aggression measures. In fact, the array means suggested nonlinear regressions although the departures from linearity were not of sufficient magnitude to be statistically significant.

DISCUSSION

The results of the present study provide strong evidence that exposure to filmed aggression heightens aggressive reactions in children. Subjects who viewed the aggressive human and cartoon models on film exhibited nearly twice as much aggression than did subjects in the control group who were not exposed to the aggressive film content.

In the experimental design typically employed for testing the possible cathartic function of vicarious aggression, subjects are first frustrated, then provided with an opportunity to view an aggressive film following which their overt or fantasy aggression is measured. While this procedure yields some information on the immediate influence of film-mediated aggression, the full effects of such exposure may not be revealed until subjects are instigated to aggression on a later occasion. Thus, the present study, and one recently reported by Lövaas (1961), both utilizing a design in which subjects first observed filmed aggression and then were frustrated, clearly reveal that observation of models portraying aggression on film substantially increases rather than decreases the probability of aggressive reactions to subsequent frustrations.

Filmed aggression, not only facilitated the expression of aggression, but also effectively shaped the form of the subjects' aggressive behavior. The finding that children modeled their behavior to some extent after the film characters suggests that pictorial mass media, particularly television, may serve as an im-

portant source of social behavior. In fact, a possible generalization of responses originally learned in the television situation to the experimental film may account for the significantly greater amount of aggressive gun play displayed by subjects in the film condition as compared to subjects in the real-life and control groups. It is unfortunate that the qualitative features of the gun behavior were not scored since subjects in the film condition, unlike those in the other two groups, developed interesting elaborations in gun play (for example, stalking the imaginary opponent, quick drawing, and rapid firing), characteristic of the Western gun fighter.

The view that the social learning of aggression through exposure to aggressive film content is confined to deviant children (Schramm, Lyle, & Parker, 1961), finds little support in our data. The children who participated in the experiment are by no means a deviant sample, nevertheless, 88% of the subjects in the Real-Life and in the Human Film condition, and 79% of the subjects in the Cartoon Film condition, exhibited varying degrees of imitative aggression. In assessing the possible influence of televised stimulation on viewers' behavior, however, it is important to distinguish between learning and overt performance. Although the results of the present experiment demonstrate that the vast majority of children *learn* patterns of social behavior through pictorial stimulation, nevertheless, informal observation suggests that children do not, as a rule, *perform* indiscriminately the behavior of televised characters, even those they regard as highly attractive models. The replies of parents whose children participated in the present study to an open-end questionnaire item concerning their handling of imitative behavior suggest that this may be in part a function of negative reinforcement, as most parents were quick to discourage their children's overt imitation of television characters by prohibiting certain programs or by labeling the imitative behavior in a disapproving manner. From our knowledge of the effects of punishment on behavior, the responses in question would be expected to retain their original strength and could reappear on later occasions in the presence of appropriate eliciting stimuli, particularly if

instigation is high, the instruments for aggression are available, and the threat of noxious consequences is reduced.

The absence of any relationships between ratings of the children's predisposition to aggression and their aggressive behavior in the experimental setting may simply reflect the inadequacy of the predictor measures. It may be pointed out, however, that the reliability of the ratings was relatively high. While this does not assure validity of the measures, it does at least indicate there was consistency in the raters' estimates of the children's aggressive tendencies.

A second, and perhaps more probable, explanation is that proprioceptive feedback alone is not sufficient to account for response inhibition or facilitation. For example, the proprioceptive cues arising from hitting responses directed toward parents and toward peers may differ little, if any; nevertheless, tendencies to aggress toward parents are apt to be strongly inhibited while peer aggression may be readily expressed (Bandura, 1960; Bandura & Walters, 1959). In most social interaction sequences, proprioceptive cues make up only a small part of the total stimulus complex and, therefore, it is necessary to take into consideration additional stimulus components, for the most part external, which probably serve as important discriminative cues for the expression of aggression. Consequently, prediction of the occurrence or inhibition of specific classes of responses would be expected to depend upon the presence of a certain pattern of proprioceptive or introceptive stimulation together with relevant discriminative external stimuli.

According to this line of reasoning, failure to obtain the expected positive relationships between the measures of aggression may be due primarily to the fact that permissiveness for aggression, conveyed by situational cues in the form of aggressive film content and play material, was sufficient to override the influence of internal stimuli generated by the commission of aggressive responses. If, in fact, the behavior of young children, as compared to that of adults, is less likely to be under internal stimulus control, one might expect environmental cues to play a relatively im-

portant role in eliciting or inhibiting aggressive behavior.

A question may be raised as to whether the aggressive acts studied in the present experiment constitute "genuine" aggressive responses. Aggression is typically defined as behavior, the goal or intent of which is injury to a person, or destruction of an object (Bandura & Walters, 1959; Dollard, Doob, Miller, Mowrer, & Sears, 1939; Sears, McCoby, & Levin, 1957). Since intentionality is not a property of behavior but primarily an inference concerning antecedent events, the categorization of an act as "aggressive" involves a consideration of both stimulus and mediating or terminal response events.

According to a social learning theory of aggression recently proposed by Bandura and Walters (in press), most of the responses utilized to hurt or to injure others (for example, striking, kicking, and other responses of high magnitude), are probably learned for prosocial purposes under nonfrustration conditions. Since frustration generally elicits responses of high magnitude, the latter classes of responses, once acquired, may be called out in social interactions for the purpose of injuring others. On the basis of this theory it would be predicted that the aggressive responses acquired imitatively, while not necessarily mediating aggressive goals in the experimental situation, would be utilized to serve such purposes in other social settings with higher frequency by children in the experimental conditions than by children in the control group.

The present study involved primarily vicarious or empathic learning (Mowrer, 1960) in that subjects acquired a relatively complex repertoire of aggressive responses by the mere sight of a model's behavior. It has been generally assumed that the necessary conditions for the occurrence of such learning is that the model perform certain responses followed by positive reinforcement to the model (Hill, 1960; Mowrer, 1960). According to this theory, to the extent that the observer experiences the model's reinforcement vicariously, the observer will be prone to reproduce the model's behavior. While there is some evidence from experiments involving both human (Lewis & Duncan, 1958; McBrearty, Marston,

& Kanfer, 1961; Sechrest, 1961) and animal subjects (Darby & Riopelle, 1959; Warden, Fjeld, & Koch, 1940), that vicarious reinforcement may in fact increase the probability of the behavior in question, it is apparent from the results of the experiment reported in this paper that a good deal of human imitative learning can occur without any reinforcers delivered either to the model or to the observer. In order to test systematically the influence of vicarious reinforcement on imitation, however, a study is planned in which the degree of imitative learning will be compared in situations in which the model's behavior is paired with reinforcement with those in which the model's responses go unrewarded.

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THE INFLUENCE OF ANTECEDENT REINFORCEMENT AND DIVERGENT MODELING CUES ON PATTERNS OF SELF-REWARD¹

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The present experiment was designed to test the hypothesis that the effect of models' self-reinforcement contingencies on the self-reinforcing behavior of observers will be partly determined by their antecedent success and failure experiences and performance discrepancy from the comparison models. Groups of children underwent a series of success or failure experiences following which they were exposed to either a superior model adopting a high criterion for self-reward, an inferior model displaying a very low standard for self-reinforcement, an equally competent model exhibiting a moderately high self-reward criterion, or they observed no models. Children in the inferior-model condition displayed a considerably higher frequency of self-reinforcement at low performance levels and greater magnitude of self-reward than Ss who had been exposed to more competent models adopting higher criteria for self-reinforcement. In accord with social comparison theory, children rejected the self-imposed reinforcement contingencies of the superior model and adopted a lower standard commensurate with their achievements. The effects of antecedent success-failure experiences were found to be dependent upon treatment conditions and level of performance.

The voluminous investigations of reinforcement processes have been confined, with few exceptions (Bandura & Kupers, 1964; Kanfer & Marston, 1963a, 1963b; Marston, 1965; Mischel & Liebert, 1966), to situations in which an agent adopts a particular criterion with respect to a performer's behavior, and dispenses reinforcers to him contingent upon the occurrence of desired responses. A highly important, but less well understood, reinforcement phenomenon characteristic of humans is evident in situations in which a person imposes a particular response-reinforcement contingency on his own behavior, and self-administers reinforcers which are under his own control on occasions when he attains or surpasses the self-prescribed standards of achievement. The latter event is analogous to providing a rat in a Skinner box with a gen-

erous supply of delectable pellets which he self-administers following commendable bar-press performances, but denies himself when he judges his attainments to be substandard.

In a previous investigation of the determinants of self-reinforcing responses (Bandura & Kupers, 1964), it was found that children's patterns of self-reward and self-punishment closely matched those of models to whom they had been exposed. Subjects who observed models adopting a high criterion for self-reinforcement utilized positive reinforcers sparingly and only when they achieved relatively high levels of performance, whereas children who had observed low-standard models rewarded themselves generously even for minimal performances.

There are several factors that might account for the surprisingly precise matching of the models' patterns of self-reinforcement obtained in the preceding study. First, the scores on the particular task employed did not have much absolute significance and consequently, they provided the subjects little basis for judging what might constitute an inadequate or a superior performance independent of some reference norm. Even if relevant normative data were available, since

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both the subjects' and models' performances varied widely the children had no reliable basis for evaluating their own abilities. Thus the combination of performance ambiguity and instability would tend to enhance the potency of the models' standard-setting and self-reinforcing responses.

Under conditions of greater performance stability, the effect of a model on the self-reinforcing behavior of an observer is likely to be determined, in part, by the discrepancy in ability between the participants, and by the observer's history of positive and negative reinforcements with respect to achievement behavior. In order to investigate systematically the influence of the later variables and their interaction on the social transmission of self-reinforcement patterns, an experiment was conducted in which groups of children underwent a series of success or failure experiences on a variety of achievement tasks. Following the differential treatments, one fourth of each group was exposed to a model adopting a high criterion for self-reward and performing the experimental task at a consistently superior level relative to that of the children; one fourth observed a model displaying a very low standard for self-reinforcement and performing at an inferior level; one fourth watched an equally competent model exhibiting a moderately high self-reward criterion, while the remaining subjects served as a no-model control group. After exposure to their respective models, the children in all conditions received the same pattern of scores on the modeling task, and the performances for which they rewarded themselves were recorded.

In the case of performances for which objective, nonsocial criteria of adequacy are lacking, the achievements of others serve as the only standard against which meaningful self-evaluations can be made. According to social comparison theory (Festinger, 1954), persons tend to select reference models who are similar in ability, and to reject those who are too divergent from themselves. It was, therefore, predicted on the basis of the latter theory that subjects would adopt the self-reinforcement contingencies of the model whose ability or competence was similar to their own. On the other hand, observers whose

performances are comparatively low and markedly discrepant from a model's achievements would tend to view the comparison person as too divergent in ability to serve as a meaningful model for self-evaluation. Accordingly, it was hypothesized that children who had been exposed to the superior model would reject his high criterion for self-reinforcement and adopt a lower standard commensurate with their own achievement level. This rejection process would be reflected in a pattern of self-reinforcement equivalent to that adopted by children in the condition involving the equally competent model, whose criterion for self-reward corresponded to the modal performance of all subjects.

Had the behavior of peer models been employed as the standard for self-evaluation, one would presuppose from social comparison theory that subjects might similarly reject the self-imposed reinforcement contingencies of an inferior model. However, evidence that achievements which match or exceed positively evaluated low performances by adults tend to be regarded by children as highly commendable and worthy of reward (Bandura & Kupers, 1964), suggests that upward discrepancies from adult models result in enhanced self-evaluation, rather than rejection of the model. Consequently, it was predicted that following low performances, children in the inferior-model condition would display a significantly higher incidence of self-rewarding responses than subjects in the equally competent and superior-model conditions. Children in the three modeling treatments were not expected to differ in the frequency of self-reinforcement associated with moderately high and superior performances. Since, however, moderately high scores are likely to be evaluated as only marginally commendable achievements by children exposed to competent models, but as meritorious attainments by children who have observed an inferior adult model, it was hypothesized that relative to the former groups, subjects in the latter condition would engage in a higher magnitude of self-reward following high-level performances.

There is some research evidence (Stotland & Zander, 1958) that persons who have undergone failure experiences lower their

evaluation both of the quality of their original performances and of closely related abilities. On the assumption that low self-evaluations are accompanied by reduced self-reinforcing behavior, it was expected that subjects in the failure condition would exhibit a lower frequency and magnitude of self-reward than children who had experienced repeated success.

METHOD

Subjects

The subjects were 80 boys and 80 girls ranging in age from 8 to 11 years, drawn from the Los Angeles and Inglewood School Districts.

Three adult males served as experimenters, and a male and a female adult played the roles of models.

Success-Failure Treatment

In the initial phase of the study each child was randomly paired with a same-sex partner. While accompanying the children to the experimental room, the experimenter introduced himself as a college student who was conducting a normative study of the physical skillfulness and reasoning ability of both children and adults. He explained that children were tested simultaneously in order to expedite collection of the data, and that, for similar reasons, adults also would be participating at the same time and place.

After the experimenter had randomly assigned one of the pair to the success condition and the other to the failure group, the partners performed alternately on the same three tasks. Several different tasks varying considerably in content were employed so as to produce a relatively generalized success or failure effect. Since the experimenter, in fact, controlled the scores, it was possible to ensure that children in the success condition performed significantly better on the series of trials than those in the failure treatment. In order to control for the possibility that a child might discount the achievement disparity as being a function of a chance idiosyncratic matching, the subjects were provided with fictitious normative data that corroborated the situationally produced differential outcomes. In addition, at the conclusion of the three tasks, the consistent discrepancies in the performances of the two children were further underscored by a summary evaluation highlighting their differential achievements relative to each other and to the normative group.

The first task, which supposedly measured physical strength, consisted of a wooden box on the front of which was mounted a dial with numbers ranging from 0 to 30. The subjects were led to believe that when they pulled the handle attached to the box, the number that registered on the dial provided a measure of their physical strength. But actually the scores were predetermined and controlled by the experimenter by means of a rheostat located at the

back of the apparatus. Children in the success condition gained a total of 40 points based on two trials, subjects in the failure group obtained a combined score of 25, and the normative achievement for children of their age was presented as 30 to 35 points.

The second task was introduced as a test of problem-solving ability. The task utilized four stimulus items and a deck of response cards, each containing geometric figures varying in number, shape, and color. The children were instructed to figure out which dimension, or combination of dimensions, was the crucial one, and then to sort the deck of response cards under the four stimulus items. Since the children received no immediate feedback concerning the accuracy of their sorts, and considering also that several classifications would be correct, the subjects had no means of evaluating their performances.

On the latter task, children in the failure condition were informed that they received a score of 24 points; in the success condition, 36 points. The experimenter then added that most children obtained 30 points.

The third task was structured as a measure of psychomotor dexterity. The apparatus consisted of a cylindrical can with holes in the top, and small plastic straws on a tray positioned under the holes. The goal was to pull the straws out of the holes using a pair of tweezers, without touching the sides of the holes. A buzzer system was devised so that, instead of signaling whenever the tweezers made contact with the metal, it sounded whenever the experimenter pushed a concealed button. Children in the success condition obtained a total of 35 points. Once again, subjects in the failure treatment were less successful, receiving only 20 points. The experimenter concluded the game with his normative statement, "Most boys [girls] of your age get 30 points."

At the completion of all three tasks, children who underwent the series of failure experiences were informed that their total score of 69 points was relatively low compared both to their partner's score and to the normative score of 95, whereas subjects in the success condition were told that their combined score of 111 points represented a meritorious performance.

Modeling of Self-Reinforcement Contingencies

Following the success and failure treatments, the model made his appearance. The experimenter invited the children to rest while the model took the first turn on the next task—a miniature bowling game—which provided the means for displaying the model's competence level and his adopted criteria for self-reinforcement. Since in the previous study (Bandura & Kupers, 1964), sex of the model had no differential effects on self-rewarding behavior, there was no attempt to manipulate this variable in the present study. All children observed same-sex models.

The bowling apparatus consisted of a 3-foot runway bounded at the far end by vertical fiberboard shields. Seven jewel lights, labeled with numbers ranging from 5 to 20, were mounted in two staggered

rows on the front shield. The subjects were informed that whenever a bowling ball hit a target (purportedly behind the fiberboard shield) the corresponding light would flash on. Since there were no visible targets, the children could not evaluate their performances independently of the flashing scoreboard. Moreover, high and low numbers were placed in adjacent positions, so that any score seemed plausible no matter where the bowling ball actually rolled. The experimenter controlled the flashing scoreboard via a remote monitor so that the models performed identically within each condition, and all children received the same pattern of scores.

Before commencing the modeling trials, the experimenter called the participants' attention to a bowl of assorted candies near the starting point of the alley within easy reach of the bowler. He explained that this energy-building food was supplied for their benefit, that they should help themselves whenever they wished, and that if they did not feel like eating all the candy during the session they could save it in the paper cup provided. A variety of candies was utilized as positive reinforcers in order to avoid satiation effects.

The model then played 12 bowling games consisting of three balls per game, while the children observed. In the *superior model high-criterion condition*, the model obtained scores ranging from 25 to 60 points and rewarded himself with candy and positive self-evaluative verbalizations only when he obtained or exceeded a score of 40. After these high-score performances he treated himself to candy and commented approvingly, "I deserve some candy for that high score . . . That's great! That certainly is worth a treat." By contrast, on trials in which he failed to meet the adopted criterion of 40, he refrained from taking candy and remarked self-critically, "No candy for that . . . That does not deserve a treat."

In the condition involving the *equally competent model displaying a moderately high criterion* for self-reinforcement, the performance scores ranged from 15 to 40, with the adopted standard being 25 points. Except for the lower self-imposed criterion, the self-rewarding and self-punitive responses were identical in form and frequency to those in the superior-model condition. On trials in which the model obtained or exceeded a score of 25 points, he rewarded himself with candy and commented self-approvingly, while on trials in which he performed below the minimum standard he denied himself candy and engaged in self-critical behavior.

In the *inferior-model low-criterion condition*, the model's scores ranged from 5 to 25 and the self-administration of material and verbal reinforcers was made contingent on obtaining a score of 15 points or higher.

It should be noted that for the purposes of the present experiment, criterion level and competence had to be covaried. That is, a superior model could not adopt a low standard for self-reinforcement unless he obtained low scores which would thereby reduce his competency; conversely, in order for the inferior model to display high criteria for self-reward,

it would have been necessary to convert him into a more competent performer. While the effects of self-imposed contingencies and competence can be evaluated independently, it was neither feasible nor particularly meaningful to do so for the phenomenon investigated in this study.

In all model conditions there was some slight variation in magnitude of self-reward. Models treated themselves to one piece of candy for criterion-level scores, two pieces for performances slightly above their adopted standard, and three for scores exceptionally high relative to this standard.

Children in the *control group* similarly participated in the success-failure session and the test for self-rewarding behavior, except that they had no intervening exposure to a model.

Measurement of Self-Rewarding Responses

After the model completed his 12 trials, the experimenter described to him the tasks the children had participated in before his arrival. The experimenter then offered to work with the model on the latter tasks, explaining to the children that in order to expedite matters, two other adults would play the bowling game with them. The children then performed the bowling task simultaneously in separate rooms with the new experimenters. The subjects were tested separately by adults who were not present during the success-failure and the modeling phases of the study in order to remove any situational pressures on the children to adopt the model's patterns of self-reinforcement. In order to control for any possible experimenter influences, the experimenters were counterbalanced across success-failure treatments, and they had no knowledge of the conditions to which the subjects were assigned.

Before commencing the trials, the experimenter replenished the candy supply, and repeated the instructions conveying considerable permissiveness for self-reward. The children then performed 18 trials of three balls each. Their scores ranged from 10 to 60 points, according to a prearranged program. Therefore, the size and sequence of scores was identical for all children, regardless of model condition.

For the purpose of testing the hypotheses, the performance levels were divided into four critical categories, which coincided with the modeled criteria for self-reward: 10, 15-20, 25-35, and 40-60. Since no model rewarded himself for scores of 10, and in order to maintain the competence differentiations, only two 10-point trials were included. The remaining trials were about equally distributed among the other three score categories. The particular sequence of scores was randomly determined except for the limitation that the three highest performances (50, 55, and 60) occurred at the end of the sequence in order to preserve the competence disparities. That is, had the extremely high scores been placed early in the serial order, the children in the superior-model condition might have judged themselves to be equally competent; conversely, the children who had observed the model displaying moderately high performances would have viewed

TABLE 1
MEAN NUMBER OF SELF-REINFORCED TRIALS AS A FUNCTION OF TREATMENT CONDITIONS
AND PERFORMANCE LEVEL

Experimental groups	No-model control				Model conditions												
					Inferior model				Equally competent				Superior model				
	10	15-20	25-35	40-60	10	15-20	25-35	40-60	10	15-20	25-35	40-60	10	15-20	25-35	40-60	
Success																	
Boys	0.4	1.6	1.5	1.0	1.4	5.6	4.7	4.5	0.6	3.7	4.3	3.9	0.7	2.1	3.3	4.6	
Girls	0.5	1.6	1.7	1.3	0.8	4.9	4.4	4.5	0.3	2.1	4.4	3.8	0.3	2.1	4.0	4.6	
Total	0.5	1.6	1.6	1.2	1.1	5.3	4.6	4.5	0.5	2.9	4.4	3.9	0.5	2.1	3.7	4.6	
Failure																	
Boys	0.9	3.0	2.6	1.6	0.5	4.2	3.9	4.0	0.6	2.2	3.1	2.8	0.9	2.8	2.9	4.2	
Girls	0.6	2.7	2.3	1.5	0.4	3.8	3.5	3.1	0.5	2.6	4.5	3.8	0.6	2.5	3.3	4.0	
Total	0.8	2.8	2.5	1.6	0.5	4.0	3.7	3.6	0.6	2.4	3.8	3.3	0.8	2.7	3.1	4.1	
Combined subgroups	0.6	2.3	2.0	1.4	0.8	4.6	4.1	4.0	0.5	2.7	4.1	3.6	0.6	2.4	3.4	4.4	

themselves as superior. The three high scores at the end of the series were primarily included to furnish additional data regarding magnitude of self-reinforcement at levels of achievement that clearly exceeded the minimum criteria adopted by the models in all experimental conditions.

The experimenter recorded the trials for which the children rewarded themselves with candy, the total number of reinforcers taken on each self-reinforced trial, and the frequency of positive and negative self-evaluative verbalizations.

After each child completed the 18 bowling trials, the two partners met again and were readministered the success-failure tasks in order to neutralize the effects of the experimental manipulations. This time the two children received similar scores and were highly praised for their performances and thanked for their participation.

RESULTS

Frequency of Self-Reinforcement

Table 1 shows the mean number of self-reinforced trials displayed by subjects in the various experimental and control subgroups. The obtained differences were evaluated by the Kruskal-Wallis test for 10-point performances, and by a three-way analysis of variance for the remaining score categories, with modeling cues, success-failure conditions, and sex of subjects serving as the three independent variables.

Children in all groups rewarded themselves relatively infrequently following 10-point scores, and did not differ in this respect. At succeeding performance levels, however, both modeling cues and the interaction of modeling

and antecedent reinforcement variables were important determinants of self-reinforcing behavior. These differences are shown graphically in Figures 1 and 2.

Low performance level. Analysis of the frequency of self-reinforcement associated with 15-20 point scores reveals a highly significant modeling effect ($F = 13.73$, $p < .001$), and a Models \times Reinforcement interaction ($F = 3.37$, $p < .05$), indicating that the success-failure experiences had a differential impact on the various groups. This significant interaction effect was primarily due to the fact that prior failure decreased self-

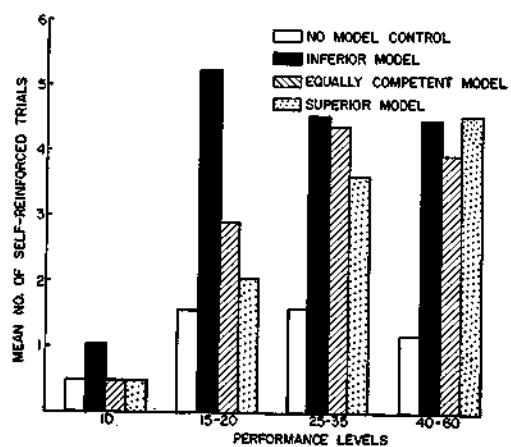


FIG. 1. Mean number of self-reinforced trials as a function of treatment conditions and performance level by subjects in the success condition.

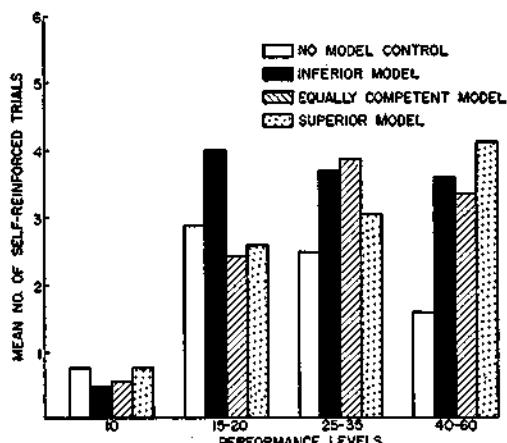


FIG. 2. Mean number of self-reinforced trials as a function of treatment conditions and performance level by subjects in the failure condition.

reinforcing behavior among children in the inferior-model condition ($t = 2.07, p < .025$), but increased the incidence of self-reinforcement among children in the control group ($t = 2.07, p < .05$).

Further comparisons of pairs of means by the t test reveal that children in the success condition who had been exposed to the inferior model, as predicted, engaged in considerably more frequent self-rewarding behavior than children who had observed either equally competent or superior models, or those in the control group (Table 2). The

hypothesis concerning rejection of highly superior models was also confirmed by the finding that children in the equally competent and superior model conditions did not differ significantly in their self-rewarding behavior.

Although the potency of modeling cues noted above was somewhat reduced under conditions of failure, children who had observed inferior models nevertheless showed a higher frequency of self-reinforcing responses relative to the other two modeling groups (Table 2). In accord with results from the success treatment, subjects in the equally competent and superior-model conditions who had undergone failure likewise did not differ significantly.

Moderately high performance level. Analysis of variance of the frequency of self-reinforcement following 25-35 point performances similarly reveals a highly significant modeling effect ($F = 21.37, p < .001$), and a Models \times Reinforcement interaction ($F = 3.25, p < .05$). Consistent with the preceding findings, the interaction reflects a lower incidence of self-rewarding behavior by children in the conditions involving the inferior ($t = 2.01, p < .05$), equally competent ($t = 1.30, p < .10$), and superior models ($t = 1.30, p < .10$), and increased self-reinforcement by controls ($t = 1.89, .10 < p < .05$) as a function of failure experiences.

TABLE 2
SIGNIFICANCE OF DIFFERENCES BETWEEN EXPERIMENTAL AND CONTROL GROUPS
IN FREQUENCY OF SELF-REINFORCEMENT

Performance level	Comparison of pairs of treatment conditions					
	Inferior versus control	Inferior versus equal	Inferior versus superior	Equal versus control	Equal versus superior	Superior versus control
15-20 point performances						
Success	6.05***	3.90***	5.22***	2.15*	1.33	0.83
Failure	1.91	2.65**	2.24*	0.75	0.41	0.33
25-35 point performances						
Success	6.85***	0.47	2.13*	6.38***	1.65	4.73***
Failure	2.95**	0.24	1.42	3.19**	1.65	1.54
40-60 point performances	8.03***	1.35	0.98	6.68***	2.33*	9.01***

Note.—One-tailed tests were employed in instances where a specific hypothesis was being tested; two-tailed tests were applied in evaluating differences between groups for which no predictions were advanced.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

TABLE 3
MEAN NUMBER OF REINFORCERS SELF-ADMINISTERED PER TRIAL AS A FUNCTION OF
TREATMENT CONDITIONS AND PERFORMANCE LEVEL

Experimental groups	No model control				Model conditions												
					Inferior model				Equally competent				Superior model				
	10	15-20	25-35	40-60	10	15-20	25-35	40-60	10	15-20	25-35	40-60	10	15-20	25-35	40-60	
Success																	
Boys	1.2	1.9	2.9	2.5	1.1	1.9	3.1	4.5	1.9	1.7	3.1	3.0	1.1	2.0	2.0	3.3	
Girls	1.0	1.5	1.8	1.8	1.5	1.5	2.8	3.9	1.3	1.8	2.8	2.7	1.0	1.0	1.4	2.5	
Total	1.1	1.8	2.3	2.2	1.2	1.7	3.0	4.2	1.7	1.8	3.0	2.8	1.1	1.5	1.7	2.9	
Failure																	
Boys	2.0	3.3	5.8	4.1	1.6	2.0	3.2	4.3	1.2	2.5	3.2	3.9	1.1	1.5	1.9	2.1	
Girls	4.0	2.3	2.3	2.3	1.3	1.5	2.1	4.3	1.5	1.3	2.1	2.9	2.0	2.3	2.5	3.9	
Total	3.0	2.8	4.2	3.1	1.4	1.7	2.6	4.3	1.3	1.8	2.6	3.3	1.5	1.9	2.2	3.0	
Total sample	2.3	2.4	3.3	2.8	1.3	1.7	2.8	4.3	1.5	1.8	2.8	3.1	1.3	1.7	1.9	3.0	

As expected at this moderately high level of performance, individual *t* tests disclosed no significant differences in either success or failure conditions between children who had observed the inferior model and those in the equally competent or superior-model groups (Table 2). Children in all three modeling conditions who had undergone rewarding experiences engaged in significantly more self-reinforcement than did the control subjects. Moreover, children in the inferior-model group displayed a higher incidence of self-reinforcing responses than did subjects who had been exposed to the superior model. Under conditions of failure, however, all group differences were reduced and only subjects in the inferior and equally competent model groups exhibited a higher incidence of self-reinforcement than the control subjects.

Superior performance level. Analysis of variance of self-reinforcing responses occurring after 40-60 point performances yielded a significant modeling effect ($F = 33.13, p < .001$), but neither prior reinforcement nor any interactions between the independent variables were statistically significant sources of variation. Thus, at the superior level of achievement subjects in all modeling conditions engaged in a high frequency of self-reinforcement regardless of whether they had previously undergone success or failure experiences (Figures 1 and 2). Further com-

parisons of pairs of means reveal a higher incidence of self-reinforcement by subjects in each of the treatments involving models compared to the control subjects (Table 2). In addition, children who had been exposed to the superior model were more self-rewarding following meritorious performances than subjects who had observed the equally competent model.

Magnitude of Self-Reward

The mean number of self-administered reinforcers per trial as a function of experimental conditions, sex of subjects, and level of performance is presented in Table 3. Since some of the children never rewarded themselves following performances at a particular level, the number of cases in each cell differed somewhat from group to group. This variation precluded simultaneous analysis of the combination of experimental variables; consequently, separate one-way analyses of variance were calculated for evaluating the effects of modeling cues, prior reinforcement, and sex of subjects at each of the four score categories.

Contrary to prediction, there were no significant differences in the magnitude of self-reward as a function of prior success-failure experiences and, except for greater amount of self-rewarding behavior displayed by girls at the moderately high level of achievement ($F = 9.42, p < .001$), no sex differences were

obtained. However, the modeling variable, as hypothesized, proved to be a significant source of variance.

Subjects in all modeling conditions rewarded themselves sparingly for 10 and 15–20 point performances, and did not differ in this respect. On the other hand, exposure to models of varying degrees of competence produced differential amounts of self-rewarding behavior in subjects at the moderately high (25–35) level of performance ($F = 5.28, p < .01$). Additional subgroup analyses by the t test reveal that children who had observed the inferior model engaged in a greater amount of self-reinforcement than those who were exposed to the superior model ($t = 2.33, p < .025$). Moreover, control-group subjects rewarded themselves more generously for attainments at this level than those in conditions involving the superior ($t = 3.71, p < .001$) and the equally competent ($t = 2.97, p < .01$) models.

A highly significant modeling effect ($F = 5.60, p < .01$) was also obtained at the 40–60 level of achievement. Subjects who had observed the inferior model exhibited a higher magnitude of self-reward than children who had observed either the superior model ($t = 3.37, p < .001$), the equally competent model ($t = 3.01, p < .01$), or had no exposure to modeling cues ($t = 3.48, p < .001$).

It will be recalled that the models rewarded themselves with one piece of candy for criterion-level scores, two pieces for performances slightly above their adopted standard, and three for scores exceptionally high relative to this criterion. The fact that some subjects never rewarded themselves following certain scores precluded analysis of within-subject variations in magnitude of self-reward as a function of performance level. It is evident from Table 3, however, that each of the modeling conditions yielded a positive monotonic relationship between achievement level and magnitude of self-reward; by contrast, subjects in the control group did not show much variation in this respect.

Frequency of Verbal Self-Reinforcement

Since the incidence of verbal self-reinforcing responses was relatively low, the subgroup data were combined across performance levels

and evaluated by the Kruskal-Wallis one-way analysis of variance, and the Mann-Whitney U test.

The results reveal a significant modeling effect ($H = 8.32, p < .025$), and a marked sex difference ($z = 2.94, p < .01$). Further comparisons show that, relative to the control group, subjects exposed to the inferior ($z = 1.69, p < .05$), or the equally competent models ($z = 1.66, p < .05$), exhibited more self-reinforcing verbal behavior. No differences were found, however, either between the superior model and control groups, or among the three modeling conditions.

It is of interest that, although boys displayed a greater amount of verbal self-reinforcement than did girls in treatment conditions involving the inferior model ($z = 2.07, p < .05$), the equally competent model ($z = 1.99, p < .05$), and the control group ($z = 2.59, p < .01$), they did not differ significantly in this respect when exposed to the superior model.

DISCUSSION

The findings of the present study provide considerable evidence for the influential role of social comparison processes and modeling cues in the development of self-reinforcing patterns of behavior. Subjects in the control group, who were provided no comparison models, showed neither a discriminative pattern of self-reinforcement nor increasing magnitudes of self-reward as a function of incremental performances. On the other hand, children in the modeling conditions displayed distinct patterns and magnitudes of self-reward that differed in predicted directions.

Children in the inferior model condition engaged in a considerably higher frequency of self-reward following relatively low performances than subjects who had been exposed to more competent models adopting higher criteria for self-reinforcement. In the case of moderately high and superior attainments, no differences of note were obtained among the groups of experimental subjects in the frequency with which they rewarded themselves with candy. At these high levels of performance, however, children who had observed the inferior model were more generous in their self-reward, indicating a higher

evaluation of the quality of their performances.

With the single exception that subjects in the superior-model condition displayed a slightly higher frequency of self-reinforcement at the highest performance level than children who had observed the equally competent model, the latter two groups yielded equivalent patterns and magnitudes of self-reward. Thus, in accord with social comparison theory, children who had been exposed to the superior model rejected his self-imposed contingencies of reinforcement and adopted a lower criterion. This outcome is somewhat analogous to familial circumstances in which the offspring of eminent parental models set themselves comparatively low standards of achievement and self-reward. It is evident from informal observation, however, that under similar conditions many children do adopt their parents' high aspirations and stringent patterns of self-reinforcement. To further elucidate this problem, the influence of social-learning variables that have been shown to enhance modeling effects will be investigated for the purpose of specifying the conditions under which the self-reinforcing behavior of superior models will be adopted or rejected.

Self-administration of positive reinforcers following highly marginal or undeserving performances is likely to generate negative self-reactions. Consequently, self-rewards may be more sparingly dispensed in achievement situations that fail to provide objective, non-social criteria of what constitutes a worthy performance. It is perhaps for this reason that, in most of the intergroup analyses, control subjects displayed a lower incidence of self-reinforcement than did children in the modeling conditions. Marston (1964) has similarly demonstrated that subjects engage in less self-rewarding behavior on ambiguous than on structured tasks, but are more inclined to reward themselves when their responses correspond to those exhibited by another person in the ambiguous situation. These findings further highlight the importance of social comparison in self-reinforcing processes.

Predictions regarding the effects of antecedent success or failure were only partially confirmed. Although in each of the modeling

conditions subjects who had undergone failure experiences generally rewarded themselves less frequently than their successful counterparts, only the differences in the group exposed to the inferior model were of statistically significant magnitude. On the other hand, control subjects who had experienced failure displayed a higher rate of self-reinforcement at low and moderately high levels of performance than did children in the success condition.

The latter finding, which is in a direction contrary to prediction, suggests that under certain circumstances self-gratification may primarily serve a therapeutic rather than a self-congratulatory function. That is, after a person has undergone stressful failure experiences he may treat himself to a play, movie, savory dinner, nightclub or televised entertainment, or engage in other types of rewarding activities for the purpose of reducing aversive stimulation generated by failure. Such temporary suspension of self-reinforcement contingencies represents a culturally sanctioned therapeutic practice that is frequently noted in naturalistic situations. In view of the fact that the self-rewarding test situation constituted an additional self-evaluative achievement task for subjects in the modeling conditions, it is perhaps not surprising that they continued to adhere to equally or even more stringent self-reinforcement contingencies under conditions of failure as compared to success.

Superior attainments outweighed the effect of reinforcement history as evidenced by the fact that subjects in all modeling conditions exhibited equally high rates of self-reward following high scores, regardless of whether they had previously met with success or failure: Nor did the control subjects differ in this respect at similarly high levels of achievement. It is apparent from the foregoing interactions of failure with performance level and adequacy, as defined by comparison models, that the effects of antecedent reinforcement of achievement behavior on self-rewarding tendencies are considerably more complex than was originally assumed.

It should also be noted that somewhat different patterns of relationships were obtained depending upon whether material or verbal reinforcers were employed as dependent

measures. Of particular interest is the finding that boys and girls differed significantly in frequency of verbal self-reinforcement, but not in the incidence and magnitude of self-administered material rewards. These differential results may be due partly to the fact that verbal self-reinforcements, which involve positive and negative self-evaluative responses, are a closer reflection of a person's self-esteem than the consumption of food reinforcers. Findings of studies conducted by Pauline Sears⁸ show that boys tend to evaluate themselves more favorably on motor skills than do girls. Hence, differential self-evaluative predispositions, if operative in relation to the performance task employed in the present experiment, may partly explain the obtained sex differences. The fact that exposure to the superior model, the most potent condition for generating low self-evaluations, diminished boys' self-reinforcing verbal behavior, accounts for the absence either of sex differences within the latter treatment, or of a significant differentiation between subjects in the superior model and control groups.

Although the foregoing results provide some support for the modeling hypothesis, no relationships were established between failure experiences and verbal self-reinforcing re-

⁸"The Effect of Classroom Conditions on the Strength of Achievement Motive and Work Output on Elementary School Children," progress report to the United States Office of Education, Cooperative Research Project No. 863, Stanford University, 1963.

sponses. Suggestive evidence that predispositional and concomitant stimulus variables may have differential impact on verbal and material self-rewards indicates the necessity for distinguishing in future research between different classes of self-reinforcing responses.

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Conditions Governing Nonreinforced Imitation¹

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The present experiment tested alternative interpretations of imitative responding which is not explicitly reinforced. The conditioned reinforcement hypothesis assumes that positive reinforcement of matching responses endows similarity with rewarding properties that serve to maintain imitative behavior. According to the discrimination hypothesis, nonrewarded imitations persist in the absence of coercive control because individuals fail to discriminate differential reinforcement contingencies associated with diverse modeled behaviors. Measures were obtained of the rate with which children imitated exemplified activities as a function of whether or not models reinforced imitative responding, and whether the nonreinforceable responses differed topographically from rewarded demonstrations or were highly similar to them. In accord with the discrimination hypothesis, children continued to perform nonrewarded matching responses that were difficult to discriminate from rewarded imitations, but they discontinued imitating nonrewarding models and nonreinforced responses that were easily distinguishable. Evidence was also obtained that nonreinforced imitations may be maintained in some instances by erroneous anticipated consequences.

Recent years have witnessed a vigorous growth of research into the mechanisms governing observational learning and the conditions that control performance of matching behavior. Among the various controversies over modeling theories that have arisen is the explanation of imitative behavior which is not explicitly reinforced. This issue is of some importance because in everyday life and in most laboratory studies of delayed imitation (Bandura, 1969a), modeled behavior is often reproduced by observers in the absence of immediate external reinforcement.

Several interpretive schemes have been advanced to explain why nonreinforced

matching responses may be repeatedly performed. Baer and his associates (Baer, Peterson, & Sherman, 1967; Baer & Sherman, 1964) have interpreted the phenomenon in terms of conditioned reinforcement, and speak of "generalized imitation." According to this view, if accurate reproduction of modeling stimuli is frequently reinforced, behavioral similarity per se eventually acquires conditioned reinforcement properties. After similarity has become reinforcing in its own right, persons are disposed to perform imitative responses for their inherent reward value.

Experimental tests of the aforementioned hypothesis typically employ a discrete trial paradigm that proceeds in the following manner: Children are instructed by the model to imitate simple responses that he demonstrates sequentially, and each correct matching response is promptly reinforced. After a stable high rate of imitative responding is established a few similar responses that are never rewarded are randomly interspersed within a large changing set of reinforceable ones. Children generally imitate nonrewarded responses as long as accurate reproduction of other modeled behavior is positively reinforced. Continued imitation of

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nonrewarded responses is taken as confirmatory evidence that behavioral similarity has become endowed with reinforcing functions.

Explanation of nonreinforced imitation in terms of conditioned reinforcement is open to question on the basis of both conceptual and empirical considerations. First of all, the theory explains more than has ever been observed. If behavioral similarity is, in fact, inherently reinforcing, then people should display widespread reproduction of all types of behavior exhibited by different models. In actuality people tend to be selective in what they reproduce. A conditioned reinforcement interpretation would, therefore, have to include some contravening conditions to explain why people do not imitate indiscriminately everything that they may happen to observe.

According to the formulation proposed by Bandura (1969a; 1971), performance of imitative behavior is for the most part controlled by anticipated consequences of prospective actions. These anticipated consequences are established through differential reinforcement that is either directly experienced, inferred from observed response consequences of others, or conveyed through verbal explanations.

A variety of stimulus events can assume discriminative functions in signifying probable outcomes resulting from imitative behavior. People are often differentially reinforced for matching the behavior of models who differ in status, power, competence, age, sex, and a variety of other attributes. Model characteristics, therefore, often serve as discriminative stimuli for likely reinforcement contingencies. Differential consequences also often accompany different activities. Thus, for example, parental models are quick to reward their children for emulating achievement behavior, but they are inclined to discourage imitation of their martini drinking or cigarette smoking. Probable consequences can thus be conveyed by distinguishable features of the modeled behavior itself. Through a similar process of selective reinforcement, situational, temporal, and other cues likewise acquire informative value.

An alternative interpretation of the occurrence of nonreinforced modeling in the absence of coercive pressures can, therefore, be

offered in terms of discrimination rather than conditioned reinforcement processes. When a few nonrewarded modeled responses are randomly distributed in a large number that are consistently reinforced the two sets of responses cannot be easily distinguished and are, therefore, likely to be performed with similar frequency. If, on the other hand, the model performed a series of reinforced responses, followed by a set of readily discriminable responses that are never rewarded, the observer would eventually recognize that the latter responses never produce positive outcomes and he would, in all likelihood, discontinue imitating them. A discrimination hypothesis thus leads to a prediction which is opposite to that derived from the principle of secondary reinforcement. According to the acquired reward interpretation, the longer imitative responses are positively reinforced, the more strongly behavioral similarity is endowed with reinforcing properties and, consequently, the greater should be the resistance to extinction of nonrewarded matching responses. In contrast, a discrimination hypothesis would predict that the longer the differential reinforcement practices are continued, the more likely the observer is to distinguish between rewarded and nonrewarded matching behaviors, with resulting rapid decline of nonreinforced imitativeness.

To test this discrimination hypothesis, young children participated in a modeling situation patterned after the generalized imitation paradigm except that pressures for imitation, such as instructing children to perform modeled responses, waiting expectantly for long periods when they fail to do so, and other extraneous influences described later, were eliminated. These coercive controls were removed because demonstrations that children will perform imitative responses that are otherwise nonrewarded when pressed to do so have little practical or theoretical significance.

During the initial phase of the present study children were positively reinforced for reproducing a series of motor responses until they displayed a high level of imitative behavior. In the next phase, which measured generalization of imitation across models, children were consistently reinforced for re-

producing motor responses demonstrated by one model, but they were never rewarded for imitating a second model of the opposite sex who exhibited a subset of similar motor responses in the same sessions.

The final phase of the study was designed to test whether children would display differential imitation of the previously rewarding model depending on the discriminability and functional value of his behavior. Accordingly, he modeled three different sets of responses. These included the same reinforceable set of motor responses that continued to be rewarded; a subset of nonrewarded motor responses having no common distinguishing features that were randomly interspersed among similar rewarded motor responses; and a second subset of nonreinforced responses consisting of vocalizations that would make them distinguishable.

It was predicted that children would show high imitation of both the rewarded motor responses and the indistinguishable nonrewarded motor responses performed by the same model. On the other hand, imitation of the nonrewarding model and nonreinforced vocalizations by the rewarding model, for which the reinforcement contingencies are more readily discernible, would occur at a low level and decline progressively with succeeding modeling trials. No predictions were advanced, however, regarding differential imitation of behavior modeled under the latter two conditions.

Method

Subjects

Four severely retarded children with Stanford-Binet IQs between 31 and 50, and 12 normal kindergarten children, of lower-middle-class background served as subjects in the present experiment. Both types of children were included because previous studies of generalized imitation are primarily based on samples drawn from these two populations. The mean age of the retardates was 7 years 7 months, while the kindergarteners averaged 6 years 3 months. There was a total of 6 girls and 10 boys in the sample.

General Procedure

The discrete trial paradigm used to study generalized imitation typically includes a variety of extraneous rewards and coercive controls that can result in multiple confounding of the effects of reinforcement variables on imitative responding.

When models bring children to and from experimental situations, as is typically the case in these studies, the social interactions that inevitably occur between the participants over a long series of sessions can significantly affect children's level of imitativeness. Explicit demonstration of discrete responses in a trial-by-trial procedure by a model who also visibly records the children's performances are additional features that may compel imitative responding. To complicate matters further, initially each modeled response is generally preceded by a command to perform the demonstrated behavior. When children do not respond the model waits expectantly without saying anything for a relatively long time which can be quite upsetting. The strained silence can be terminated or attenuated only by performing the requested response. If subjects still fail to respond imitatively, the desired behavior is physically prompted by the model. Escape from discomfort created by the social demands could serve as a more powerful source of reinforcement maintaining imitative responding than the material rewards dispensed by the model. These factors might account for why responses modeled under such conditions are often imitated regardless of the rewarding consequences that are deliberately arranged (Peterson & Whitehurst, 1971; Steinman, 1970b).

In keeping with common usage, the term nonreinforced imitation is applied in this article to the occurrence of matching responses for which experimenters provide no direct reinforcement. As noted above, however, the procedures that have been widely employed to study this phenomenon inadvertently create contingencies wherein imitation produces external reinforcing consequences. Several general procedures were, therefore, adopted in the present experiment to minimize coercive control over imitative responding. In order to eliminate variability in imitative behavior arising from differential relationship experiences, children were escorted to and from the experimental room by a female assistant who did not participate in any way in the modeling sessions. No interactions took place between the children and the model outside the experimental room. However, to help the children become acquainted with the models by sight, they made several brief appearances on the play yard and in the classroom, without interacting with the children.

On the first day, the assistant brought the children individually to the room in which the experiment was to be conducted, where they played freely with various toys and puzzles. These preliminary activities were included to familiarize children with the experimental room, and to allay any apprehensions they might have about being removed from their classroom. At the end of the initial session the assistant explained to the children that they would meet the next day with other adults but otherwise no further instructions were given about the modeling situation.

During the imitation session experimenters modeled responses sequentially without instructing children to perform their behavior. Another im-

portant factor involved timing considerations. Extensive pretesting revealed that if children were going to imitate the model's behavior they invariably did so during or immediately upon completion of the demonstration. Any subsequent waiting time served merely as a social demand for them to respond when they would not otherwise do so. Consequently, after a given response had been modeled, children were given 3 seconds to initiate a matching response, which provided more than ample time without forcing behavior from them.

Eye contact can serve, among other functions, to control the attention of others, to prompt response from them, and to reinforce their behavior. In this study the model focused his attention on the movements he was performing during response demonstration and on the list of items pinned to the side of the table during the waiting period. Eye contact was established and maintained with the child only when he was being reinforced.

If children failed to imitate within the specified interval, the model demonstrated the next response. Whenever children reproduced a response in the nonreinforced class, the model waited for 3 seconds—the time that it would ordinarily take to administer rewards—and then proceeded to demonstrate the next response. On the other hand, accurate reproductions of modeled behavior in the reinforced class produced a series of positive consequences. The model smiled, attended to the child, praised him, occasionally patted or tickled him, and offered him cookies, candy, or sherbert as rewards. The aforementioned procedures were employed in all phases of the experiment. Children participated in the study daily, in sessions of approximately 5-minute duration.

Four different sets of responses were employed in various phases of the experiment. Three of these sets consisted of motor responses similar to those used by Baer et al. (1967), having no conspicuous features that would make them distinguishable from each other. One of these sets, which contained 20 items, was assigned to the reinforced group. These responses were demonstrated by the rewarding model in every session of the experiment and correct reproductions were consistently reinforced. The second group of motor responses, comprising 10 items, was exhibited in the dual model phase of the experiment by the nonrewarding model, and was never reinforced. The third set of 5 motor responses, which was demonstrated in the last phase of the study by the rewarding model, was likewise never reinforced. Finally, the fourth set of items, also used in the final phase and never reinforced, included 5 vocal responses that were easily discriminable from the motor responses. The motor responses included simple activities such as brushing one's hair, and squeezing oneself with the arms, while the vocal responses contained vowel speech sounds (e.g., OO, EE) clearly within the children's capabilities.

These sets of responses were modeled with imitation-contingent reinforcement for six children who were not participants in the formal study to

measure whether the items were of comparable difficulty level. These children were drawn from the same classroom as their experimental counterparts. The percentage of correct reproductions was 98.4, 98.7, and 100 for the motor reinforced, motor nonreinforced, and vocal nonreinforced responses, respectively. The three sets of responses were thus virtually identical in the ease with which they could be reproduced.

All of the children's responses were scored independently by the two experimenters. Responses were recorded by activating inconspicuous footswitches connected to an Esterline-Angus event recorder. During the dual model phase both experimenters scored the responses in the experimental room, while in the single model phase the second experimenter observed through a one-way screen and recorded the children's imitative behavior. High interscorer reliabilities were obtained, ranging from 97% to 99% for the different sets of responses.

Two adults, a male and a female, served as models. The sex of the model who rewarded imitation was counterbalanced so that the female functioned as the rewarding model with some of the children, and the male served in that role with the remainder. It was originally planned to use a balanced design. However, due to an initial difference mainly in the retarded children's spontaneous imitation of male and female models, and the decision to include all subjects who qualified for the experiment, the reinforcing role was performed by the female model with 11 children and by the male with 5. The experiment, which contained three separate phases, proceeded in the following manner.

Establishment of Imitative Responding

The preliminary phase of the study was designed to produce a high level of imitative responding in children so that behavioral similarity could be frequently reinforced before differential reinforcement was instituted. High stable imitativeness constituted the precondition for inclusion in the experiment. After the assistant seated the child at the table the experimenter modeled the 20 reinforceable motor responses sequentially without instructing the child to reproduce his behavior. Whenever the child performed a correct imitative response he was promptly rewarded as described earlier.

This phase was continued until children reached the criterion of at least 75% correct imitations. A standard sequence of procedures was employed to produce a high level of imitative responding without resort to coercive controls. If children failed to attain the selected criterion in the first session of imitation-contingent reinforcement, they received an additional session in which correct imitations were positively reinforced. As is shown later, the vast majority of children did not perform a single imitative response during either of the first two sessions.

Since the behavior being modeled was clearly

within the children's capabilities, it was assumed that the absence of imitation was not a question of either learning to imitate or learning the specific behaviors being demonstrated. Rather, the apparent imitation deficit primarily reflected a lack of awareness of the reinforcement contingencies—that reproducing the model's behavior was appropriate and would bring rewarding consequences. To convey this contingency information without having experimenters assume a compelling role, a brief peer-modeling procedure was used.

During the third session, nonimitating children took turns in modeling trials with a peer who had been preinstructed by the experimenter to reproduce his behavior. After demonstrating a response for the peer and rewarding his matching behavior, the experimenter modeled two items for the subject and rewarded accurate imitations; this procedure was continued until 10 peer-modeling trials and 20 subject-modeling trials were completed. Since the observational trials were designed to convey contingency information rather than to produce response learning, the responses modeled for the peer were never administered to the subjects. Peer modeling proved exceedingly effective, producing essentially asymptotic imitative performances immediately in most children. To further strengthen and stabilize their imitative behavior, subjects participated in an additional session without the peer during which the 20 reinforceable responses were demonstrated and correct imitations were reinforced.

Four retardates and three kindergarteners who did not display response gains after observing another child rewarded for imitation were given multiple peer modeling of the same behavior, manual prompting of matching responses, or verbal instructions to perform demonstrated behavior, merely to show that imitative responding can be promptly instated by compelling methods. The retardates imitated nearly all modeled responses (87%) when, in addition to these procedures, specific idiosyncratic reinforcers were introduced. The kindergarteners showed a similar marked imitativeness (99%) in response to explicit requests for them to reproduce demonstrated behavior. These children were not included in the formal study because the forceful induction influences would obscure the effects of response discriminability and manipulated reinforcement contingencies on imitation of nonreinforced behavior.

Differential Reinforcement of Imitation through Dual Modeling

In the second phase of the experiment, which measured generalization of imitation across models, children performed the imitation task with both the male and the female model. The rewarding model continued to demonstrate and to reinforce imitation of the 20 reinforceable motor responses. The nonrewarding model performed 10 motor responses in each session, but children were never reinforced for imitating them. During the first dual modeling session, the nonreinforced re-

sponses were randomly intermixed with the 20 reinforced items; in subsequent sessions the nonreinforced responses were modeled in two blocks of 5 items each, one block coming within the first third and the other block within the last third of reinforceable responses demonstrated by the rewarding model. Each experimental session thus contained a total of 30 modeling trials.

Differential reinforcement for imitation of the two models was continued until children either ceased imitating the responses exhibited by the nonrewarding model or, in the event that this did not occur, after five sessions were completed.

Differential Reinforcement of Responses Exhibited by the Same Model

In the third and final phase of the study the experimenter who had modeled only reinforced responses in preceding sessions displayed three sets of responses associated with different reinforcement contingencies. The 20 reinforceable motor responses continued to be modeled and children were consistently rewarded for imitating them. The set of 5 nonreinforced motor responses was randomly interspersed among the larger number of reinforced motor responses. In addition, the experimenter modeled the 5 easily distinguishable but nonrewarded vocal responses.

During the initial session of this phase of the experiment the three sets of responses were randomly intermixed. Thereafter, the nonreinforced motor responses continued to be distributed throughout the set of reinforced motor responses in an unpredictable order, while the vocalizations were modeled one after the other within a single block of trials, to further increase their discriminability. As in the preceding phase, differential reinforcement of matching behavior was continued until children either ceased imitating the discriminable vocal responses, or until five sessions were completed.

Postexperimental Interview

At the conclusion of the experiment all of the kindergarten children were interviewed by the assistant to assess the degree to which they discerned the differential reinforcement contingencies and whether or not they regulated their imitative performances in accordance with this knowledge. In addition, children were administered a brief contingency recognition test in which the assistant demonstrated two responses drawn at random from each of the three sets of responses performed by the rewarding model, and the children reported whether or not the different responses had been reinforced during the experimental sessions.

Results

Seventy percent of the children performed no matching responses during the initial two sessions of imitation-contingent reinforcement. Observing a peer model rewarded for

imitation produced an abrupt rise in correct matching responses from 0% to 90% in these initially nonimitative children. Thus, a few vicarious reinforcement trials were sufficient to convey the information necessary to instill a high level of imitative responding. Chi-square analyses of initial imitativeness, based on the combined data from the 16 subjects and the subgroup of children who participated only in the imitation induction phase, revealed no significant sex differences, nor did retardates and kindergarteners differ in this respect. However, children in this initial phase were more prone to imitate spontaneously the female model than the male model ($\chi^2 = 4.69, p < .05$). This initial difference was due mainly to the retardates, since the kindergarteners, who make up the bulk of the experimental sample, were equally imitative of the two models ($\chi^2 = .57$). Moreover, as is shown later, after children discovered in the introductory sessions that it was appropriate to imitate the modeled activities both the retardates and the kindergarteners were equally responsive to the two models during the experimental phases of the study.

The postexperimental recognition test was scored to determine the accuracy with which children identified the reinforcement contingencies associated with the various responses. They specified the correct consequences without error (100%) for the rewarded motor responses; they were highly accurate (75%; $p < .05$) with respect to the nonrewarded vocal responses; but their accuracy rate (58%) for the nondiscriminable motor responses that were never reinforced did not differ significantly from the 50% chance level. The experimental procedures thus succeeded in creating uncertainty about the consequences accompanying imitation of responses in the last class.

Total Imitation

The percentages of correct imitations were transformed to arc sines to reduce heterogeneity of variance and all the statistical tests were applied to the transformed values. An overall analysis of variance was computed on correct imitations shown by children in the two phases of differential rein-

forcement. Response class was a major contributor to variation in imitativeness ($F = 4.13, p < .01$), but neither sex of the model nor the interaction of these two variables had any significant effects.

The mean percentage of correct imitations was 94.6 for the reinforced motor responses; 93.8 for the intermixed motor responses that were never reinforced; 69.9 for the nonreinforced vocal responses; and 52.5 for the motor responses demonstrated by the nonrewarding model. Individual comparisons between these means reveal that both discriminability of responses and discriminative properties of the model are, as hypothesized, important determiners of imitative responding. Models who rewarded matching responses were imitated much more frequently than models who never rewarded the children for reproducing their behavior ($F = 25.34, p < .001$). Nondiscriminable motor responses that never received reinforcement in the single model phase of the study were imitated at the same high rate as reinforced motor responses exhibited by the same model ($F = .04$). By contrast, nonreinforced vocal responses were imitated to a substantially lesser degree than either the reinforced motor responses ($F = 7.20, p < .025$) or the nonrewarded motor responses intermixed within the latter group ($F = 6.20, p < .025$).

In addition, children were much less inclined to perform motor responses displayed by the nonrewarding model than they were to imitate nonreinforced motor ($F = 23.42, p < .001$) and vocal ($F = 6.20, p < .025$) responses exhibited by the rewarding model.

Imitation on Successive Modeling Trials

A more stringent test of the discrimination hypothesis can be made by comparing changes in rate of imitative responding in the different response classes over successive modeling trials. For this analysis, the total number of modeling trials that each subject received in each of the response classes was divided into five equal blocks. This was done separately for data from the dual model and the single model phases. The mean percentages of correct imitations on the five successive blocks of modeling trials are plotted in Figure 1.

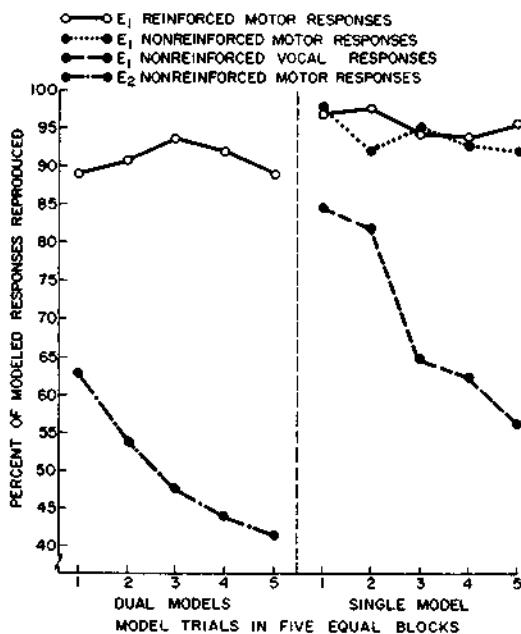


FIG. 1. Percentage of modeled responses reproduced by children on successive blocks of modeling trials as a function of differential reinforcement for matching performances based on model characteristics and topography of the responses. (E_1 refers to the model who rewarded imitations of 20 motor responses; E_2 refers to the model who never reinforced children for reproducing his behavior.)

Dual model phase. A two-way analysis of variance performed on data from the dual model phase of the study revealed a significant main effect for the differential reinforcement contingencies associated with the two models ($F = 16.23, p < .005$), and a significant Models \times Blocks of Trials interaction ($F = 3.54, p < .025$). Separate trend analyses disclosed no change in the degree to which children imitated the rewarding model across trial blocks ($F = .22$), whereas they showed a progressive decline in imitation of the nonrewarding model ($F = 57.85, p < .001$).

Tests of significance were also conducted on the differential imitation of the two models at each of the five blocks of modeling trials. The model differences are highly significant on the first block ($F = 22.97, p < .001$) and the F values for these differences increase with successive trial blocks, the fifth one yielding an F value of $79.64 (p < .001)$.

Single model phase. Similar statistical analyses were computed on differential imitation of the three sets of responses demonstrated by the rewarding model in the third phase of the experiment. Analysis of variance of these scores showed significant differences for response class ($F = 8.06, p < .005$) and blocks of trials ($F = 4.36, p < .005$), as well as a significant Response \times Blocks interaction effect ($F = 2.64, p < .02$). In tests for linear trend, imitation of reinforced motor responses ($F = .07$) and nondistinguishable motor responses that were never rewarded ($F = .81$) remained consistently high across blocks of trials. Imitation of nonreinforced vocal responses, on the other hand, dropped sharply ($F = 30.97, p < .001$) over successive modeling trials.

In separate comparisons between mean imitation scores, reinforced and nonreinforced motor performances did not differ from each other at any of the five trial blocks. By contrast, vocal responses were imitated less often than the two sets of motor responses on the first block of modeling trials ($F = 6.58, p < .02$), and the significance levels became progressively larger as reproduction of vocal responses decreased sharply on succeeding trials. At the fifth and final block of modeling trials the difference between vocal and motor imitations was highly significant ($F = 49.59, p < .001$).

Supplementary Analyses

The variances within the classes of responses differed somewhat. Although the treatment effects are sufficiently large that they remain significant even by highly conservative statistical standards, the data were also analyzed by nonparametric methods. Results of these supplementary analyses are essentially the same as those yielded by the parametric tests. The Friedman two-way analysis of variance computed on the total imitation scores revealed differential imitation depending on the ease with which the reinforcements accompanying the various groups of responses could be discerned ($\chi^2 = 9.52, p < .025$). Reinforced and nondiscriminable nonreinforced motor responses were imitated at an equally high rate but both differed above the .02 significance level

from vocal imitations, and beyond the .005 level from reproductions of motor responses exhibited by the nonrewarding model. No significant differences were obtained in the extent to which the latter two discriminable classes of nonreinforced responses were imitated.

Wilcoxon signed-rank tests performed on the data from the dual model phase showed that children imitated the rewarding model substantially more often than the nonrewarding model, beyond the .005 significance level at each of the five successive blocks of modeling trials. On similar Wilcoxon analyses of reproduction scores from the single model phase, children imitated the rewarded motor responses and the nondiscriminable nonreinforced responses at the same high level throughout the series, whereas vocal imitation diverged progressively more from them. In the first two blocks of trials, vocal imitation differed beyond the .05 and .025 significance level from the rewarded motor responses but not from the unrewarded ones; in the third block, vocal imitation departed from the latter two groups beyond the .01 and the .025 levels, respectively; vocal imitation differed from each of the two sets of motor responses beyond the .025 significance level in the fourth block, and at the .01 level in the fifth block of modeling trials.

The preceding statistical analyses are based on composite data from the 16 children in the experiment. Although most of the children displayed discriminative modeling there was, of course, some intersubject variability in imitative performances both across models and over the different classes of responses. Individual performance curves presented in Figure 2 illustrate the different patterns of imitative responding obtained in the study.

Children's responses to the postexperimental interview indicated that imitation of discriminable nonrewarded responses, when it did occur, was primarily controlled by erroneous expectations regarding probable consequences for nonresponding. Some believed that they were obliged to reproduce all modeled behavior ("I supposed to"); in others unrewarded imitative performances were maintained by mistaken beliefs that eventually the unresponsive model would be-

come 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 performed some unrewarded behavior to confirm their hypotheses about the responses required to obtain reinforcement ("Sometimes I'd do it and sometimes not to see if I'd get any candy.").

Discussion

Findings of the present experiment reveal that discrimination processes play an influential role in nonreinforced imitation. When differential consequences associated with diverse modeled behavior can be readily discerned, either on the basis of distinguishable model characteristics or topography of the responses themselves, children perform rewarded imitations at a high stable rate, but they discontinue unrewarded imitations. Under conditions where some imitative responses are positively reinforced, similar nondiscriminable responses can be effectively maintained even though they never produce reinforcement. These findings, taken together, call into question the conditioned reinforcement hypothesis, which assumes that if some matching responses are rewarded, similarity itself becomes a conditioned reinforcer that maintains all nonreinforced imitative behavior.

Results of a number of other studies similarly are counter to the hypothesis that performance of unrewarded imitations is under intrinsic reinforcement control. Rather, such performances are generally sustained by a variety of external stimulus supports; consequently, unrewarded imitations promptly cease when these external controls are removed. It has been shown, for example, that unreinforced imitations drop markedly when instructions to imitate modeled behavior are rescinded (Zahn & Yarrow, 1970), when tangible rewards used to reinforce other matching responses are not visibly displayed (Berkowitz, 1968), when unrewarded responses are spontaneously demonstrated by the same model in a different context (Zahn & Yarrow, 1970), and when the model absents himself from the room immediately after demonstrating unreinforced responses (Peterson & Whitehurst, 1971).

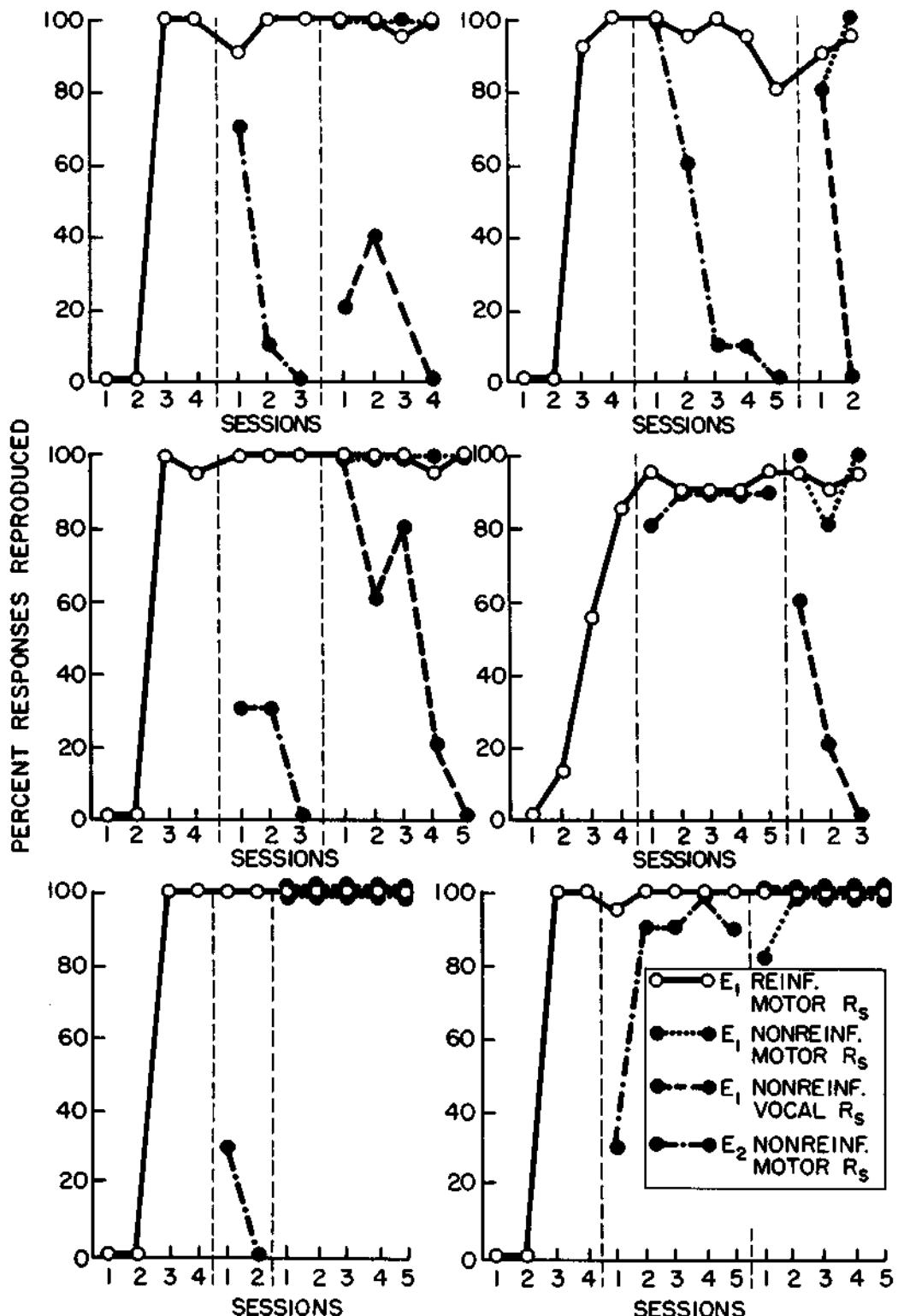


FIG. 2. Differential imitative performances of individual children across models and different classes of modeled behavior. (The first two sessions of the initial phase involved imitation-contingent reinforcement; the third session included peer modeling with imitation-contingent reinforcement; in the fourth session, children received additional imitation-contingent reinforcement to strengthen further imitative responding. The child whose data are presented in the middle right graph increased matching responses on the basis of imitation-contingent reinforcement and did not receive peer modeling. The second phase included dual modeling with differential reinforcement. The third, and final, phase involved differential reinforcement of different classes of responses demonstrated by the rewarding model.)

Finally, in studies presented in support of the conditioned reinforcement hypothesis (Baer et al., 1967; Brigham & Sherman, 1968), when contingent reinforcement for imitative responses is discontinued all imitations generally drop precipitously and reappear with equal suddenness when reinforcement of some imitations is reinstated. If behavioral similarity were rewarding in its own right, matching performances should not undergo such abrupt changes the moment that external reinforcement for the larger subclass of imitative responses is withdrawn. The intrinsic rewards arising from precise response duplication, if operative, should sustain imitative behavior for some time in the absence of extrinsic reinforcement.

The preceding discussion is not meant to imply that all imitative behavior is exclusively under the joint control of discriminative stimuli and external reinforcement. Imitative behavior can be rendered partially independent of its external consequences. It is important to distinguish, however, between response similarity as an automatic conditioned reinforcer and self-reinforcement of one's own performances. There is a growing body of evidence (Bandura, 1971) that human behavior is extensively under self-reinforcement control. In this type of self-regulatory system people set themselves certain performance standards and respond to their own behavior in self-rewarding and self-punishing ways in accordance with their self-imposed demands. For this reason similarity is not invariably rewarding. People are inclined to respond self-approvingly, and thereby to reinforce their own efforts, whenever they achieve close matches to meritorious performances. On the other hand, equally close matches to devalued behaviors are likely to evoke self-punishing reactions and are therefore not repeated.

In several experiments reported by Steinman (1970a, 1970b), in which each modeled response was preceded by a command to the child to reproduce the demonstrated behavior, children imitated nonreinforced responses that they discriminated when no other alternatives were available. Discriminative responding is, of course, unlikely to emerge under conditions where subjects are commanded to respond alike to stimuli that

are correlated with reinforcement and those that are not. When strong coercive control is superimposed on a differential reinforcement schedule one would expect children to perform the demanded behavior regardless of whether or not it might later be rewarded. Steinman's research provides a convincing demonstration that instructional control can override the effects of differential reward for imitation in the paradigm widely employed to study nonreinforced imitation. However, the findings have little bearing on the more important question of whether failure to discriminate differential consequences accounts for persistence of nonrewarded imitations under conditions where modeled behavior is rarely, if ever, preceded by commands for immediate imitation.

When children were given choices between imitating reinforceable and nonreinforceable modeled responses (Steinman, 1970b) they initially exhibited a relatively high rate of nonrewarded imitations but decreased such performances in succeeding modeling trials. Moreover, nonrewarded imitations were performed at a much higher level when they were topographically similar to the reinforced demonstrations than when they differed from them. This pattern of results, from the few cases studied, lends further support for the discrimination hypothesis.

Considering the coercive features inherent in the generalized imitation paradigm, it may be poorly suited for exploring the reinforcement conditions governing generalization of imitative responding, especially as it occurs in everyday life. Imitative responding is so strongly determined by characteristics of the procedure itself that, unless a host of extraneous influences are removed, the effects of variables known to exercise a high degree of behavioral control are obliterated. Paradigms in which reproduction of modeled behavior is measured at varied temporal intervals, in relation to different models, and in different social contexts, are likely to yield more representative empirical relationships. Much of the research conducted within the social learning framework (Bandura, 1969b; Flanders, 1968; Masters & Morris, 1970), in fact, investigates conditions governing the occurrence of nonreinforced imitations under these more natural circumstances.

It is interesting to note that some of the children in the present study recognized the differential reinforcement contingencies but they did not act on their knowledge because of erroneous expectations that nonimitation would be punished, or that ignored imitations would eventually be rewarded. The influential role of anticipated consequences in regulating imitative behavior is consistent with evidence reported by Kaufman, Baron, and Koff (1966) that illusory schedules of reinforcement can exercise strong control over nonimitative responding. In that study, the reinforcement schedules that subjects believed to be in effect outweighed the influence of the program of reinforcement that was actually imposed on their behavior. These and other similar findings indicate that theories assuming that imitative behavior is maintained solely by extrinsic reinforcers (Gewirtz & Stingle, 1968) must consider cognitive influences on behavior if their predictive power is to be increased.

Unlike the prevalence of imitativeness in more lifelike modeling situations, children were initially reluctant to imitate an unfamiliar adult in the discrete trial paradigm. Considering that the models exhibited unrelated disjunctive actions in a formal setting it is not surprising that most children did not imitate until shown by a reinforced peer that it was appropriate and functional to behave that way. When repeated presentation of modeling stimuli fails to produce imitative behavior, the observers are often characterized as "lacking imitative repertoires." The precise nature of the presumed deficit—whether it be absence of behavioral elements, of integrated matching responses, or of imitative sets—is never specified. Results of the present experiment reveal that nonimitators are fully capable of behaving imitatively but they fail to do so for a variety of other reasons. A high level of imitative responding was promptly elicited from these children when reinforcement contingencies were made more explicit, when idiosyncratic reinforcers were introduced, or when a familiar person served as the model; and two of the retarded children imitated only if food rewards were deleted! When imitative deficits are prematurely invoked, search for condi-

tions determining nonimitativeness is apt to be discontinued.

The implication of the overall research findings is that if one wished to produce indiscriminate imitation one would consistently have to reinforce imitation of different models performing diverse behaviors in varied settings, rather than depend on an inherent reinforcement mechanism to do the job. Such an outcome would not only be exceedingly difficult to achieve and even harder to maintain under the highly variable contingencies of everyday life, but since adaptive functioning requires discriminative responding, it would often create adverse consequences for undiscerning imitators.

"Generalized imitation" might be more accurately designated as generalization of imitative responding which is largely regulated by discriminability of stimuli signifying probable consequences, by prior history of selective reinforcement of imitative performances, and by subjective reinforcement contingencies derived by individuals from other informative cues. These influences control imitative behavior primarily through anticipated consequences that may or may not accurately reflect objective conditions of reinforcement. In everyday life, of course, some imitative behavior is undoubtedly self-maintained in the absence of external reinforcement through self-rewarding reactions to one's own skillful reproductions of personally valued activities.

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Behavior Theory and the Models of Man

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The views about the nature of man conveyed by behavior theory require critical examination on conceptual and social grounds. What we believe man to be affects which aspects of human functioning we study most thoroughly and which we disregard. Premises thus delimit research and are, in turn, shaped by it. As knowledge gained through study is put into practice, the images of man on which social technologies rest have even vaster implications. This is nowhere better illustrated than in growing public concern over manipulation and control by psychological methods. Some of these fears arise from expectations that improved means of influence will inevitably be misused. Other apprehensions are aroused by exaggerated claims of psychological power couched in the language of manipulation and authoritarian control. But most fears stem from views of behaviorism, articulated by popular writers and by theorists themselves, that are disputed by the empirical facts of human behavior.

In the minds of the general public, and of many within our own discipline, behavior theory is equated with "conditioning." Over the years, the terms *behaviorism* and *conditioning* have come to be associated with odious imagery, including salivating dogs, puppetry, and animalistic manipulation. As a result, those who wish to disparage ideas or practices they hold in disfavor need only to label them as behavioristic or as Pavlovian precursors of a totalitarian state.

Contrary to popular belief, the fabled reflexive conditioning in humans is largely a myth. *Conditioning* is simply a descriptive term for learning through paired experiences, not an explanation of how the changes come about. Originally, conditioning was assumed to occur automatically. On

closer examination it turned out to be cognitively mediated. People do not learn despite repetitive paired experiences unless they recognize that events are correlated (Dawson & Furedy, 1974; Grings, 1973). So-called conditioned reactions are largely self-activated on the basis of learned expectations rather than automatically evoked. The critical factor, therefore, is not that events occur together in time, but that people learn to predict them and to summon up appropriate anticipatory reactions.

The capacity to learn from correlated experiences reflects sensitivity, but because Pavlov first demonstrated the phenomenon with a dog, it has come to be regarded as a base animalistic process. Had he chosen to study physiological hyperactivity in humans to cues associated with stress, or the development of empathetic reactions to expressions of suffering, conditioning would have been treated in a more enlightened way. To expect people to remain unaffected by events that are frightening, humiliating, disgusting, sad, or pleasurable is to require that they be less than human. Although negative effects such as fears and dislikes can arise from paired experiences of a direct or vicarious sort, so do some of the enabling qualities of man. The pejorative accounts of learning principles, which appear with regularity in professional and lay publications, degrade both the science of psychology and the audiences that the offensive rhetoric is designed to sway.

It is well documented that behavior is influenced by its consequences much of the time. The image of man that this principle connotes depends on the types of consequences that are acknowledged and on an understanding of how they operate. In theories that recognize only the role of proximate external consequences and contend they shape behavior automatically, people appear as mechanical pawns of environmental forces. But external consequences, influential as they often are, are not the sole determinants of human behavior, nor do they operate automatically.

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Response consequences serve several functions. First, they impart information. By observing the effects of their actions individuals eventually discern which behaviors are appropriate in which settings. The acquired information then serves as a guide for action. Contrary to the mechanistic metaphors, outcomes change behavior in humans through the intervening influence of thought.

Consequences motivate, through their incentive value, as well as inform. By representing foreseeable outcomes symbolically, future consequences can be converted into current motivators of behavior. Many of the things we do are designed to gain anticipated benefits and to avert future trouble. Our choices of action are largely under anticipatory control. The widely accepted dictum that man is ruled by response consequences thus fares better for anticipated than for actual consequences. Consider behavior on a fixed-ratio schedule (say, 50:1) in which only every fiftieth response is reinforced. Since 96% of the outcomes are extinction and only 4% are reinforcing, behavior is maintained despite its dissuading consequences. As people are exposed to variations in frequency and predictability of reinforcement, they behave on the basis of the outcomes they expect to prevail on future occasions. When belief differs from actuality, which is not uncommon, behavior is weakly controlled by its actual consequences until repeated experience instills realistic expectations (Bandura, 1971b; Kaufman, Baron, & Kopp, 1966).

Had humans been ruled solely by instant consequences, they would have long become museum pieces among the extinct species. Not that our future is unquestionably secure. The immediate rewards of consumptive life-styles vigorously promoted for short-term profit jeopardize man's long-term chances of survival. But immediate consequences, unless unusually powerful, do not necessarily outweigh deferred ones (Mischel, 1974). Our descendants shall continue to have a future only because those who foresee the aversive long-term consequences of current practices mobilize public support for contingencies that favor survival behavior. Hazardous pesticides, for example, are usually banned before populations suffer maladies from toxic residues. The information-processing capacities with which humans are endowed provide the basis for insightful behavior. Their capacity to bring remote consequences to

bear on current behavior by anticipatory thought supports foresighted action.

Explanations of reinforcement originally assumed that consequences increase behavior without conscious involvement. The still prevalent notion that reinforcers can operate insidiously arouses fears that improved techniques of reinforcement will enable authorities to manipulate people without their knowledge or consent. Although the empirical issue is not yet completely resolved, there is little evidence that rewards function as automatic strengtheners of human conduct. Behavior is not much affected by its consequences without awareness of what is being reinforced (Bandura, 1969; Dulany, 1968). After individuals discern the instrumental relation between action and outcome, contingent rewards may produce accommodating or oppositional behavior depending on how they value the incentives, the influencers and the behavior itself, and how others respond. Thus reinforcement, as it has become better understood, has changed from a mechanical strengthener of conduct to an informative and motivating influence.

People do not function in isolation. As social beings, they observe the conduct of others and the occasions on which it is rewarded, disregarded, or punished. They can therefore profit from observed consequences as well as from their own direct experiences (Bandura, 1971c). Acknowledgment of vicarious reinforcement introduces another human dimension—namely, evaluative capacities—into the operation of reinforcement influences. People weigh consequences to themselves against those accruing to others for similar behavior. The same outcome can thus become a reward or a punishment depending upon the referents used for social comparison.

Human conduct is better explained by the relational influence of observed and direct consequences than by either factor alone. However, behavior is not fully predictable from a relational coefficient because social justifications alter the impact of outcome disparities. Inequitable reinforcement is willingly accepted when people are graded by custom into social ranks and rewarded according to position rather than by performance. Arbitrary inequities are also likely to be tolerated if the underrewarded are led to believe they possess attributes that make them less deserving of equal treatment. Persuasively justified inequities have more detrimental personal effects than acknowledged unfairness because they foster self-de-

valuation in the maltreated. Negative reactions to inequitable reinforcement, which is acknowledged to be unwarranted, can likewise be diminished by temporizing. If people are led to expect that unfair treatment will be corrected within the foreseeable future, it becomes less aversive to them.

Theories that explain human behavior as the product of external rewards and punishments present a truncated image of man because people partly regulate their actions by self-produced consequences (Bandura, 1971c; Thoresen & Mahoney, 1973). Example and precept impart standards of conduct that serve as the basis for self-reinforcing reactions. The development of self-reactive functions gives humans a capacity for self-direction. They do things that give rise to self-satisfaction and self-worth, and they refrain from behaving in ways that evoke self-punishment.

After self-reinforcing functions are acquired, a given act produces two sets of consequences: self-evaluative reactions and external outcomes. Personal and external sources of reinforcement may operate as supplementary or as opposing influences on behavior. Thus, for example, individuals commonly experience conflicts when rewarded for conduct they personally devalue. When self-condemning consequences outweigh rewarding inducements, external influences are relatively ineffective. On the other hand, if certain courses of action produce stronger rewards than self-censure, the result is cheerless compliance. Losses in self-respect for devalued conduct can be abated, however, by self-exonerating justifications. I shall return to this issue shortly.

Another type of conflict between external and self-produced consequences arises when individuals are punished for behavior they regard highly. Principled dissenters and nonconformists often find themselves in this predicament. Personally valued conduct is expressed provided its costs are not too high. Should the threatened consequences be severe, one inhibits self-praiseworthy acts under high risk of penalty but readily performs them when the chances of punishment are reduced. There are individuals, however, whose sense of self-worth is so strongly invested in certain convictions that they will submit to prolonged maltreatment rather than accede to what they regard as unjust or immoral.

External consequences exert greatest influence on behavior when they are compatible with those that are self-produced. These conditions obtain when

rewardable acts are a source of self-pride and punishable ones are self-censured. To enhance compatibility between personal and social influences, people select associates who share similar standards of conduct and thus ensure social support for their own system of self-reinforcement.

Individualistic theories of moral action assume that internalization of behavioral standards creates a permanent control mechanism within the person. Restraints of conscience thereafter operate as enduring controls over reprehensible conduct. The testimony of human behavior, however, contradicts this view. Much human maltreatment and suffering are, in fact, inflicted by otherwise decent moral people. And some of the most striking changes in moral conduct, as evidenced, for example, in political and military violence, are achieved without altering personality structures or moral standards. Personal control is clearly more complex and flexible than the theorizing implies.

Although self-reinforcing influences serve as regulators of conduct, they can be dissociated from censurable deeds by self-exonerating practices (Bandura, 1973). One device is to make inhumane behavior personally and socially acceptable by defining it in terms of high moral principle. People do not act in ways they ordinarily consider evil or destructive until such activities are construed as serving moral purposes. Over the years, much cruelty has been perpetrated in the name of religious principles, righteous ideologies, and regulatory sanctions. In the transactions of everyday life, euphemistic labeling serves as a handy linguistic device for masking reprehensible activities or according them a respectable status. Self-deplored conduct can also be made benign by contrasting it with more flagrant inhumanities. Moral justifications and palliative comparisons are especially effective because they not only eliminate self-generated deterrents but engage self-reward in the service of reprehensible conduct. What was morally unacceptable becomes a source of self-pride.

A common dissociative practice is to obscure or distort the relationship between one's actions and the effects they cause. People will perform behavior they normally repudiate if a legitimate authority sanctions it and acknowledges responsibility for its consequences. By displacing responsibility elsewhere, participants do not hold themselves accountable for what they do and are thus spared self-prohibiting reactions. Exemption

from self-censure can be facilitated additionally by diffusing responsibility for culpable behavior. Through division of labor, division of decision making, and collective action, people can contribute to detrimental practices without feeling personal responsibility or self-disapproval.

Attribution of blame to the victim is still another exonerative expedient. Victims are faulted for bringing maltreatment on themselves, or extraordinary circumstances are invoked as justifications for questionable conduct. One need not engage in self-reproach for committing acts prescribed by circumstances. A further means of weakening self-punishment is to dehumanize the victim. Inflicting harm upon people who are regarded as subhuman or debased is less likely to arouse self-reproach than if they are looked upon as human beings with sensitivities.

There are other self-disinhibiting maneuvers that operate by misrepresenting the consequences of actions. As long as detrimental effects are ignored or minimized, there is little reason for self-censure. If consequences are not easily distortable, distress over conduct that conflicts with self-evaluative standards can be reduced by selectively remembering the benefits and forgetting the harm of one's acts.

Given the variety of self-disinhibiting devices, a society cannot rely on control by conscience to ensure moral and ethical conduct. Though personal control ordinarily serves as a self-directive force, it can be nullified by social sanctions conducive to destructiveness. Indoctrination and social justifications give meaning to events and create anticipations that determine one's actions. Control through information, which is rooted in cognitive processes, is more pervasive and powerful than conditioning through contiguity of events. Cultivation of humaneness therefore requires, in addition to benevolent personal codes, safeguards built into social systems that counteract detrimental sanctioning practices and uphold compassionate behavior.

A conceptual orientation not only prescribes what facets of man will be studied in depth but also how one goes about changing human behavior. Early applications of reinforcement principles, for example, were guided by the then prevalent belief that consequences alter behavior automatically and unconsciously. Since the process supposedly operated mechanically, the reinforcers had to occur instantly to be effective. Participants in change programs were, therefore, uninformed about why

they were being reinforced, and, in an effort to ensure immediacy of effects, reinforcers were presented intrusively as soon as the requisite responses were emitted. The net effect was a tedious shaping process that produced, at best, mediocre results in an ethically questionable manner. In many public and professional circles, reinforcement still connotes furtive control even though reinforcement theory and practices have progressed well beyond this level.

Realization that reinforcement is an unarticulated way of designating appropriate conduct prompted the use of cognitive factors in the modification of behavior. Not surprisingly, people change more rapidly if told what behaviors are rewardable and punishable than if they have to discover it from observing the consequences of their actions. Competencies that are not already within their repertoires can be developed with greater ease through the aid of instruction and modeling than by relying solely on the successes and failures of unguided performance.

As further research revealed that reinforcers function as motivators, consequences were recognized as sources of motivation that depend heavily for their effectiveness upon the incentive preferences of those undergoing change. Hence, people do not indiscriminately absorb the influences that impinge upon them. Outcomes resulting from actions need not necessarily occur instantly. Humans can cognitively bridge delays between behavior and subsequent reinforcers without impairing the efficacy of incentive operations.

At this second evolutionary stage, reinforcement practices changed from unilateral control to social contracting. Positive arrangements affirm that if individuals do certain things they are entitled to certain rewards and privileges. In the case of negative sanctions, reprehensible conduct carries punishment costs. The process is portrayed in reinforcement terms, but the practice is that of social exchange. Most social interactions are, of course, governed by conditional agreements, though they usually are not couched in the language of reinforcement. Describing them differently does not change their nature, however.

Contingencies vary in the human qualities they embody and in the voice individuals have in decisions concerning the social arrangements that affect their lives. Reflecting the salient values of our society, reinforcement practices have traditionally favored utilitarian forms of behavior. But

conditions are changing. With growing reservations about materialistic life-styles, reinforcement practices are being increasingly used to cultivate personal potentialities and humanistic qualities. These emerging changes in value commitments will probably accelerate as people devote fewer hours to working for income and have more leisure time for self-development.

Another change of some consequence is the renewed concern for individual rights. People are seeking a collaborative role in the development of societal contingencies that affect the course and quality of their lives. As part of this social trend, even the actions taken in the name of psychotherapy are being examined for their ethics and social purposes. These concerns have provided the impetus for prescripts to ensure that reinforcement techniques are used in the service of human betterment rather than as instruments of social control.

A closely related issue is the relative attention devoted to changing individuals or to altering the institutions of society to enrich life. If psychologists are to have a significant impact on common problems of life, they must apply their corrective measures to detrimental societal practices rather than limit themselves to treating the casualties of these practices. This, of course, is easier said than done. Practitioners, whatever their specialty, are reinforced more powerfully for using their knowledge and skills in the service of existing operations than for changing them. Socially oriented efforts are hard to sustain under inadequate reinforcement supports.

The methods of change discussed thus far draw heavily upon external consequences of action. Evidence that people can exercise some control over their own behavior provided the impetus for further changes in reinforcement practices. Interest began to shift from managing conduct to developing skills in self-regulation. In the latter approach, control is vested to a large extent in the hands of individuals themselves: They arrange the environmental inducements for desired behavior; they evaluate their own performances; and they serve as their own reinforcing agents (Goldfried & Mervbaum, 1973; Mahoney & Thoresen, 1974). To be sure, the self-reinforcing functions are created and occasionally supported by external influences. Having external origins, however, does not refute the fact that, once established, self-influence partly determines what actions one performs. Citing historical determinants of a generalizable function

cannot substitute for contemporaneous influences arising through exercise of that function.

The recognition of self-directing capacities represents a substantial departure from exclusive reliance upon environmental control. But the emerging self-influence practices are still closely rooted in physical transactions—the self-administered consequences are, for the most part, material. Eventually changes in form, as well as source, of reinforcement will appear as the insufficiency of material outcomes is acknowledged. Most people value their self-respect above commodities. They rely extensively on their own self-demands and self-approval as guides for conduct. To ignore the influential role of covert self-reinforcement in the regulation of behavior is to disavow a uniquely human capacity of man.

Proponents who recognize only external consequences restrict their research and practice to such influences and thus generate evidence that reinforces their conceptions. Those who acknowledge personal influences as well tend to select methods that reveal and promote self-directing capabilities in man. The view of man embodied in behavioral technologies is therefore more than a philosophical issue. It affects which human potentialities will be cultivated and which will be underdeveloped.

The preceding remarks addressed the need to broaden the scope of research into the reinforcement processes regulating human behavior. Much the same might be said for the ways in which human learning is conceptualized and investigated. Our theories have been incredibly slow in acknowledging that man can learn by observation as well as by direct experience. This is another example of how steadfast adherence to orthodox paradigms makes it difficult to transcend the confines of conceptual commitment. Having renounced cognitive determinants, early proponents of behaviorism advanced the doctrine that learning can occur only by performing responses and experiencing their effects. This legacy is still very much with us. The rudimentary form of learning based on direct experience has been exhaustively studied, whereas the more pervasive and powerful mode of learning by observation is largely ignored. A shift of emphasis is needed.

The capacity to represent modeled activities symbolically enables man to acquire new patterns of behavior observationally without reinforced enactment. From observing others, one forms an idea of how certain behavior is performed, and on

later occasions the coded information serves as a guide for action. Indeed, research conducted within the framework of social learning theory shows that virtually all learning phenomena resulting from direct experience can occur on a vicarious basis by observing other people's behavior and its consequences for them (Bandura, 1969). The abbreviation of the acquisition process through observational learning is, of course, vital for both development and survival. Modeling reduces the burden of time-consuming performance of inappropriate responses. Since errors can produce costly, if not fatal, consequences, the prospects of survival would be slim indeed if people had to rely solely on the effects of their actions to inform them about what to do.

In many instances the behavior being modeled must be learned in essentially the same form. Driving automobiles, skiing, and performing surgery, for example, permit little, if any, departure from essential practices. In addition to transmitting particular response patterns, however, modeling influences can create generative and innovative behavior. In the latter process, observers abstract common features from seemingly diverse responses and formulate generative rules of behavior that enable them to go beyond what they have seen or heard. By synthesizing features of different models into new amalgams, observers can achieve through modeling novel styles of thought and conduct. Once initiated, experiences with the new forms create further evolutionary changes. A partial departure from tradition eventually becomes a new direction.

Some of the limitations commonly ascribed to behavior theory are based on the mistaken belief that modeling can produce at best mimicry of specific acts. This view is disputed by growing evidence that abstract modeling is a highly effective means of inducing rule-governed cognitive behavior (Bandura, 1971a; Zimmerman & Rosenthal, 1974). On the basis of observationally derived rules, people alter their judgmental orientations, conceptual schemes, linguistic styles, information-processing strategies, as well as other forms of cognitive functioning. Nevertheless, faulty evaluations continue to be mistaken for weaknesses inherent in theory.

Observational learning has recently come to be accepted more widely, but some theorists are willing to grant it full scientific respectability only if it is reduced to performance terms. As a result,

enactment paradigms are used which are rooted in the traditional assumption that responses must be performed before they can be learned. Instant reproduction of modeled responses is favored, thereby minimizing dependence upon cognitive functions which play an especially influential role when retention over time is required. The issue of whether reinforcement enhances modeling is pursued to the neglect of the more interesting question of whether one can keep people from learning what they have seen.

When learning is investigated through observational paradigms, a broader range of determinants and intervening mechanisms gains prominence. Learning by observation is governed by four component processes: (a) attentional functions regulate sensory input and perception of modeled actions; (b) through coding and symbolic rehearsal, transitory experiences are transformed for memory representation into enduring performance guides; (c) motor reproduction processes govern the integration of constituent acts into new response patterns; and (d) incentive or motivational processes determine whether observationally acquired responses will be performed. Studied from this perspective, observational learning emerges as an actively judgmental and constructive, rather than a mechanical copying, process.

Because observational learning entails several subfunctions that evolve with maturation and experience, it obviously depends upon prior development. Differences in theoretical perspectives prescribe different methodologies for studying how the capacity for observational learning itself is acquired. When modeling is conceptualized in terms of formation of stimulus-response linkages, efforts are aimed at increasing the probability of imitative responses through reinforcement. Modeling can be increased by rewarding matching behavior, but such demonstrations are not of much help in identifying what exactly is being acquired during the process, or in explaining imitation failures under favorable conditions of reinforcement. From a social learning view, the capability for observational learning is developed by acquiring skill in discriminative observation, in memory encoding, in coordinating ideomotor and sensorimotor systems, and in judging probable consequences for matching behavior. Understanding how people learn to imitate becomes a matter of understanding how the requisite subfunctions develop and operate. Capacity for observational learning is restricted by

deficits, and expanded by improvements, in its component functions.

Over the years, proponents of the more radical forms of behaviorism not only disclaimed interest in mentation but also marshaled numerous reasons why cognitive events are inadmissible in causal analyses. It was, and still is, argued that cognitions are inaccessible except through untrustworthy self-reports, they are inferences from effects, they are epiphenomenal, or they are simply fictional. Advances in experimental analysis of behavior, it was claimed, would eventually show them to be unnecessary. Empirical evidence, however, has shown the opposite to be true. A large body of research now exists in which cognition is activated instructionally with impressive results. People learn and retain much better by using cognitive aids than by repetitive reinforced performance (Anderson & Bower, 1973; Bandura, 1971a). With growing evidence that cognition has causal influence in behavior, the arguments against cognitive determinants are losing their force.

These recent developments have shifted emphasis from the study of response learning to analyses of memory and cognition. From this effort we have gained a better understanding of the mechanisms whereby information is acquired, stored, and retrieved. There is more to learning, however, than the acquisition and retention of information. Behavioristic theories addressed themselves to performance but deemphasized internal determinants, whereas the cognitive approaches remain immersed in thought but divorced from conduct. In a complete account of human behavior, internal processes must eventually be tied to action. Hence, explanations of how information eventuates in skilled performance must additionally be concerned with the organization and regulation of behavior. Social learning includes within its framework both the processes internal to the organism as well as performance-related determinants.

Speculations about man's nature inevitably raise the fundamental issues of determinism and human freedom. In examining these questions it is essential to distinguish between the metaphysical and the social aspects of freedom. Many of the heated disputes on this topic arise as much, if not more, from confusion over the dimensions of freedom being discussed as from disagreements over the doctrine of determinism.

Let us first consider freedom in the social sense. Whether freedom is an illusion, as some writers

maintain, or a social reality of considerable importance depends upon the meaning given to it. Within the social learning framework, freedom is defined in terms of the number of options available to people and the right to exercise them. The more behavioral alternatives and social prerogatives people have, the greater is their freedom of action.

Personal freedom can be limited in many different ways. Behavioral deficits restrict possible choices and otherwise curtail opportunities to realize one's preferences. Freedom can therefore be expanded by cultivating competencies. Self-restraints arising from unwarranted fears and stringent self-censure restrict the effective range of activities that individuals can engage in or even contemplate. Here freedom is restored by eliminating dysfunctional self-restraints.

In maximizing freedom a society must place some limits on conduct because complete license for any individual is likely to encroach on the freedom of others. Societal prohibitions against behavior that is socially injurious create additional curbs on conduct. Conflicts often arise over behavioral restrictions when many members of society question conventional customs and when legal sanctions are used more to enforce a particular brand of morality than to prohibit socially detrimental conduct.

The issue of whether individuals should be allowed to engage in activities that are self-injurious but not detrimental to society has been debated vigorously over the years. Prohibitionists argue that it is difficult for a person, other than a recluse, to impair himself without inflicting secondary harm on others. Should self-injury produce incapacities, society usually ends up bearing the treatment and subsistence costs. Libertarians do not find such arguments sufficiently convincing to justify a specific prohibition because some of the self-injurious activities that society approves may be as bad or worse than those it outlaws. Normative changes over time regarding private conduct tend to favor an individualistic ethic. Consequently, many activities that were formerly prohibited by law have been exempted from legal sanctions.

Some groups have their freedom curtailed by socially condoned discrimination. Here, the alternatives available to a person are limited by skin color, sex, religion, ethnic background, or social class, regardless of capabilities. When self-determination is prejudicially restricted, those who are subordinated remove inequities by altering

practices that compromise or temporize the professed values of society.

Freedom deals with rights as well as options and behavioral restraints. Man's struggle for freedom is principally aimed at structuring societal contingencies so that certain forms of behavior are exempted from aversive control. After protective laws are built into the system, there are certain things that a society may not do to an individual, however much it might like to. Legal prohibitions on societal control create freedoms that are realities, not simply feelings or states of mind. Societies differ in their institutions of freedom and in the number and types of behaviors that are officially exempted from punitive control. Social systems that protect journalists from punitive control, for example, are freer than those that allow authoritative power to be used to silence critics or their vehicles of expression. Societies that possess an independent judiciary ensure greater social freedom than those that do not.

In philosophical discourses, freedom is often considered antithetical to determinism. When defined in terms of options and rights, there is no incompatibility of freedom and determinism. From this perspective, freedom is not conceived negatively as the absence of influences or simply the lack of external constraints. Rather, it is defined positively in terms of the skills at one's command and the exercise of self-influence upon which choice of action depends.

Psychological analyses of freedom eventually lead to discourses on the metaphysics of determinism. Are people partial determiners of their own behavior, or are they ruled exclusively by forces beyond their control? The long-standing debate over this issue has been enlivened by Skinner's (1971) contention that, apart from genetic contributions, human behavior is controlled solely by environmental contingencies, for example, "A person does not act upon the world, the world acts upon him" (p. 211). A major problem with this type of analysis is that it depicts the environment as an autonomous force that automatically shapes and controls behavior. Environments have causes as do behaviors. For the most part, the environment is only a potentiality until actualized and fashioned by appropriate actions. Books do not influence people unless someone writes them and others select and read them. Rewards and punishments remain in abeyance until prompted by appropriate performances.

It is true that behavior is regulated by its con-

tingencies, but the contingencies are partly of a person's own making. By their actions, people play an active role in producing the reinforcing contingencies that impinge upon them. Thus, behavior partly creates the environment, and the environment influences the behavior in a reciprocal fashion. To the oft-repeated dictum, change contingencies and you change behavior, should be added the reciprocal side, change behavior and you change the contingencies.

The image of man's efficacy that emerges from psychological research depends upon which aspect of the reciprocal control system one selects for analysis. In the paradigm favoring environmental control, investigators analyze how environmental contingencies change behavior [$B = f(E)$]. The personal control paradigm, on the other hand, examines how behavior determines the environment [$E = f(B)$]. Behavior is the effect in the former case, and the cause in the latter. Although the reciprocal sources of influence are separable for experimental purposes, in everyday life two-way control operates concurrently. In ongoing interchanges, one and the same event can thus be a stimulus, a response, or an environmental reinforcer depending upon the place in the sequence at which the analysis arbitrarily begins.

A survey of the literature on reinforcement confirms the extent to which we have become captives of a one-sided paradigm to map a bidirectional process. Environmental control is overstudied, whereas personal control has been relatively neglected. To cite but one example, there exist countless demonstrations of how behavior varies under different schedules of reinforcement, but one looks in vain for studies of how people, either individually or by collective action, succeed in fashioning reinforcement schedules to their own liking. The dearth of research on personal control is not because people exert no influence on their environment or because such efforts are without effect. Quite the contrary. Behavior is one of the more influential determinants of future contingencies. As analyses of sequential interchanges reveal, aggressive individuals actualize through their conduct a hostile environment, whereas those who display friendly responsiveness produce an amicable social milieu within the same setting (Rausch, 1965). We are all acquainted with problem-prone individuals who, through their aversive conduct, predictably breed negative social climates wherever they go.

It should be noted that some of the doctrines

ascribing preeminent control to the environment are ultimately qualified by acknowledgment that man can exercise some measure of countercontrol (Skinner, 1971). The notion of reciprocal interaction, however, goes considerably beyond the concept of countercontrol. Countercontrol portrays the environment as an instigating force to which individuals react. As we have already seen, people activate and create environments as well as rebut them.

People may be considered partially free insofar as they can influence future conditions by managing their own behavior. Granted that selection of particular courses of action from available alternatives is itself determined, individuals can nevertheless exert some control over the factors that govern their choices. In philosophical analyses all events can be submitted to an infinite regression of causes. Such discussions usually emphasize how man's actions are determined by prior conditions but neglect the reciprocal part of the process showing that the conditions themselves are partly determined by man's prior actions. Applications of self-control practices demonstrate that people are able to regulate their own behavior in preferred directions by arranging environmental conditions most likely to elicit it and administering self-reinforcing consequences to sustain it. They may be told how to do it and initially be given some external support for their efforts, but self-produced influences contribute significantly to future goal attainment.

To contend, as environmental determinists often do, that people are controlled by external forces and then to advocate that they redesign their society by applying behavioral technology undermines the basic premise of the argument. If humans were in fact incapable of influencing their own actions, they could describe and predict environmental events but hardly exercise any intentional control over them. When it comes to advocacy of social change, however, thoroughgoing environmental determinists become ardent exponents of man's power to transform environments in pursuit of a better life.

In backward causal analyses, conditions are usually portrayed as ruling man, whereas forward deterministic analyses of goal setting and attainment reveal how people can shape conditions for their purposes. Some are better at it than others. The greater their foresight, proficiency, and self-influence, all of which are acquirable skills, the greater the progress toward their goals. Because of

the capacity for reciprocal influence, people are at least partial architects of their own destinies. It is not determinism that is in dispute, but whether it is treated as a one-way or a two-way control process. Considering the interdependence of behavior and environmental conditions, determinism does not imply the fatalistic view that man is but a pawn of external influences.

Psychological perspectives on determinism, like other aspects of theorizing, influence the nature and scope of social practice. Environmental determinists are apt to use their methods primarily in the service of institutionally prescribed patterns of behavior. Personal determinists are more inclined to cultivate self-directing potentialities in man. The latter behavioral approach and humanism have much in common. Behavioral theorists, however, recognize that "self-actualization" is by no means confined to human virtues. People have numerous potentialities that can be actualized for good or ill. Over the years, man has suffered considerably at the hands of self-actualized tyrants. A self-centered ethic of self-realization must therefore be tempered by concern for the social consequences of one's conduct. Behaviorists generally emphasize environmental sources of control, whereas humanists tend to restrict their interest to personal control. Social learning encompasses both aspects of the bidirectional influence process.

When the environment is regarded as an autonomous rather than as an influenceable determinant of behavior, valuation of dignifying human qualities and accomplishments is diminished. If inventiveness emanates from external circumstances, it is environments that should be credited for people's achievements and chastised for their failings or inhumanities. Contrary to the unilateral view, human accomplishments result from reciprocal interaction of external circumstances with a host of personal determinants including endowed potentialities, acquired competencies, reflective thought, and a high level of self-initiative.

Musical composers, for example, help to shape tastes by their creative efforts, and the public in turn supports their performances until advocates of new styles generate new public preferences. Each succeeding form of artistry results from a similar two-way influence process for which neither artisans nor circumstances deserve sole credit.

Superior accomplishments, whatever the field, require considerable self-disciplined application. After individuals adopt evaluative standards, they expend large amounts of time, on their own,

improving their performances to the point of self-satisfaction. At this level of functioning, persistence in an endeavor is extensively under self-reinforcement control. Skills are perfected as much, or more, to please oneself as to please the public.

Without self-generated influences most innovative efforts would be difficult to sustain. This is because the unconventional is initially resisted and gradually accepted only as it proves functionally valuable or wins prestigious advocates. As a result, the early efforts of innovators bring rebuffs rather than rewards or recognition. In the history of creative endeavors, it is not uncommon for artists or composers to be scorned when they depart markedly from convention. Some gain recognition later in their careers. Others are sufficiently convinced of the worth of their work that they labor indefatigably even though their productions are negatively received during their lifetimes. Ideological and, to a lesser extent, technological advances follow similar courses. Most innovative endeavors receive occasional social support in early phases, but environmental conditions alone are not especially conducive to unconventional developments.

The operation of reciprocal influence also has bearing on the public concern that advances in psychological knowledge will produce an increase in human manipulation and control. A common response to such apprehensions is that all behavior is inevitably controlled. Social influence, therefore, is not a question of imposing controls where none existed before. This type of argument is valid in the sense that every act has a cause. But it is not the principle of causality that worries people. At the societal level, their misgivings center on the distribution of controlling power, the means and purposes for which it is used, and the availability of mechanisms for exercising reciprocal control over institutional practices. At the individual level, they are uneasy about the implications of psychotechnology in programming human relations.

Possible remedies for exploitative use of psychological techniques are usually discussed in terms of individual safeguards. Increased knowledge about modes of influence is prescribed as the best defense against manipulation. When people are informed about how behavior can be controlled, they tend to resist evident attempts at influence, thus making manipulation more difficult. Awareness alone, however, is a weak countervalue.

Exploitation was successfully thwarted long before there existed a discipline of psychology to

formulate principles and practices of behavior change. The most reliable source of opposition to manipulative control resides in the reciprocal consequences of human interactions. People resist being taken advantage of, and will continue to do so in the future, because compliant behavior produces unfavorable consequences for them. Sophisticated efforts at influence in no way reduce the aversiveness of yielding that is personally disadvantageous. Because of reciprocal consequences, no one is able to manipulate others at will, and everyone experiences some feeling of powerlessness in getting what they want. This is true at all levels of functioning, individual and collective. Parents cannot get their children to follow all their wishes, while children feel constrained by their parents from doing what they desire. At universities, the administrators, faculty, students, and alumni all feel that the other constituencies are unduly influential in promoting their self-interests but that one's own group is granted insufficient power to alter the institutional practices. In the political arena, Congress feels that the executive branch possesses excessive power, and conversely the executive branch feels thwarted in implementing its policies by congressional counteraction.

If protection against exploitation relied solely upon individual safeguards, people would be continually subjected to coercive pressures. Accordingly, they create institutional sanctions which set limits on the control of human behavior. The integrity of individuals is largely secured by societal safeguards that place constraints on improper means and foster reciprocity through balancing of interests.

Because individuals are conversant with psychological techniques does not grant them license to impose them on others. Industrialists, for example, know full well that productivity is higher when payment is made for amount of work completed rather than for length of time at work. Nevertheless, they cannot use the reinforcement system most advantageous to them. When industrialists commanded exclusive power, they paid workers at a piece-rate basis and hired and fired them at will. Reductions in power disparity between employers and employees resulted in a gradual weakening of performance requirements. As labor gained economic coercive strength through collective action, it was able to negotiate guaranteed wages on a daily, weekly, monthly, and eventually on an annual basis. At periodic intervals new contractual contingencies are adopted that are mutually ac-

ceptable. In the course of time, as better means of joint action are developed, other constituents will use their influence to modify arrangements that benefit certain segments of labor and industry but adversely affect the quality of life for other sectors of society.

As the previous example illustrates, improved knowledge of how to influence behavior does not necessarily raise the level of social control. If anything, the recent years have witnessed a diffusion of power, creating increased opportunities for reciprocal influence. This has enabled people to challenge social inequities, to effect changes in institutional practices, to counteract infringements on their rights, and to extend grievance procedures and due process of law to activities in social contexts that hitherto operated under unilateral control. The fact that more people wield power does not in and of itself ensure a humane society. In the final analysis, the important consideration is the purposes that power serves, however it might be distributed. Nor does knowledgeability about means of influence necessarily produce mechanical responsiveness in personal relations. Whatever their orientations, people model, expound, and reinforce what they value. Behavior arising out of purpose and commitment is no less genuine than improvised action.

The cliché of 1984, and its more recent kin, diverts public attention from regulative influences that pose continual threats to human welfare. Most societies have instituted reciprocal systems that are protected by legal and social codes to prevent imperious control of human behavior. Although abuses of institutional power arise from time to time, it is not totalitarian rule that constitutes the impending peril. The hazards lie more in the intentional pursuit of personal gain, whether material or otherwise, than in control by coercion. Detrimental social practices arise and resist change, even within an open society, when many people benefit from them. To take a prevalent example, inequitable treatment of disadvantaged groups for private gain enjoys public support without requiring despotic rule.

Man, of course, has more to contend with than inhumanities toward one another. When the aversive consequences of otherwise rewarding life-styles are delayed and imperceptibly cumulative, people become willful agents of their own self-destruction. Thus, if enough people benefit from activities that progressively degrade their environment, then, barring contravening influences, they will eventually

destroy their environment. Although individuals contribute differentially to the problem, the harmful consequences are borne by all. With growing populations and spread of lavish life-styles taxing finite resources, people will have to learn to cope with new realities of human existence.

Psychology cannot tell people how they ought to live their lives. It can, however, provide them with the means for effecting personal and social change. And it can aid them in making value choices by assessing the consequences of alternative life-styles and institutional arrangements. As a science concerned about the social consequences of its applications, psychology must also fulfill a broader obligation to society by bringing influence to bear on public policies to ensure that its findings are used in the service of human betterment.

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Disinhibition of Aggression through Diffusion of Responsibility and Dehumanization of Victims

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The present study tested derivations from social learning theory on the disinhibition of aggression through processes that weaken self-deterring consequences to injurious conduct. Subjects were provided with opportunities to behave punitively under diffused or personalized responsibility toward groups that were characterized in either humanized, neutral, or dehumanized terms. Both dehumanization and lessened personal responsibility enhanced aggressiveness, with dehumanization serving as the more potent disinhibitor. Escalation of aggression under conditions of dehumanization was especially marked when punitiveness was dysfunctional in effecting desired changes. The uniformly low level of aggression directed toward humanized groups, regardless of variations in responsibility and instrumentality of the conduct, attested to the power of humanization to counteract punitiveness. Results of supplementary measures are consistent with the postulated relationship between self-disinhibiting processes and punitiveness. Dehumanization fostered self-absolving justifications that were in turn associated with increased punitiveness. Findings on the internal concomitants of behavior performed under different levels of responsibility suggest that reducing personal responsibility heightens aggressiveness more through social than personal sources of disinhibition.

Psychological explanations of aggression traditionally have been concerned with individual injurious acts that are aversively motivated. In most of these accounts, aggression is attributed not only to a limited set of instigators but to a narrow range of regulative influences as well. In recent years social scientists have enlarged their view of what constitutes aggression and have begun to reexamine its sources from a broader perspective.

A complete theory of aggression must explain how aggressive patterns are developed, what provokes people to behave aggressively, and what regulates their aggressive actions. Figure 1 summarizes the determinants of these separable processes from the perspective of social learning theory (Bandura, 1973). This theory is designed to encompass different

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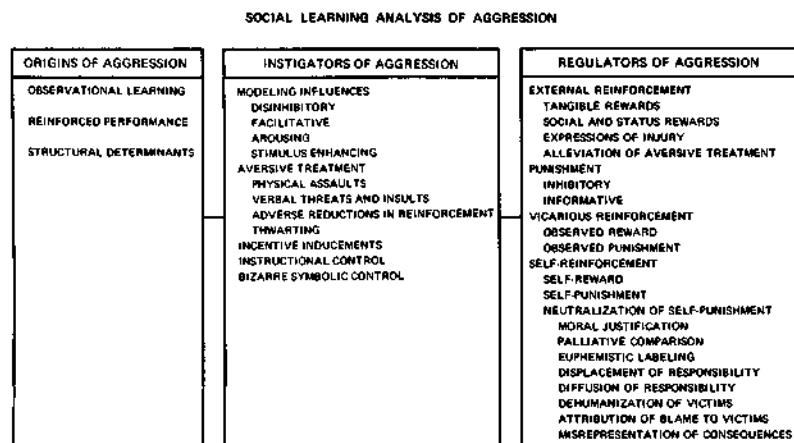


FIG. 1. Schematic outline of the origins, instigators, and regulators of aggression in social learning theory.

facets of aggression, whether individual or collective, personally or institutionally sanctioned.

Among the processes controlling aggressive behavior, self-reinforcement plays an especially influential role. After people acquire standards of conduct through modeling and selective reinforcement, they partly regulate their own actions by self-created consequences. They do things that give them self-satisfaction and a sense of self-worth but refrain from conduct that produces self-devaluative consequences. Internalization of standards, however, does not create an invariable control mechanism within the person. Because activation of self-reinforcement is under discriminative control, variations in moral conduct often occur with the same internalized moral codes.

Self-generated consequences can be disengaged from censurable acts by self-exonerating practices (Bandura, 1973; Kelman, 1973; Sanford & Comstock, 1971). One method is to make reprehensible behavior personally and socially acceptable by construing it in terms of high moral principle. Euphemistic labeling provides a convenient linguistic device for masking reprehensible activities or according them a respectable status. Self-deplored acts can also be made benign by contrasting them with more flagrant inhumanities. Moral justifications and palliative comparisons can serve as effective disinhibitors of aggression because they not only eliminate self-generated deterrents but also engage self-reward in the service of inhumane conduct. What was morally unacceptable becomes, through cognitive restructuring, a source of self-pride.

Self-reinforcing consequences are likely to be activated most strongly when the causal connection between moral behavior and its outcomes is

well defined. A common dissociative practice in everyday life is to obscure or distort the relationship between actions and the effects they cause. People will behave in aggressive ways they normally repudiate if a legitimate authority sanctions their conduct and acknowledges responsibility for its consequences (Milgram, 1974). By displacing responsibility elsewhere, people need not hold themselves accountable for what they do and are thus spared self-prohibiting reactions.

Exemption from self-censure can be facilitated by diffusing responsibility for culpable behavior. Through division of labor, division of decision making, and collective action, people can behave injuriously without feeling personally responsible. Anonymity can weaken restraints socially by reducing the chances of being blamed and punished by others for misdeeds. To the extent that dispersing responsibility also obscures individual contributions to collectively produced consequences, it can reduce personal restraints by attenuating self-disapproval.

Attributing blame to the victim is still another exonerative expedient. Victims are faulted for bringing suffering on themselves, or extraordinary circumstances are invoked as vindications for punitive conduct. One need not engage in self-reproach for committing acts dictated by circumstances.

The strength of self-evaluative reactions partly depends upon the characteristics of the people toward whom actions are directed. Inflicting harm upon 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. The reason for this is that people who are reduced to base creatures are likely to be viewed as insensitive to maltreatment and influenceable only through the more primitive methods. Dehumanizing the victim is therefore a further means of reducing self-punishment for cruel actions. Additional ways of weakening self-deterring reactions operate by misrepresenting the consequences of actions. As long as detrimental effects are ignored or minimized there is little reason for self-censure.

Disinhibiting phenomena are amply documented by naturalistic accounts of collective violence, but they have only recently received systematic study under controlled conditions (Zimbardo, 1969; Diener, Note 1). Evidence is needed on how sanctioning arrangements interact to weaken restraints over aggression and on the mechanisms by which they achieve their effects.

EXPERIMENT 1

The present experiment investigated in a factorial design the influence of diffusion of responsibility and victim dehumanization on aggression

when control of punitive actions relied mainly on self-deterrants. Groups of subjects were provided with opportunities to behave punitively toward others under conditions of personalized or diffused responsibility. Within each of these conditions, the targets of aggression were characterized in either humanized, neutral, or dehumanized terms. It was hypothesized that both dehumanization and diffused responsibility would reduce self-deterring responses and enhance aggressiveness. Dehumanization was expected to be a more powerful disinhibitor of aggression under diffused than under individualized conditions of responsibility.

Self-absolving practices alone are unlikely to transform otherwise considerate people into callous aggressors instantly. Rather, the change is usually achieved through a process of gradual desensitization in which distress and self-reproach are extinguished with repeated performance of aggressive acts. It was predicted that aggression would be disinhibited more rapidly when responsibility is diffused and victims are dehumanized than when people are held personally responsible for their actions and victims are humanized. There was no a priori basis, however, for predicting the relative disinhibitory power of the responsibility and dehumanization conditions.

Method

Subjects

A total of 72 paid male volunteers from junior colleges participated in the study. The experiment employed a 3×2 factorial design based upon three variations in victim labeling and two levels of responsibility. Punishment trials constituted the repeated measure of aggression. Twelve subjects were randomly assigned to each experimental condition.

Apparatus

The experimental room was partitioned into three identical cubicles so that subjects could neither see nor communicate with each other. Each cubicle contained an aggression device for delivering shocks in 10 levels of intensity. A red light on the apparatus signaled inadequate solutions ostensibly recommended by a group of decision makers. Preconceptions concerning the personal characteristics of the decision makers were conveyed through headphones connected to a tape recorder.

Procedure

Subjects arrived in groups of three in all conditions and were assigned as a triad to one of the treatments. As the experimenter escorted them to the experimental room, his assistant announced, within hearing distance, that he would begin the instructions to the group of decision makers who had presumably arrived earlier and were assembled in a nearby room. The experimenter explained to the subjects that the study was concerned with the effects of punishment on the quality of collective decision making. The task was presented as an analog of organizational procedures in which members of a task group jointly decide the best course of action from several alternatives and project supervisors take corrective steps if advisors propose solutions that prove inadequate. It was further explained that in

order to increase the generality of the findings, participants from different social backgrounds were being included in the project but that each group was composed of people with similar attributes. Information on the homogeneous composition was included so that characterizations of the group would apply to individual members, as in conventional stereotyping.

The subjects were informed that they would serve as supervisors for a three-member team of decision makers assigned the task of formulating collective solutions for a series of bargaining situations. On each of 25 bargaining trials they would choose one of several options that, the experimenter explained, were known to vary in effectiveness. Whenever the decision makers proposed effective bargaining solutions, an amber light would flash on the supervisors' display panel, which required no action. However, on occasions when they recommended inadequate solutions, as signaled by the illumination of the red light, the supervisors were to punish them by administering a shock in any intensity they saw fit. They were informed that the ten shock intensities ranged from mild at level 1 to painful at level 10. Thus, participants who did not wish to behave punitively could easily meet the task requirements simply by selecting the weakest shock levels. Since, in fact, there were no decision makers, no pain was inflicted by subjects' punitive actions.

After the task was described, but before the treatment conditions were created, subjects were informed that they were free to leave without loss of pay if they did not wish to participate in the study. Eight declined. In these instances the other members of the triad were also dismissed because observed refusal could affect their subsequent behavior.

Responsibility Conditions

Subjects in the *individualized responsibility* condition were told that each of them was assigned supervisory responsibility for a member of the decision-making team and that they personally determined the level of shock that their supervisee received on each punishment trial.

In the *diffused responsibility condition*, subjects were informed that the shock levels they selected were automatically averaged by the device so that the level of shock received by their supervisees represented the average of their collective decision on each punishment trial.

Labeling of the Victims

Upon completing the responsibility induction, the experimenter announced that he was leaving for the bargaining room and would issue further instructions through the intercom when the decision makers were ready to begin. The subjects donned their headphones, and the experimenter departed.

A short time later subjects overheard a brief interchange between the experimenter and his assistant through an apparent inadvertence that served as the vehicle for characterizing the decision makers. The interchanges were tape recordings that varied in content in accordance with the treatment condition. Each recording opened with a click of the microphone switch followed by the experimenter's reporting that the bargaining sessions would soon begin. At this point, he was suddenly interrupted by the assistant, asking where the scoring forms were stored. The distracting interruption provided the pretext for leaving the microphone on. As they searched in the back of the room, the experimenter was heard asking his assistant if the decision makers had completed their questionnaires. After replying, he remarked, in a brief aside, that the personal qualities exhibited by the group confirmed the views of the person through whom the participants were recruited. To minimize any implied social sanctioning of aggressive actions the remarks were made matter-of-factly as a reiteration of the groups' reported characteristics rather than as a personal evaluation.

For subjects in the *humanized condition*, the decision makers were characterized as a perceptive, understanding, and otherwise humanized group. By contrast, in the *dehumanized condition*, the decision makers were described as an animalistic, rotten bunch. In the *neutral condition*, no evaluative references were made as to the characteristics of the group.

The prerecorded exchanges ended with the experimenter's expressing muffled alarm on discovering that the microphone had been inadvertently left on. A click sounded as though it were abruptly shut off. After a short pause the microphone was again activated, whereupon the experimenter announced the start of the bargaining series.

Dependent Measure

Inadequate solutions were signaled on 10 of the 25 trials and distributed in the following predetermined pattern: trials 3, 5, 6, 8, 10, 14, 16, 21, 22, 23. The intensity of shock administered on these occasions served as the measure of aggressiveness.

Postexperimental Questionnaire

When the formal procedures were concluded, subjects filled out a questionnaire on which they rated their supervisees' responsiveness to disciplinary measures and wrote their reactions to their supervisory role. The latter item provided data on the self-disinhibiting processes accompanying the treatment conditions. In addition, subjects' evaluations of the supervisees were assessed by the semantic differential technique. The form used consisted of 6-bipolar rating scales using pairs of contrasting adjectives along dimensions of rigidity, intelligence, indolence, competence, impulsiveness, and sensitivity. After all the procedures were completed, the participants were encouraged to comment freely on their experiences and were provided with a full explanation of the experiment.

Results

The mean of the pooled ratings on the semantic differential scales provides a check on the success of the dehumanization treatments. The labeling procedures were highly effective in creating differential evaluations of the group members ($F = 15.71, p < .001$). All three conditions differed significantly from one another beyond the .01 level, with the dehumanizing, neutral, and humanizing characterizations inducing degrading, neutral, and favorable evaluations, respectively.

Level of Aggression

Figure 2 presents the mean intensity of shocks administered by subjects as a function of treatment conditions. The main effects on punitiveness of victim labeling ($F = 54.96, p < .001$) and responsibility ($F = 18.21, p < .001$) are both highly significant. The interactions of these two factors with each other and with shock trials are also significant sources of variance. There was no significant variation across triads within conditions.

The way in which labeling interacted with responsibility ($F = 3.56, p < .05$) to produce differences in aggressiveness is depicted graphically in Fig. 2. Comparisons between means of the different conditions reveal that subjects behaved more punitively under diffused than individualized

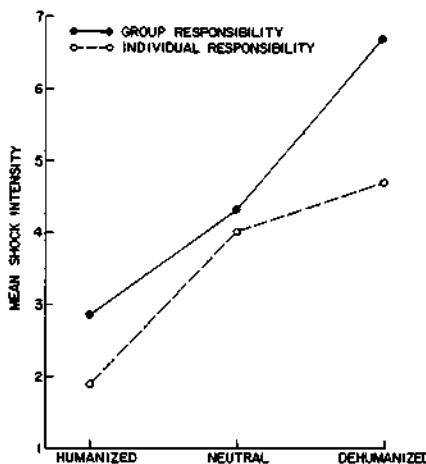


FIG. 2. Mean intensity of shocks administered by subjects as a function of diffusion of responsibility and dehumanization of the recipients of punishment.

responsibility when the group members were humanized ($t = 2.64$, $p < .01$) or dehumanized ($t = 3.33$, $p < .005$). Variations in responsibility did not affect aggressiveness, however, when the members were presented in neutral terms.

Under both responsibility conditions, aggressiveness mounted with dehumanization of the performers. Subjects who had a diminished sense of personal responsibility shocked dehumanized performers more severely than neutral ones ($t = 3.93$, $p < .001$), who, in turn, were treated more harshly than those invested with humanized qualities ($t = 3.62$, $p < .001$). A similar pattern of differences was obtained under personalized responsibility, although the rise in aggressiveness was less marked between the neutral and dehumanized treatments ($t = 1.93$, $p < .05$).

The significant interaction between labeling and trials ($F = 3.58$, $p < .001$) may be seen in Fig. 3. Intergroup differences were tested for significance at each trial. Characterization of the performers had a significant though weak effect on aggression at the outset. Compared to subjects in the humanized condition, those in the neutral ($t = 2.35$, $p < .025$) and dehumanized ($t = 3.01$, $p < .005$) treatments were slightly more punitive. On the second trial, subjects continued to treat the humanized performers in a relatively gentle manner but abruptly escalated their level of punitiveness with neutral ($t = 5.31$, $p < .001$) and dehumanized ($t = 6.41$, $p < .001$) members. The latter groups, however, did not differ significantly in this respect. On all subsequent occasions, the three groups were significantly differentiated from each other in levels of aggressiveness. Dehumanized performers were treated most punitively, humanized ones were spared painful shocks, while the neutral ones were administered an intermediate level of punishment.

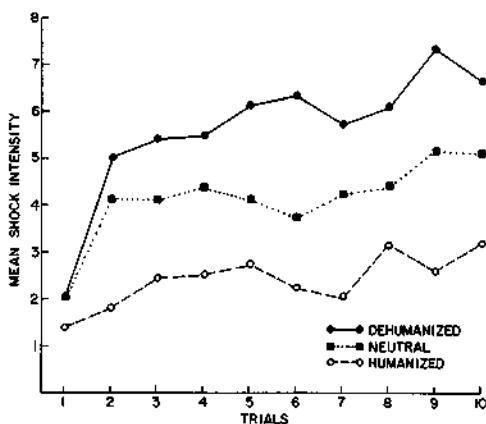


FIG. 3. Mean intensity of shocks administered on repeated occasions by subjects to performers who are represented as humanized, neutral, or devoid of humanness.

The interaction between responsibility and trials ($F = 1.94, p < .05$) is shown in Figure 4. Initially subjects behaved nonpunitively regardless of how responsible they were for the shocks inflicted on the performers. Once having aggressed, subjects operating under diffused responsibility promptly intensified their level of punitiveness. Beginning with the second trial and continuing through the eighth one, they administered significantly more severe shocks under diffused than under individualized responsibility. On the ninth trial, which signaled two consecutive inadequate performances, subjects who were personally responsible promptly heightened their punitiveness and did not differ significantly in this

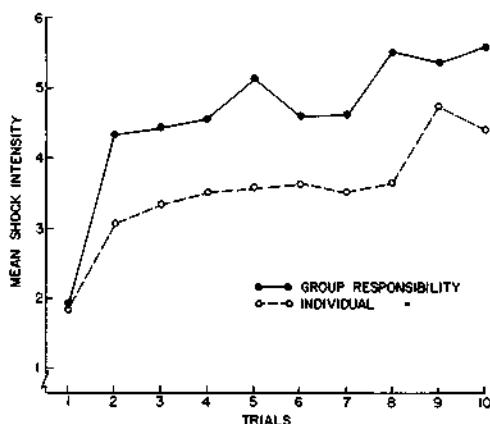


FIG. 4. Mean intensity of shocks administered on repeated occasions by subjects behaving under conditions of individualized or diffused responsibility for the effects of their actions.

respect from their counterparts in the diffused responsibility condition. When increased shock failed to improve the supervisees' performance on the subsequent trial, the individually responsible subjects reduced their punitiveness to a level significantly below that of subjects who were only partially responsible.

Self-Disinhibiting Processes

Forty-four percent of the subjects did not register any responses to the item concerning their reactions to having served in a punitive role, and the various groups did not differ in this respect. Nor did the nonresponders differ in level of punitiveness from those who recorded personal reactions. The responses of the latter subjects were scored for self-disinhibiting justifications or for expressions of disapproval of punitive measures.

In the justification category were included such responses as (a) ascribing culpability to the performers (e.g., "In many cases poor performance is indicative of laziness and a willingness to test the supervisor" and "People are basically evil and have to be put in their place"); (b) extolling the benefits or necessity of punishment (e.g., "It gets more efficiency out of the group" and "Although punishment is looked down upon, that's not going to influence me because I've seen it work"); (c) attributing their punitive behavior to situational or role requirements (e.g., "As an acting supervisor it was my job to punish poor performance" and "If doing my job as a supervisor means I must be a son of a bitch, so be it"); (d) displacing responsibility (e.g., "I administered shocks because I was told to"); (e) minimizing the painful consequences of their actions (e.g., "It would not hurt them too bad"); (f) disavowing conscious involvement in the activities (e.g., "I was reacting mechanically to the lights"); (g) emphasizing the prevalence of punishment (e.g., "Everyone is punished for something everyday").

Disapproval of punitive practices was indexed by such responses as (a) certifying the detrimental effects of punishment (e.g., "Physical punishment is not good. It just causes additional stress, which makes everything worse"); (b) affirming the relative superiority of nonpunitive methods (e.g., "People should not be punished for doing bad; they should be rewarded for doing good"); (c) registering concern over punishing people without sufficient acquaintance with them or the causes of their errors in judgment (e.g., "I felt uncomfortable because I was administering punishment without knowing whom I was punishing and also not knowing enough about their mistakes"); and (d) objecting to the use of excessive punishment on moral grounds (e.g., "Morally and ethically, I couldn't give a painful punishment").

The responses were coded independently by two raters as representing self-disinhibition or disapproval or as inapplicable to these two

TABLE 1
 PERCENTAGE OF SUBJECTS EXPRESSING SELF-DISINHIBITING JUSTIFICATIONS OR
 DISAPPROVAL OF PUNITIVE MEASURES AS A FUNCTION OF RESPONSIBILITY
 AND VICTIM LABELING

Treatment conditions	Self-disinhibiting justifications	Disapproval of punitiveness
Responsibility		
Diffused	18	50
Individualized	33	50
Victim labeling		
Humanized	0	81
Neutral	40	40
Dehumanized	43	21
Combined disinhibitors		
Individualized humanized	0	100
Individualized neutral	50	33
Individualized dehumanized	60	0
Diffused humanized	0	67
Diffused neutral	25	50
Diffused dehumanized	33	33

forms of self-response. In the latter instances subjects' reports contained no evaluative responses. Since subjects rarely expressed both justifying and disapproving evaluations of punitive behavior, they were rated as either self-disinhibiting or disapproving if they gave one or more responses within the same category. The raters agreed on 80% of their categorizations.

Table 1 shows the percentage of subjects who expressed self-disinhibiting or disapproving reactions under the different treatment conditions. Subjects who assumed personal responsibility for the punishments they administered were more inclined to generate self-absolving justifications than those operating under group responsibility, but the difference was not of statistically significant magnitude. Dehumanization, however, produced significant differences both in self-disinhibiting justifications ($\chi^2 = 8.92, p < .02$) and in disapproval of punitive sanctions ($\chi^2 = 11.24, p < .01$). When the performers were humanized, subjects strongly disapproved of physical punishment and rarely excused its use. By contrast, when performers were divested of humanness, subjects seldom condemned punitive techniques but often voiced self-absolving justifications. The neutral condition, in turn, produced an intermediate diversity of responses. Essentially the same pattern of results is replicated under both individualized and collective responsibility.

The previous analysis provides some evidence linking the sanctioning conditions to internal self-disinhibitory processes. In order to determine

whether self-disinhibition, in turn, is linked to punitive behavior, the shock intensities administered by self-exonerating subjects ($M = 5.24$) were compared with those of subjects who disapproved of punitive actions ($M = 3.41$). The findings show the self-exonerators to be significantly more punitive ($t = 2.54, p < .01$).

EXPERIMENT 2

In the preceding experiment aggression was abruptly heightened after subjects had administered punishment under circumstances conducive to self-disinhibition. One possible explanation for the precipitous rise in aggression is in terms of the apparent success of punitive actions. It will be recalled that in the early trials, punishment was followed by unerring solutions. Having apparently affected an improvement in performance through punishment, subjects who are freed of restraints might be quick to intensify their punitiveness when the next opportunity to behave aggressively arose.

It would be predicted from the process of self-disinhibition, however, that under dehumanizing conditions escalation of aggression would be even more precipitous when punitiveness is dysfunctional in improving performance. When punishment fails to achieve desired results, the negative feedback is likely to affect aggressors differentially, depending upon how they view their victims. Apparent lack of progress by degraded victims is apt to be interpreted as further evidence of their culpability and thereby justifies intensified punitiveness toward them. By contrast, a similar lack of improvement by valued individuals is more likely to be attributed to the disruptive consequences of punishment and thus supports self-restraints over aggression. The second experiment was primarily designed to test the hypothesized interactive effects of dehumanization and differential efficacy of punishment on the escalation of aggression.

Method

Subjects

The subjects were 72 paid volunteers from junior colleges. They were randomly assigned in groups of three to one of six experimental conditions.

Procedure

The procedures for measuring punitiveness and for labeling the performers were the same as those used in the preceding experiment. Subjects administered shocks in intensities of their own choosing for inadequate solutions allegedly made by supervisees characterized in either humanized, neutral, or dehumanized terms.

Aggressiveness was measured under conditions of individualized responsibility in all groups. Personalized rather than diffused responsibility was selected because the former

condition elicits lower levels of punitiveness and thus allows greater latitude for the escalation of aggression.

Within each of the three labeling treatments, half the subjects were assigned to the *functional aggression condition*. In this feedback series every punished trial was followed by a correct solution, which signifies that aggression was highly effective in improving the supervisees' performances. For the remaining subjects, who were assigned to the *dysfunctional aggression condition*, punishment trials were grouped sequentially so that aggression was repeatedly followed by failure. The predetermined pattern of punishment trials was 3, 5, 8, 10, 12, 15, 18, 20, 23, 25 for the functional series and 3, 4, 5, 9, 10, 16, 17, 18, 24, 25 for the dysfunctional sequence. Both groups thus administered punishment on 10 of the 25 trials, but the patterns of success and failure were arranged to convey differential efficacy for aggression.

Results

Level of Aggression

The significant effect on punitiveness of labeling ($F = 16.32, p < .001$) and the interaction between labeling and trials ($F = 2.70, p < .005$) replicates the findings of the initial experiment. Subjects were less aggressive when their actions were consistently successful than when their punishments usually failed to produce improvements in subsequent performance ($F = 6.71, p < .025$). The significant interaction between efficacy and trials ($F = 3.33, p < .001$) reveals that the differential escalation of aggression did not occur until after the second administration of shocks.

Efficacy feedback had quite different effects on punitiveness over trials, however, depending upon how the performers were portrayed. The significant triple interaction ($F = 2.43, p < .005$), which is depicted in Fig. 5, bears on the hypothesized relationship tested in this study.

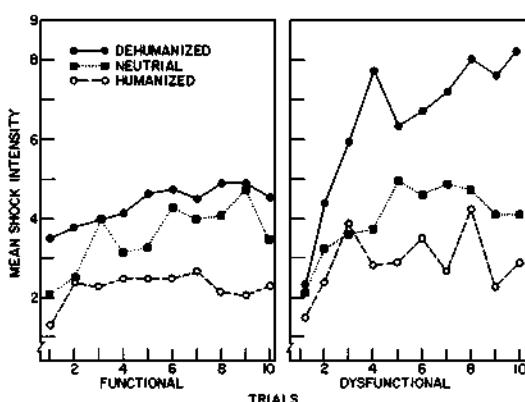


FIG. 5. Mean intensity of shocks administered to performers on repeated occasions as a function of dehumanization and efficacy of the punitive actions.

When punishment was consistently effective in rectifying errors, subjects gradually raised the intensity of shocks over trials with dehumanized and neutral performers but adhered to a consistently low level of punishment with humanized performers. Whereas at first neutral and humanized performers were treated comparably, as the trials progressed subjects punished neutral and dehumanized performers more severely and did not differ significantly from each other in this respect.

When punishment usually failed to eliminate errors, aggression was precipitously escalated to extreme levels with dehumanized performers; it increased gradually and then leveled off at a moderate level with neutral performers; and, after an initial rise, it deescalated and fluctuated around a low level of punishment with humanized performers.

Self-Disinhibiting Processes

Although results of the previous study on self-reactions to aggression are consistent with predictions, they require interpretative caution because of the reduced number of respondents. In the second experiment 97% of the subjects reported reactions on the questionnaire to their supervisory activities. These personal responses were coded independently by two raters, with 82% agreement in terms of the response categories described earlier.

The percentage of subjects in the various treatments who expressed self-disinhibiting or disapproving reactions is presented in Table 2. The

TABLE 2
PERCENTAGE OF SUBJECTS EXPRESSING SELF-DISINHIBITING JUSTIFICATIONS OR
DISAPPROVAL OF PUNITIVE MEASURES AS A FUNCTION OF EFFICACY AND
VICTIM LABELING

Treatment conditions	Self-disinhibiting justifications	Disapproval of punitiveness
Efficacy		
Functional	29	51
Dysfunctional	23	57
Victim labeling		
Humanized	4	74
Neutral	13	63
Dehumanized	61	23
Combined conditions		
Functional humanized	9	73
Functional neutral	25	58
Functional dehumanized	50	25
Dysfunctional humanized	0	75
Dysfunctional neutral	0	67
Dysfunctional dehumanized	73	27

internal concomitants of aggression did not differ as a function of instrumentality. Consistent with previous findings, self-disinhibiting justifications ($\chi^2 = 22.57, p < .001$) and repudiation of punitiveness ($\chi^2 = 11.95, p < .005$) varied under different labeling conditions. Subjects consistently disapproved of physical punishment with humanized performers, whereas they self-excused such conduct with dehumanized members. When they lacked knowledge about the performers, subjects' reactions were more variable though mainly self-disapproving of punitiveness. The differences in self-disinhibiting reactions were especially marked when aggression produced dysfunctional effects. The link between self-disinhibition and level of punitiveness was likewise replicated. Self-exonerators shocked performers more severely ($M = 5.24$) than did the disapprovers ($M = 2.95$), a difference that was highly significant ($t = 4.28, p < .001$).

DISCUSSION

Results of the present experiment confirm the hypothesized effects of responsibility, dehumanization, and the interaction of these factors on aggressiveness. Subjects behaved more punitively when responsibility was obscured by a collective instrumentality than when they were personally responsible for the amount of pain inflicted on others. Dehumanization had even greater disinhibitory power than did masking of responsibility links. Dehumanized performers were treated more than twice as punitively as those invested with human qualities and considerably more severely than the neutral group. As anticipated, dehumanization is especially conducive to aggression when people have a reduced sense of responsibility for the consequences of their actions.

The influential role played by victim labeling in the escalation process is most graphically revealed in changes in punitiveness over trials with differential feedback. Under conditions of functional feedback, subjects gradually increased their punitiveness toward dehumanized and neutral performers even in the face of evidence that weak shocks effectively improved performance and thus provided no justification for escalating aggression. By contrast, with humanized performers, subjects consistently adhered to mild punishment. The latter finding suggests some qualifying limits to the view that escalation of aggression is a general phenomenon that occurs independently of feedback or other factors (Buss, 1966; Goldstein, Davis, & Herman, 1975). Although many determinants have been varied in the studies demonstrating aggression escalation over trials, the recipients of aggression are always impersonalized.

Under dysfunctional feedback, subjects suddenly escalated punitiveness toward dehumanized performers to near maximum intensities. Although shocks typically failed to eliminate errors, increased punish-

ment was occasionally followed by a correct performance. It is conceivable that subjects were reinforced on those few occasions for escalated aggression. An explanation in terms of differential reinforcement, however, does not account for why subjects who also eventually succeeded through increased punishment of neutral and humanized performers were not reinforced into greater punitiveness. After the initial series of rising punishment produced a correct solution, on the subsequent (4th) error trial subjects escalated their punitiveness with dehumanized performers, did not change their level of punishment with neutral ones, and deescalated their punitiveness with humanized performers. This pattern of results, as well as that obtained under functional feedback, appears to be more consistent with differential disinhibition than with differential reinforcement processes.

The discussion thus far has focused on the disinhibiting power of labeling that divests people of human qualities. Of equal theoretical and social significance is the power of humanization in counteracting punitiveness. Subjects treated humanized performers in a mild fashion regardless of whether opportunities to aggress occurred under personalized or diffused responsibility, with functional or dysfunctional feedback. These findings suggest that designations of others in terms that humanize them can serve as an effective corrective against aggression.

Lack of knowledge about the performers enhanced punitiveness, compared to conditions in which they were humanized. These findings confirm the common belief that impersonality is conducive to interpersonal aggression. Variations in responsibility, however, failed to produce differential amounts of aggression toward the neutral targets. It appears from the pattern of results that nonpersonalization substantially weakened self-restraints, thus reducing the capacity of mechanisms for obscuring responsibility to effect further changes in internalized control.

Conditions that dissociate or obfuscate the connection between actions and their effects do not automatically weaken self-restraints. Sequential analyses of aggression disclose that disinhibitory influences interact with aggressive experiences in determining levels of punitiveness. Neither shared responsibility nor dehumanization initially had much effect on punitive behavior. Aggression was abruptly heightened only after subjects had administered punishment under circumstances conducive to self-disinhibition. The uniformly low aggressiveness at the outset and the differential escalation of punitiveness under different feedback conditions indicate that the dehumanizing procedures produced their effects by divesting the victims of their humanness rather than through social sanctioning of punitive actions. In everyday life, of course, dehumanizing practices are almost invariably accompanied by active encouragement and reinforcement of maltreatment of those who are victimized.

Social learning theory provides a framework for analyzing different sources of disinhibition of aggression. Within this conceptualization, restraints over injurious conduct are largely governed by external, vicarious, and self-generated consequences. External and observed punishing consequences function as social inhibitors of aggressive responding, whereas self-evaluative reactions are the internal inhibitors. The operation of internal consequences is therefore best tested under conditions in which external consequences for injurious conduct are removed. It is in such situations that anticipatory self-reactions must serve as major deterrents of action.

The supplementary data on internal self-disinhibitory accompaniments of punitiveness attest to the numerous processes that may operate in weakening self-deterring consequences. When circumstances of personal responsibility and humanization made it difficult to avoid self-censure for injurious conduct, subjects disavowed the use of punitive measures and used predominantly weak shocks. By contrast, under sanctioning conditions, subjects resorted to a variety of self-disinhibiting devices and displayed a surprisingly high level of punitiveness. In studies of obedient aggression people are commanded to behave punitively. Here, participants escalated their punitiveness on their own.

Unlike dehumanization, diffusion of responsibility appears to increase aggression through social rather than personal disinhibition. The anonymity provided by collective action can effectively reduce restraints arising from fear of social censure. But since functionaries within a group are fully aware of how they behaved, a collective instrumentality may not necessarily lessen the sense of personal culpability. In the current study aggressiveness was measured under minimal threat of external censure. This factor might well account for why diffused responsibility emerged as a weaker disinhibitor than dehumanization. Evidence that sanctioning practices have differential internal concomitants attests to the value of distinguishing between social and personal sources of disinhibition.

The present study does not establish unequivocally the causal sequence between self-disinhibiting maneuvers and punitiveness. A detailed deterministic analysis would require an experimental design in which measures of self-disinhibition are taken prior to performance of aggression. The sanctioning process, however, is more likely a reciprocal than a simple unidirectional one. Disinhibiting social conditions facilitate expression of mildly reprehensible conduct, which, in turn, activates self-absolving responses that weaken restraints over more culpable behavior. If this is indeed the process, it would be best studied by sequential analysis of the interdependent changes in self-disinhibition and aggression.

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The Role of Proximal Intentions in Self-Regulation of Refractory Behavior¹

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The present experiment tested the hypothesis that self-regulation of refractory behavior varies as a function of goal proximity. Obese subjects were assigned to conditions in which they either monitored their eating behavior, monitored their eating behavior and set subgoals for reducing the amount of food consumed, or received no treatment. Within the goal-setting conditions, subjects adopted either distal goals defined in terms of weekly goal limits or proximal goals specifying the goal limits for each of four time periods during each day. Goal setting enhanced self-directed change as measured by reductions in both eating behavior and weight. The higher the goal attainments, the greater were the losses in weight. Proximal and distal goal setting yielded comparable overall results because the majority of subjects assigned remote goals altered this condition by adopting proximal goals to augment control over their own behavior. Within the distal goal-setting condition, the adherents to distal goals achieved relatively small changes, whereas those who improvised proximal subgoals for themselves attained substantial reductions on the multifaceted measures of self-directed change. The combined evidence lends support to the motivational and regulative functions of proximal intentions and highlights the reciprocal influence processes that operate in self-directed change.

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Among the conceptual issues receiving increasing attention in recent years is the role of intention in the self-regulation of behavior. An *intention* is defined here as the determination to perform certain activities or to attain certain future conditions. According to social learning theory (Bandura, 1977), intentional control of behavior operates principally through two cognitively based sources of motivation. The capacity to represent future consequences in thought provides a necessary condition for one cognitive source of motivation. Through cognitive representation of future outcomes individuals can generate current motivators for courses of action that are instrumental in attaining valued external incentives.

A second cognitively based source of motivation operates through the intervening processes of goal setting and self-evaluative reactions to one's own performances. Self-motivation arising from internal contingencies requires goals or standards against which to evaluate performance. By making self-rewarding reactions conditional on a certain level of behavior, individuals create self-inducements to persist in their efforts until their performances match self-prescribed standards. Perceived negative discrepancies between performance and standards create dissatisfactions that motivate corrective changes in behavior. Both the anticipated satisfactions of desired accomplishments and the negative appraisals of insufficient performances thus provide incentives for action.

Goals do not automatically activate the self-evaluative processes that govern performance. In the social learning analysis (Bandura, 1977), certain properties of goals determine the likelihood that self-evaluative contingencies will become enlisted in any given activity. The degree to which goal setting creates incentives and guidelines for performance is partly determined by the specificity of the goals. Explicitly defined goals regulate performance by designating the type and amount of effort required to attain them, whereas general intentions provide little basis for regulating one's efforts or for evaluating how one is doing.

The amount of effort and satisfaction that accompanies variations in goals also depends upon the level at which they are set. When self-satisfaction is made contingent upon attainment of difficult goals, more effort is likely to be expended than if easy ones are adopted as adequate. Although theorists agree that goal difficulty raises performance, they differ on whether the relationship between goal level and performance is linear (Locke, 1968) or curvilinear (Atkinson, 1966). Social learning theory distinguishes between end goals and subgoals. End goals serve a general directive function, but it is specific subgoals that determine people's immediate choice of activities and how hard they will work at them. The relationship between probability of goal attainment and effort expenditure will differ for subgoals and end goals. Subgoals that are challenging but attainable

through extra effort are likely to be most motivating and self-satisfying. Therefore, a high level of self-motivation can be sustained through progressively increasing subgoals even though the terminal goals are exceedingly difficult to realize (Jeffery, 1977). In an ongoing process, however, the perceived difficulty of an ultimate goal does not remain constant. The rate and pattern of progress alters subjective estimates of eventual success.

In the social learning view, the effectiveness of intention in regulating behavior depends largely on how far into the future they are projected. Immediate goals mobilize effort and direct what one must do in the here and now. Distal goals, on the other hand, are too far removed in time to serve as effective incentives and guides for present action. By focusing on the distant future, it is easy to put off efforts at change in the present—one can always begin in earnest or make amends tomorrow. Exercising control over behavior in the present increases the likelihood that desired futures will be realized. The stronger the momentary inducements against engaging in the goal-directed activity, the greater the necessity for proximal goals to enlist internal contingencies for actions that lead toward a future condition.

The effects of goal level and specificity on behavior have been amply documented under both laboratory and naturalistic conditions (Locke, 1968; Steers & Porter, 1974). However, goal proximity, which is perhaps the most critical factor in the self-regulation of behavior through intentions, has not been examined systematically. The present experiment was designed to elucidate the role of goal proximity in the process of self-directed change.

Most of the research on goal setting involves performances that are readily amenable to voluntary control. It cannot be assumed that evidence of intentional control of easily manageable behavior is generalizable to goal-directed activities that are difficult to sustain over an extended period. For this reason, this study investigated the sustaining influence of proximal intentions on behavior that is notoriously resistant to change—namely, excessive eating behavior by people burdened with severe obesity (Stunkard, 1975).

Obese subjects were randomly assigned to conditions in which they simply monitored their eating behavior, monitored their eating behavior and set progressive subgoals for reducing the amount of food consumed, or received no intervening treatment. Within the goal-setting conditions, subjects adopted either distal goals defined in terms of weekly goal limits or proximal goals specifying the goal limits for each of four time periods during each day. It was predicted that goal setting would facilitate self-regulation of eating behavior compared to self-monitoring alone. It was further hypothesized that proximal goals would prove significantly more effective than distal goals in reducing eating behavior and body weight.

METHOD

Subjects

Sixty-six subjects (9 males and 57 females) were recruited through an advertisement in a community newspaper. Only persons who were at least 25% above ideal weight were selected for this project. They ranged from 26% to 138% above ideal weight, averaging 50% overweight. This study thus dealt with cases of severe obesity who were unable to exercise much control over their eating behavior. Their mean age was 43 years, with a range of 17 to 71 years.

There is some evidence that persons who have been obese since childhood, and have thus acquired an excessive number of fat cells, encounter greater difficulty controlling their eating behavior than those who become obese during adulthood (Stunkard, 1975). Subjects were therefore blocked on the basis of juvenile onset and adult onset of obesity and were then randomly assigned from blocks to one of four conditions.

Research with obese subjects is often plagued by differential attrition across conditions, especially if the treatments extend over a long period and require repeated assessments. Such differential rates of attrition seriously distort experimental findings because it is the less successful who are most likely to discontinue or to attend irregularly (Hagen, Foreyt, & Durham, 1976). Therefore, to increase commitment to the program, subjects made a \$20 deposit, \$5 of which would be forfeited for each absence. Of the 66 subjects, 2 were absent at least once and were therefore disqualified from the experiment. Several other subjects were also disqualified for failure to use counter consistently (5), for loss of a record card (1), and in one case the subject was inadvertently assigned the wrong goal for the week. Except for these few cases, all subjects performed all the activities required by their treatment assignment. The distribution of subjects across conditions was as follows: control (16), self-monitoring (14), distal goals (13), and proximal goals (14).

Orientation Session

All subjects, except those in the delayed treatment control, attended a group session during which they learned the rationale for the experimental procedures and how to record their food intake. They were told that by recording and reducing the number of mouthfuls of food and beverages they consume, they can gain control over their eating habits. After the general introduction, subjects read a manual, patterned after the one developed by

Fowler and his colleagues (Fowler, Fordyce, Boyd, & Masock, 1972), which informed them that the program was devised to help them lose weight gradually but steadily by teaching them to control the amount of food they ate, and thereby to establish eating patterns they could maintain on their own. Subjects then observed a demonstration of the correct way to use a wrist counter to tally the number of mouthfuls of food and beverage they consumed. They also completed a questionnaire assessing the history of their weight problem, their prior involvements in weight control programs, and the strength of their motivation to alter their eating habits. At the conclusion of the orientation session, subjects were measured for height and weighed on a standard medical balance scale to the nearest quarter pound.

Subjects practiced recording their food intake for 2 days before beginning the baseline measurement. The purpose of this practice period was to resolve any problems in using the counter before the formal study began. It also gave subjects an experiential basis for deciding whether or not they wished to participate in the program. Beginning with the baseline period, subjects came in individually at scheduled intervals to be weighed and to receive instructions for the procedures they were to follow until the next appointment. Two female experimenters conducted the study through its various phases.

Baseline Phase

In order to provide a baseline against which to measure the effectiveness of the treatment conditions, subjects were instructed to record on their wrist counter every mouthful of food and beverage that they consumed. The present study focused on how much, rather than what, subjects ate. However, to ensure that subjects were altering eating habits that would affect their weight, a designated list of foods that were very low in calories (e.g., beverages without cream and sugar, diet soft drinks, vegetable juices, fresh vegetables, and other low calorie foods) were exempted from the count.

One-half of the subjects recorded their cumulative food intake for the entire week. The other half recorded the number of mouthfuls consumed during each of four periods each day. These proximal time intervals included: (1) breakfast to lunch, (2) lunch to dinner, (3) dinner to 9:00 p.m., and (4) 9:00 p.m. to breakfast the next morning. Subjects were provided with record cards on which they recorded, depending on their treatment assignment, either their aggregate weekly count or the amount they ate each day during each of the four time intervals.

Subjects were weighed at the beginning and at the end of the baseline phase, which lasted for 1 week. To control for any possible variations in

weight due to extraneous factors, at each assessment subjects were weighed at about the same time of the day without shoes, jewelry, and outer clothing. Subjects received a chart for graphing their weight at weekly intervals.

Treatment Conditions

At the end of the baseline period, subjects were assigned to one of the following treatment conditions, each of which continued for a period of one month:

Distal Self-Monitoring. These subjects simply continued recording their food intake as they did during the baseline period. Because performance assessment is a necessary constituent of goal-setting activities, the self-monitoring conditions were included to determine what changes, if any, might be produced by intensive self-observation alone.

Proximal Self-Monitoring. These subjects also continued to record their mouthful count for each of the four daily time intervals.

The distal and proximal self-monitoring subgroups did not differ significantly during either the baseline or the treatment phases on any measure, so they were combined into a single self-monitoring group in the statistical analyses.

Distal Goal Setting. Subjects in this condition were given progressive weekly subgoals to meet: they were to reduce their food intake by 10% of their baseline aggregate amount, and by an additional 10% on each of the 3 succeeding weeks. To increase the strength of subjects' goal commitment, if they exceeded their weekly goal, they were instructed to reduce their food intake in the next week by the amount they had overeaten. If they had not made up for eating beyond their goal limit by then, they were to write off any remaining excess.

Proximal Goal Setting. Subjects in the proximal goal condition pursued the same goal levels as those assigned distal goals except that the subgoals were computed for each of the four daily time periods. Thus, these subjects reduced their intake by 10% of their mean baseline amount for each of the four time intervals during the 1st week, and by an additional 10% for each period on each of the 3 succeeding weeks. If they exceeded any of their subgoals, they were to reduce their food intake by a comparable amount in the next time period. Should they overeat so excessively that they could not make up for it in the next period, they had 2 days in which to do so. Then they were to write off any remaining excess.

Subjects in the distal conditions recorded their aggregate count at the end of the week on a record card; those in the proximal conditions recorded the number of mouthfuls of food they consumed in each of the time inter-

vals. The completed record cards were mailed to the experimenter every week. This procedure underscored the importance of keeping precise records of their eating behavior.

Subjects were again weighed midway through the treatment and at the end of the 4-week period. In addition, questionnaires were administered measuring the extent to which subjects altered their treatment conditions by adopting goals in the self-monitoring group, or by transforming distal goals into proximal ones in the remote goal-setting treatment. They also described any other strategies they might have devised for controlling their weight.

Delayed Treatment Control. Subjects assigned to the delayed treatment control group were weighed at the beginning and end of the experimental phase but received no intervening treatment. They were informed that they would be contacted later as openings in the treatment program developed.

Supplemental Phase

At the completion of the formal experiment, subjects who were previously in the self-monitoring, distal goal-setting, and control groups received the proximal goal-setting procedure. Those who were assigned originally to the proximal condition simply continued following their treatment program. They had the option, however, of either pursuing their previous goals or of raising them further if they had not as yet reduced their level of overeating sufficiently.

At the end of the transition week, the experimenter weighed each subject and planned an individualized program for them using the proximal goals format.

Fading Procedure

After subjects had gained control over their eating behavior, they received instructions for gradually reducing their reliance on recording with goal limits. During the 1st week they continued using the counter, but only in the time periods they tended to overeat. In the next 3 weeks they used the counter only in the potential overeating periods every 2nd, 3rd, and 4th day, respectively. After the 4th week, they could discontinue using the counter altogether but were instructed to monitor their weight and to reinstate the goal-setting procedure during overeating periods until they regained control over their eating behavior. Because the supplemental and fading procedures were conducted in an individualized fashion for the subjects' benefit, only the data obtained during the formal phase of the experiment are analyzed.

A number of the subjects in the proximal goals condition recorded their eating behavior regularly for 5 additional weeks of treatment and participated in the fading procedure for an additional month. Data from these subjects are also presented because they provide some evidence regarding the self-regulation of refractory behavior through proximal goals over an extended period.

RESULTS

Statistical analyses disclosed no significant initial differences between groups in percent overweight, absolute weight, or age. Nor did subjects show any significant changes in weight during the baseline phase either within or between treatment conditions. The effects of goal proximity on self-regulation were measured in terms of changes both in eating behavior and in body weight.

Regulation of Eating Behavior

The mean percent change in food intake was computed by dividing the number of mouthfuls eaten during the final week of treatment by the amount eaten during the baseline week. The changes achieved in amount of eating behavior under self-monitoring and goal-setting conditions are summarized graphically in Figure 1.

Intragroup analyses show that subjects in the self-monitoring ($t_{(1)} = 2.58; p < .05$), distal goal ($t_{(12)} = 11.48; p < .001$) and proximal goal ($t_{(13)} = 23.77; p < .001$) conditions all reduced their consumption of food and beverages compared to their baseline levels. However, analysis of variance of intergroup changes in eating behavior ($F_{(2,36)} = 10.87; p < .001$), further reveals that those who set goals for themselves achieved the greater reductions in eating behavior. Subjects who simply recorded how much they ate were surpassed by those in the proximal ($t_{(23)} = 4.43; p < .001$) and distal ($t_{(23)} = 3.45; p < .01$) goal-setting conditions, who did not differ significantly from each other.

Inspection of the questionnaire data revealed that, although subjects in the distal condition were instructed to focus their efforts solely on weekly goals, many in fact set highly proximal goals for themselves. Five judges rated independently the protocols in terms of whether subjects adhered to the remote goals or segmented the weekly goals into proximal ones. The raters were in virtually complete agreement ($r = .96$) that 7 of the 13 subjects in the distal goal condition set themselves proximal goals in terms of upper limits either for each meal, for different periods of the day, or for each day.

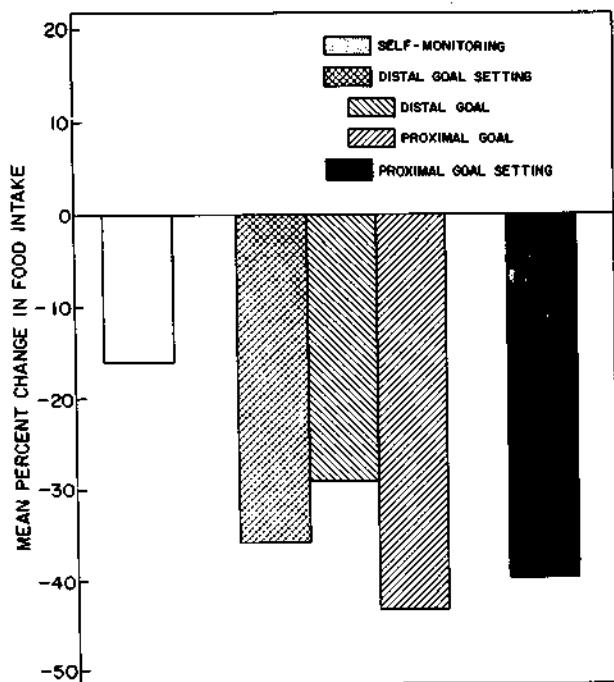


Fig. 1. Reductions in eating behavior achieved by subjects in self-monitoring and goal-setting conditions, and by adherents to distal goals and those who improvised proximal subgoals within the remote goal-setting condition.

As shown in Figure 1, subjects who pursued distant goals achieved smaller reductions in eating behavior, and did not differ in this regard from the self-monitoring condition. In contrast, those in the distal condition who set themselves proximal subgoals matched the achievements of the group originally instructed in the proximal system and surpassed the adherent remote goal-setters ($t_{(11)} = 2.44; p < .025$).

Goal Attainment

Percent of goal attainment was computed by dividing the amount actually eaten by the goal limit set for each of the 4 weeks of treatment. Over this period, subjects assigned to the distal condition exceeded their goal limit by approximately 3%, whereas those who had the benefit of proximal goal setting ate about 6% less than the upper limit ($t_{(25)} = 1.69; .10 > p > .05$). The difference in goal attainments is even more evident for the two subgroups within the distal goal-setting condition. Subjects

overate by 12% when they stuck to distant goals but reduced their food consumption 6% below their goal limit when they improvised proximal goals for themselves. This difference in degree of goal attainment is highly significant ($t_{(11)} = 2.67; p < .025$).

Weight Reduction

Changes in body weight were measured in terms of absolute number of pounds lost by the end of the treatment phase and by a weight reduction quotient. The latter index, which takes into consideration variations in height, weight, and degree of obesity, was computed by dividing the number of pounds lost by ideal weight.

Figure 2 presents the mean changes in weight displayed by subjects in the various conditions. The delayed treatment controls and the self-monit-

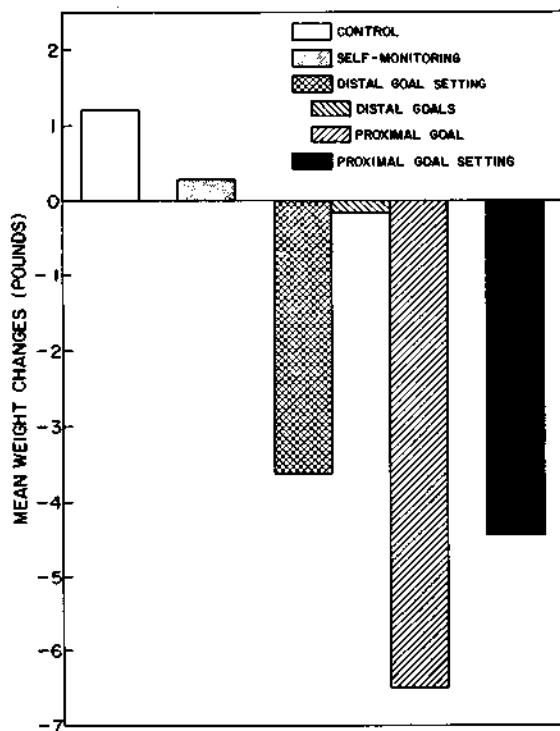


Fig. 2. Changes in weight exhibited by nontreated controls, by subjects in self-monitoring and goal-setting conditions, and by adherents to distal goals and those who improvised proximal subgoals within the remote goal-setting condition.

tors gained 1.19 lbs. and .29 lbs., respectively, but the increases in weight were not of statistically significant magnitude. Both distal ($t_{(12)} = 2.44$; $p < .025$) and proximal ($t_{(13)} = 5.39$; $p < .001$) goal setting, however, produced highly significant weight reductions.

Results of an analysis of variance performed on this measure ($F_{(3,53)} = 7.36$; $p < .001$) and further comparisons of pairs of means indicate that goal setting is a significant facilitator of self-regulation. The control condition differs from distal ($t_{(27)} = 3.28$, $p < .01$) and proximal ($t_{(28)} = 3.93$; $p < .001$) goal setting, as does the self-monitoring condition. In comparison with self-monitoring, subjects in both the distal ($t_{(25)} = 2.57$; $p < .01$) and proximal ($t_{(26)} = 3.19$; $p < .01$) goal-setting treatments lost substantially more weight. Controls and self-monitors did not differ from each other. Although subjects in the proximal condition shed more pounds than those in the distal group, the difference was not statistically significant. However, comparison of the two subgroups within the distal goal-setting condition reveals that subjects who improvised proximal goals for themselves lost a substantial amount of weight (6.5 lbs.), whereas those who adhered to distal goals achieved virtually no change (.13 lbs.). This differential weight reduction is highly significant ($t_{(11)} = 2.73$; $p < .01$).

The weight loss and reduction quotient yielded an identical pattern of results. In fact, the two measures were almost perfectly correlated ($r = .94$). Therefore, results based on the reduction quotient will not be presented because of their redundancy.

Correlational Analysis

Product-moment correlations were computed between indices of eating behavior, goal attainment, and weight reduction for the two goal-setting conditions, which produced the significant effects. Because the correlations obtained within these two groups were of comparable magnitude, the values were averaged by means of an r to z transformation.

The correlational analysis revealed that initial weight, baseline level of eating behavior, and age of onset of obesity were unrelated to weight loss during treatment. Nor was degree of weight loss correlated with such self-rated factors as frequency of participation in previous dieting programs, use of low caloric substitutes, and time spent in the household each day. However, changes in eating behavior proved to be significant predictors of weight reduction. The more subjects decreased their eating behavior ($r = .39$; $p < .025$) and the higher their goal attainments ($r = .45$; $p < .01$), the more pounds they lost. Had the recording procedure differentiated between foods varying in caloric value, the relationship between changes in eating behavior and weight would doubtless have been even higher.

The pattern of correlations with subjects' self-rated motivation to reduce their weight is also noteworthy. Variations in level of motivation did not affect weight loss when subjects simply counted how much they ate ($r = .16$) or kept track of their weight in the control condition ($r = .00$). By contrast, when subjects set explicit goal limits as guides for regulating their behavior, the more motivated they were to change, the more weight they lost ($r = .45$; $p < .01$).

Treated Controls

All of the control subjects were weighed at the end of the month, at which time the proximal goal-setting format was described in detail. Nine of the subjects expressed an interest in pursuing the full program. After completing the baseline recording of their eating behavior, they were instructed in the system of proximal self-regulation. As in the standard procedure, the subjects continually recorded their eating behavior, reduced their food consumption in the four daily periods by 10% on each of 4 successive weeks, and were weighed at the end of the month.

The beneficial changes exhibited by the treated controls replicate the results achieved by those who originally received the proximal treatment and by the subgroup within the distal condition who improvised proximal goals on their own. In contrast to the prior control month, during which these subjects gained 2 pounds, under proximal goal setting they reduced their eating behavior by 39% ($t_{(1)} = 7.08$; $p < .001$) and lost an average of 7.1 pounds ($t_{(1)} = 2.93$; $p < .01$) compared to their baseline level.

Extended Application of Proximal Goal Setting

Complete data are available for about half the subjects (6) in the proximal condition extending over a 2-month treatment and a 1-month follow-up, during which the proximal self-regulatory procedures were progressively phased out. These subjects did not differ during the treatment phase in amount of reduction in eating behavior and weight from the others in this condition who did not participate regularly in all the supplementary procedures. By the 3rd week of treatment subjects had reduced their food intake by 30% and effectively stabilized their eating behavior at that level on all succeeding weeks (Figure 3). The effects of the reduced food consumption are reflected in the continuing losses in weight, which are also shown in Figure 3. It is interesting to note that subjects maintained the same rate of weight reduction during the month when they were decreasing their reliance on the proximal self-regulatory system. By the end of this period, they had shed an average of 15 pounds.

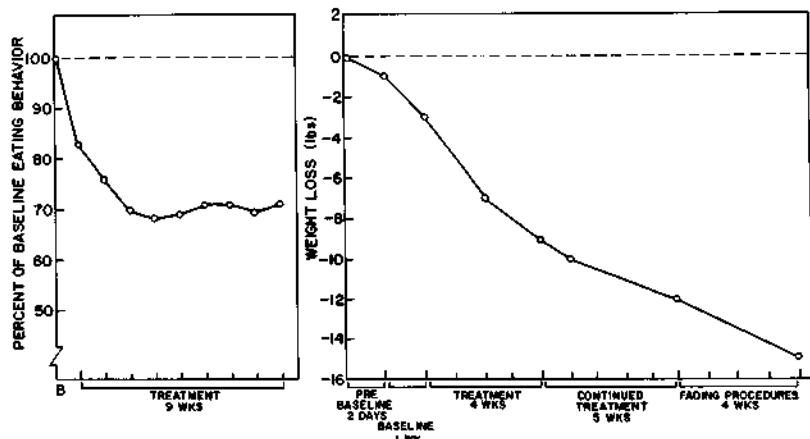


Fig. 3. Weight losses achieved by subjects using the proximal goal procedure during the treatment phases and after the proximal self-regulatory aids were progressively phased out.

At the time that the present study was initiated, a participant, who was not part of the experimental group, expressed an interest in using the proximal self-regulatory procedure. Over the years she had struggled valiantly to reduce her weight by about 10 pounds only to find her efforts repeatedly foiled by the lure of appetizing victuals. After completing the baseline recording, she used the aid of proximal goals until the desired reduction in weight was achieved, whereupon she discontinued the procedure. During the subsequent year she continued to record her weight daily and

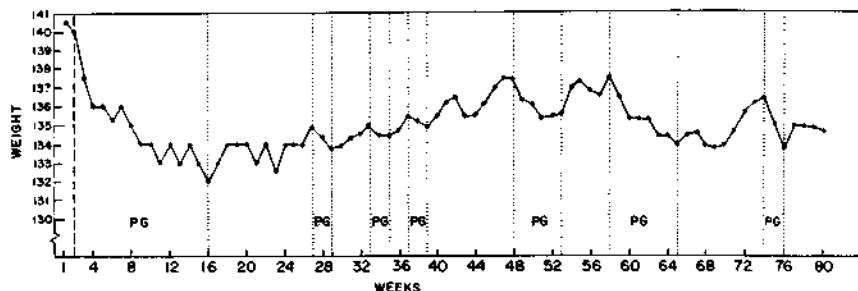


Fig. 4. Weekly weight changes during baseline (first two points on the graph), during periods when the proximal-goal procedure (PG) was used, and during intervening intervals when both recording of eating behavior and goal setting were suspended. Each point on the graph represents the mean of the daily weight scores for each week, for a period extending well over a year.

periodically reinstated the proximal self-regulatory procedure at her own discretion.

Figure 4 presents graphically the changes in weight at weekly intervals over this lengthy period. Under proximal goal setting the subject reduced her food consumption by 34%, and achieved progressive reductions in weight. This initial weight loss was well maintained over a period of three months, even though the proximal-goal system was no longer employed. Subsequent rises in weight were promptly arrested and the trend reversed by reinstating temporarily the proximal goals. As a result, the subject's weight never strayed too far beyond the selected optimal level.

DISCUSSION

Results of the present study lend validity to the general thesis that behavioral intentions or goals enhance self-regulation of behavior that is refractory to change. Subjects achieved substantial reduction in both eating behavior and weight under goal-setting conditions, but they continued to overeat and shed no pounds when they failed to set explicit goals for themselves even though they continuously monitored their eating behavior. The higher their goal attainments the greater were the reductions in weight. Further support for the influential role of goal-setting processes is provided by the motivational correlates of weight change. High motivation alone did not help subjects lose weight, whereas high motivation with the aid of goal setting did.

The supplementary evidence indicates that personal goal setting accounts for the apparent similarity of proximal and distal goals. More than half of the subjects who were assigned remote goals altered this condition by adopting proximal goals to enhance control over their own behavior. The marked differences between subjects who improvised proximal subgoals for themselves and the adherents to distal goals attests further to the motivational and regulative functions of goal proximity. Those who focused on distal goals rarely attained them, achieved relatively small reductions in eating behavior, lost no weight, and did not differ in these respects from subjects who simply recorded their eating behavior without the benefit of reductive goals. In contrast, subjects who set themselves proximal subgoals not only reduced substantially their food consumption but ate even less than their goal limit, and lost more than a pound per week. On all of these multifaceted measures of self-directed change, the informal proximal goal-setters resembled those who were originally instructed to use proximal goals in self-regulation.

Proximal goal setting altered eating patterns in several ways. It encouraged the inclusion of low caloric foods, which were exempted from the count in the preparation of meals ("I prepared more vegetables"), and otherwise fostered a lower caloric diet ("I have stopped using cream in coffee and sugar in tea, I eat less starches, more salads, and drink low caloric drinks"). In addition, such goals provided a continuing basis for regulating the amount of food eaten in the midst of plenty ("I have always eaten second helpings and by counting, I couldn't do that"). They also reduced indiscriminate eating to a more controlled pattern ("When I was reaching the total number of mouthfuls I am allowed I was very careful to choose just the food I enjoyed eating rather than finishing off everything on my plate"). Explicit proximal goals not only facilitate regulation of what, and how much, is eaten but support anticipatory control of eating behavior ("When I knew I'd be having 'eating occasions,' such as dinner at a restaurant or at a friend's house, I made sure I kept my prior intake low so that a small overindulgence would do no overall harm").

Previous research has shown goal setting to have variable effects on self-regulation of refractory behavior (Mahoney & Thoresen, 1974). Some divergence in results is not entirely surprising considering that studies differ on numerous dimensions, including the nature of the activities being regulated, number of supplemental strategies, strength of goal commitment, and the susceptibility of the behavior to voluntary control. Studies in which goal setting has failed to enhance self-directed change have relied almost exclusively on distal goals. The findings of the present investigation indicate that unless participants segment remote goals on their own into proximal subgoals the prospects of success are limited.

Many of the same comments apply to the inconsistent behavioral effects accompanying self-monitoring (Bellack, 1976; Kazdin, 1974; Mahoney, 1974; Romanczyk, 1974; Romanczyk, Tracey, Wilson, & Thorpe, 1973). From the social learning perspective, self-monitoring alone is unlikely to have any appreciable impact on behavior unless it occurs under conditions in which internal self-evaluative contingencies become engaged in the activity. These include conditions in which performers set goals for themselves, the self-monitoring is temporally proximate to the behavior being regulated, the self-recording has informative value for judging one's progress, and the changes in the behavior being monitored are valued. In other words, it is not that the self-monitoring procedures are "reactive," as commonly asserted, but that people are inclined to react evaluatively to their own performances once they adopt an evaluative standard. In the present study, the self-monitoring was informative and proximate, and the behavioral changes were highly valued. However, in the postexperimental

questionnaire subjects in the self-monitoring condition rarely reported devising performance subgoals for themselves. Thus, the most critical element for the engagement of self-evaluative contingencies—the adoption of proximal subgoals—was lacking.

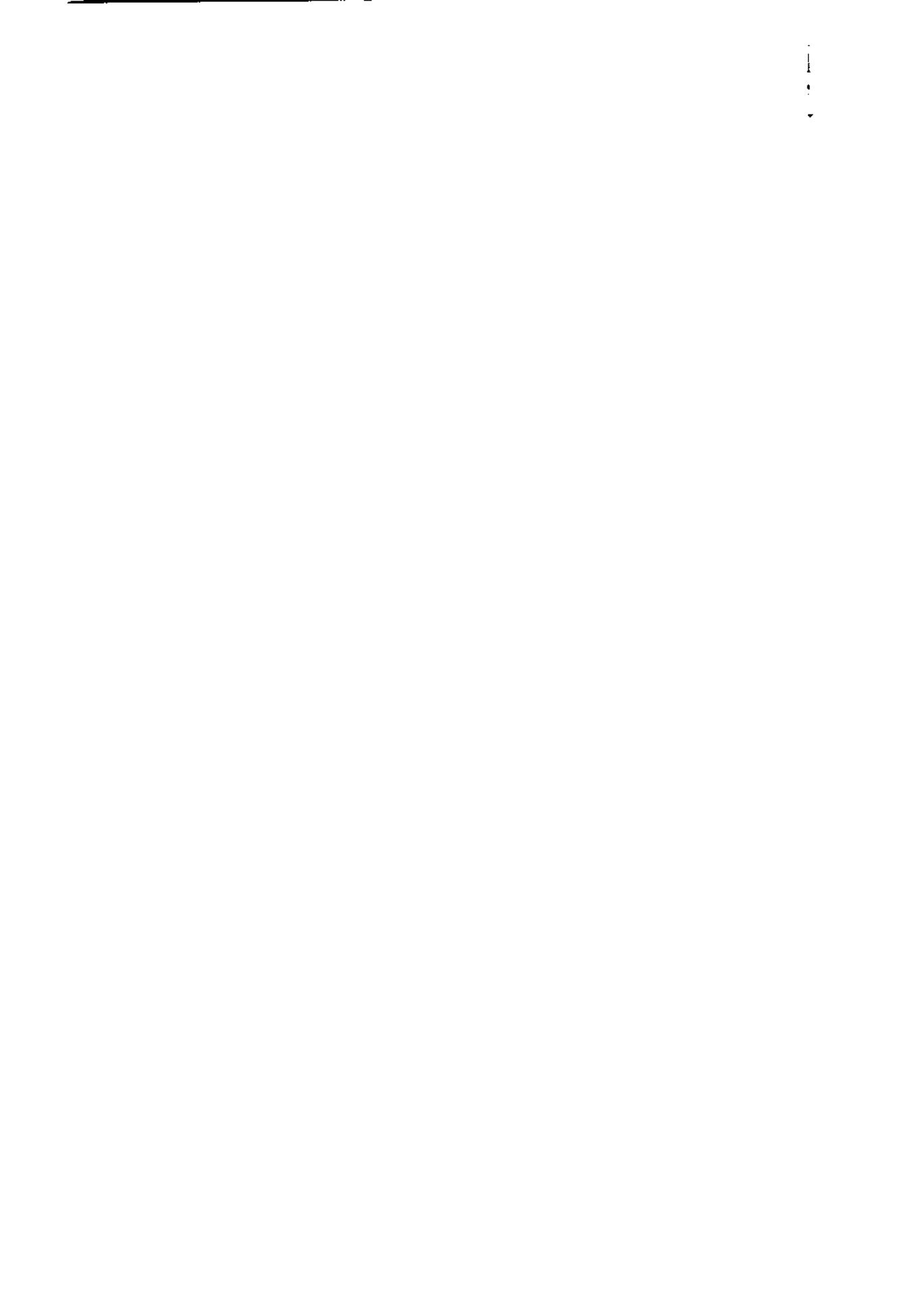
The findings of the distal goal-setting condition raise another intriguing issue, namely, the dual process of the influenced self and the influencing self. Through instructional means subjects were influenced to adopt goals for their performances. However, many of them improvised on this knowledge to create their own goal-setting conditions that are especially conducive to effective performance. 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 to situational inducements, they transform and augment them. Theories that attempt, through regressive causal analysis, to reduce self-regulatory processes to situational control overlook the fact that people serve as agents as well as objects of change. Social learning theory adopts a reciprocal model of self-regulation in which cognitive, behavioral, and environmental influences operate as interlocking determinants of each other (Bandura, 1977).

Results of the intensive case study suggest that, in regulating their own behavior, people do not have to apply concerted effort continuously. After desired changes are achieved, they can be stably maintained provided individuals keep track of their behavior and apply explicit criteria for instituting self-corrective measures when needed. This is why an effective program of personal change should cultivate skills at self-direction. Since people constantly preside over their own activities, they themselves best know when to bring corrective influences to bear on their behavior.

This experiment was primarily aimed at elucidating some aspects of the mechanism by which intentions regulate behavior, rather than at evaluating a weight control program. Nevertheless, the rate of weight loss under the optimal goal-setting condition compares favorably with that typically achieved by formal treatment programs. There is some evidence (Romanczyk, 1974; Romanczyk et al., 1973) to suggest that a program combining proximal goals with informative, proximal self-monitoring through a convenient counting system such as caloric intake, might prove as effective in altering eating habits and managing obesity as the more elaborate multi-faceted programs that have been devised for this purpose. Because excess weight can result from underexercise as well as overeating, an exercise program combining self-monitoring with proximal goal levels for amount of physical activity can also aid in the self-management of obesity. Whatever program formats might be adopted, proximal self-influence is apt to be a critical ingredient in successful achievement of self-directed change.

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Cultivating Competence, Self-Efficacy, and Intrinsic Interest Through Proximal Self-Motivation

Albert Bandura and Dale H. Schunk

Cultivating Competence, Self-Efficacy, and Intrinsic Interest Through Proximal Self-Motivation

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The present experiment tested the hypothesis that self-motivation through proximal goal setting serves as an effective mechanism for cultivating competencies, self-percepts of efficacy, and intrinsic interest. Children who exhibited gross deficits and disinterest in mathematical tasks pursued a program of self-directed learning under conditions involving either proximal subgoals, distal goals, or no goals. Results of the multifaceted assessment provide support for the superiority of proximal self-influence. Under proximal subgoals, children progressed rapidly in self-directed learning, achieved substantial mastery of mathematical operations, and developed a sense of personal efficacy and intrinsic interest in arithmetic activities that initially held little attraction for them. Distal goals had no demonstrable effects. In addition to its other benefits, goal proximity fostered veridical self-knowledge of capabilities as reflected in high congruence between judgments of mathematical self-efficacy and subsequent mathematical performance. Perceived self-efficacy was positively related to accuracy of mathematical performance and to intrinsic interest in arithmetic activities.

Much human behavior is directed and sustained over long periods, even though the external inducements for it may be few and far between. Under conditions in which external imperatives are minimal and discontinuous, people must partly serve as agents of their own motivation and action. In social learning theory (Bandura, 1977b, *in press*), self-directedness operates through a self system that comprises cognitive structures and subfunctions for perceiving, evaluating, motivating, and regulating behavior.

An important, cognitively based source of

self-motivation relies on the intervening processes of goal setting and self-evaluative reactions to one's own behavior. This form of self-motivation, which operates largely through internal comparison processes, requires personal standards against which to evaluate ongoing performance. By making self-satisfaction conditional on a certain level of performance, individuals create self-inducements to persist in their efforts until their performances match internal standards. Both the anticipated satisfactions for matching attainments and the dissatisfactions with insufficient ones provide incentives for self-directed actions.

Personal goals or standards do not automatically activate the evaluative processes that affect the level and course of one's behavior. Certain properties of goals, such as their specificity and level, help to provide clear standards of adequacy (Latham & Yukl, 1975; Locke, 1968; Steers & Porter, 1974). Hence, explicit goals are more likely than vague intentions to engage self-reactive influences in any given activity. Goal proximity, a third property, is especially critical because the more closely referential standards are related to ongoing behavior, the greater the likelihood that self-influences will be activated during the process. Some

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suggestive evidence exists that the impact of goals on behavior is indeed determined by how far into the future they are projected (Bandura & Simon, 1977; Jeffery, 1977).

In the social learning view, adopting proximal subgoals for one's own behavior can have at least three major psychological effects. As already alluded to, such goals have motivational effects. One of the propositions tested in the present experiment is that self-motivation can be best created and sustained by attainable subgoals that lead to larger future ones. Proximal subgoals provide immediate incentives and guides for performance, whereas distal goals are too far removed in time to effectively mobilize effort or to direct what one does in the here and now. Focus on the distant future makes it easy to temporize and to slacken efforts in the present.

Proximal subgoals can also serve as an important vehicle in the development of self-percepts of efficacy. Competence in dealing with one's environment is not a fixed act or simply knowing what to do. Rather, it involves a generative capability in which component skills must be selected and organized into integrated courses of action to manage changing task demands. Operative competence thus requires flexible orchestration of multiple subskills. Self-efficacy is concerned with judgments about how well one can organize and execute courses of action required to deal with prospective situations containing many ambiguous, unpredictable, and often stressful elements. Self-percepts of efficacy can affect people's choice of activities, how much effort they expend, and how long they will persist in the face of difficulties (Bandura, 1977a; Brown & Inouye, 1978; Schunk, 1981).

Without standards against which to measure their performances, people have little basis for judging how they are doing or for gauging their capabilities. Subgoal attainments provide indicants of mastery for enhancing self-efficacy. By contrast, distal goals are too far removed in time to provide sufficiently clear markers of progress along the way to ensure a growing sense of self-efficacy.

The processes underlying the development of intrinsic interest may similarly be gov-

erned, at least in part, by goal proximity. Most of the activities that people enjoy doing for their own sake originally had little or no interest for them. Young children are not innately interested in singing operatic arias, playing tubas, deriving mathematical equations, writing sonnets, or propelling heavy shotput balls through the air. However, through favorable continued involvement, almost any activity can become imbued with consuming significance.

One can posit at least two ways in which proximal goals might contribute to enhancement of interest in activities. When people aim for, and master, desired levels of performance, they experience a sense of satisfaction (Locke, Cartledge, & Knerr, 1970). The satisfactions derived from subgoal attainments can build intrinsic interest. When performances are gauged against lofty, distal goals, the large negative disparities between standards and attainments are likely to attenuate the level of self-satisfaction experienced along the way.

Conceptual analyses of intrinsic interest within the framework of both self-efficacy theory (Bandura, 1981) and intrinsic motivation theory (Deci, 1975; Lepper & Greene, 1979) assign perceived competence a mediating role. A sense of personal efficacy in mastering challenges is apt to generate greater interest in the activity than is self-perceived inefficacy in producing competent performances. To the extent that proximal subgoals promote and authenticate a sense of causal agency, they can heighten interest through their effects on perception of personal causation.

Investigations of intrinsic interest have been concerned almost exclusively with the effects of extrinsic rewards on interest when it is already highly developed. Although results are somewhat variable, the usual finding is that rewards given regardless of quality of performance tend to reduce interest, whereas rewards for performances signifying competence sustain high interest (Boggiano & Ruble, 1979; Enzle & Ross, 1978; Lepper & Greene, 1979; Ross, 1976). The controversy over the effects of extrinsic rewards on preexisting high interest has led to a neglect of the issue of how intrinsic interest is developed when it is lacking. One of the present

study's aims was to test the notion that proximal subgoals enlist the type of sustained involvement in activities that build self-efficacy and interest when they are absent.

Children who displayed gross deficits in mathematical skills and strong disinterest in such activities engaged in self-directed learning over a series of sessions. They pursued the self-paced learning under conditions involving either proximal subgoals, distal goals, or bids to work actively without any reference to goals. It was predicted that self-motivation through proximal subgoals would prove most effective in cultivating mathematical competencies, self-percepts of efficacy, and intrinsic interest in mathematical activities. For reasons given earlier, distal goals were not expected to exceed bids to work actively in promoting changes. It was hypothesized further that strength of self-efficacy would predict subsequent accuracy on mathematical tasks and level of intrinsic interest.

Method

Subjects

The subjects were 40 children of predominantly middle-class backgrounds, ranging in age from 7.3 to 10.1 years, with a mean age of 8.4 years. There were 21 males and 19 females distributed equally by age and sex across conditions.

Children were drawn from six elementary schools. As an initial screening procedure, teachers identified children in their classes who displayed gross deficits in arithmetic skills and low interest in such activities. The pre-treatment procedures were administered to each of the identified children by one of two testers (a male and a female) to determine whether the children's arithmetic skills were sufficiently deficient to qualify for the experiment.

Pretreatment Measures

The study was presented to the children as a project aimed at gaining understanding of how arithmetic skills are acquired. To reduce further any evaluative concerns, they were informed that the project was being conducted in several schools and that their work would be treated in full confidence.

Mathematical performance test. The performance pretest consisted of 25 subtraction problems graded by level of difficulty. The test problems, which ranged from two to six columns, were specifically designed so as to tap each of seven subtraction operations that were included in the treatment phase of the study.

Of the 25 pretest problems, 8 were similar in form and difficulty to some of the types of items used in the subsequent treatment phase. To test for generalization effects, 17 problems required application of the various subtraction operations to problem forms that were more complex than those children would encounter in the self-instructional phase. For example, in treatment they learned how to borrow once or twice from zero in, at most, four-column problems, whereas a generalization item would require borrowing from three consecutive zeros in a six-column set. To add a further element of complexity, all the test problems were cast in a form in which the minuend and the difference between the minuend and the subtrahend were provided so that children had to solve the subtrahend.

Children were presented the set of 25 subtraction problems one at a time on separate pages and were instructed to turn each page over after they had solved the problem or had chosen not to work at it any longer. The tester recorded the time spent on each problem. The measure of competence in subtraction was the number of problems in which the children applied the correct subtraction operation.

Pilot work in the development of the test procedures revealed that children who do not fully comprehend subtraction operations fail to grasp the nature of their deficiency because they faithfully apply an erroneous algorithm. When presented with a subtraction problem, they simply subtract the smaller number from the larger one in each column regardless of whether the smaller number is the minuend or the subtrahend. To address this problem at the outset of the experiment proper, after children completed the arithmetic pretest they compared their solutions to the correct answers. However, children performed the posttest without feedback of accuracy.

Since this study centered on motivational processes by which competencies, perceived efficacy, and interest can be developed when they are lacking, children who solved more than four problems were excluded. The selected sample of children indeed exhibited gross deficits; one third could not solve a single problem, and another third could only solve one.

The children's substantial quantitative deficiencies were further confirmed by standardized measures of their mathematical ability obtained from the school district on three subtests of the Metropolitan Achievement Test (Durost, Bixler, Wrightstone, Prescott, & Balow, 1970). They occupied the bottom percentile ranks in computation (22), concepts (27), and problem solving (22). Children in the various treatment conditions did not differ in this respect.

Self-efficacy judgment. Before measuring perceived mathematical efficacy, children performed a practice task to familiarize them with the efficacy assessment format. The tester stood at varying distances from the children and asked them to judge whether they could jump selected distances and to rate on a 100-point scale the degree of certainty of their perceived capability. In this concrete way, children learned how to use numerical scale values to convey the strength of their self-judged efficacy.

In measuring strength of mathematical self-efficacy, children were shown, for 2 sec each, 25 cards containing

pairs of subtraction problems of varying difficulty. This brief exposure was sufficient to portray the nature of the tasks but much too short to even attempt any solutions. After each sample exposure, children judged their capability to solve the type of problem depicted and rated privately the strength of their perceived efficacy on a 100-point scale, ranging in 10-unit intervals from high uncertainty through intermediate values of certainty to complete certitude. The higher the scale value, the stronger the perceived self-efficacy. The measure of strength of self-efficacy was obtained by dividing the summed magnitude scores by the total number of problems.

Self-Instructional Material

Research conducted at the Stanford Institute of Mathematical Studies has shown that competence in subtraction requires several subskills (Friend & Burton, 1981). These include subtracting a number from a larger one, subtracting zero, subtracting a number from itself, borrowing once, borrowing caused by zero, borrowing twice, borrowing from 1, and borrowing from zero. Seven sets of instructional material were designed, which incorporated the various subtraction operations. The material was organized in such a way that children could work independently at their own pace over a series of sessions.

The format of each instructional set was identical. The first page of each set contained a full explanation of the relevant subtraction operation, along with two examples illustrating how the solution strategies are applied. The following six pages contained sets of problems to be solved using the designated operation. Pre-testing showed that if children worked at a steady pace, they could complete each self-instructional set in about 25 min.

Procedure for Self-Directed Learning

One of three experimenters (one male and two females) brought the children individually, at slightly staggered times, into the study room, where they were seated in different locations, facing away from each other to preclude any visual contact. Both the experimenter and the schools from which the children were drawn were the same across treatment conditions. The entire set of instructional materials was placed face down on the table. The children were informed that they could work on these subtraction problems for seven 30-min. sessions.

In describing the procedure for self-directed learning, the experimenter turned over the first page, which explained the subtraction operation for the first six-page set. Children were told that whenever they came to a page of instructions, they should bring it to the experimenter who would read it to them. Then they should solve, on their own, the subtraction problems contained on the succeeding pages. If children asked for further assistance with the instructions, the experimenter simply reread the relevant sections of the instructions but never supplemented them in any way. Since the instructions were self-explanatory and the importance of children

working on their own was underscored, they rarely sought the experimenter's attention during the sessions.

The self-directed study was conducted on consecutive school days. At the end of each session, children marked where they had stopped and simply resumed work at that point in the subsequent session.

The situational arrangement for the instructional phase of the study was designed to leave the initiative to the children, thus allowing leeway for self-directedness and self-motivation to exert their effects. By working independently but in a group setting, none of the children was the focus of attention. The seating arrangement and sequential entry precluded communication between the children. After delivering the instructions, the experimenter retired to a table away from the children and remained as unobtrusive as possible throughout the sessions. By having children in different treatments pursue separately the self-directed learning in the same setting at the same time, social and situational factors that might otherwise vary were comparable across treatment conditions.

Treatment Conditions

Children were assigned randomly to one of three treatment conditions or to a nontreated control group. The instructions, format, and materials for the self-directed study were identical across treatment conditions except for variations in goal setting.

Proximal goals. For children in the proximal-goal treatment, the experimenter suggested that they might consider setting themselves a goal of completing at least six pages of instructional items each session. To give some salience to a continuing goal orientation, the suggestion of proximal goals was made at the beginning of the second session as well. There was no further mention of goals thereafter.

Distal goals. For children assigned to the distal-goal treatment, the experimenter suggested that they might consider setting themselves the goal of completing the entire 42 pages of instructional items by the end of the seventh session, which comprised a total of 258 problems.

In both treatment conditions, the goals were mentioned suggestively rather than prescriptively so as to leave the goal-setting decision to the children. This mode of goal structuring was used for two reasons. First, it was designed to increase children's self-involvement in the instructional task. Second, choice increases the level of personal responsibility and commitment to goals.

No goals. A third group of children pursued the self-directed learning without any reference to goals. However, they were told to try to complete as many pages of instructional items as possible as they went along. The reasons for including this particular condition were twofold: to provide a control for the effects of self-directed instruction alone and to equate the groups for the social suggestion that they work productively.

No treatment. A fourth group of children was administered the full set of assessment procedures without any intervening exposure to the instructional material. This group provided a control for any possible effects of testing and concomitant classroom instruction.

Posttreatment Assessment

The procedures used in the pretreatment phase of the study were readministered on the day following completion of the fourth session. This intermediate point was selected to gauge the effects of goal proximity on the development of skill, self-efficacy, and intrinsic interest within an identical length of time. Had children been tested after completing the entire program of study, the posttreatment changes would have been confounded by variations in the amount of time different children required to complete the self-instruction.

Children's mathematical self-efficacy was measured at the end of treatment and after the posttest of subtraction performance. The self-efficacy scores obtained at the end of treatment were used to gauge the value of self-efficacy judgment in predicting subsequent arithmetic performance. Since posttest performance can affect perceived efficacy, the measure of self-efficacy obtained following the arithmetic posttest was related to the subsequent measure of intrinsic interest.

Each of the 25 pairs of efficacy assessment items, which were the same as those used in the pretreatment assessment, corresponded in form and difficulty level to a subtraction problem in the performance test but involved different sets of numbers. As noted previously, most of the test problems were more complex than the ones included in the treatment phase of the study. Because the test of self-efficacy tapped new applications of cognitive operations, children had to rely on generalizable perceptions of their mathematical capabilities in making their efficacy judgments.

A parallel form of the performance test used in the pretest was devised for the posttreatment assessment of mathematical competence. This eliminated any possible effects due to familiarity with problems. Both forms were administered in a counterbalanced order to a sample of 17 children who were not participants in the formal study. The alternate forms yielded highly comparable scores ($r = .87$).

Children's intrinsic interest in subtraction problems was measured in a separate session scheduled the day after the posttreatment assessment. The tester explained that she/he had another task the children could do. Their attention was then drawn to two stacks of 10 pages each. One stack contained 60 subtraction problems of varying levels of difficulty; the other stack contained rows of digit-symbol problems adapted from the Wechsler Intelligence Scale for Children (Wechsler, 1974). The latter task involved filling in rows of empty squares with symbols corresponding to the digits appearing above each square.

The tester stressed that the children should feel free to decide whether they wanted to work on one, or the other, or both tasks. It was further emphasized that it was up to them to decide how much time they wanted to spend on each activity. The children worked alone until 25 min. had elapsed. The number of subtraction problems the children solved under these permissive choice conditions constituted the measure of intrinsic interest.

All of the assessment procedures were administered individually by the same tester in both phases of the study. To control for any possible bias, the testers had

no knowledge of the conditions to which the children had been assigned.

After the experiment was concluded, all children, including the controls, pursued self-directed instruction to completion under proximal subgoals to provide maximal benefits for all participants.

Results

No significant sex differences were found on any of the measures at either the pretest or posttest assessments, since the sample was confined to children with gross arithmetic deficits. In the posttest assessment, children showed comparable gains in self-efficacy and arithmetic performance on generalization problems and on the types of items used in the treatment phase. Having mastered particular subtractive operations on simpler exemplars, children applied them accurately to more complex forms. The data were therefore pooled across sex and class of item for the primary analyses.

Analyses of variance were computed on the different sets of data, with phases of the experiment and treatment conditions representing the main factors. At the pretest phase, the groups did not differ on any of the measures. Significant intergroup differences obtained in the posttreatment phase were analyzed further, using the Newman-Keuls multiple-comparison method. Table 1 shows the significance levels of the treatment effects, the changes achieved by children within each condition, and comparisons between treatment conditions.

Perceived Self-Efficacy

The strength of children's perceived mathematical efficacy at different phases of the experiment is presented graphically in Figure 1.

Analysis of these data shows the main effect of treatment, $F(3, 36) = 10.13, p < .001$, and the interaction between treatment and experimental phases, $F(6, 72) = 5.96, p < .001$, to be highly significant.

Intragroup comparisons of changes in strength of self-efficacy, evaluated by the t test for correlated means, yielded no significant differences for children in the control group (Table 1). Those who had the benefit of proximal subgoals substantially increased

Table 1
Significance of Intergroup Differences and Intragroup Changes

Measure	Proximal vs. distal	Proximal vs. no goals	Proximal vs. control	Distal vs. no goals	Distal vs. control	No goals vs. control
Intergroup comparisons (Newman-Keuls comparisons)						
Strength of Self-efficacy						
Post ₁	<.05	<.05	<.01	ns	<.05	ns
Post ₂	<.01	<.05	<.01	ns	<.05	<.01
Arithmetic performance	<.01	<.01	<.01	ns	<.01	<.01
Persistence						
Easy problems	ns	ns	ns	ns	ns	ns
Difficult problems	ns	ns	<.05	ns	<.05	<.05
Intrinsic interest	<.05	<.05	<.05	ns	ns	ns
Accuracy of Self-Appraisal of Efficacy	<.05	<.05	<.05	ns	ns	ns
Intragroup changes (t tests)						
	Proximal	Distal	No goals	Control		
Strength of Self-efficacy						
Pre vs. Post ₁	4.69***	2.93**	2.16*	0.01		
Pre vs. Post ₂	5.90****	2.15*	3.70***	0.78		
Post ₁ vs. Post ₂	3.55***	2.75**	1.18	1.12		
Arithmetic Performance	12.62****	3.17***	4.27***	1.01		
Persistence						
Easy problems	0.72	0.26	0.32	4.12***		
Difficult problems	4.57***	1.41	1.76	3.34***		

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

their perceived self-efficacy and exhibited even further gains following the performance posttest. Children oriented toward distal goals displayed a moderate increase in self-efficacy but a small decline after the posttest. Self-directed learning without goals produced a modest increase at a borderline level of significance.

In separate comparisons between treatments, the proximal group exceeded all others in strength of perceived self-efficacy, as measured both before and after the behav-

ioral posttest (Table 1). Children in the distal condition also exceeded the controls in self-efficacy, but they did not differ significantly from those who set no goals for themselves. Children in the latter condition judged their mathematical efficacy more highly than did the controls after but not before the performance posttest.

Mathematical Performance

Figure 1 presents the mean scores obtained on the subtraction performance test

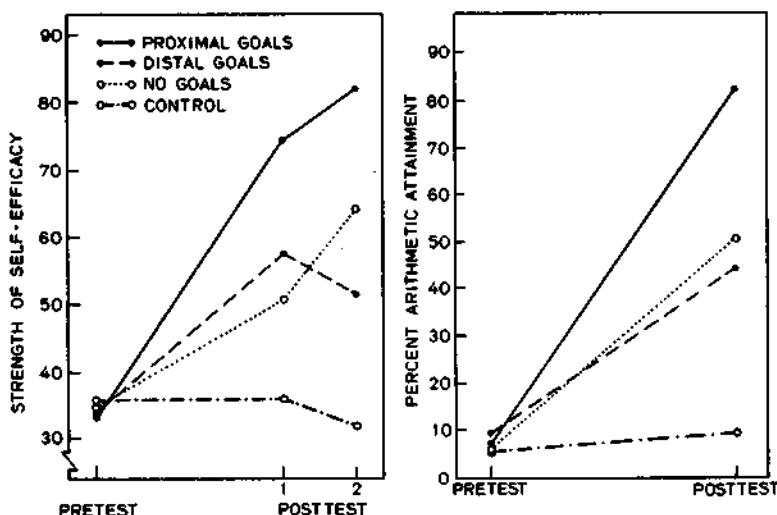


Figure 1. The left panel shows the strength of children's self-percepts of arithmetic efficacy at the beginning of the study (pretest), and before (Post₁) and after (Post₂) they took the subtraction posttest. The right panel displays the children's level of achievement on the subtraction tests before and after the self-directed learning.

by children in the various conditions. The main effect of treatment was highly significant, $F(3, 36) = 12.80, p < .001$, as was the interaction between treatment and experimental phases, $F(3, 36) = 12.55, p < .001$.

Self-directed instruction promoted mastery of subtractive operations in all three groups, whereas the controls remained at a loss on how to subtract numbers from each other (Table 1). In pairwise comparisons, children who had employed proximal subgoals surpassed all the other groups in subtractive skills. Children who engaged in self-directed learning either with distal or no goals did not differ significantly from each other, but both groups outperformed the controls.

In the above measure, children received partial credit if they applied the appropriate subtractive operations but made a minor error in deriving or in recording the answer. The identical pattern of results is obtained on scores using a stringent criterion requiring perfect accuracy on all counts. In comparing the children's subtractive skills before and after treatment, all three groups that engaged in self-directed instruction achieved significant gains beyond the $p < .001$ level of significance; whereas the controls, who

solved only 5% of the problems in pretest and only 8% in posttest, remained grossly deficient in this regard.

Contrasts between the means of the different treatment conditions show the children in the proximal condition to be much more skilled than those in the distal ($p < .01$), no-goals ($p < .01$), or control ($p < .01$), conditions. Children who pursued the self-learning with distal ($p < .01$) or no goals ($p < .01$) were also more skilled than the controls, but the former two groups did not differ from each other.

Persistence

Children who gain high self-efficacy through skill acquisition solve problems readily and, therefore, need not spend much time on them. An aggregate measure of persistence spanning the entire range of difficulty is not too meaningful because long perseverance times on hard problems are offset by rapid solutions of less difficult ones. Changes in persistence were, therefore, analyzed separately for problems at two levels of difficulty: The difficult set of problems required two or more borrowing operations, whereas the easier set involved either no bor-

rowing or, at most, only one smaller minuend.

Analysis of persistence on the easy arithmetic items revealed no differences except for the controls, who were significantly less persevering (-31%) when tested again. However, in the efforts expended on difficult arithmetic items, the proximal children were markedly more persistent after treatment than before (+90%), the distal (+22%) and the no-goals children (+39%) were moderately more persistent, whereas the controls slackened their efforts (-27%) in the posttest. This differential pattern of perseverance yielded a highly significant Treatment \times Phases interaction, $F(3, 36) = 5.67, p < .005$. Analyses of intragroup changes presented in Table 1 show that the increased perseverance of the proximally self-motivated children and the diminished effort of the controls are highly significant. Multiple comparisons among groups in the posttest assessment disclose that children in each of the treatment conditions, although not differing from each other, were all significantly more persevering than were the controls (Table 1).

Intrinsic Interest

The role of goal proximity in the development of intrinsic interest may be seen in Figure 2. Analysis of variance of the number of subtraction problems that children chose to solve on their own yielded a significant treatment effect, $F(3, 36) = 3.57, p < .05$. Inspection of Table 1 shows that children in the proximal subgoal condition exceeded all three comparison groups, which did not differ from each other. Indeed, 90% of the children who developed their arithmetic skill through the aid of proximal subgoals performed subtraction problems under the free-choice conditions; whereas only about 40% of the children in the other groups did so.

The involvement in arithmetic problems displayed by the proximal children was not at the detriment of the competing activity. Children in all groups performed a comparable number of digit-symbol items and did not differ in this respect ($F = 0.77$). It would seem that experience with proximal self-motivators enhances the total level of subse-

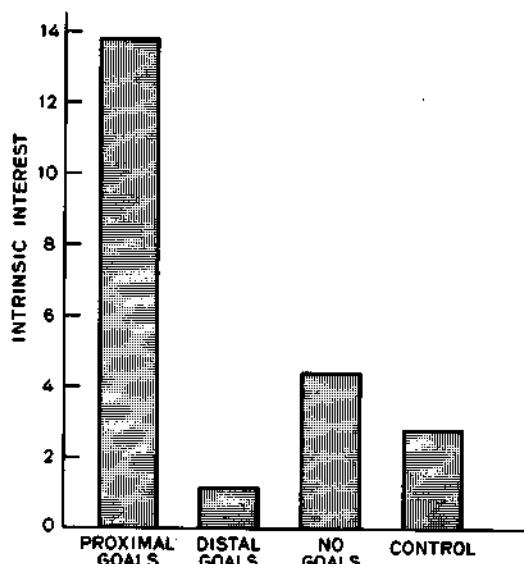


Figure 2. Average number of subtraction problems children in the different conditions chose to solve when given free choice of activities.

quent productivity, since children in this condition were as prolific on the competing task and more so on the arithmetic one.

Progress in Self-Directed Learning

The average length of time it took children to complete each lesson was 21, 29, and 30 min. for the proximal, distal, and no-goals conditions, respectively. Thus, proximal self-motivators produced more rapid mastery of the subject matter than did distal ones, $F(1, 27) = 3.94, p < .10$, or self-instruction without goals, $F(1, 27) = 5.44, p < .05$.

By the end of the four sessions, the percentage of the total instructional material completed was 74% in the proximal condition, 55% in the distal condition, and 53% in the condition involving no goals. Although proximal subgoals, compared to distal goals, $F(1, 27) = 3.66, p < .10$, and no goals, $F(1, 27) = 4.67, p < .05$, fostered greater mastery of subtractive operations, distal goals had no significant effect either on rate or level of self-directed instruction.

Congruence Between Self-Efficacy Judgment and Performance

Congruence indices can be computed by comparing efficacy judgments at the end of

treatment with subsequent posttest performance of subtraction problems of comparable form and difficulty. In this procedure, judgments of self-efficacy are dichotomized into positive and negative instances, based on a selected cutoff strength value. Instances of congruence occur when children judged themselves capable of solving a given level of problem and, in fact, solved it or judged themselves incapable and then failed the same class of problem. Mismatches between efficacy judgments and performances (i.e., judged efficacy for failed items and judged inefficacy for solved items) represent instances of incongruence.

Congruence indices were calculated separately for efficacy cutoff values at different levels of strength. When a low-strength value is selected as the criterion of self-judged efficacy, a weak sense of efficacy (e.g., 20) is treated like complete certitude (100). Such a low criterion could produce artifactual mismatches. If the criterion were set near the maximal strength value (80), reasonably high levels of self-judged efficacy (e.g., 70) would be defined as inefficacy. This too would produce artifactual discrepancies. For the mathematical performances examined in this study, an efficacy strength of 40, which reflects a moderate degree of assurance, provided the optimal cutoff criterion.

Results of the congruence analysis disclose that the conditions of treatment affected the level of accuracy with which children appraised their mathematical efficacy, $F(3, 36) = 3.06, p < .05$. Children in the distal (54%), no-goals (51%), and control (60%) conditions displayed moderate congruence between their self-judged efficacy and their performance. In contrast, children who developed their skills under proximal subgoals were highly accurate in their self-appraisals of efficacy (80%). Table 1 shows that in accurateness of self-appraisal, the proximally self-motivated children exceed other experimental groups, which do not differ significantly from each other. In most instances the children erred by overestimating their capabilities.

Correlational Analyses

Correlational analyses were carried out to provide additional information on the rela-

tionship between theoretically relevant variables. Product-moment correlations were calculated separately within groups, and when they did not differ significantly, they were averaged by means of an r to z transformation.

That skill acquisition builds self-efficacy receives support in the data. The more self-instructional material the children mastered, the stronger was their sense of mathematical self-efficacy, $r(28) = .42, p < .01$. Performances that are readily achieved suggest a higher level of self-ability than do analogous attainments gained through slow, heavy labor. Consistent with this expectation, the faster the children completed each lesson, the more efficacious they judged themselves to be, $r(28) = .32, p < .05$. Standardized measures of mathematical competence, based on the Metropolitan Achievement Test, did not predict rate of skill acquisition or degree of self-efficacy enhancement.

Both instructional performance, $r(28) = .33, p < .05$, and strength of self-efficacy, $r(38) = .42, p < .01$, were moderately related to the children's facility in using subtractive operations. However, strength of self-efficacy was a significant predictor of perfect arithmetic accuracy for the total sample, $r(38) = .49, p < .001$, and for the self-instructed groups, $r(28) = .40, p < .025$, whereas past self-instructional performance was only marginally related to faultless post-test performance, $r(28) = .25, p < .10$.

Skill acquisition speeds problem solving. This factor attenuated the relationship between self-efficacy and persistence for the treated children who found most of the problems readily soluble and, hence, had no need to spend much time on them. The influence of perceived self-efficacy on perseverance is, of course, best revealed on problems that cannot be solved however hard one tries. Children who doubt their capabilities quit sooner than those who believe they can eventually master the task should they persevere. This condition obtains for the control children whose marked arithmetic deficiencies rendered most of the problems insoluble. For this group, the stronger the children's self-perceived efficacy, the longer they persevered, $r(8) = .63, p = .025$. For all children, high perseverance was accompanied by high

performance attainments on the more difficult problems, $r(38) = .51, p < .001$. Even the easy problems were exceedingly difficult for the control children, and here too, persistence was related to performance success, $r(8) = .61, p < .001$.

The relationship of perceived self-efficacy to intrinsic interest can be analyzed in several ways. It may require at least moderately high self-efficacy to generate and sustain interest in an activity, but interest is not much affected by small variations above or below the threshold level. To test this threshold notion, interest scores were correlated with number of self-percepts of efficacy that matched or exceeded an efficacy strength of 40, which was previously shown to be the optimal criterion in the congruence analysis. The results disclose that the higher the level of self-efficacy at the end of the posttest, the greater the interest shown in arithmetic activities, $r(38) = .27, p < .05$.

An alternative possibility is that intrinsic interest is linearly related to strength of self-efficacy. Correlation of the latter measures shows that variations in mean strength of self-efficacy covaried with interest in the control and the no-goals conditions, $r(18) = .39, p < .05$, but not in the goal-setting treatments.

Although interest was positively related to self-percepts of efficacy derived from performance attainments in treatment, it was uncorrelated with the performance attainments themselves. However, the standardized measures of competence in mathematical subfunctions emerged as significant correlates. The more competent children were at mathematical computation, $r(38) = .42, p < .01$, and problem solving, $r(38) = .58, p < .001$, the more subtraction problems they completed in the free-choice situation.

Discussion

Results of the present study confirm the influential role of proximal self-motivators in the cultivation of competence, self-percepts of efficacy, and intrinsic interest. Children who set themselves attainable subgoals progressed rapidly in self-directed learning, achieved substantial mastery of mathemat-

ical operations, and heightened their perceived self-efficacy and interest in activities that initially held little attraction for them.

Efforts to clarify how goal proximity operates in self-regulatory mechanisms ordinarily present difficulties because even though encouraged to set themselves distal goals, people are prone to convert them into more aidful proximal ones. They simply fractionate desired future accomplishments into attainable daily subgoals (Bandura & Simon, 1977). In the present experiment, children could not transform distal into proximal self-motivators because not knowing how to divide, they could not partition the entire instructional enterprise into equivalent subunits. Results of the combined studies attest to the motivating potential of proximal goals, whether they are suggested or spontaneously generated, or whether the self-sustained behavior is tractable or very difficult to produce.

Judgment of mathematical self-efficacy by children just beginning to understand the requisite cognitive skills is no simple matter. With very brief exposure to sample items, it is hard to discriminate among different levels of task difficulty. This is because the complexity of some of the subtractive operations is not instantly apparent from what is most readily observable. When complex operations are imbedded in seemingly easy problems, which is often the case, appearances can be quite misleading. In such situations, incongruities between perceived self-efficacy and action may stem from misperceptions of task demands as well as from faulty self-knowledge. Moreover, solving problems typically requires applying multiple operations. Even if they were readily recognizable, judgment of personal capabilities for a given type of task is complicated if some of the constituent operations are thoroughly mastered and others are only partially understood. Selective attention to mastered elements highlights competencies; whereas focus on what is less well understood highlights shortcomings. Even equal attentiveness to all aspects of the task will produce some variance in judgments of self-efficacy, depending on how much weight is given to the differentially mastered operations.

Given these complexities, it is not sur-

prising that children sometimes overestimated their capabilities, especially on tasks that appeared deceptively simple. However, it is noteworthy that in addition to its other benefits, goal proximity fosters veridical self-knowledge of capabilities. Children who guided and judged their progress in terms of proximal subgoals were highly accurate in their self-appraisals. In contrast, skill development under conditions in which progress toward competence is somewhat ambiguous does not improve self-knowledge. Despite the fact that children in the distal and no-goal conditions acquired new information about mathematics and applied it repeatedly, the accurateness of their self-appraisals was no better than that of the controls, who did not have the benefit of substantial performance information for constructing their self-knowledge.

The above results are consistent with previous findings that judgments of self-efficacy are not simply reflectors of past performance (Bandura, 1977a, 1977b). Rather they reflect an inferential process in which the self-ability inferences drawn from one's performances vary, depending on how much weight is placed on personal and situational factors that can affect how well one performs. The evaluative standards against which ongoing performances are appraised constitute an additional factor that determines how well people judge their capabilities.

Results of microanalyses of congruence between self-efficacy judgment and performance indicate that the optimal cutoff value of efficacy strength varies across activities, depending on the complexity and the variety of skills they require. Performances that draw on only a few skills reduce the likelihood of overestimating personal capabilities by overweighting a mastered subpart. Hence, lower efficacy strength values can be predictive of success (Bandura, 1977a). In activities that depend on diverse subskills, knowledge of some of them, especially the more directly observable ones, raises the level of assurance that one might be able to perform successfully. Consequently, somewhat higher cutoff values of efficacy strength become predictive of success.

Research on intrinsic interest has centered

primarily on how extrinsic incentives affect high interest when it is already present rather than on how to develop it when it is lacking. It is the latter problem that presents major challenges, especially when avoidance of activities essential for self-development reflects antipathy arising from repeated failure rather than mere disinterest. The present findings lend support to the general thesis that skills cultivated through proximal standards of competency build interest in disvalued activities. When progress is gauged against distal goals, similar accomplishments may prove disappointing because of wide disparities between current performance and lofty future standards. Consequently, interest fails to develop, even though skills are being acquired in the process.

Perceived self-efficacy was accompanied by high-performance attainments and perseverance under conditions in which such a relationship would be expected to obtain. Regardless of conditions of treatment, persistency increased the likelihood of success. There was some evidence to indicate that faultless arithmetic performance was better predicted from self-efficacy than from behavioral attainments in treatment. However, caution should be exercised in judging causal contributions from correlations because some of the measures reflect continuously interactive processes rather than discrete sequential ones. Consider, for example, the question of directionality of influence in obtained relationships between treatment performance, posttreatment self-efficacy, and posttest performance. Self-efficacy judgments are unconfounded by future posttest performance, but it is highly unlikely that self-percepts of efficacy played no role whatsoever in performance attainments during the self-directed learning. Judgments of one's capabilities can affect rate of skill acquisition, and performance mastery, in turn, can boost self-efficacy in a mutually enhancing process. It is not as though self-efficacy affects future performances in the posttest but does not affect earlier performances in the treatment phase.

The causal contribution of perceived self-efficacy to performance is most clearly revealed in studies in which self-percepts of

efficacy are developed solely through vicarious or cognitive means that entail no overt performance (Bandura & Adams, 1977; Bandura, Adams, & Beyer, 1977; Bandura, Adams, Hardy, & Howells, 1980; Bandura, Reese, & Adams, Note 1). Perceived self-efficacy, instated symbolically, predicts well the pattern of performance successes and failures on specific tasks.

A further issue addressed in this research concerns the relationship between perceived self-efficacy and intrinsic interest. It was mainly children in the proximally self-motivated condition, all of whom felt highly efficacious, who displayed the notable level of intrinsic interest. In contrast, children in the other conditions generally expressed self-doubts concerning their capabilities and showed little spontaneous interest in solving arithmetic problems. Regardless of treatment conditions, self-percepts of moderate to high strength were positively related to interest.

Intrinsic interest seems to covary most closely with the more long-standing indicants of actual or perceived competence, that is, the standardized measures of competence in mathematical subfunctions and perceived self-efficacy in groups whose preexisting self-percepts were either unaltered or changed only marginally. These findings raise the interesting possibility that some temporal lag exists between newly acquired self-efficacy and corresponding growth of interest. The link between boosts in perceived self-efficacy and sustained involvement in challenging activities is now well established across a wide range of behavioral domains (Bandura, 1981; Brown & Inouye, 1978; Weinberg, Gould, & Jackson, 1979; Schunk, 1981; Condiotte & Lichtenstein, in press). But it may require mastery experiences over a period of time before the self-efficacy derived from progressive successes creates strong interest in activities that were disvalued or even disliked. If, in fact, effects follow such a temporal course, then increased interest would emerge as a later rather than as an instant consequent of enhanced self-efficacy. Because of the theoretical import of the link between self-efficacy and interest, both the threshold and the tem-

poral lag effects warrant systematic investigation.

Reference Note

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The Psychology of Chance Encounters and Life Paths

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ABSTRACT: Psychological theories have neglected the fundamental issue of what determines people's life paths. The central thesis of this article is that chance encounters play a prominent role in shaping the course of human lives. In a chance encounter the separate chains of events have their own causal determinants, but their intersection occurs fortuitously rather than through deliberate plan. Some fortuitous encounters touch only lightly, others leave more lasting effects, and still others branch people into new trajectories of life. A science of psychology cannot shed much light on the occurrence of fortuitous encounters, but it can provide the basis for predicting the impact they will have on human lives. An analysis is presented of personal factors and milieu properties that govern the branching power of chance encounters.

Psychological theories of human development focus heavily on the growth of cognitive and behavioral competencies, especially during the early formative years. But our theories have not devoted much attention to the fundamental issue of what determines people's life paths. Knowledge of cognitive and behavioral skills does not, in itself, tell us much about what course personal lives will take. Several factors might account for neglect of this crucial aspect of human development.

Most developmental models of human behavior presuppose a developmental determinism in which childhood experiences set the course of later development. According to psychoanalytic theory (Freud, 1953), personality patterns are firmly set in the first few years of life. Thereafter, the child's inner life becomes the major source of action and the definer of social reality. Socialization theories, while not foreclosing discordant changes over time, nevertheless tend to view life patterns as largely the product of childhood socialization (Goslin, 1969). Stage theorists portray development in terms of an invariant succession of distinct stages (Piaget & Inhelder, 1969). People may differ in the rates and terminal levels of their development, but the path itself is foreordained.

The appearance of continuities in the lives of many people adds credence to the primacy of early

experience. The scholastically gifted are more likely than are school truants to enter the ranks of eminent scientists. Metamorphoses of social isolates into vivacious personalities or aggressors into passive personalities are not all that common. There are two psychological processes by which the products of early development can foster continuities in behavioral patterns. One process operates through selection of environments, the second through production of environments. After people acquire certain preferences and standards of behavior, they tend to select activities and associates who share similar value systems, thereby mutually reinforcing preexisting bents (Bandura & Walters, 1959; Bullock & Merrill, 1980; Elkin & Westley, 1955; Mischel, 1968). Through their actions people create as well as select environments. By constructing their own circumstances they achieve some regularity in behavior (Bandura, 1977; Raush, Barry, Hertel, & Swain, 1974).

Continuity has distinct meaning when applied to particular response patterns, but it takes on considerable indefiniteness where life paths are concerned. One can always find linkages between early and later endeavors as, for example, between pursuit of scholarship in childhood and professional careers in adulthood. However, at this level of generality, continuity can be achieved through a variety of life paths. Personal lives, whether marked by continuities or discontinuities, have their particular characters. A comprehensive developmental theory must therefore specify factors that set and alter particular life courses if it is to provide an adequate explanation of human behavior.

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Theorists who approach human development from a life-span perspective call attention to the need for an expanded orientation to the study of lives (Baltes, Reese, & Lipsitt, 1980; Brim & Kagan, 1980). In this view, the environment is treated not as a situational entity, but as a varied succession of life events that vary in their properties to affect the direction lives take (Brim & Ryff, 1980; Hultsch & Plemons, 1979). Some of these include biological events, many include customary social events, others involve unpredictable occurrences in the physical world, and still others involve irregular life events such as career changes, divorce, migration, accidents, and illness. The impact of sociocultural change on life patterns—economic depressions, wars and cultural upheavals, technological revolutions, and other social events that make life markedly different—also receives attention within the life-span framework (Elder, 1981).

Whatever the social conditions might be, there is still the task of explaining the varied directions that personal lives take at any given time and place. This requires a personal, as well as a social, analysis of life paths. A central thesis to be developed and documented in this article is that chance encounters play a prominent role in shaping the course of human lives.

Chance Encounters as Determinants of Life Paths

For purposes of the present discussion a chance encounter is defined as an unintended meeting of persons unfamiliar to each other. Consider, by way of example, the following fortuitous encounter that profoundly altered a person's life. Paul Watkins was a talented teenager headed on a promising course of personal development—He enjoyed a close family life, was well liked by his peers, excelled in academic activities, and served as student-body president of his high school, hardly the omens of a disordered destiny (Watkins & Soledad, 1979). One day he decided to visit a friend who lived in a cabin in Topanga Canyon in Los Angeles. Unbeknown to Watkins, the friend had since moved elsewhere and the Manson "family" now lived there. This fortuitous visit led to a deep entanglement in the Manson gang in the period before they embarked on their "helter skelter" killings. To an impressionable youth the free flow of communal love, group sex, drugs, spellbinding revelations of divine matters, and isolation from the outside world provided a heady counterforce that launched

him on a divergent life path requiring years to turn his life around.

In the preceding case the initial meeting was entirely due to happenstance. Human encounters involve degrees of fortuitiveness. People often intentionally seek certain types of experiences, but the persons who thereby enter their lives are determined by a large element of chance. It is not uncommon for college students to decide to sample a given subject matter only to leave enrollment in a particular course to the vagaries of time allocation and course scheduling. Through this semifortuitous process some meet inspiring teachers who have a decisive influence on their choice of careers.

Such a twist of events launched one of my colleagues into an academic career in psychology. Having to fulfill an area distribution requirement, he was faced with a choice between two philosophy courses or an additional course in psychology, which he had grown to dislike through contact with instructors unburdened by infectious enthusiasm. Choosing what he considered to be the lesser of two woes, he opted for a psychology course that enjoyed some popularity. However, because of heavy overenrollment, an additional section had to be created, a gifted scholar was persuaded to teach it on short notice, and the disconsolate undergraduate had the good fortune to be cast into it. What he discovered was very much to his liking. This compounded fortuity of distribution requirements, overenrollment, faculty recruitment, and chance section assignment set a career path. Had any one of these factors been absent, his occupational pursuit would doubtless have taken an entirely different course.

One can similarly document the influential role that initial chance encounters often play in the formation of partnerships of marriage. Let me cite but one example with which I have some personal acquaintance. Seeking relief from an uninspiring reading assignment, a graduate student departs for the golf links with his friend. They happen to find themselves playing behind a twosome of attractive women golfers. Before long the two twosomes become one foursome and, in the course of events, one of the partners eventually becomes the wife of the graduate golfer. Were it not for this fortuitous constellation of events, it is exceedingly unlikely that their paths would ever have crossed. Different partnerships create different life courses. The graduate student in this particular case happens to be myself.

A further variant of fortuity includes scenarios in which chance events give rise to arranged en-

counters that alter life paths. Nancy Davis met her future husband, Ronald Reagan, through such a turn of events (Reagan & Libby, 1980). While pursuing her acting career, she began to receive in the mail announcements of communist meetings intended for another person bearing the same name, who appeared on a Hollywood list of communist sympathizers. Fearing that her career might be jeopardized by mistaken identity, she voiced concern to her film director, who arranged a meeting with Ronald Reagan, then president of the Screen Actors Guild. Before long they were wed. In this instance, a coincidental likeness of names and a postal mix-up altered the course of lives.¹

The discussion thus far has focused on direct chance encounters that profoundly affect life paths. Sometimes the path-setting event involves a fortuitous symbolic encounter mediated through another's actions. In his Nobel lecture, Herbert Brown (1980) recounts how he happened to decide to pursue doctoral research in the rare field of boron hydrides. As a baccalaureate gift, his girlfriend presented him with a copy of the book, *The Hydrides of Boron and Silicon*, which launched his interest in the subject. This was during the Depression when money was scarce. She happened to select this particular chemistry book undesignedly because it was the least expensive one (\$2.06) available in the university bookstore. Had his girlfriend been a bit more affluent, Brown's research career would in all likelihood have taken a different route.

As the preceding examples illustrate, some of the most important determinants of life paths often arise through the most trivial of circumstances. Although the separate chains of events in a chance encounter have their own causal determinants, their intersection occurs fortuitously rather than through deliberate plan (Nagel, 1961).

Predicting the Impact of Chance Encounters

Some chance encounters touch people only lightly, others leave more lasting effects, and still others branch people into new trajectories of life. Psychology cannot foretell the occurrence of fortuitous encounters, however sophisticated its knowledge of human behavior becomes. This factor introduces a measure of unpredictability about the direction of the flow of human lives. Patterns of change can therefore vary widely in different individuals. They may display basic continuities throughout their life spans, continuities in some aspects of life but discontinuities in others, or a

vast discontinuity at any point along the way affecting virtually all domains of functioning. A science of psychology does not have much to say about the occurrence of fortuitous intersects except that personal bents and social structures and affiliations make some types of encounters more probable than others. However, psychological knowledge can provide the basis for predicting the nature, scope, and strength of the impact they will have on human lives.

Recent years have witnessed growing public apprehension that advancement of psychological knowledge will provide increasingly effective techniques for predicting and controlling human behavior. This popular view is nurtured by literary futurists conjuring up scary images of societies populated with human marionettes whose every act is highly predictable and controllable. Enlarging the knowledge and methods of social influence does not necessarily raise the level of social control. This is because personal and social mechanisms of reciprocal influence place constraints on how much people can control one another. This issue has been addressed fully elsewhere (Bandura, 1974, 1977) and need not be reviewed here. However, the matter of predictability is especially germane to the concerns of this article. The unforeseeability and branching power of fortuitous influences make the specific course of lives neither easily predictable nor easily socially engineerable. Fortuity of influence does not mean that behavior is undetermined. Unforeseeability of determinants and determination of actions by whatever events happen to occur are separate matters. Fortuitous influences may be unforeseen, but having occurred, they enter as evident factors in causal chains in the same way as prearranged ones do.

Analyses of the power of chance encounters to inaugurate enduring change generally emphasize personal susceptibilities to social influence. These are usually treated as personal vulnerabilities in influences judged to be negative and as personal competencies in influences that lead toward beneficial futures. Personal attributes certainly play

¹ At the 1982 meeting of the Western Psychological Association, I received a call from a social science editor who wished to share an experience he had in connection with this presidential address. Upon arriving for the talk, he took a seat which happened to be next to a former Stanford undergraduate who had recently completed her doctoral degree. This chance meeting eventually led to their marriage. With only a slight change in time of entry, seating constellations would have altered and this particular social intersect would probably not have occurred. A marital partnership was thus fortuitously formed at a talk devoted to fortuitous determinants of life paths!

a significant role in determining what changes, if any, fortuitous influences may produce. However, the attributes of social environments into which persons are fortuitously inducted also operate as highly influential determiners of the degree and course of personal change. Indeed, closed social systems wielding strong coercive and rewarding power can work profound irreversible changes even in the seemingly invulnerable. As the Watkins case cited earlier illustrates, even the best laid personal foundations can be undermined by powerful group influence.

Neither personal proclivities nor situational imperatives operate as independent shapers of the course of lives. Chance encounters affect life paths through the reciprocal influence of personal and social factors. In documenting these determinants and reciprocities, evidence of negative discontinuities is cited more often than fortuitously initiated triumphs over adversity. This is because tragedies are more highly publicized than personal triumphs. Moreover, it is the derailment and destruction of promising futures that is of particular social concern and hence commands priority. Although the focus of analysis is on drastic personal change, it should be noted that chance encounters touch all lives throughout the life span.

Personal Determinants of the Impact of Chance Encounters

ENTRY SKILLS

If persons are to affiliate with those whom they have had the good or bad fortune to meet, they must possess at least some of the personal resources needed to gain sufficient acceptance to sustain continued involvement with them. Mismatches of attributes and interests cut short fortuitous encounters through disinterest or rejection. Personal attributes mediate the effects of fortuitous encounters on life paths in another important way. The skills and interests people cultivate determine the circles in which they move and hence the kinds of social encounters they are most likely to experience. The everyday activities of delinquent gangs and those of enrollees in Ivy League colleges will bring them into contact with quite different types of associates. Differential affiliations cultivate different interests and skills. Individuals contribute to their own destiny by developing potentialities that afford access to particular social milieus.

The branching power of fortuitous encounters is most graphically revealed when a chance inci-

dent permanently alters the course of people's lives by bringing them into an entirely new circle of associates. Markedly discontinuous inductions are unlikely to take hold without adequate preparedness of entry attributes. Pasteur's adage that chance favors the prepared mind is, of course, well illustrated in the shaping of research paths through accidental discovery.

Groups vary in the types and level of entry skills they demand for rewarding affiliation. Chance encounters more readily produce converts to undemanding life-styles than to those built through toil on complex competencies. Thus, for example, to gain acceptance by a pre-med group requires substantial knowledge of science and academic skills achievable only through arduous effort over a long period. Other groups, such as quasireligious cults and authoritarian collectives, initially require little beyond personal compliance (Richardson, 1978). The all-too-easy entry into semiclosed milieus arouses public fears over the hazards such groups pose to young people's futures. Groups relying on deceptive recruitment and heavy-handed constraints to bar defections are of greatest concern to the public.

EMOTIONAL TIES

Chance meetings are most likely to affect life courses when individuals come to like the people they meet or gain other satisfactions from them. Interpersonal attraction seals chance encounters into lasting bonds. Once established, binding relationships serve as a vehicle for personal changes that can have long-range effects.

The way in which an encounter can set in motion events that alter the entire course of a person's life through subsequent affectional involvement is vividly documented in the tragic case of Diana Oughton (Powers, 1971). She was a sensitive, gentle woman whose background and personal attributes contradicted the common correlates of political activism. She came from a privileged conservative family from which she received a sheltered conventional upbringing. After graduating from Bryn Mawr, her humanitarian concerns led her to service work as a Vista volunteer in a remote Indian village in Guatemala. This work among the destitute Indians greatly sensitized her to the human suffering caused by social inequities. On a visit to Guatemala City, she met a Fulbright scholar who had grown cynical about the prospects for peaceful social change. He belittled her tireless efforts as mere symptomatic treatment and argued repeat-

edly that only revolutionary force would bring needed sweeping reforms. This encounter set her on the path of militant action.

Upon her return to the United States she became increasingly involved in the Students for a Democratic Society (SDS), which at the time was splintering into opposing ideological camps. She was drawn into the violent Weatherman faction, not by studied design, but through affectional attachment to a leader of this faction, whom she met as a fellow teacher at a makeshift community school. As is often the case in radical psychological change, affectional dependence is combined with an environmental closedness within which intense conversion efforts are applied. To discipline themselves and to extinguish revulsion over ruthless behavior, the Weathermen created small collectives in which they eradicated their "bourgeois morality" with a vengeance. The brutalizing process, carried out around the clock in barricaded houses, included devastating group criticism, intense political indoctrination, revolting acts such as eating tomcats and vandalizing gravestones, mandatory sexual relations between members of the collective, and martial training (Powers, 1971). These charged activities were often conducted under high deprivation of sleep and food. When destructive forays and street battles with the Chicago police failed to produce the heralded revolution, the Weathermen resorted to underground bombing attacks. Diana's brief career as a revolutionary ended with tragic suddenness in a townhouse bomb factory when an antipersonnel explosive intended to help destroy the society she had come to hate took her life instead.

VALUES AND PERSONAL STANDARDS

Human behavior is partly governed by value preferences and self-evaluative standards (Bandura, 1977). Through this internal source of guidance people give direction to their lives and derive satisfactions from what they do. Valuational mechanisms therefore partly govern the extent to which social encounters may shape the course of personal development. Unintended influences are more likely to leave their marks if the persons involved share similar standards and value systems than if they clash.

Some of the earlier studies of determinants of atypical life courses centered on children from impoverished backgrounds who went on to college careers (Ellis & Lane, 1963; Krauss, 1964). In these families the parents themselves could not provide

the necessary resources and preparatory skills. However, a key role in setting the course of the children's intellectual development during their early years was usually played by a parent or a family acquaintance who valued education highly. The values so instilled were further promoted by admired teachers and through selective association with college-oriented peers who served as the major acculturating agency.

Lives follow less predictable courses when personal standards are inadequately developed and there is much cultural confusion about what is valued. In the absence of internal guides and normative consensus fortuitous influences more easily hold sway. The cultural upheaval of recent years—when countercultures were springing up around mystical and religious cults, makeshift communes, drugs, and merchandised human potential movements—left many dislocated lives in its wake.

Personal vulnerability to recruitment into unusual life paths has aroused the greatest interest in relation to cultist influence (Bromley & Shupe, 1979; Singer, 1979). For the most part, the recruits for quasireligious cults and regimented communes are teenagers and young adults who feel lonely and despondent, who find their lives devoid of meaning, and who lack career skills around which to organize their lives. Cults provide instant friendship, an ideology that gives purpose and meaning to one's existence, and a communal regimen that imposes order on one's everyday activities. For youths leading unhappy, empty lives, cultist offerings can hold considerable appeal.

People are better able to resist entrapment in life courses through insidious means if there exist societal safeguards against deceptive recruitment and coercive social control. However, it is difficult to devise safeguards that do not threaten freedom of belief and association. Indeed, a number of writers have deplored use of the brainwashing metaphor to justify forcible actions that violate the civil liberties of unpopular but law-abiding devotees of strange creeds (Robbins & Anthony, 1980). As Szasz (1976) argues in his characteristic penetrating style, one can no more wash a brain than draw blood with a cutting remark. In these brainwashing accounts, which are colored by selective reports of defectors with understandable antipathy to cultist regimentation, powerful "mind control" techniques presumably transform unsuspecting recruits into devoted automatons. Although cultist influence certainly involves vigorous indoctrination, for people leading discontented lives affiliation with such groups is perhaps better

explained by the attractions they provide—a sense of community, meaning, and direction—than in terms of occult “mind control.”

Social Determinants of the Impact of Chance Encounters

MILIEU REWARDS

The course that human behavior follows is substantially influenced by the effects it produces. Hence, the rewards a group provides play a crucial role in determining whether chance encounters will link individuals enduringly to groups that favor certain life paths over others. In studies in which social rewards are systematically varied, individuals affiliate with groups when social rewards are high but withdraw from them when rewards are low (Baer & Wolf, 1970).

Groups can supply a variety of benefits. Because individuals differ in what they value and desire, they may become strongly attracted to a particular social milieu for quite varied reasons. To those lacking close personal ties, social acceptance and affection become a strong source of attraction. In their recruitment practices, some cults exploit such voids by “love bombing,” in which they shower initiates with unconditional love and friendship (Lofland, 1978). To the insecure and confused, the meaning and direction that dedicated groups give to one’s life may serve as a major basis of attraction. Others may be drawn to a group by the worthy purposes it is designed to serve. In the lives that went awry through fortuitous induction into pernicious collectives, initially these groups traded heavily on mesmerizing images of utopian societies (Powers, 1971; Watkins & Soledad, 1979; Winfrey, 1979).

Whatever the initial affiliative inducements might be, once individuals become attached to a primary group, they are socialized into its ideology and life-style through a vast network of proximal rewards and sanctions that members provide each other in their daily transactions.

SYMBOLIC ENVIRONMENT AND INFORMATION MANAGEMENT

Constraints of time, resources, and physical separation impose severe limits on the amount of information that can be gained through direct personal experience. To a large extent people therefore must act on their images of reality. The rapid growth of communication technology has vastly

increased the power of the symbolic environment on human thought and action (Gerbner, 1972). Print, audio, and audiovideo media enable groups to transcend the confines of time and place in promoting their systems of beliefs and images of social reality. Even unacquainted members who are widely dispersed are easily linked together through the shared symbolic environment.

Fortuitous induction into a group not only brings one into contact with new incentive systems, it furnishes a distinct symbolic environment as well. Symbolic systems help build affinity and solidarity and shape ideological perspectives on life. A libertine who, through an odd turn of events, becomes a convert to a born-again religiosity will come to experience a markedly different social and symbolic life. Through a similar inaugural process, individuals who choose paths that lead to medical schools, athletic fields, or to the theatrical world become deeply immersed in distinctive symbolic environments.

Groups seeking mass followings devise their own communication modes to promote their beliefs and systems of values. In the past the print media were used heavily for this purpose. Because of its greater potential for collective influence, the video system feeding off telecommunication satellites has become the dominant vehicle for disseminating symbolic environments. By creating their own video networks, for example, electronic evangelists have now become a prominent part of the daily lives of their many followers. Further developments in fiberoptic laser transmission, with its enormous information-carrying capacity, will provide households with diverse symbolic environments to serve almost any preference. Diversity and ready choice of symbolic environments allow greater leeway for self-directedness to affect the course of personal development.

In a pluralistic society, groups embracing diverse ideologies must vie for attention and influence. As a result, the persuasiveness of any one group can be attenuated or nullified by the sway of others. In communal life where members are cut off from outside influences, the symbolic system becomes a powerful force that can shape even the most bizarre patterns of collective thought and action. In the beginning, Jim Jones used messages of love and egalitarian utopias to gain and hold followers in the People’s Temple. As his image as faith healer and prophet began to tarnish and members began to defect, the humanitarian themes turned into messages of fear and hate designed to implant suspicion and dread of the outside world. In the iso-

lated jungle settlement of Jonestown, where Jones exercised total control, "for hours on end, and sometimes all night, Jones used the camp loudspeakers to amplify his nightmare vision" of outside mercenaries invading their compound and torturing, killing, or imprisoning them in concentration camps (Winfrey, 1979). He preached that, since their destruction was inevitable, they should follow the only dignified course available—revolutionary mass suicide through which they would be reunited by reincarnation to form the utopian society that had eluded them.

MILIEU REACH AND CLOSEDNESS

The social contexts within which interpersonal influences operate vary in how extensively they touch personal lives and in their degree of closedness. The least confining milieus involve loose alliances centered on a few activities that constrain neither personal ties nor beliefs and latitude of action. At the opposite end of the continuum are the totalistic milieus structured around an insulated communal life that prescribes beliefs and behavior patterns for virtually all aspects of living. If needed, heavy-handed methods are used to counteract dissent and defection. In the moderately constraining milieus personal lives are extensively shaped by one's primary affiliations, but active participation in mainstream societal activities creates opportunities for competing influences to exert their effects.

Chance encounters have the greatest potential for branching persons abruptly into new trajectories of life when they induct them into a relatively closed milieu. A totalistic environment supplies a pervading new reality—new kinships, strongly held group beliefs and values, all-encompassing codes of conduct, few vestiges of individuality, and substantial rewarding and coercive power to alter the entire course of personal lives (Bromley & Shupe, 1979). The power of communal control is further enhanced by curtailing personal ties and exposure to influences outside the group. Immersion in heavily prescribed activities that leave little time to think or to explore other milieus has similar encapsulating effects.

Public attitudes toward milieu control vary depending on the purposes it serves. People fear the existence of engulfing milieus that gain converts to unconventional or cultist life-styles, but they cherish those that steer lives in socially valued directions. To cite but one example, highly regimented prep schools that set children on paths

leading to prestigious universities and illustrious careers are held in very high regard.

When insulated communal life is heavily dictated by a charismatic figure, the imbalances of power and lack of counteracting mechanisms generally produce a drift toward increasing coercive control. Exercise of power changes the user in ways that are conducive to punitiveness. As Kipnis (1976) has shown, wielding power over others strengthens manipulative attitudes and fosters estrangement from, and devaluation of, those subject to control. Devaluation in turn heightens punitiveness in unilateral power relationships (Bandura, Underwood, & Fromson, 1975). Dissent is suppressed through punitive control, and defection is deterred by threats and forcible restraint. The perversion of communal power is most tragically illustrated in the Jonestown massacre.

PSYCHOLOGICAL CLOSEDNESS

People seek and hold firmly to beliefs because they serve valuable functions. Indeed, life would be most taxing and chaotic if people had no conceptions of themselves and the world around them. Their experiences would lack coherence; they would cede the substantial benefits of foresightedness, which requires a system for predicting conditional happenings in daily affairs; they would lack guides for action with situational influences pulling in all directions; and finally, they would be without basic goals for organizing their efforts over long time spans. Belief systems thus help to provide structure, direction, and purpose to life. Because personal identity and security become heavily invested in belief systems, they are not readily discardable once acquired.

Group affiliation instills and strengthens beliefs in accordance with its ideological commitments. Once initiates get caught up in the belief system, it can exert selective influence on their course of development for better or for worse, depending on the nature and imperativeness of the creed. Belief systems vary in their immutability, ranging from authoritarian prescriptions to be accepted unquestioningly to provisional conceptions that invite change through experience and critical analyses (Rokeach, 1960). Induction into a group that invests its own system of beliefs with infallibility and treats those of others as mistaken, if not evil, erects a psychological closedness to outside influence. In some groups the psychological hold is further strengthened by devaluing independent thought and implanting distrust of family members and other outsiders (Bromley & Shupe, 1979).

While beliefs provide direction and meaning to experience, they distort it as well. Adherents see what they want to see, reinterpret incongruities to their liking, and even rewrite their memory of events they have experienced (Greenwald, 1980; Snyder, 1980). Moreover, by influencing actions anticipatorily, beliefs channel social interaction in ways that create their own validating realities (Snyder, 1981). Thus, through selective perception and processing of information and anticipatory construction of social realities, belief systems take on self-perpetuating properties. Control through indoctrination is much more profound than control through milieu constraints. Once a creed is fully adopted, behavioral adherence in diverse settings no longer requires the presence and sanctions of advocates.

Fostering Valued Futures

Knowing what factors mediate the impact of chance encounters on life paths provides guides for how to foster and safeguard valued futures. At the personal level, one set of factors concerns mastery of the means for shaping one's own destiny. Human influence operates in reciprocal rather than unidirectional ways (Bandura, 1978; Endler & Magnusson, 1976; Pervin & Lewis, 1978). The degree of reciprocity in social transactions partly depends on the personal resources people have to draw on and on the extent to which they exercise the influence that is theirs to command. The more they bring their influence to bear on themselves and others, the greater the likelihood that they will realize valued futures.

A strong sense of personal agency requires development of competencies, self-percepts of efficacy, and self-regulatory capabilities for exercising self-directedness (Bandura, 1982a, 1982b). These types of personal resources expand freedom of action and enable people to serve as causal contributors to their own life course by selecting, influencing, and constructing their own circumstances. Mastering the tools of personal agency does not necessarily assure desired futures. But with such skills people are better able to provide supports and direction for their actions, to capitalize on planned or fortuitous opportunities, to resist social traps that lead down detrimental paths, and to disengage themselves from such predicaments should they become enmeshed in them.

To exercise some measure of control over one's developmental course requires, in addition to ef-

fective tools of personal agency, a great deal of social support. Emotional resources are especially important during formative years when preferences and personal standards are in flux and there are many conflicting sources of influence with which to contend. Social ties contribute in several ways toward achieving a secure sense of self-direction. The internal standards through which people influence their own motivation and actions are acquired through modeling and evaluative reactions by significant others (Bandura, 1977; Kanfer, 1977). Self-directed influences do not act as autonomous regulators of behavior. To surmount the obstacles and stresses encountered in the life paths people take, they also need social supports to give incentive, meaning, and worth to what they do. When social ties are weak or lacking, vulnerability is increased to fortuitous influences that offer friendship in exchange for conformity to strictly prescribed life-styles and ideologies.

Humans have an unparalleled capability to become many things. The life paths that realistically become open to them are also partly determined by the nature of the cultural agencies to which their development is entrusted. Social systems that cultivate generative competencies, provide aidful resources, and allow ample room for self-directedness increase the chances that people will realize what they wish to become.

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The Role of Visual Monitoring in Observational Learning of Action Patterns: Making the Unobservable Observable

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ABSTRACT. The present experiment tested the hypothesis that concurrent visual feedback enhances observational learning of a novel action pattern that normally would be unobservable. Subjects repeatedly enacted a modeled action pattern with visual monitoring of their reproductions throughout enactments, during only early or late phases of enactment, or not at all. At periodic intervals, the adequacy of their conception of the modeled pattern was also measured. Visual feedback during ongoing performance enhanced accurate reproduction of the modeled pattern; the facilitative effect was most pronounced for reproduction of complex response components. The superiority of subjects who had enacted these difficult response components with visual feedback was maintained even when both the model and feedback were withdrawn. Visual feedback did not facilitate accurate enactment of the modeled pattern before development of an adequate cognitive representation of it. The results support the social learning view that observationally-learned behaviors are cognitively represented and that visual monitoring serves to decrease discrepancies between conception and action.

DEMONSTRATION IS WIDELY used in the development of motor skills, and it has been argued that visual presentation is preferred over verbal instruction because language is unable to specify with precision critical aspects of human movement (Martens, 1975). It is, thus, paradoxical that the role of modeling in the acquisition of action patterns has received relatively little attention by investigators in the area of motor learning (Martens, Burwitz, & Zuckerman, 1976). Holding (1965) at-

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tributes this inattention to the fact that usually performers have partially mastered through prior observation the activities they are to perfect by formal training; consequently, the contribution of modeling may be seriously underestimated. An additional, and possibly more important, reason for the neglect of observational learning is the implicit assumption of many current theories of motor learning that overt practice and outcome feedback are necessary for improvement in performance to occur, although this kind of feedback may be unnecessary later in learning (Adams, 1971; Schmidt, 1975). Furthermore, most commonly-used laboratory tasks emphasize attaining a goal, such as accuracy, by a rudimentary action, rather than acquisition of novel action patterns. This emphasis has led to the neglect of the issue of how complex movement patterns are acquired (Adams, 1978). It is in the acquisition of more intricate behavior patterns that observational learning plays an especially important role.

According to social learning theory (Bandura, Note 1), acquisition and performance of complex action patterns are mediated by a common conception-matching process. Viewed from this perspective, the principal constituent processes include conception induction from modeled information; centrally-guided enactment; monitoring of response enactments; and matching action to conception through corrective performance adjustments. This approach posits that motor learning involves the construction of a conceptual representation which provides the internal model for response production, and which serves as the standard for response correction from feedback accompanying response execution. The conceptual representation is constructed by transforming observed sequences of behavior into symbolic codes which are cognitively rehearsed to increase the probability of their retention. During the course of rehearsal, these codes may be further modified by meaningful elaboration and/or conversion into more concise codes which, in turn, further reduce memory load and maximize retrievability.

Initially, response patterns are organized at the cognitive level and the cognitive representation of the behavior enables learners to produce from the outset at least a rough approximation of the activity. If the response components of the modeled actions are already in the behavioral repertoire of observers, an adequate conceptual representation can be readily formed to guide performance without requiring much in the way of enactments and accompanying feedback. However, in the case of novel and complex activities, and especially those involv-

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ing subtle combinations of spatial and/or temporal features, overt performance is usually necessary to detect mismatches between the conceptual representation and performance feedback and to make appropriate corrections in response execution.

Recent studies of observational learning of complex action patterns provide support for the view of motor learning espoused by social learning theory. Bandura and Jeffery (1973) found that if observers transformed modeled actions into symbolic codes and rehearsed them cognitively, reproduction was markedly more accurate than if they did not symbolically code what they saw. If coding was not employed and mentally rehearsed, observers were rarely able to reproduce what was modeled. Observational learning is best achieved by coding operations combining reductive symbolic codes to facilitate retrieval and elaborative linguistic codes to facilitate retention (Bandura, Jeffery, & Bachica, 1974). Failure of code retrieval almost invariably results in failure to reproduce the action patterns.

Imaginal coding (i.e., visualizing oneself performing the modeled actions) has also received attention. Gerst (1971) found that imaginal coding enhanced observational learning of compound motoric responses used in the language of the deaf. The more vivid the imaginal coding, the more accurate were the reproductions of response configurations which were difficult to encode verbally. Using assembly tasks, Jeffery (1976) found that imaginal coding facilitated observational learning and that the effect was most pronounced on intricate constructions. The combination of imaginal coding followed by motor rehearsal led to a higher level of reproduction on both simple and intricate activities than did the exclusive reliance on imaginal coding.

The studies just described provide substantial evidence for the paramount role played by cognitive transformations in the development of the cognitive representation of modeled actions. If observers do not transform modeled actions into cognitive representations, or if these cognitive guides are not retained, attempts at overt performance are significantly flawed.

A persistent problem in the learning of many activities arises because performers cannot observe during enactment aspects of their performance which lie outside their field of vision (Bandura, 1977). For example, this problem occurs in the learning of sports skills, such as golf and tennis, and is most pronounced in the acquisition of skills for which none of the movement pattern is directly observable, as in singing. Given the importance of vision in the learning and regulation of complex motor behavior (e.g., Posner, Nissen, & Klein, 1976; West, 1967), the learner is at a serious disadvantage in attempting to enact accurately what cannot be visually monitored. Mismatches between the conceptual representation and performance are not only difficult to detect, but performers may erroneously assume that they are performing correctly. To the extent that discrepancies between the symbolic model and what is enacted go undetected, it is difficult to make corrective adjustments in performance that match the conceptual representation.

The present experiment was designed to address the problem of unobservability in the enactment of observationally-learned action patterns. All subjects observed a model perform a novel action pattern that would normally lie outside their field of vision. After each modeling trial, they were tested for their ability to reproduce what they had seen either with or without concurrent visual feedback for some or all enactments. Visual feedback was provided by allowing subjects to observe themselves in a video monitor while they were performing. It was predicted, for reasons given earlier, that the provision of visual feedback for all enactments would result in superior reproduction of the modeled action pattern than would the absence of such feedback.

It was further hypothesized that visual feedback presented prior to the development of an adequate conceptual representation of the action pattern would have little or no effect on performance since subjects would not have developed an accurate standard for using feedback correctively. To test this hypothesis, a group of subjects was given visual feedback on early reproduction trials, but had it withdrawn subsequently. If visual feedback cannot be utilized effectively without formation of an adequate conception, one would expect this group not to differ in reproduction accuracy from a group which did not receive visual feedback on any trial. Additionally, one would expect a group of subjects who performed without visual feedback on early trials, but had it introduced subsequently, to produce a level of performance comparable to that of a group that had received visual feedback on all trials.

To determine whether performance could be guided by the conceptual representation without additional presentations of the model, and whether the predicted facilitative effect of visual feedback was transitory or more enduring, all subjects enacted the action pattern on a final series of trials without the aid of modeling or visual feedback.

Method

Subjects. The subjects were 20 male and 20 female right-handed, paid volunteers who were undergraduate students at Stanford University. They were randomly assigned to four treatment conditions as they arrived at the laboratory, with the restriction that an equal number of subjects of each sex were assigned to each condition.

Modeling Stimuli and Apparatus. A male model employing a light-weight paddle (28.3 g) enacted on a video monitor a sequence of nine different response components which varied as to the spatial attributes of the paddle, arm, and wrist (see Figure 1). A light-weight paddle was chosen to minimize any heightened proprioceptive feedback that would have arisen from gains in inertia if a heavy paddle had been used. A round handle was used to eliminate orienting guides regarding the face of the paddle. The paddle consisted of a square (10.2 × 10.2 cm), white polyethylene head with a depth of 1.3 cm. The handle of the paddle, made of light pine, was 17.8 cm in length with a diameter of 1.3 cm. Each face of the paddle was painted black with the exception of an un-

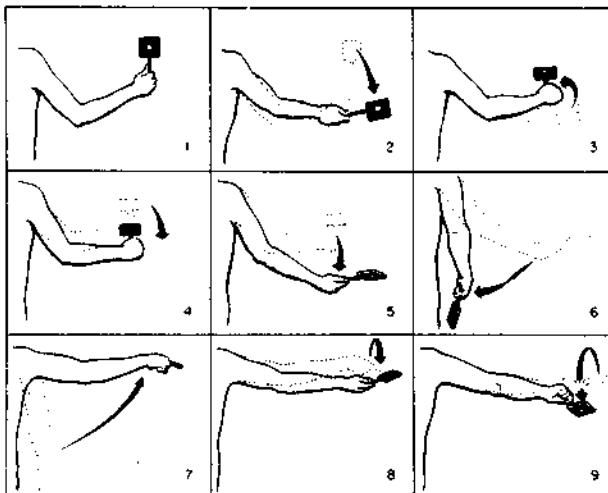


Fig. 1—Response components of the action pattern. (Arabic numerals refer to the order in which components were enacted; 1 = starting position.)

painted and centered white circle whose diameter was 2.5 cm. The sides of the head were also unpainted and, therefore, appeared white. The combination of white and black areas served to increase visual contrast and, thus, to increase visibility of the paddle.

The modeled performance began with a 5-sec demonstration of the first response component or starting position. Each of the subsequent eight response components were modeled for 2 sec, with a 2-sec transitional movement from one response component to another. The aggregate of pauses at the various positions and transitions from one position to another resulted in an overall movement sequence of 32-sec duration.

The modeled performance was recorded and played back by means of a video recorder connected to a 21-in (53.3 cm) video monitor. A video camera equipped with a wide-angle lens was located behind the model and scanned only the extreme right portion of his body. The model's performance was recorded in such a way that the visual stimuli resulting from playback would closely approximate those that subjects themselves would receive when attempting to reproduce the modeled movement pattern. A second video recorder, shielded by a large screen and connected to the same video monitor, was used to record unobtrusively subjects' enactments of the modeled movement pattern and also to play back their performance for subsequent scoring. A manual switching device connected to the two video recorders permitted subjects to observe themselves in the video monitor while they were performing. When subjects were not scheduled to receive visual feedback, the switch was placed in a position which produced a neutral gray, imageless raster on the video monitor. An additional 14-in (35.8 cm)

monitor was located near the video recorders so that the operator could observe subjects' performance when no image was visible in the large monitor.

Procedure. Subjects were seated facing the video monitor. The video camera was located behind them, with the camera angle adjusted so as to make visual feedback from each subject's performance as similar as possible to visual feedback from the modeled performance.

The male experimenter told subjects that the study in which they were about to participate dealt with the effect of different types of training on the learning of movement patterns. They were then told to roll up their right sleeve, and to put on a pair of plastic safety goggles whose lenses had been removed, and whose translucent areas had been covered with black, plastic tape. They were also instructed to keep their eyes focused on the video monitor while they were performing. Although subjects in pilot research reported being unable to see their movements even when not wearing the goggles, the latter were used to further ensure the unobservability of the movement pattern.

After the standard grip for holding the paddle handle was demonstrated by the experimenter, the subject's arm was passively moved and adjusted to match the correct starting position. Subjects were then given two trials in which they practiced the correct grip and the designated starting position. They were informed that they should indicate when they had completed enactment of the modeled pattern by saying "finished." Furthermore, subjects were instructed to attend to the arm, wrist, and paddle position of the model, and to try to match their movements as closely as possible to the demonstrated movement. In the conditions providing visual feedback, subjects were informed that they would be able to see their actions in the video monitor as they performed them.

The movement pattern was modeled six times, and subjects were verbally cued to enact it after each demonstration. Immediately after each enactment, subjects were asked to rate the perceived similarity between their performance and the modeled pattern on a 7-point scale. After Trials 3, 6, and 9, subjects were shown nine photographs which depicted, in a scrambled order, each of the various positions at which the model had paused briefly. They were instructed to arrange these photos in the order which accurately depicted the sequence of component responses exhibited by the model. A maximum of two minutes was allowed for this task. The pictorial-arrangement and perceived-similarity ratings provided measures of the development of conceptual representation of the modeled pattern.

After completing the similarity-rating and pictorial-arrangement tasks on Trial 6, all subjects were informed that they would no longer see the demonstration before performing, but that they would continue the enactments of the action pattern. Subjects who were provided visual feedback were also informed that they would no longer be able to view their enactments.

Experimental Conditions. Subjects were randomly assigned to four

treatment conditions; trial blocks (blocks of three trials) constituted the within-subjects factor of the 4×3 mixed-design ANOVA. The vision condition received six trials of visual feedback. The vision-non-vision condition received three trials of visual feedback, followed by three trials in which visual feedback was omitted. The non-vision-vision condition was not provided visual feedback during the first three trials, but received it on the subsequent three trials. The non-vision condition was not given visual feedback during any of the six trials. All subjects performed the final three trials without either the provision of a model or visual feedback.

The visual feedback provided to subjects in the present experiment should not be confused with knowledge of results. Knowledge of results is an external source of error information. In the case of visual feedback, subjects derive error information from it by comparing what they see themselves doing with their internal conception of the activity.

Response Scoring. A measure of reproduction accuracy was specified for each response component and the transition movement which preceded it. To facilitate scoring, each of the response components was played back and viewed separately by stopping the movement of the tape. Two points were awarded for each match to the model's performance that was essentially perfect. If there was a discernible, but minor, difference between the model and subjects' performance on paddle, wrist, arm position, or transition, one point was awarded. If there was a major discrepancy between the model and subjects' reproduction on one or more dimensions, or if a response component was omitted, no points were awarded. If subjects produced a response component out of sequence which would otherwise receive two points, a score of one point was awarded to reflect the error in sequencing. The maximum score possible was thus 16 points for each trial.

Two judges independently rated the reproductions of half the sample of subjects, with an equal number of performances being randomly drawn from the four experimental conditions. The overall reliability for the sum of scores achieved on the three trial blocks was $r = .98$. Reliability coefficients computed for each trial block were, in order, $r = .97$; $r = .97$; $r = .94$.

The pictorial-arrangement measure was scored by awarding one point for any two response components which were arranged in the correct sequence, excluding the starting position. A maximum score of 7 was achieved if all photos were placed in the correct sequence on a particular trial. As discussed earlier, perceived similarity between enactments and the modeled pattern was determined by subjects' ratings. The maximum score for each trial block was 21.

Results

Data for males and females were pooled since the sex factor did not approach significance on any of the three response measures ($F_s < 1$).

Reproduction Accuracy. A 4 (conditions) \times 3 (trial blocks) ANOVA revealed significant main effects for conditions, $F (3, 36) = 6.50$,

$p < .005$, and trial blocks, $F(2, 72) = 210.24, p < .001$. The Condition \times Blocks interaction was also significant, $F(6, 72) = 6.65, p < .001$. Planned orthogonal comparisons on the main treatment effect revealed that the pooled vision and non-vision-vision conditions produced significantly higher mean reproduction scores than did the pooled vision-non-vision and non-vision conditions, $F(1, 36) = 17.06, p < .001$. The vision-non-vision condition was not significantly different from the non-vision condition, $F(1, 36) = 1.83, p > .05$, nor was there a significant difference between the vision and non-vision-vision conditions ($F < 1$). Further analysis of the treatment source of variance revealed that the vision and non-vision-vision conditions were each significantly superior to the non-vision condition in reproduction accuracy, $F(1, 36) = 15.89, p < .001$, and $F(1, 36) = 10.30, p < .005$, respectively. As may be seen in Table 1, no condition showed a decrement in reproduction accuracy on the last trial block during which subjects performed without the model and without visual feedback.

Table 1
Mean Reproduction Accuracy for Treatment
Conditions on Each Trial Block

Conditions ^a	Trial Block		
	1	2	3
Vision	23.30	38.40	39.40
Vision-Non-Vision	20.50	30.50	32.80
Non-Vision-Vision	20.50	37.40	38.10
Non-Vision	20.10	25.90	28.90

Note. Maximum score = 48

^an = 10

In order to facilitate interpretation of the Conditions \times Blocks interaction, separate ANOVAs were conducted on each trial block. No significant difference was found on the first trial block, $F(3, 36) = 1.06, p > .05$. Significant difference among conditions, however, emerged on the second, $F(3, 36) = 10.84, p < .001$, and third, $F(3, 36) = 5.88, p < .005$, block of trials. Comparisons between conditions for Blocks 2 and 3 precisely mirror results obtained from the same comparisons based on the overall analysis of the main treatment effect. Subjects who had the benefit of visual feedback surpassed the performance of those who did not in both the second block of trials, $F(1, 36) = 24.16, p < .001$, and the final set of trials during which they performed without observing their actions, $F(1, 36) = 11.24, p < .005$. Visual feedback only during the initial trial block did not facilitate reproduction of the modeled action pattern, and visual feedback only during the second trial block produced equivalent gains in

reproduction accuracy on the second and third trial blocks to those subjects who had visual feedback throughout both sets of trials.

Inspection of the data suggested that the learning of response components which were complex benefited more from the provision of visual feedback than did those which were relatively simple. In order to test this notion, five judges were instructed to rank independently the modeled response components according to level of complexity. Complexity was defined as the degree of perceived difficulty in determining and coordinating the joints at which movement should take place in order to make the transition to a particular component from the one immediately preceding it. Kendall's coefficient of concordance (Siegel, 1956) yielded excellent agreement among the raters ($W = .92$, $p < .001$). The sum of the ranks for each response component was then used to define operationally the three simplest and the three most complex components. Component 9 in Figure 1 was rated most complex. In addition to positioning of the paddle, enactment of this component requires a combination of flexion at the shoulder joint and pronation of the wrist.

Examination of the relationship between component complexity and visual feedback by means of a 4(conditions) \times 3(blocks) \times 2(component complexity) ANOVA revealed significant main effects for conditions, $F(3, 36) = 7.15$, $p < .001$, for trial blocks, $F(2, 72) = 50.30$, $p < .001$, and for component complexity, $F(1, 36) = 364.33$, $p < .001$. The latter finding reflects the superior reproduction accuracy produced by simple components as compared to those that were judged to be complex. The significant effect of conditions yielded the same pattern of significant differences previously reported for analysis on all eight response components.

A significant interaction was found between trial blocks and component complexity, $F(2, 72) = 22.62$, $p < .001$, which reflects substantial gains in reproduction accuracy on complex components, but relatively small gains on simple ones. A significant interaction was also found between component complexity and conditions, $F(3, 36) = 4.44$, $p < .01$. This interaction resulted from the lack of a treatment effect on simple components, $F(3, 36) = 1.72$, $p > .05$, and a pronounced impact on complex ones, $F(3, 36) = 9.05$, $p < .001$. Comparisons between conditions on complex components revealed the same pattern of significant results as previously reported for comparisons based on the analysis of all response components. Similarly, analysis of the significant interaction between conditions and trial blocks, $F(2, 72) = 4.77$, $p < .025$, disclosed the same pattern of significant results as those previously reported.

The triple interaction between treatments, trial blocks, and component complexity was also found to be significant, $F(6, 72) = 2.75$, $p < .025$. To clarify the meaning of this interaction, separate ANOVAs were performed on each trial block for simple and complex components. On the first block of trials, there was no difference among conditions for either simple or complex components ($F_s < 1$). On the sec-

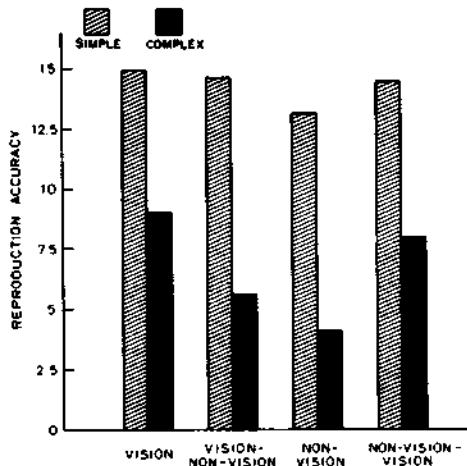


Fig. 2—Mean reproduction accuracy as a function of treatment conditions and component complexity.

ond block, significant treatment effects were found for both simple, $F(3, 36) = 4.11, p < .025$, and complex, $F(3, 36) = 8.18, p < .001$, components. On the third block of trials, significant treatment effects were found for complex components, $F(3, 36) = 8.41, p < .001$, but not for simple ones ($F < 1$).

On simple components, both the vision and non-vision-vision conditions were superior in reproduction accuracy to the non-vision condi-

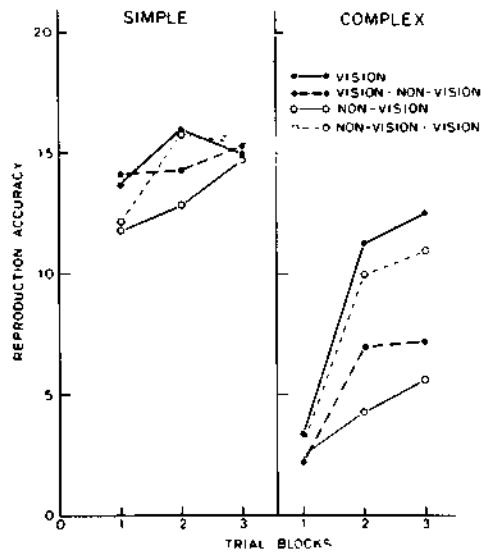


Fig. 3—Mean reproduction accuracy as a function of treatment conditions, component complexity, and trial blocks.

tion on the second trial block, $F(1, 36) = 9.11, p < .005$, and $F(1, 36) = 8.53, p < .01$, respectively. These two conditions were not significantly different, nor did the difference between the vision-non-vision and non-vision conditions approach significance. None of the conditions provided with visual feedback were significantly superior to the non-vision condition on the third or final block of trials. On complex components, in contrast, the vision and non-vision-vision conditions were superior in reproduction accuracy to the non-vision condition on both the second trial block, $F(1, 36) = 20.23, p < .001$, and $F(1, 36) = 13.80, p < .001$, and on the third trial block, $F(1, 36) = 20.29, p < .001$, and $F(1, 36) = 11.97, p < .005$. The vision and non-vision-vision conditions did not differ significantly from each other, nor was there a significant difference between the vision-non-vision and non-vision conditions on either trial block.

Development of the Conceptual Representation. A 4(conditions) \times 3(blocks) ANOVA revealed that the main effect of conditions was not significant for either the perceived-similarity, $F(3, 36) = 2.42, p > .05$, or the pictorial-arrangement measure, $F < 1.00$. A significant main effect of trial blocks was found, however, for both the perceived-similarity, $F(2, 72) = 189.67, p < .001$, and pictorial-arrangement measure, $F(2, 72) = 18.23, p < .001$, reflecting a progressively better conception of the modeled pattern over trials. The mean scores for perceived similarity on trial blocks 1 through 3 were, in order, 8.95, 14.98, and 16.83; for the pictorial-arrangement measure, they were 3.40, 5.20, and 5.33.

Discussion

The results of the present experiment demonstrate that observational learning of a novel action pattern that normally lies outside an individual's visual field can be markedly accelerated by the provision of concurrent visual feedback. The failure to find differences in reproduction accuracy between those performing with and without visual feedback on the first trial block is consistent with the proposition that action patterns are first organized cognitively before being successfully enacted. If an adequate conceptual representation has not been developed, visual feedback provides little basis for error detection or correction, and is, therefore, ineffective in improving performance for which external reference points are lacking. The finding that independent measures of conceptual-representation development parallel increases in reproduction accuracy across trials also lends support to the necessity of developing a conceptual representation of action patterns in order for visual feedback to facilitate learning.

The conceptual representation developed as a function of exposure to modeled displays, but was not directly affected by the addition of visual feedback. Conceptions of action patterns can be extracted through repeated observation alone when constituent elements are limited and highly salient. In extended sequences of activities, observing one's

enactments can help to identify those aspects that were missed or only partially learned. On subsequent observations of the same behavior, observers are apt to focus their attention on troublesome segments to fill in the missing components in the conception.

Although the present experiment was not designed specifically to determine whether visual feedback would differentially affect acquisition of simple and complex components, the results of post hoc analyses clearly indicate that visual feedback has a more pronounced effect on complex subunits of action patterns. Even when the model and visual feedback were withdrawn, subjects who enacted complex components with visual feedback on both trial blocks, or who had the benefit of it on the second trial block, continued to be superior to those who had enacted the same components without the aid of visual feedback.

Despite the fact that separate analyses of the development of conceptual representation for simple and complex components is not possible in the present study, it is likely that modeling of simple components would produce a more adequate conceptual representation since the spatio-temporal features of these components, being more familiar and less intricate, would be easier to represent cognitively. Moreover, on simple components, the coordination between kinesthetic and visual feedback arising from performance should be firmly established by past learning. One would, therefore, not expect provision of visual feedback to play a major role in the guidance of response reproduction. In contrast, cognitive representation of complex response components, consisting of subtle combinations of spatial and/or temporal features, should be less adequate. Moreover, because of less experience in coordinating visual and kinesthetic feedback arising from the performance of complex response components, one would expect provision of visual feedback to markedly facilitate accurate reproduction of what was modeled.

In contrast to the positive effect of modeling with visual monitoring of enactments, many studies employing film or videotape techniques have failed to facilitate the acquisition of complex motor skills (Keele & Summers, 1976; Singer, 1980). Keele and Summers attribute the failure of many of these studies to reliance solely on either a model or video feedback rather than on both sources of information. They argue that a model aids development of a template, but provides inadequate performance feedback for comparison with it. Video feedback without an adequate template is ineffective because there is no standard of correctness against which to evaluate such feedback. These investigators also argue that neglect of the issue of closeness of match between modeling stimuli and stimuli received from response enactment may have contributed to failures to achieve observational learning. For example, Greenwald and Albert (1968) found that observational learning of a discrete motor task is better if both the model and subject maintain the same spatial orientation. Rosenthal (1961) found superior observational learning of an intricate task if the camera angle used to film the modeled

activity was identical to the visual feedback received by performers attempting to reproduce what they had seen.

According to Bandura (Note 1), the causes of modeling deficits must be considered within the context of the four component processes that govern observational learning (i.e., attentional, representational, motor production, and motivational processes). If observers do not selectively attend to the critical features of the modeled display, they will not extract the necessary information to construct an adequate representation of what they have seen. Narration which accompanies visual presentation has been found to enhance observational learning by directing the observer's attention to the relevant aspects of the model's performance (McGuire, 1961; Sheffield & Maccoby, 1961). The subdivision of complex actions into natural segments and emphasis of constituent skills have also been found to enhance response enactment (Sheffield & Maccoby, 1961). A further problem involving attentional processes occurs in the observational learning of response patterns that comprise subtle neuromuscular adjustments without salient, accompanying visual features. To the extent that the visual information conveyed is inadequate, failures to reproduce the modeled performance will occur (Martens et al., 1976).

In addition to attentional processes, we have seen earlier that effective observational learning requires cognitive representation of modeled events. Both symbolic coding and rehearsal of codes are critical to the formation and retention of conceptual representations which guide performance. Failure to transform modeled input into enduring symbolic codes will result in performance which is markedly flawed.

Motor production processes come into play when performers attempt to use their conceptual representation to guide behavioral enactments. Discrepancies between cognitive representation and response execution serve as cues for identifying and correcting errors. However, if visual feedback is impoverished, or unavailable to monitor performance, the detection and correction of deficits in performance will be severely hampered. In the studies reviewed by Keele and Summers, subjects do not observe their performance in real time. Instead, their performances are viewed sometime after their completion. Providing delayed visual feedback has the disadvantage of not allowing for immediate detection of mismatches between performance and cognitive representation. Subsequent attempts to reproduce the modeled behavior will then require memory of errors and their appropriate correction. Even if persons are able to effectively retain this information, they may not be able to translate it into action because the lack of visual feedback while performing may result in their erroneously assuming they are performing correctly. As suggested by the present study, this problem is apt to be most serious when enactments which require precise spatial and temporal adjustments are not fully observable.

In addition to the processes already discussed, motivational processes influence observational learning by affecting selective attention and symbolic coding and rehearsal. Insufficient incentives will also have a

more direct effect on performance itself. The focus of this study centered on the acquisition and accurate enactment of a behavioral pattern. In everyday life, of course, the behavioral skills that are learned are used to secure desired outcomes. However, questions about how certain skills are best learned and the purpose they might serve address different issues. That is, knowledge about the ends does not explain how the means are best acquired. As noted, likely outcomes can augment observational learning by providing incentives for cognitive processing of modeling and feedback information.

The preceding analysis of observational learning leads to the conclusion that merely providing a model is not usually sufficient to produce mastery of modeled activities. One must consider the effect of the various processes of observational learning. Attempts can then be made to create modeling displays and informative feedback that will optimize the operation of these processes. Since visual feedback does not preclude failure to detect small differences between enactments and modeled patterns, corrective modeling (Vasta, 1976) can be used in which troublesome segments are identified and the correct ways of performing them are modeled, coded, and rehearsed.

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Influence of Gender Constancy and Social Power on Sex-Linked Modeling

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Competing predictions derived from cognitive-developmental theory and social learning theory concerning sex-linked modeling were tested. In cognitive-developmental theory, gender constancy is considered a necessary prerequisite for the emulation of same-sex models, whereas according to social learning theory, sex-role development is promoted through a vast system of social influences with modeling serving as a major conveyor of sex role information. In accord with social learning theory, even children at a lower level of gender conception emulated same-sex models in preference to opposite-sex ones. Level of gender constancy was associated with higher emulation of both male and female models rather than operating as a selective determinant of modeling. This finding corroborates modeling as a basic mechanism in the sex-typing process. In a second experiment we explored the limits of same-sex modeling by pitting social power against the force of collective modeling of different patterns of behavior by male and female models. Social power over activities and rewarding resources produced cross-sex modeling in boys, but not in girls. This unexpected pattern of cross-sex modeling is explained by the differential sex-typing pressures that exist for boys and girls and socialization experiences that heighten the attractiveness of social power for boys.

Most theories of sex role development assign a major role to modeling as a basic mechanism of sex role learning (Bandura, 1969; Kagan, 1964; Mischel, 1970; Sears, Rau & Alpert, 1965). Maccoby and Jacklin (1974) have questioned whether social practices or modeling processes are influential in the development of sex-linked roles. They point to findings that in laboratory situations children do not consistently pattern their

behavior after same-sex models. However, these studies typically include only one model of each sex. In a recent series of studies, Bussey and Perry (1982; Perry & Bussey, 1979) have used multiple modeling as more closely related to how modeling influences operate in everyday life. When exposed to multiple models the propensity of children to pattern their performances after same-sex models increases as the percentage of same-sex models displaying the same preferences increases.

The preceding research lends support to the view that same-sex modeling can promote same-sex differentiated patterns of behavior. It remains an open question, however, concerning the extent to which modeling plays an important role in the development of sex-typed behavior in younger children. Models may simply serve to activate the already developed sex-typedness of children.

Cognitive-developmental theory holds that sex typing is simply one outgrowth of children's cognitive development. From this viewpoint, the most important consideration of the child's sex role development is the

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child's cognitive capacity. According to Kohlberg (1966), it is not until about age six that a child understands that a person's gender remains constant regardless of appearance changes. Recognition of gender constancy is achieved during the same stage in which Piagetian conservation is attained. After children achieve a clear conception of themselves as a "boy" or "girl," they automatically value and strive to behave in ways appropriate for their sex. Therefore, in this view, it is as a result of having attained the concept of gender constancy that children will seek behavior appropriate for their own sex. Furthermore, consistency between the child's gender, self-categorization, and appropriate behaviors and values is thought to sustain the child's self-esteem. Sex-typed behavior is considered to be motivated by the child's desire to behave in a way consistent with his or her sexual label.

According to cognitive-developmental theory, children imitate same-sex models because they perceive them as similar to themselves. Such selective imitation fosters emotional ties to same-sex models. Children's differentiation of gender roles and their perception of themselves as more similar to same-sex models precedes, rather than follows, identification. That is, sex typing is not viewed as a product of identification, but rather as an antecedent of it.

One of the problems for Kohlberg's (1966) theory has been that children show preferences for sex-typed objects earlier than gender constancy normally develops (Maccoby & Jacklin, 1974). Although stable gender identity is not attained until about 4 to 6 years of age, Thompson (1975) found that 24-month-olds did quite well when asked to sort pictures of feminine and masculine toys, articles of clothing, tools, and appliances in terms of their stereotypical sex relatedness.

Social learning theorists (Bandura, 1969; Mischel, 1966, 1970) view sex role development as promoted through a vast system of social influences. These involve differential gender labeling and the structuring of activities in ways that teach the sex roles traditionally favored by the culture. Modeling serves as a major conveyor of sex role information (Bandura, *in press*). Children are continuously exposed to models of sex-typed behavior in

the home, in schools, and in televised representations of society. On the basis of these multiple sources of sex role information, young children learn the behaviors appropriate for their own sex. Social sanctions make outcomes partly dependent on the sex-appropriateness of actions. Observed consequences to others also convey role knowledge. On the basis of direct and vicarious experiences, children learn to use sex-typing information as a guide for action. Other things being equal, children are, therefore, more inclined to pattern their behavior after a same-sex model than an opposite-sex model.

Kohlberg (1966) postulates attainment of gender constancy as a necessary prerequisite for children's identification with same-sex models. Social learning theorists, however, view gender constancy as a product rather than an antecedent of the emulation of same-sex models. To explore these contrasting predictions, we selected children for study on the basis of their level of gender constancy as measured by the procedure devised by Slaby and Frey (1975). This measure distinguishes between gender identity (knowledge of self and other's gender), gender stability (knowledge that gender remains invariant across time), and gender consistency (knowledge that gender remains invariant across situations). Children at three levels of gender constancy were selected: low, medium, and high. Those in the low group had not achieved gender identity. The medium gender constancy group had attained gender identity, but neither gender stability nor consistency. Finally, the high group had attained both gender identity and gender stability and some displayed gender consistency as well. Children from these three levels of gender constancy were exposed to multiple male and female models exhibiting differential patterns of behavior, whereupon the children's acquisition and spontaneous emulation of the modeled patterns was measured.

Experiment 1

Method

Subjects. Subjects were 18 boys and 18 girls enrolled in the Stanford University Nursery School. They ranged in age from 29 to 68 months, with mean age of 44.5 months. Models were three men and three women, all of

whom had prior acting experience. Two female experimenters conducted the study.

Design. The subjects were assigned randomly to a modeling group and a control group of 18 subjects each. Within each group, equal numbers of boys and girls were selected as either low, medium, or high on the Slaby and Frey (1975) gender constancy interview.

Assessment of gender constancy. The tester administered the gender constancy interview (Slaby & Frey, 1975) to each child individually. On the basis of the children's responses, equal numbers of boys and girls were selected at the low, medium, and high levels of gender constancy.

Sex-linked modeling. Approximately 3 days after the test of sex constancy, the same experimenter brought each child individually to the experimental room and asked the child if he or she wanted to watch television. The child was seated in front of the television set and the experimenter sat in front of and with her back to the child. This seating arrangement prevented the experimenter from inadvertently communicating to the child any reactions to the modeled displays. Half of the children saw a modeling videotape and the other half a cartoon; both were in color. The modeling display depicted three men and three women playing a game, *Find the Surprise*, in which all the men exhibited the same behavior patterns but differed from the women, who also acted like each other.

Two modeling tapes were produced to counterbalance sex of models and the set of behaviors they modeled. For the second videotape, the men and women displayed the set of behaviors and verbalizations performed by the opposite-sex models in the first tape. Half the subjects in the modeling condition saw one videotape and the remainder saw the other one. The modeling display opened with a woman inviting three men and three women seated on chairs beside her to play a game, *Find the Surprise*. She explained that she would hide a picture sticker in one of two boxes and the object of the game was to guess which box contained the sticker. They would take turns playing this guessing game. The sticker game served as a cover task for modeling a varied array of stylistic behaviors, preferences, and novel utterances.

The models were then invited to select a "thinking cap." All the men chose a green Mickey Mouse cap and placed it with the Mickey Mouse photograph to the front of their head. The women chose a blue Mickey Mouse cap and placed the cap on their head with the Mickey Mouse photograph to the back. The experimenter then hid the picture sticker in one of the two boxes. Each model individually had a chance to find a sticker. When a female model approached one of the boxes she said, "Forward march," and began marching slowly towards Box A repeating, "March, march, march." When she reached Box A she said, "Jump, jump," as she made a koala bear jump from the lid of the box. She opened the box and exclaimed, "Bingo," took the sticker from the box and walked to the paper hanging on the wall behind the boxes and said, "Lickit-stickit," as she pressed the picture sticker with her thumb, in the upper-right quadrant of the paper, with the comment "Up there." She then placed the koala bear on the lid of the box facing sideways and said, "Look at the door," walked back to her chair with her arms folded and said, "There." Each female model displayed the same patterns of behavior.

The men in their turn each stood up and said, "Get set, go," and walked stiffly towards the boxes repeating, "Left, right, left, right." When the male model reached Box B he said, "Fly, fly" as he made the koala bear fly from the lid of the box. He opened the box and exclaimed, "A stickeroo," took the sticker from the box and walked to the paper hanging on the wall behind the boxes and said, "Weto-smacko" as he slapped the picture sticker with his open hand, in the lower left quadrant of the paper, and said, "Down there." He then placed the koala bear on the lid of the box and said, "Lay down," and walked back to his chair with his hands behind his back and sat down with the comment, "That's it."

At the completion of the game, the male models said, "Off with think caps," walked to Box A and placed their hats inside the box and said, "In there." The female models said, "No more think caps," walked to Box B and placed their hats on top of the box and said, "On top." Each model exhibited the appropriate behavior pattern twice. In the other version of the modeling videotape, the behavior patterns of the male and female models were reversed.

Test for modeled behavior. The modeling videotape and cartoon were of approximately 11 min duration. After the two sets of models had selected their Mickey Mouse caps, the experimenter turned off the television and informed the child that another woman at the nursery school was playing a game with children. The experimenter returned with the second experimenter who was unaware of the experimental condition to which the children were assigned. The first experimenter exited and the second experimenter asked the child to select a Mickey Mouse cap. The children were free to perform any or none of the behaviors they had seen modeled in the videotape.

After the test for modeled behavior, the first experimenter showed the children a further segment of the videotape in which the two sets of models had a chance to find a sticker. The first experimenter exited again and the second experimenter administered seven trials on the sticker task. The children then watched the remainder of the videotape, after which they performed the sticker task for a further eight trials. A picture sticker was hidden 12 out of the total 15 trials for each child. Children in the control condition were exposed to the cartoon for the same length of time as children in the modeling condition. The same procedure of interspersing tests for imitation between segments of television viewing was also used. Televised exposure and test trials were interspersed to sustain children's attention.

The child's spontaneous imitative behavior was recorded by an observer who watched the test sessions through a one-way mirror. The observer was provided with a checklist of responses exhibited by the models in the videotape and the observer simply checked any of the responses performed by each child on each trial. The observer was unaware of the child's experimental assignment. A second observer independently scored the performance of five children. The product-moment correlation ($r = .99$) revealed virtually perfect interrater agreement.

Acquisition test. Children in the modeling condition were administered a test of acquisition at the conclusion of the experiment. They were asked to demonstrate how the men and women behaved. The order in which they

reenacted the behavior of each sex was counterbalanced. Standard prompts were used to direct the children's attention to different aspects of the modeled events. For example, the experimenter asked, "How did the boys (girls) walk to the box?" Following the acquisition test, the children responded to questions designed to check the effectiveness of the experimental manipulations.

Results

Modeled behavior. A $2 \times 3 \times 2 \times 2$ (Sex of Subject \times Level of Gender Constancy: High, Medium, Low \times Condition: Modeling, Control \times Sex of Models/Within-Subjects Factor) analysis of variance (ANOVA) was performed on the scores for modeled behavior. These scores were obtained by summing the frequency of the stylistic responses (postural, verbal, and motor) and preferences that matched those of either the male or female models. This analysis yielded a significant main effect for gender constancy level, $F(2, 24) = 3.41, p < .05$. Children of low gender constancy reproduced fewer of the modeled behaviors than children of either medium

gender constancy, $t(24) = 2.48, p < .05$, or high gender constancy, $t(24) = 1.97, p < .06$, who did not differ from each other. The main effect for modeling is also significant, $F(1, 24) = 49.40, p < .0001$. Children exposed to modeling performed substantially more of the behaviors exemplified by the models than children in the control condition.

A significant interaction emerged between sex of model and sex of subject, $F(1, 24) = 11.22, p < .005$. This interaction was qualified, however, by a three-way interaction involving sex of model, sex of subject, and condition, $F(1, 24) = 16.20, p < .0005$. This interaction is depicted graphically in Figure 1. We examined the nature of this interaction by performing *t* tests on the subgroup means. In the modeling condition, boys spontaneously performed those behaviors displayed by the male models in preference to those displayed by the female models, $t(24) = 5.06, p < .001$, and conversely the girls spontaneously performed behaviors exhibited by the female models over those displayed by the

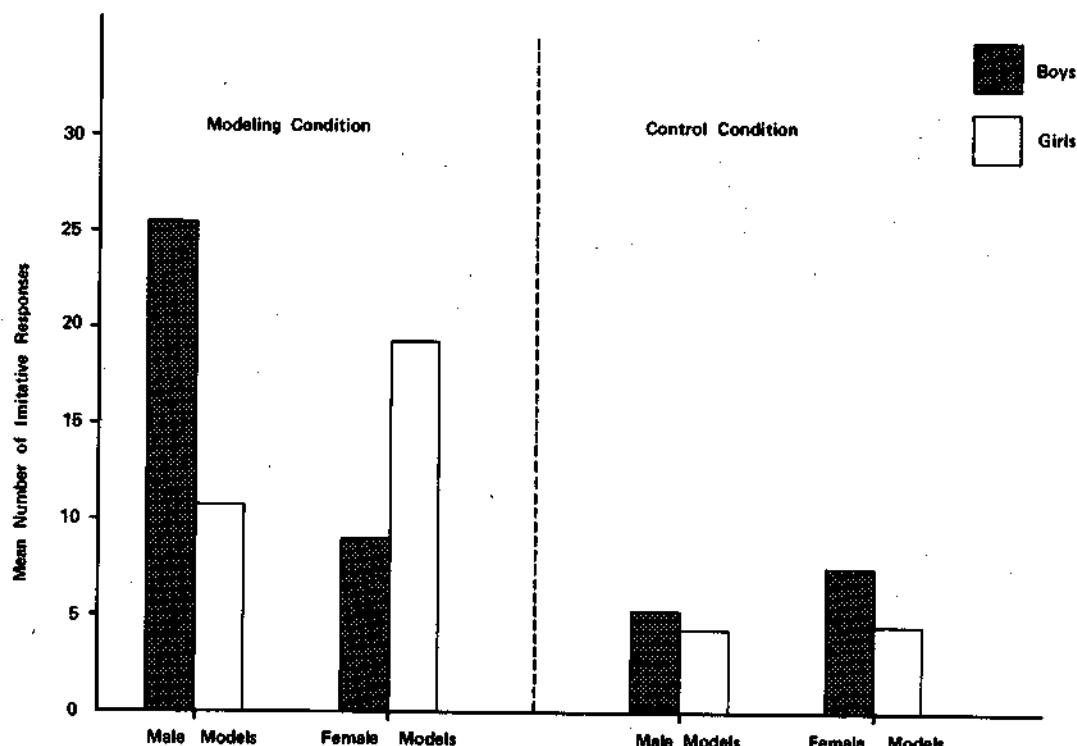


Figure 1. Mean imitative performance scores of boys and girls exposed to male and female models as a function of condition (Experiment 1).

male models, $t(24) = 2.71, p < .02$. Children in the control condition, who had no exposure to the modeled behavior, evidenced few matching responses in either of the two modeled sets of performances. The latter finding demonstrates the efficacy of the modeling influence and also reveals the neutrality of the modeled responses. The sex-linked modeling provides strong support for the same-sex modeling hypothesis regardless of gender constancy level.

Acquisition of modeled behavior patterns. Children in the modeling condition were asked to reenact the various behaviors displayed by the male and female models, respectively. In the ANOVA performed on these scores the only effect to attain significance was gender constancy level, $F(2, 12) = 4.40, p < .05$. Children of low gender constancy ($M = 3.67$) recalled fewer modeled responses than did children of either medium ($M = 7.67$) or high ($M = 9.50$) gender constancy, whose scores did not differ from each other.

Relation between age and gender constancy level. Children who achieve higher gender constancy scores are also older. Indeed, age is highly correlated with gender constancy scores for boys ($r = .76, p < .01$) and for girls ($r = .82, p < .01$). Because age and gender constancy are so highly related, we might ask if gender constancy exerts any effect on modeling when age is controlled? To answer this question we performed an analysis of covariance, using age as a covariate and sex of subject, level of gender constancy, condition, and sex of models as factors. The results reveal, as in the previous analyses of modeling scores, a main effect for modeling, $F(1, 23) = 48.70, p < .001$; an interaction between sex of model and sex of subject, $F(1, 24) = 11.22, p < .005$; and an interaction between sex of model, sex of subject, and modeling, $F(1, 24) = 16.20, p < .0005$. When age is controlled as a covariate in the analysis of spontaneous modeling, gender constancy does not account for any variance in children's modeling behavior.

The children's acquisition scores were submitted to a similar covariance analysis to control for the effect of age. The only effect to attain significance was the covariate for age, $F(1, 11) = 5.99, p < .05$. Therefore, gen-

der constancy is no longer a significant determinant of modeling when age is controlled.

Discussion

Results of this experiment document the prevalence of same-sex modeling. When children observe that same-sex models collectively exhibit stylistic behaviors that diverge from those displayed by opposite-sex models under the same circumstances, children are far more likely to pattern their behavior after same-sex models. The same-sex modeling occurs irrespective of children's level of gender constancy.

Children with low levels of gender constancy, in this case, those who had not even achieved gender identity on Slaby and Frey's (1975) gender constancy scale, adopted more behaviors displayed by same-sex than opposite-sex models. Although the total amount of modeling behavior increased with the children's level of gender constancy, they adopted more behaviors displayed by same-sex than opposite-sex models irrespective of their gender constancy level. Because age and gender constancy levels were highly correlated and low gender identity did not preclude same-sex modeling, it seems that gender constancy reflects children's overall cognitive competencies rather than operating as a uniquely selective factor in sex role development. This interpretation is further supported by the analysis that shows that when age is controlled, gender constancy exerts no effect on the children's modeling behavior. A stereotypic sex role conception is not a prerequisite for same-sex modeling.

This does not mean that cognitive factors are thought to be of minimal significance in the child's sex role development. The ability to selectively adopt these behaviors displayed by same-sex models requires cognitive skills in categorization and judgment of similarity of self to others. Rather, the specific role of gender constancy in the sex-typing process is being questioned. There is little in the findings to indicate that mastery of gender constancy is necessary for sex-typing. Results of other studies are also consistent with this view. Large sex differences in preference for sex-typed objects and play patterns exist in the

toddler and nursery school child long before a fully matured gender constancy is established (Blakemore, La Rue, & Olejnik, 1979; Masters & Wilkinson, 1976; Thompson, 1975). Children as young as 2 and 3 years possess remarkable awareness of sex role stereotypes and sex differences (Kuhn, Nash, & Brucken, 1978; Marcus & Overton, 1978).

Same-sex modeling seems to involve relying on classifying males and females into distinct groups, recognizing personal similarity to one group of models, and tagging that group's behavior patterns in memory as the ones to be used as a guide to behavior. Even very young children give evidence of classificatory capabilities involving social stimuli. By the time infants are 6 months old, they are capable of treating infant faces as a category different from adult faces, and female faces as different from male faces (Fagan & Singer, 1979). Sex labeling and differential structuring of social experiences teach children to use the sex of the model as a guide for action (Huston, 1983).

It is thus possible to explain same-sex modeling even in young children on the basis of their having cognitively abstracted activities stereotypical for each sex and judging that behaviors displayed by same-sex models are the appropriate ones for them to adopt, without requiring a conception of gender constancy. Both the gender classificatory basis of same-sex modeling and the impact of social factors on this process accord with Spence's (1984) formulation. She posits that sexual identity facilitates adoption of prototypic gender-congruent attributes, but interacting social and personal factors determine what particular constellations of gender-related characteristics are developed. Thus people within each sex can develop heterogeneous patterns of gender-related attributes while retaining a confirmed personal sense of masculinity and femininity.

Results of the acquisition test cast further doubt on mastery of gender constancy as the selective mechanism of sex role learning. Children's level of gender conception was related to acquisition of modeled patterns, but not selectively according to the model's sex. The higher the gender conception was, the more children learned the behavior of

both types of models. The measure of gender conception may serve more as a proxy measure of skill in cognitive processing than a unique determinant of sex role learning. The older the children are, the more they learn the behavior of both male and female models. Thus when age is controlled, children of all gender constancy levels learn equally from the models.

Gender-schema theory also suggests that children's readiness to classify objects and people in gender-related terms may well develop before a conception of gender constancy is achieved (Bem, 1981; Markus, Crane, Bernstein, & Siladi, 1982). Children learn to encode, organize, and retrieve information about themselves and others in terms of a developing gender schema. Results of the acquisition test, however, reveal that same-sex modeling is not due to differential gender-schematic processing and retention of the behavior patterns exhibited by the male and female models. Rather, gender self-knowledge seems to be operating more on selective retrieval and enactment of what has been learned observationally from both sexes. These findings underscore the importance of including measures of observational learning as well as of spontaneous performance in testing theories about gender-role development. Children observe and learn extensively from models of both sexes, but they are selective in what they express behaviorally.

Experiment 2

The purpose of the second experiment was to test the power of model sex on same-sex modeling when countervailing social influences come into play. Do children always choose a same-sex model over an opposite-sex one, or is this proclivity readily altered by social factors? Sex roles reflect, in part, power relations in a society. Social power can exert a strong impact on modeling (Bandura, Ross, & Ross, 1963). It is, therefore, of considerable interest to clarify what happens in the course of modeling when social power is pitted against the force of collective modeling. In most societies, men typically wield more social power than do women. Of special interest is the impact of cross-sex social power on cross-sex modeling.

To clarify these issues, we varied the power of one group of models over the other group. In one condition, three male models were depicted as the powerful controllers of rewarding resources and three female models occupied a subordinate role. In a second condition, the male and female power positions were reversed so that the female models were the powerful members of the group and the male models the subordinate ones. Social power was manifested in several ways: ownership of play materials, command over play activities, and the dispensation of food and soft drinks.

After children observed on videotape either the men or the women exercising power, they were then exposed to the same collective modeling used in the previous experiment. Children assigned to a condition in which power of the models was not varied watched a cartoon in place of the power induction videotape and then the videotape of collective modeling of behavior patterns. Children in the control condition, who were exposed neither to power nor modeling displays, saw two cartoons. If social power is an influential determinant of model selection, cross-sex modeling would be expected in those conditions in which models of the opposite sex are portrayed as the wielders of social power.

Method

Subjects. Subjects were 16 boys and 16 girls enrolled in the Stanford Nursery School. They ranged in age from 3 years to 5 years and 10 months, with a mean age of 4 years and 8 months, and all were categorized as high scorers on the Slaby and Frey (1975) gender constancy measure (i.e., 72% had attained at least gender identity and gender stability, and 28% has also attained gender consistency).

Design. Children were assigned randomly to conditions in a 2×4 design involving sex of child (boys, girls) and treatment condition (men in power, women in power, no power, control).

Procedure. The procedure used in this experiment was virtually identical to that described in Experiment 1. The main difference was the portrayal of social power before the collective modeling.

The two videotapes for the power induction were identical, except that in one videotape the male models were in power and in the other the female models exercised power. The females-in-power movie opened with a narrative about three girls who owned a playroom. The girls are seen in their playroom unpacking their large collection of toys and having much fun playing with them. As they were playing with their toys, three boys

walk by and hear the fun and laughter emanating from the room. One of the boys peeks through the ajar door to see what is happening inside. He quickly exclaims to the other boys that there are some girls in there who are playing with some "really neat" toys. The boys ask the girls if they too could play with some of their toys. After some deliberation, the girls allow the boys into the playroom, but initially only to watch them play. The girls play with even more interesting games, a Mickey Mouse dip game, a wind-up dog, musical instruments, and other exciting playthings. Finally, the girls who are the controllers of these resources, allow the boys to play with one of their toys. The boys express much joy at being able to play with the girls' toys. The boys are given other playthings.

The girls further exemplify their controller status by telling the boys that they recently had \$50 to spend, so they went to San Francisco and bought a pinball machine. After taking turns playing the pinball machine, the girls announce, "It's time for treats," whereupon they set out cans of soda, cookies, candy, chocolates, and make popcorn in their popcorn machine. The girls shared their goodies with the boys. The end of the session is heralded by the boys, at the girls' request, packing away the toys for the day. Before leaving the playroom, one of the girls announces that she had located a "really neat" department store in San Francisco that sells lots of things suitable for their playroom. The girls count their money and then peruse the department store's catalogue. They consider buying roller skates and computer games, but finally settle on a color television set: "Let's buy a color T.V. set for our room. We can keep it in our room. Then we can come to our room and watch any program we like."

When the boys were in power, the sequence of events and activities were the same except that the boys rather than the girls exercised the control over resources and activities. The participants in the power-induction videotape appear as the models in the collective modeling videotape.

At the completion of the power induction or exposure to the cartoon, children in the experimental condition observed the collective modeling on the television monitor, the children in the control condition saw another cartoon. The tests for acquisition and spontaneous adoption of modeled behavior were identical to those followed in Experiment 1. Similarly, the test procedures were identical, with the tester having no knowledge of the conditions to which the children were assigned.

Results

Modeled behavior. A $2 \times 4 \times 2$ (Sex of Subject \times Treatment Condition \times Sex of Models/Within-Subject Factor) ANOVA was performed on the scores of modeled behavior. There was a strong main effect of modeling, $F(3, 24) = 12.14, p < .001$, with children in the modeling conditions displaying more modeled behavior than children not exposed to the models. A significant interaction between sex of subject and sex of model, $F(1, 24) = 10.58, p < .005$, also emerged. We ex-

Table 1
Modeled Behavior Means for Interaction of Sex of Subject and Sex of Model (Experiment 2)

Sex of subject	Sex of models	
	Males	Females
Boys	18.88	9.81
Girls	12.19	15.19

amined the nature of this interaction by performing *t* tests on the means in Table 1. Both boys and girls patterned their behavior more after same-sex models than opposite-sex models. This effect was highly statistically significant for boys, $t(24) = 3.49, p < .01$, but the difference fell short of significance for girls, $t(24) = 1.15, p > .10$.

The three-way interaction involving all three factors (sex of subject, power treatment, and sex of model) was also significant, $F(3, 24) = 3.30, p < .05$. This interaction is depicted graphically in Figure 2. In contrast to

boys and girls in the control condition, children in the treatment conditions were influenced by the power displays. First, it is of interest to note that in the no-power condition, same-sex modeling predominates, an effect that is stronger for boys, $t(24) = 4.38, p < .001$, than for girls, $t(24) = 1.59, p = .12$.

The portrayal of the models as powerful produced different results depending on the sex of the models and the sex of the observer. Boys emulated many of the behaviors of the male models irrespective of whether they were powerful or not, enacting an average of 20, 22, and 29 imitative responses in the males-in-power, females-in-power, and no-power conditions, respectively. However, the boys did not show an equal propensity to imitate the female models irrespective of power. The boys' mean imitative scores of the female models for the males-in-power and no-power conditions, were 8 and 6, respectively. When the female models were in power, however, a different result emerged. The boys emulated the female models ($M = 18$) almost

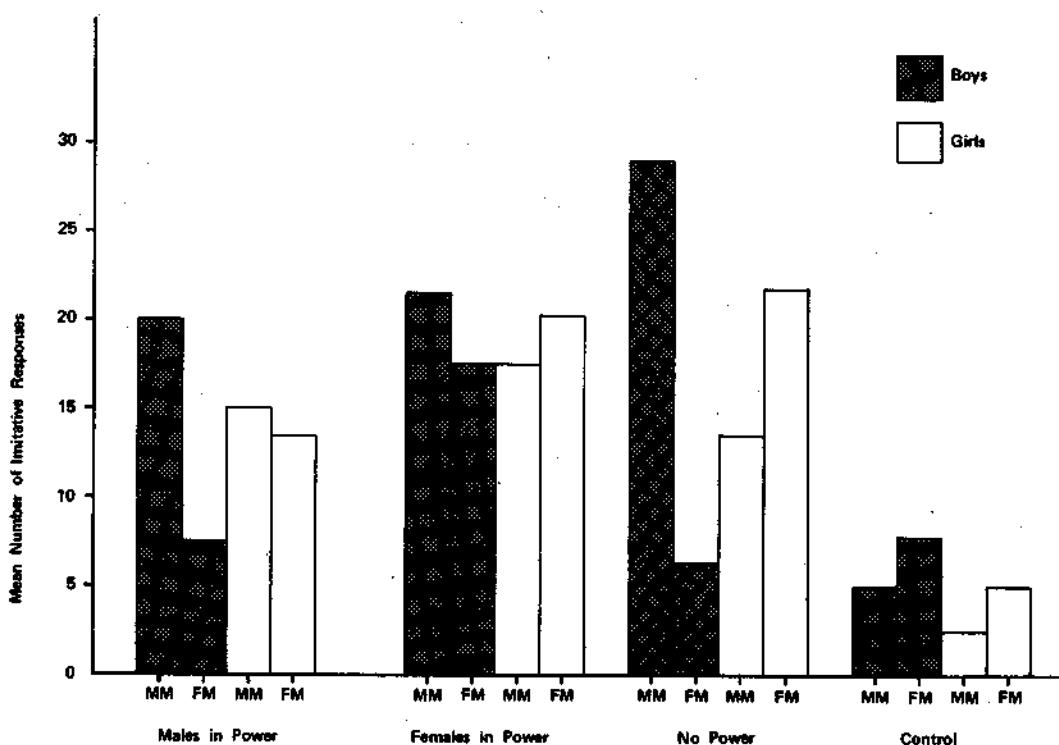


Figure 2. Mean imitative performance scores of boys and girls exposed to male and female models as a function of condition (Experiment 2; MM = male models, FM = female models).

to the same extent as the male models ($M = 21$), $t(24) = 0.72$, $p > .10$, and this was significantly greater than their imitation of female models who lacked power $t(24) = 1.98$, $p < .06$, or for whom power relations were left undefined, $t(24) = 2.20$, $p < .05$. Their emulation of female models in power was equal to that of the male models in power, $t(24) = 0.43$, $p > .10$, but less than their imitation of the male models for whom power relations were left undefined, $t(24) = 2.11$, $p < .05$. Same-sex modeling is thus a robust phenomenon in boys. Emulation of female models is relatively infrequent in boys, unless the female models command power; under such conditions the boys' same-sex imitation preference is attenuated so that male and female models are emulated equally.

In all conditions the girls were influenced by both male and female models. When power differentials were not exhibited girls tended to favor same-sex models. When female models exercised power, girls adopted significant amounts of both the female and male models' behavior, although they revealed a slight preference for the female models over the male models, $t(24) = 0.48$, $p > .10$. For girls, seeing women command rewarding power equalized sex-linked modeling; seeing males exercise power attenuated but did not completely override the influence of the same-sex models, $t(24) = 0.24$, $p > .10$.

Acquisition of modeled pattern. Analysis of variance of the acquisition scores yielded no significant differences as a function of sex status and power differentials. The latter factors clearly exert their effects on spontaneous performance of modeled patterns of behavior rather than on their acquisition.

Discussion

Results of the second experiment further corroborate the prevalence of same-sex modeling, although the effect was much stronger for boys than for girls. Interestingly, powerful female models were effective in producing cross-sex imitation in boys. This readiness to emulate a powerful opposite-sex model was not so apparent for the girls.

The results of this study, along with those of others (Bussey, 1979; Bussey & Perry, 1980; Bussey & Perry, 1982; Perry & Bussey,

1979), underscore the efficacy of models in the sex-typing process. They further support the two-process model of sex-typing proposed by Bussey and Perry (1982), for boys. The stronger same-sex modeling shown by boys in many of the modeling studies presumably stems from boys' desire to adopt masculine behavior, and, simultaneously, to reject feminine behavior. Girls also adopt same-sex behavior, but not at the expense of rejecting behavior patterns modeled by the opposite sex.

A surprising finding of this research is that cross-sex modeling was more pronounced in boys than for girls. This finding would seem to contradict the common view that boys show a more rigid adherence to the masculine role than girls show for the feminine role (Brown, 1956; Hartup & Moore, 1963; Hetherington, 1967; Kleinke & Nicholson, 1979; Marcus & Overton, 1978; Nadelman, 1974). For example, boys are less likely to imitate cross-sex behavior or to develop egalitarian conceptions of sex roles when pressured to do so (Abramovitch & Grusec, 1978; Flerx, Fidler, & Rogers, 1976; Grusec & Brinker, 1972; Wolf, 1973, 1975). Why then was cross-sex modeling so effective, in this study, for boys but not girls?

For boys, cross-sex modeling resulted when female models commanded power, which in this instance involved controlling rewarding resources and the activities of others. This form of interpersonal power may conform more closely to the sex role that boys have been socialized to play. If the type of power exercised in this study is more in keeping with the male sex role, the results become understandable. Boys may be prone to emulate models whose style of behavior is consistent with the male sex role stereotype, regardless of the models' sex. Similar cross-sex modeling may well occur for girls if, for example, a factor such as nurturance, which is more consistent with the female sex role stereotype, was varied instead of power.

An alternative explanation is that girls are less constrained in their modeling by the sex of the model. Girls, typically, do not reject opposite-sex models to the same extent as boys do (Bussey & Perry, 1982). In the condition that did not include power differentials girls tended to imitate male models more

than the boys imitated female ones. Because boys tend to adopt the behavior patterns of same-sex models and reject the behavior patterns of opposite-sex models, they generally engaged in minimal cross-sex imitation. If, however, the opposite-sex models command power, which may appeal to boys, then the boys not only cease rejecting the behavior patterns of the opposite-sex models, but actively adopt them.

In contrast to the boys, the girls exhibited greater consistency, across all three modeling conditions, in their degree of cross-sex modeling, whereas the boys engaged in highly specific cross-sex modeling confined predominantly to the condition in which the female models had social power. For girls, cross-sex modeling was thus not as dramatic as for boys, because it occurred to a lesser extent under ordinary conditions. The same inhibition for cross-sex models does not exist for girls in the way it does for boys, so that unless the behavior is particularly unattractive to girls, they are likely to demonstrate some cross-sex imitation, at least more than is characteristic of boys. Boys, in contrast, are unlikely to show much cross-sex modeling at all in the absence of strong vicarious instigators.

General Discussion

The results of our studies support and extend previous research (Bussey & Perry, 1982; Perry & Bussey, 1979) in demonstrating the viability of same-sex modeling as a mechanism of sex role development. The results demonstrate this impact on diverse behavior patterns in children as young as 3 years of age, who have not even achieved gender identity. This finding is at variance with the assumption in cognitive-developmental theory (Kohlberg, 1966) that the attainment of gender constancy is a necessary antecedent of same-sex modeling. Instead, this research shows that children pattern their behavior after members of their sex long before they grasp gender constancy.

Another noteworthy feature of this research is the dramatic cross-sex modeling effect for boys. There are few reports of successful cross-sex modeling effects for boys, but many for girls. The finding of this study departs

from these typical findings in that the reverse was true: Cross-sex modeling was more successful and dramatic in boys than girls. One reason for this lies in the nature of the factor pitted against sex of the model, namely, the powerlessness of the models. Boys emulated powerful female models almost to the same extent as male models. Because power is a valued male behavior, the boys were prepared to emulate models assuming power, regardless of their sex. The girls, in contrast, were less affected by the power manipulation. There are two possible explanations for this finding. First, girls displayed more generalized adoption of cross-sex behavior across the various modeling conditions and hence it was more difficult to demonstrate a cross-sex modeling effect for girls than boys. Second, power is much more consistent with the male role and hence the girls were less likely to construe the male models as appropriate models for themselves. Had the male models behaved in a way more consistent with the female sex role, the reverse result might have been obtained.

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Perceived Self-Efficacy in Coping With Cognitive Stressors and Opioid Activation

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This experiment tested the hypothesis that perceived self-inefficacy in exercising control over cognitive stressors activates endogenous opioid systems. Subjects performed mathematical operations under conditions in which they could exercise full control over the cognitive task demands or in which the cognitive demands strained or exceeded their cognitive capabilities. Subjects with induced high perceived self-efficacy exhibited little stress, whereas those with induced low perceived self-efficacy experienced a high level of stress and autonomic arousal. Subjects were then administered either an inert saline solution or naloxone, an opiate antagonist that blocks the analgesic effects of endogenous opiates, whereupon their level of pain tolerance was measured. The self-efficacious nonstressed subjects gave no evidence of opioid activation. The self-in efficacious stressed subjects were able to withstand increasing amounts of pain stimulation under saline conditions. However, when endogenous opioid mechanisms that control pain were blocked by naloxone, the subjects were unable to bear much pain stimulation. This pattern of changes suggests that the stress-induced analgesia found under the saline condition was mediated by endogenous opioid mechanisms and counteracted by the opiate antagonist.

There is a growing body of evidence that the ability to exercise control over potential stressors is a critical factor in the activation of different neurophysiological systems. Exposure to stressors without controlling efficacy activates neurotransmitters, stress-related hormones, and impairs various cellular components of the immune function (Bandura, Taylor, Williams, Mefford, & Barchas, 1985; Coe & Levine, *in press*; Maier, Laudenslager, & Ryan, 1985). Exposure to the same stressful events with controlling efficacy has few neurochemical effects. These findings are based mainly on experimentation with animals involving uncontrollable physical stressors.

Stressors take diverse forms and can produce different patterns of physiological activation. This places certain limitations on extrapolation of conclusions across species and stressors. Research into the neurochemical effects of inefficacious control therefore needs to be broadened and extended to events and psychological processes that have high ecological relevance to human coping. 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 ones that relate to the strain of task demands and workloads. It is the perception of demands as exceeding capabilities that becomes the stressful reality. Efforts to determine the neurochemical effects of inefficacious control in humans have relied extensively on correlational or quasi-experimental studies in which occurrences of life stressors are related to indexes of neurophysiological functioning. Although these lines of research have clarified some aspects of inefficacious control, experimental studies are needed to verify the direction of causality.

It is generally acknowledged that inefficacious control produces neurochemical changes by creating a state of stress. Psychological stress is the result of a relational condition in which perceived environmental demands strain or exceed perceived coping capabilities in domains of personal import. People's judgments of their controlling efficacy figure prominently in their relational appraisal of demands to capabilities. Perceived self-efficacy is concerned with beliefs in one's capabilities to mobilize the motivation, cognitive resources, and courses of action needed to meet given situational demands.

Findings of different lines of research underscore the influential role of perceived control in stress reactions (Averill, 1973; Lazarus & Folkman, 1984; Miller, 1980). A sense of controllability can be achieved either behaviorally or cognitively. In behavioral control, individuals take action that forestalls or attenuates environmental stressors. In cognitive control, people operate under the belief that they can manage such stressors should they arise. Although these two forms of controllability are distinguishable operationally, human coping under life circumstances rarely involves controlling action devoid of any perceptions of personal control, or perceptions of personal control devoid of any actions. Self-efficacious thought and actions are usually products of reciprocal causation (Bandura, 1986).

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Being able to exercise control over potential stressors can diminish stress because the capability is used to reduce or to prevent aversive experiences. But there is much more to the process of stress reduction by behavioral control than simply the momentary curtailing of aversive events. Behavioral control instills and strengthens beliefs concerning one's coping efficacy. These cognitive changes serve as proximal determinants of anticipatory stress reactions and level of stress during encounters with stressors (Bandura, 1988). Thus, in some studies of controllability, merely the exercise of personal control over the occurrence of aversive events without curtailing their intensity reduces stress reactions (Gunnar-vonGnechten, 1978). Repeated failures create stress reactions when ascribed to personal incapability, but the same failure experiences leave people unperturbed if ascribed to situational factors (Wortman, Panciera, Shusterman, & Hibschre, 1976). In situations in which the opportunity to wield control exists but is unexercised, it is the self-knowledge that one can exercise control should one choose to do so rather than its application that reduces stress reactions (Glass, Reim, & Singer, 1971). These types of findings indicate that much of the stress reductive effects of behavioral control result anticipatorily from perceived capability to wield control over troublesome events rather than simply from attenuating them.

Perceived control without the actuality has been shown to reduce stress reactions. People who are led to believe they can exercise some control over aversive events display lower autonomic arousal and less impairment in performance than do those who believe they lack personal control, even though they are equally subjected to the painful stimuli (Geer, Davison, & Gatchel, 1970; Glass, Singer, Leonard, Krantz, & Cummings, 1973). The foregoing studies have relied on plausible presumptive mediation inferred from the manipulations rather than on direct assessment of perceived self-efficacy and its linkage to level of stress reactions.

As already alluded to, in social cognitive theory perceived self-efficacy operates as a cognitive mechanism through which controllability affects stress reactions (Bandura, 1986). If people believe they can deal effectively with potential stressors, they are not perturbed by them. But if they believe they cannot control aversive circumstances, they have much cause for distress. They tend to dwell on their coping deficiencies and see the environment as fraught with threats. In so doing, they distress themselves and constrain and impair their level of functioning (Beck, Emery, & Greenberg, 1985; Lazarus & Folkman, 1984; Meichenbaum, 1977; Sarason, 1975). Perceived self-inefficacy to control perturbing cognitions further augments stress reactions (Kent & Gibbons, 1987).

The microrelation of perceived inefficacy to stress reactions has been examined most extensively in coping with phobic stressors (Bandura, O'Leary, Taylor, Gauthier, & Gossard, 1987; Bandura, Reese, & Adams, 1982). Phobics display little stress on tasks for which they judge themselves fully efficacious. As they cope with tasks for which they distrust their coping efficacy, however, their subjective distress mounts, their heart rate accelerates, their blood pressure rises, and they display elevated catecholamine secretion. After their perceived coping efficacy is fully strengthened, they manage the same stressors with little stress or physiological activation. Thus, the combined

results from different manifestations of stress are consistent in showing that stress reactions to coping tasks differ when perceived self-efficacy differs, but reactions to the identical tasks are the same when perceived self-efficacy is raised to the same maximal level.

Studies with animals subjected to painful stimulation show that stress can activate endogenous opioids that block pain transmission (Kelley, 1986). Opioid involvement is indicated by evidence that stress-induced analgesia is reduced by opiate antagonists, such as naloxone. 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 (Maier, 1986). Animals who can turn off shock stimulation show no opioid activation, whereas yoked animals who experience the same shock stimulation without being able to control its offset give evidence of stress-activated opioids. Of the different functions of endogenous opioids, their pain-relieving effects have received greatest attention. However, endogenous opioids have a broader adaptive function. By blunting the aversive impact of stressors, they enable individuals to deal more effectively with distressing environmental events.

The purpose of the present study was to determine whether perceived inefficacy in exercising control over cognitive stressors activates endogenous opioid systems. Subjects performed mathematical operations under conditions in which they could exercise full control over the cognitive task demands or in which the cognitive demands strained or exceeded their cognitive capabilities. Changes in subjects' perceived mathematical self-efficacy, their level of autonomic arousal during the cognitive stressor task, and their subjective distress, mental strain, and perceived performance impairment were measured. Following induction of high and low levels of perceived mathematical self-efficacy, subjects at each level of self-efficacy were administered either an inert saline solution or an opiate antagonist, naloxone. Their level of pain tolerance was then measured at periodic intervals.

Perceived controlling inefficacy was expected to be accompanied by high stress reactions. We hypothesized that self-inefficacious stressed subjects would be able to withstand increased amounts of pain stimulation because of the analgesic effects of opioid activation. However, they would be unable to bear much pain stimulation when the endogenous opioid mechanisms that control pain were blocked by naloxone. In contrast, we predicted that the self-efficacious nonstressed subjects would display no significant changes in pain tolerance under either saline or naloxone conditions.

Method

Subjects

Twelve male and 28 female paid volunteers from a college population participated in the study. They were randomly assigned to conditions, balanced for sex, with 10 subjects in each of four conditions. Subjects were selected whose pain tolerance on a cold-pressor test fell within the tolerance range, above 20 s at the lower limit and below 180 s at the upper limit. These screening criteria were used to avoid ceiling and basement effects. The mean pretest pain tolerance was 69 s. Subjects

thus had ample latitude to exhibit reductions or increases in pain tolerance.

The study was presented to subjects as being concerned with the effects of intermittent pain on level of cognitive functioning.

Heart Rate Recording

After signing the consent form, subjects were outfitted with a Vitalog recording device to provide a continuous measure of heart rate during the cognitive stressor task. The Vitalog is a miniature microcomputer that continuously records heart rate from three chest electrodes into a microchip contained in a small unit attached to the subject's waist. The Vitalog stores total heart rate per minute. Heart rate was used as a physiological indicant of the stressfulness of the task under differential levels of perceived control.

Perceived Self-Efficacy to Manage Pain

Self-efficacy scales were devised to measure perceived self-efficacy to withstand pain and perceived self-efficacy to reduce its intensity. 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. Subjects checked the items they judged they could perform at that time. For each item checked, they rated the strength of their perceived self-efficacy on a 100-point scale, ranging in 10-unit intervals from high uncertainty, through intermediate levels of certainty, to complete certitude.

Prior research has shown that recording perceived self-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. The self-efficacy scales were administered before and after each test of pain tolerance.

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 water kept at 20 °C was used prior to 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 pump and maintained at a constant temperature of 0 °C.

Subjects were instructed to place their dominantly preferred hand in the 20 °C water for 2 min to equalize initial hand temperatures. They were then asked to immerse their hand in the ice water up to the wrist for as long as they could. The pain tolerance score was the number of seconds subjects were able to keep their hands in the ice water. In the drug phase of the study, the maximum time allowed for each cold-pressor test was 5 min. All the cold-pressor pain tests were administered by a female experimenter.

Efficacy Induction Procedure

In the next step of the experiment, subjects performed the mathematical problem-solving task under conditions designed to create high and low perceived controlling efficacy. All the instructions and the cognitive task demands were presented on a computer monitor following a programmed procedure.

To eliminate any possible social bias, the female experimenter initi-

ated the appropriate computer program for each subject by entering into the subjects' keyboard a preassigned code, and then promptly left the room. The code determined which efficacy induction condition subjects would receive and to whom they would be yoked. For subjects in the low controlling efficacy condition, the program presented the same number of mathematical problems as had been attempted by their counterparts in the high controlling efficacy condition to whom they had been randomly yoked. Thus, each pair of yoked subjects was presented with the same number of mathematical problems in the identical order, and the conditions differed only in the degree to which subjects could exercise control over the cognitive task demands. The codes were predetermined by a coder who was not associated with the conduct of the experiment. This coding procedure ensured that the experimenter had no knowledge of the conditions to which subjects had been assigned, as the computer automatically branched to the appropriate stimulus presentation on the basis of the coded information.

The mathematical problems required subjects to perform sequentially a series of cognitive operations on three integers to arrive at a solution (e.g., $73 - 15 \times 3$). The task was described as a test of basic cognitive-processing capabilities. Subjects were presented with the mathematical problems continuously over a period of 18 min. They were told that their performance would be assessed as a function of both speed and accuracy. To enhance personal involvement in the task, they were further informed that, at the end of the session, they would compare their cognitive processing attainments with those of others who had performed the computational activity.

Subjects in the high self-efficacy condition could exercise full control over the cognitive task demands because they regulated the pace of the task. Problems appeared on the monitor one at a time and remained there until subjects pressed the key for the next mathematical problem.

The yoked subjects in the low self-efficacy condition were presented the same problems in the same order as their high efficacy counterparts, but at a pace that exceeded their cognitive capabilities. The pace was set on the basis of pretest evidence of the minimal time required to perform the necessary cognitive operations. To equate for total length of the problem-solving task, several time gaps were programmed between the rapidly paced subset of problems.

Perceived Mathematical Self-Efficacy

The instructional part of the computer program instructed subjects to complete the mathematical self-efficacy scale before and after the mathematical problem-solving session. The self-efficacy scale included 10 levels of performance attainments that ranged from solving 10% to 100% of the problems. Subjects rated the strength of their self-judged efficacy that they could achieve each of the levels of mathematical attainment by using a 100-point scale ranging in 10-unit intervals from high uncertainty, through intermediate levels of certainty, to complete certitude. The measure of perceived mathematical self-efficacy was obtained by dividing the summed magnitude scores by the total number of items.

The treatment conditions were highly effective in instating high and low levels of perceived self-efficacy. In only two instances did subjects' perceived self-efficacy diverge from the induction conditions. One subject in the low controllability condition registered high perceived self-efficacy (83 strength), and one in the high controllability condition registered very low perceived self-efficacy (39 strength), despite having solved 92% of the mathematical problems. As this study is concerned with the opioid activation effects of perceived self-efficacy, the latter subjects were assigned to the high and low perceived self-efficacy groups, respectively.

The mean strength of perceived mathematical self-efficacy was 23 for subjects in the low efficacy group, and 87 in the high efficacy group. This marked difference in perceived self-efficacy is highly significant, $t(38) = 14.23, p < .0001$.

Naloxone Intervention

Because of its capacity to counteract the analgesic effect of opiates by blocking opiate receptors, naloxone is widely used to detect endogenous opioid activity. To test for opioid activation, half the subjects in each perceived self-efficacy group received an intravenous injection of 10 mg of naloxone, an opiate antagonist. Previous studies have shown that this high dosage of naloxone produces complete opioid blockage (Levine & Gordon, 1984). The other half of the subjects were given an injection of saline solution.

The subjects were informed at the outset of the experiment that they would receive an injection of either an inactive medication or a substance that may affect the physical mechanism controlling pain but that the individual effects on the experience of pain were not yet fully known. A nurse administered the injections under a double-blind procedure. Neither the nurse nor the tester knew whether the subjects received naloxone or saline.

Postinjection Tests

The experimenter administered pain tolerance tests at 5, 15, and 30 min after the injection. Levine and his associates (Levine, Gordon, Jones, & Fields, 1978) have found that naloxone's antagonistic effects do not become evident until after 5 min. This temporal effect is corroborated by previous research on cold-pressor pain (Bandura et al., 1987).

Postexperiment Questionnaire

At the conclusion of the experiment, subjects rated the level of stress and time pressure they experienced during the mathematical task, and the percent of their errors they judged were due to the pressure of the cognitive demands. These ratings were made on 10-point scales. At the end of the session, subjects were given a full explanation of the nature and purpose of the study.

Results

Analyses of variance (ANOVAs) performed on the pretest scores revealed that the groups did not differ initially on any of the measures of perceived self-efficacy, pain tolerance, or level of heart rate. Nor were there any significant sex differences in percentage change as a function of treatment on any of the measures.

Changes in Perceived Mathematical Self-Efficacy

At the outset, subjects registered a moderately strong sense of mathematical self-efficacy (67 strength). However, after coping with the task demands, subjects in the low self-efficacy group experienced a marked decline in perceived self-efficacy, $t(19) = 9.91, p < .0001$, whereas those in the high self-efficacy group heightened their sense of mathematical self-efficacy, $t(19) = 3.67, p < .001$. These differential changes in self-judged efficacy, which are plotted in Figure 1, are highly significant, $t(38) = 8.49, p < .0001$.

Level of Subjective Stress

Figure 2 summarizes the mean levels in subjective stress and stress-induced performance impairment reported by subjects in the high and low perceived self-efficacy groups.

Compared with the self-efficacious subjects, the self-ineffici-

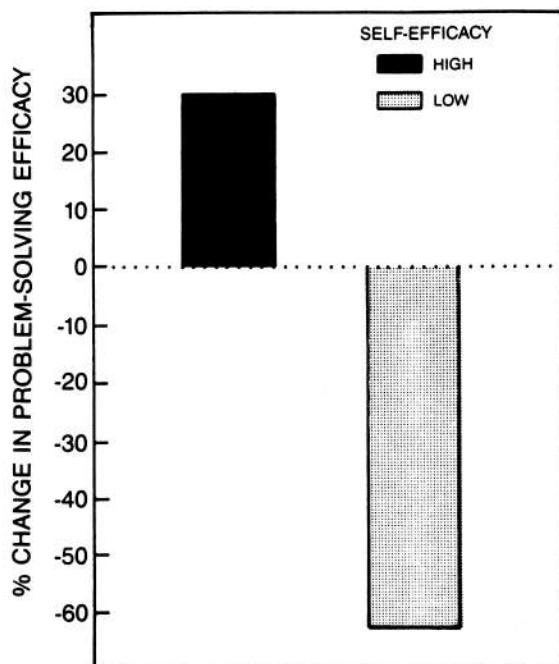


Figure 1. Magnitude of change in perceived mathematical self-efficacy exhibited by subjects in the perceived self-efficacious and perceived self-inefficacious conditions.

cacious ones reported experiencing more than twice as much stress, $t(38) = 7.09, p < .0001$, and considerably more mental strain from time pressure, $t(38) = 10.32, p < .0001$. They also perceived a markedly higher stress-induced impairment of their mathematical problem-solving, $t(38) = 10.38, p < .0001$.

Heart Rate Changes

In Figure 3 are plotted the mean percent changes in heart rate in beats per minute (bpm) from baseline at different phases of the problem-solving task of subjects in the high and low perceived self-efficacy groups. The data are plotted over 2-min intervals. Because of an equipment malfunction, the data for 2 subjects in the high efficacy condition are missing. The intimidation of a medical setting with all its concomitant paraphernalia, together with anticipations of tests of cognitive capabilities, pain tolerance tests, drug injections, and blood draws understandably elicited an initial heightened heart rate that averaged 84 bpm in the total sample during the baseline period. As previously noted, the high and low perceived mathematical self-efficacy groups did not differ in heart rate in the baseline period, which preceded the instructions for the computational task. The subsequent course of autonomic arousal was differentially affected by perceived coping self-efficacy.

The two efficacy groups were comparable during the period when they received instructions for the mathematical task. However, they diverged substantially while coping with the mathematical problems, especially during the first third of the task. An ANOVA was performed on the heart-rate data with perceived self-efficacy and time interval as the factors. The analysis

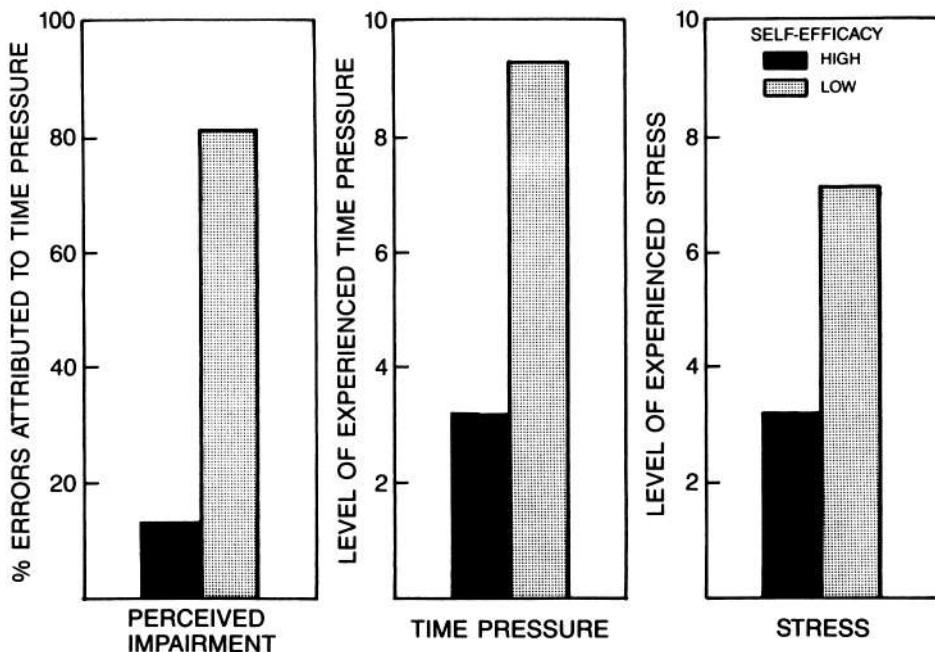


Figure 2. Level of subjective stress, mental strain from time pressure, and perceived stress-induced impairment in mathematical problem-solving reported by subjects in the perceived self-efficacious and perceived self-inefficacious conditions.

revealed a significant interaction, $F(10, 360) = 1.92, p < .04$. The perceived self-inefficacious subjects exhibited a higher heart rate than their perceived self-efficacious counterparts during the first 2-min interval, $t(36) = 1.87, p < .04$, and the third 2-min period, $t(36) = 1.51, p < .07$. Although the perceived self-inefficacious subjects also continued to exhibit a higher heart rate at all the subsequent time points, the differences fell short of statistical significance.

The differences in heart rate between the two groups again became highly pronounced at the end of the task when subjects were rating their perceived mathematical self-efficacy. Perceived self-inefficacious subjects showed a heightened heart rate, whereas the perceived self-efficacious ones displayed a marked decline in heart rate. These opposite directional changes are highly significant, $t(36) = 1.97, p < .03$.

Heart rate was significantly related to perceived mathematical self-efficacy. For the perceived self-inefficacious subjects, the weaker their perceived self-efficacy following the computational task, the more elevated was their heart rate. This was true for the first 2 min of the computational task, $r(18) = .47, p < .02$; the first third of the task when the elevation was most evident, $r(18) = .47, p < .02$; and for the entire duration of the computational activity, $r(18) = .45, p < .03$. The greater the decline in perceived self-efficacy, the more elevated was their heart rate during the first 2 min, $r(18) = .33, p < .08$, and the first third of the computational task, $r(18) = .30, p < .10$.

The perceived self-efficacious subjects exhibited a uniformly high sense of efficacy following the computational task. Even within the limited variance at this upper level of efficacy, the weaker the perceived self-efficacy, the higher the heart rate dur-

ing the first third of the task, $r(16) = .38, p < .06$. The more subjects increased their perceived self-efficacy, the greater was the decline in their heart rate at 2 min, $r(16) = -.35, p < .08$, and the first third of the task, $r(16) = -.37, p < .07$. Moreover, the stronger the subjects' perceived self-efficacy, the greater the reduction they experienced in heart rate when they judged their self-efficacy after the computational task had been completed, $r(16) = .52, p < .02$.

Test for Opioid Activation

The changes exhibited under different drug conditions by perceived self-efficacious and self-inefficacious subjects were evaluated in terms of percentage change in pain tolerance from the preinjection baseline level. This measure was used because it 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).

Variances in pain tolerance were significantly much larger under saline than under naloxone conditions at each of the tests of pain tolerance. Several extreme responders produced highly skewed distributions. Hence, nonparametric tests were used to test for naloxone antagonistic effects. Figure 4 presents the median changes in pain tolerance at the three postinjection tests as a function of perceived self-efficacy and drug administration. Opioid activity is indicated if subjects who had been given naloxone are less able to endure pain stimulation than those given saline.

High perceived self-efficacy. To evaluate intragroup changes,

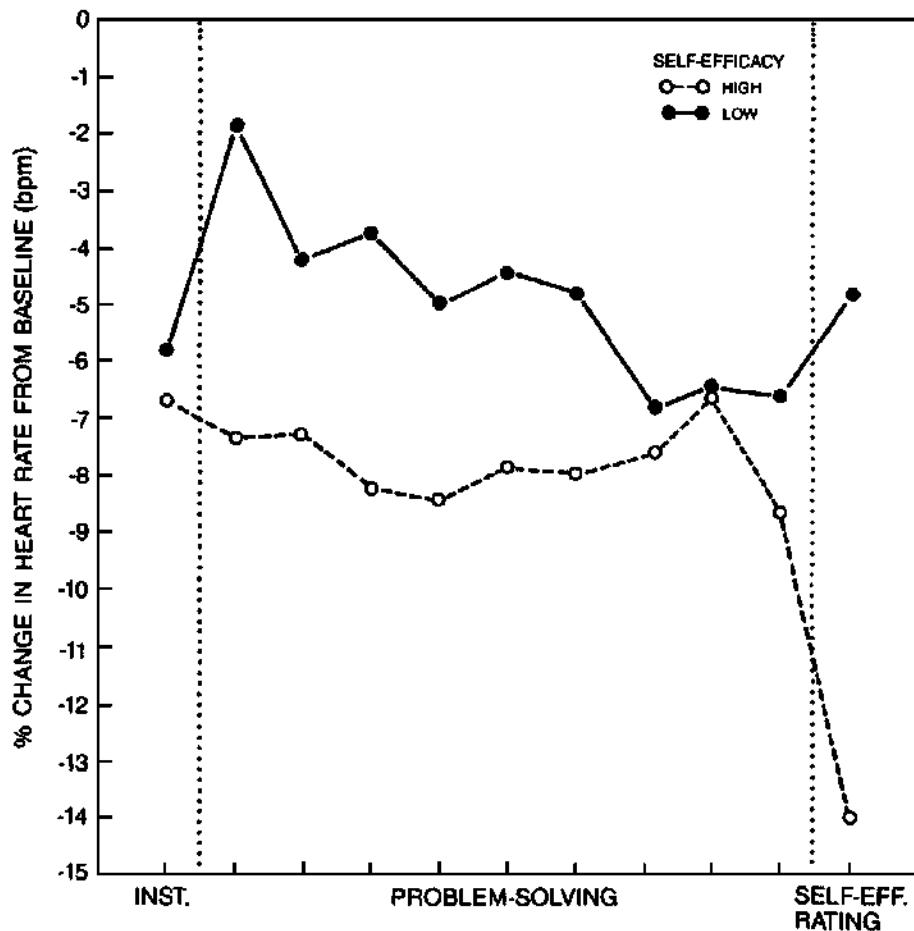


Figure 3. Percentage changes in heart rate displayed by perceived self-efficacious and perceived self-inefficacious subjects while they received instructions for the task (INST), coped with the mathematical task demands, and rated their perceived mathematical self-efficacy at the completion of the task. (Each data point in the problem-solving phase represents the mean heart rate [bpm] over a 2-min interval for a total of 18 min.)

Friedman two-way ANOVAs were performed separately on the scores for the saline and naloxone subgroups across the four tests of pain tolerance. For the highly self-efficacious subjects, neither the fluctuations in pain tolerance under naloxone, $\chi^2 r(3) = 3.00$, nor the rise under saline, $\chi^2 r(3) = 4.11$, was significant.

Evaluation of intergroup differences by the Mann-Whitney test showed that highly self-efficacious subjects administered naloxone did not differ significantly in pain tolerance from those given saline at any of the three postinjection tests. Thus, subjects who judged themselves highly efficacious in coping with cognitive task demands showed no evidence of opioid activation.

Low perceived self-efficacy. Perceived self-inefficacious subjects, who were stressed by their inability to fulfill cognitive demands, displayed a uniformly low level of pain tolerance under naloxone (Figure 4). In marked contrast, self-inefficacious subjects administered saline achieved a substantial rise in pain tolerance, $\chi^2 r(3) = 9.60$, $p < .03$. Pairwise comparisons were per-

formed with the Wilcoxon test between the levels of pain tolerance at the four data points to identify the significant changes. Compared with their baseline level, self-inefficacious saline subjects were better able to tolerate painful stimulation at both the 15-min test, $z = 2.50$, $p < .02$, and the 30-min test, $z = 2.09$, $p < .04$. They were also able to tolerate much more pain stimulation both at the 15-min test, $z = 2.09$, $p < .04$, and the 30-min test, $z = 1.99$, $p < .05$, than at the 5-min point.

The divergent tolerances of painful stimulation by self-inefficacious subjects under drug and saline conditions are significant at the points at which the opioid antagonistic effects of naloxone should become most evident. The groups did not differ at the 5-min test. However, perceived self-inefficacious subjects administered naloxone were much less tolerant of pain than their saline counterparts at the 15-min test, $U = 25$, $p < .03$, and at the 30-min test, $U = 24$, $p < .03$.

Heightening pain sensitivity by opioid blockage would attenuate pain tolerance under all conditions and, indeed, the two naloxone groups did not differ in this respect. Self-inefficacious

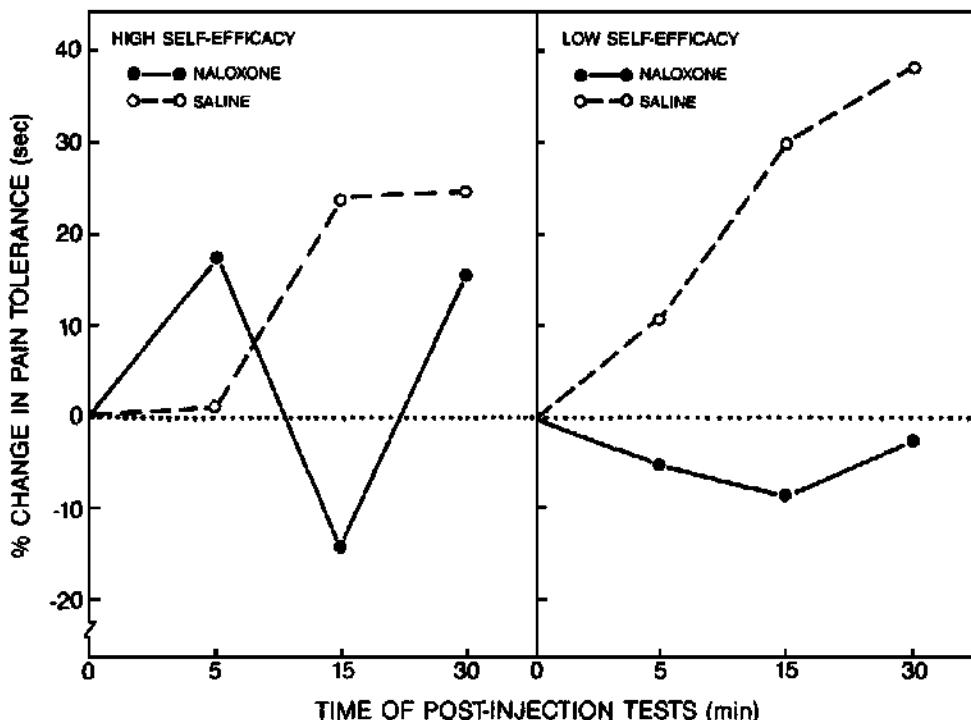


Figure 4. Percentage change in pain tolerance as a function of perceived self-efficacy to exercise control over mathematical task demands and whether the subjects have received saline or the opiate antagonist, naloxone.

saline subjects increasingly surpassed their self-efficacious saline counterparts on successive cold-pressor tests. However, several subjects in the latter group displayed sizable increases in pain tolerance so that the intergroup differences fell short of significance. The predictors of pain tolerance under different conditions, which are considered next, reveal interesting relations that help to explain these increases.

Pain Control Self-Efficacy and Pain Tolerance

Pain endurance self-efficacy. Subjects' perceived self-efficacy to withstand pain measured before their baseline assessment predicted their level of pain tolerance in both the subsequent baseline test, $r(38) = .47, p < .001$, and the postinjection tests. As the correlations at the different postinjection tests were of comparable magnitude, they were averaged by means of an r to z transformation. The stronger the subjects' perceived self-efficacy to withstand pain, the longer they tolerated the painful stimulation in the succeeding cold-pressor tests. However, perceived self-efficacy was more strongly related to pain tolerance under saline conditions, $r(18) = .65, p < .001$, than under naloxone antagonistic conditions, $r(18) = .35, p < .07$.

Pain reduction self-efficacy. Subjects' initial baseline perceived self-efficacy to reduce experienced pain did not predict pain tolerance for the total sample. However, the mathematically self-in efficacious subjects given saline, whose pain sensitivity was apparently blunted by opioid activity, were able to translate their perceived pain-reductive capabilities into pain-toler-

ant behavior. The stronger their perceived self-efficacy at the outset to reduce pain, the longer they endured painful stimulation in the postinjection tests, $r(8) = .55, p < .05$. Their low mathematical self-efficacy counterparts, who received the opiate antagonist, exhibited a negative, although nonsignificant, relation between perceived pain-reductive efficacy and level of pain tolerance, $r(8) = -.27$.

For the mathematical self-efficacious subgroups, the correlations between pain reduction self-efficacy at baseline and pain tolerance in the postinjection tests were $r(8) = .46, p < .10$, under saline treatment, and $r(8) = -.10, ns$, under naloxone treatment.

Impairment of Mathematical Self-Efficacy and Pain Tolerance

The powerful efficacy induction produced subgroups that differed markedly in mathematical self-perceived efficacy and stress, with minimal variance within the subgroups. The severely curtailed range of scores for these variables precluded any meaningful correlational analysis. However, one of the variables that has bearing on stressfulness of the cognitive task provided a wider variation of scores for correlational analysis. This variable is the percentage impairment in subjects' perceived mathematical self-efficacy as calculated from their self-judged efficacy before and after the computational task.

The subgroup combining perceived self-in efficacious with the saline treatment yielded a moderately high correlation between

magnitude of self-efficacy impairment and pain tolerance. The greater the loss subjects suffered in perceived mathematical self-efficacy, the longer they were able to endure pain in the postinjection tests, $r(8) = .57, p < .05$. In sharp contrast, self-efficacy impairment had a strong opposite effect under conditions in which endogenous opioid mechanisms were controlled by naloxone. The more subjects suffered impairment in their perceived mathematical self-efficacy, the less able they were to bear pain, $r(8) = -.59, p < .04$.

Although self-efficacious subjects did not significantly alter their pain tolerance under saline treatment, the degree of change in their perceived mathematical self-efficacy accounted for a large portion of the variance in pain tolerance exhibited by this subgroup. The more they raised their perceived mathematical self-efficacy, the better they tolerated painful stimulation, $r(8) = .84, p < .01$ (two-tailed test). However, for the self-efficacious subgroup given naloxone, gains in perceived mathematical self-efficacy were unrelated to pain tolerance.

Changes in Heart Rate and Pain Tolerance

Under conditions of opioid blockage by naloxone, no relations were expected between changes in autonomic arousal and pain tolerance, and none were found. However, some positive relations were obtained between these variables under saline conditions. The higher the heart rate elevation relative to baseline level, the greater was the increase in pain tolerance at the 30-min test. These relations are $r(16) = .36, p < .07$, for elevated arousal during the first 2 min of the computational task, and $r(16) = .36, p < .07$, for arousal in the first third of the task.

Discussion

The results of the present experiment provide evidence that perceived self-efficacy in coping with cognitive stressors activates endogenous opioid systems. Perceived coping ineffectiveness was highly stressful and autonomically arousing. Subjects who perceived themselves as unable to exercise control over cognitive demands experienced a high level of stress, mental strain, and perceived impairment in cognitive functioning. In sharp contrast, subjects who had developed a strong sense of controlling efficacy were relatively unperturbed by the cognitive task.

Perceived coping ineffectiveness not only activated higher autonomic arousal during the problem-solving, but left subjects in a sensitized ineffectiveness state that persisted beyond the task. Thus, when simply asked to judge their capabilities after the cognitive task was over, the perceived self-ineffective subjects displayed a heightened autonomic arousal, whereas the perceived self-efficacious ones exhibited a marked drop in autonomic arousal. The autonomic reductive effects of perceived self-efficacy are especially striking. Stress reactions can be cognitively activated by self-referent thought (Bandura, 1986). Because of this capacity for cognitive self-activation, arousal does not simply dissipate with the termination of the stressor. The empty intervals between cold-pressor tests provided ample opportunities for cognitive reactivation of divergent levels of autonomic arousal.

Naloxone and saline treatments had substantially different effects on the self-ineffective stressed groups and the self-efficacious nonstressed groups. Subjects who had a strong sense of controlling efficacy were not sufficiently stressed to activate endogenous opioids to block pain transmission. Their pain tolerance did not change significantly across repeated cold-pressor tests under either saline or naloxone treatments. The lack of any differences in toleration of pain stimulation between saline and naloxone subgroups of self-efficacious subjects indicates an absence of opioid activity in self-efficacious nonstressed subjects.

In contrast, the self-ineffective stressed subjects were able to withstand increasing amounts of pain stimulation under saline conditions. However, when the endogenous opioid mechanisms that control pain were blocked by naloxone, the subjects were unable to bear much pain stimulation. This pattern of changes suggests that the stress-induced analgesia found under the saline condition was mediated by endogenous opioid mechanisms and counteracted by the opiate antagonist. In accord with previous findings, the naloxone antagonistic effect became evident after sufficient time had elapsed for the drug to exert its effects (Bandura et al., 1987; Levine et al., 1978).

Experience of controllability produced substantial cognitive changes in perceived self-efficacy. Thereafter, mere self-appraisal of coping capabilities autonomically aroused the perceived self-ineffective subjects, but calmed the perceived self-efficacious ones. These different stress reactions suggest that, after self-efficacy beliefs are instilled, simply approaching environmental demands in a self-ineffective frame of mind may produce some opioid activation anticipatorily. Any reductions in pain sensitivity could make coping with aversive situations easier. Preparatory opioid activation by self-ineffective thought remains a significant problem to be investigated.

Initial strength of perceived self-efficacy to endure pain predicted how well subjects managed subsequent pain stimulation. The stronger their beliefs in their ability to withstand pain, the longer they endured mounting pain under all treatment conditions. These findings are in accord with several lines of evidence supporting the positive role of perceived self-regulatory efficacy in coping with acute pain (Bandura, in press; Litt, 1988; Manning & Wright, 1983; Vallis & Bucher, 1986) and with chronic clinical pain (Holroyd et al., 1984; O'Leary, Shoor, Lorig, & Holman, in press; Philips, 1987; Shoor & Holman, 1984). As might be expected, perceived self-efficacy exercised weaker pain control under conditions in which sensitivity to painful stimulation was increased by blockage of endogenous opioid mechanisms. It is much more difficult to translate self-efficacy belief into pain-tolerating behavior in a physical state of heightened pain sensitivity.

Perceived self-efficacy to effect reductions in experienced pain reflects a more active exercise of personal agency than does stoic endurance. Consideration of the contributions of pain control self-efficacy and cognitive self-efficacy to variance in pain tolerance under different perceived controllability and drug conditions reveals interesting patterns of results. As will be recalled, the perceived self-efficacious nonstressed subjects exhibited no significant changes in pain tolerance over the series of postinjection tests. However, the predictors of variance in pain tolerance for these subjects differs depending on whether

they received the saline or naloxone treatment. Variation in pain tolerance for those administered naloxone seemed to be due, in part, to force of effort as reflected in the positive relation between belief in ability to endure pain and level of pain tolerance. For the subjects administered the saline solution, the predictors of variance in pain tolerance were perceived self-efficacy to withstand pain as well as enhancement of cognitive self-efficacy. Evidently, a boost in perceived self-efficacy in the cognitive domain was transferred to a more perseverant effort in the pain coping domain.

The perceived self-inefficacious subjects who were administered the opiate antagonist were also unable to endure much pain. But the predictors of their variance in pain tolerance differ in an important respect from their self-efficacious naloxone counterparts. Belief in efficacy to withstand pain and low impairment of perceived cognitive self-efficacy presaged pain tolerance. These correlates indicate reliance on forbearance and cognitive resilience in efforts to cope with pain sensations under the state of heightened pain sensitivity.

The substantial increase in pain tolerance achieved by self-inefficacious subjects administered saline seemed to rest on the stress of perceived cognitive impairment and active exercise of self-regulatory efficacy. With the blunting of pain sensitivity by opiate activity, they could readily act on their perceived self-efficacy to withstand and reduce pain sensations.

As noted, increased pain tolerance was predicted by perceived enhancement of cognitive self-efficacy in self-efficacious saline subjects, but by perceived impairment of cognitive self-efficacy in self-inefficacious saline subjects. These differential predictors may help to explain why these two groups did not show even greater divergence in pain tolerance. Among subjects in the self-efficacious saline group, those who experienced a sizable boost in cognitive self-efficacy achieved notable increases in pain tolerance. This reduced intergroup differences. Measurement of different possible determinants helps to clarify the sources of variance and magnitude of change in pain tolerance under different efficacy and drug conditions.

It is interesting to speculate on how the capacity of stressors to activate endogenous opioids evolved. In physically threatening situations entailing fear and pain, it would be highly adaptive to possess an opioid system to alleviate pain so that vigorous defense or speedy flight can be successfully executed. Stress-induced analgesia would clearly be advantageous in the struggle for physical survival. Indeed, Fanselow (1986) has shown that through paired experience with painful stimulation, danger signals acquire the ability to activate endogenous opioids that attenuate the aversiveness of painful stimuli and facilitate defensive behavior.

Modern-day struggles involve strenuous activities and prolonged exposure to psychological stressors on athletic fields, in classrooms, in social circles, and in occupational settings. These stressors produce their own set of aches, strains, pains, headaches, and other physical discomforts. Success in difficult undertakings requires perseverant effort in the face of many stressful and aversive elements. To abort one's efforts prematurely because of accompanying discomfort is self-limiting. People are better able to deal with stressful environmental demands if not beset by pain. Thus, for example, opioid reduction of pain sen-

sitivity in exercise stress helps athletes to achieve high performances that they might otherwise forsake (Janal, Colt, Clark, & Glusman, 1984). An endogenous mechanism that enables people to handle stressful situations with some relief from physical aversiveness has some advantageous functions.

Benefits rarely come devoid of costs. A growing body of evidence reveals that the stress of coping inefficacy not only activates endogenous opioids, but also impairs cellular components of the immune system (Kiecolt-Glaser & Glaser, 1988; Maier et al., 1985; Shavit & Martin, 1987). Prolonged impairment of the immune function increases vulnerability to infection. Physiological systems are highly interdependent. There is evidence that some of the immunosuppressive effects of inefficacy in controlling stressors are mediated by release of endogenous opioids (Shavit & Martin, 1987). When opioid mechanisms are blocked by naloxone, the stress of coping inefficacy loses its immunosuppressive capabilities. Thus, the benefits of reduced pain sensitivity may be gained at the cost of immunocompetence.

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Impact of Conceptions of Ability on Self-Regulatory Mechanisms and Complex Decision Making

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Tested the hypothesis that induced conceptions of ability as a stable entity or as an acquirable skill would affect self-regulatory mechanisms governing performance in a simulated organization. Ss served as managerial decision makers in which they had to match employees to subfunctions and to discover and apply managerial rules to achieve a difficult level of organizational performance. Those who performed the challenging managerial task under an entity conception of ability suffered a loss in perceived self-efficacy, lowered their organizational goals, and became less efficient in their analytic strategies. Ss who managed the organization under an acquirable skill conception of ability sustained their perceived self-efficacy, set challenging organizational goals, and used analytic strategies effectively. These divergences in self-regulatory factors were accompanied by substantial differences in organizational performance. Path analysis revealed that perceived self-efficacy had both a direct effect on organizational performance and an indirect effect through its influence on analytic strategies. Personal goals also affected organizational performance through the mediation of analytic strategies. The relation of prior organizational performance to subsequent performance was mediated entirely by the combined influence of the self-regulatory factors.

Complex decision making is, by its nature, a motivated, cognitive process. This is especially true in dynamic organizational environments. Decision making in such environments is an ongoing process that requires complex integration of multiple sources of information to produce distal, socially mediated outcomes (Mintzberg, 1973; Stewart, 1967). Because organizational outcomes must be achieved through the concerted efforts of others, some of the most important managerial decisions are concerned with how to use human talent and how to guide and motivate human effort. In executing this role, managers have to cope with numerous obstacles, failures, and setbacks that often carry perturbing self-evaluative implications as well as social consequences. These affective factors can undermine self-conceptions and motivation in ways that impair good use of decision-making skills. Effective decision making thus involves more than applying a set of cognitive operators to existing knowledge for desired solutions. Self-regulatory influences have considerable impact on how well cognitive-processing systems work (A. Bandura, 1986; Wood, Bandura, & Bailey, in press).

The mechanisms and outcomes of managerial decision making do not lend themselves readily to experimental analysis in

actual organizational settings. The governing processes are usually influenced by a multiplicity of interacting factors that are difficult to identify and over which it is even more difficult to exercise experimental control. Advances in this complex field can be achieved by experimental analyses of decision making in simulated organizational environments. 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. Much of the research on human decision making involves single trial judgments in static environments (Beach, Barnes, & Christensen-Szalanski, 1986; Hogarth, 1981). Judgments under such conditions may not provide a sufficient basis for developing either descriptive or normative models of decision making in dynamic naturalistic environments that involve sequential judgments governed by learning and motivational mechanisms. By incorporating multiple trials in the simulated environment it is possible to examine temporal interdependencies and cumulative effects in decision-making processes (Wood & Bailey, 1985).

The conception of ability with which people approach complex activities is likely to have a significant impact on the self-regulatory influences that govern ongoing motivation and personal accomplishments in complex decision-making environments. Recent research has identified two major conceptions of ability to which people subscribe (M. Bandura & Dweck, 1987; Dweck & Elliott, 1983; Nicholls, 1984). In one perspective, they construe ability as an *incremental skill* that can be continually enhanced by acquiring knowledge and perfecting one's competencies. People with this conception adopt a learning goal. They seek challenging tasks that provide opportunities to expand their knowledge and competencies. Errors are regarded as a natural, instructive part of an acquisition process. They judge ca-

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pabilities more in terms of personal improvement than by comparison against the achievement of others.

In the contrasting perspective, ability is construed as a more or less *fixed entity*. This type of conception of ability heightens evaluative concerns about personal competence that can have diverse effects on cognitive functioning (Nicholls, 1984). Because performance level is regarded as diagnostic of intellectual capacity, errors and deficient performances carry personal and social evaluative threats. Therefore, people adopting the entity view tend to pursue performance goals of demonstrating their competence. They prefer tasks that minimize errors and permit ready display of intellectual proficiency at the expense of expanding their knowledge and learning new skills. High effort, which is often required to develop competencies in complex activities, also poses evaluative threats because high effort is taken as indicative of low ability. An entity conception of ability is less conducive to effective management of failure than is the view of ability as an incremental skill (Elliott & Dweck, 1988).

According to social cognitive theory (A. Bandura, 1986, 1988), self-regulation of motivation and performance attainments is governed by several self-regulatory mechanisms operating in concert. They include affective self-evaluation, perceived self-efficacy for goal attainment, and personal goal setting. Perceived self-efficacy refers to beliefs in one's capabilities to mobilize the motivation, cognitive resources, and courses of action needed to meet given situational demands. Self-beliefs of efficacy affect the challenges that are undertaken, the amount of effort expended in an endeavor, the level of perseverance in the face of difficulties, whether thinking patterns take self-aiding or self-impeding forms, and vulnerability to stress and depression.

Among the different modes of altering self-beliefs of efficacy, performance experiences are especially influential. Substandard performances are likely to carry markedly different diagnostic implications depending on whether ability is construed as an acquirable skill or as a relatively stable entity. When performances are viewed as skill acquisition in which one learns from mistakes, perceived self-efficacy is unlikely to be adversely affected by substandard performances. This is because errors become a normative part of any acquisition process rather than serving as indicators of basic personal deficiencies. In contrast, when performances are construed as being diagnostic of underlying cognitive capability, frequent experience of substandard performances can take a heavy toll on perceived self-efficacy.

Perceived managerial self-efficacy can influence organizational performance both directly and indirectly through its effects on personal goal setting and use of analytic strategies. The stronger the perceived self-efficacy, the higher the goals people set for themselves (A. Bandura & Cervone, 1986; Taylor, Locke, Lee, & Gist, 1984; Wood et al., in press) and the stronger the commitment to them (Locke, Frederick, Lee, & Bobko, 1984). The findings of diverse lines of research show that challenging goals enhance motivation and performance attainments (Latham & Lee, 1986; Locke, Shaw, Saari, & Latham, 1981; Mento, Steel, & Karren, 1987) especially if combined with performance feedback (A. Bandura & Cervone, 1983).

The multifaceted nature of managerial activities and their mazelike linkage to organizational performance introduces complexities in the relation between personal goals and group

attainment (Wood et al., in press). In virtually all previous research, self-set goals are applied to personal performances over which individuals can exercise direct control by regulating their level of effort. In organizational environments, managerial goals must be socially mediated through the coordinated efforts of others. Sheer managerial effort alone does not ensure attainment of a collective goal. To complicate matters further, efforts to enhance the level of organizational functioning often require constituent changes in particular aspects of the social structure and the way in which social resources are allocated. Systematic pursuit of such operational subgoals contributes to eventual success but does not necessarily produce sizable gains in organizational performance in the short run (Wood et al., in press). So prediction regarding the performance-enhancing effects of goal challenges at the group level must be tempered by considerations of these complexities.

In complex decision-making environments, appropriate decision rules are discovered through systematic application of analytic strategies (Bourne, 1965; Bruner, Goodnow, & Austin, 1956; Wood et al., in press). Initially, performers must draw on their existing state of knowledge in constructing tentative composite rules for how various motivational factors may affect outcomes. The optimal value of these different factors must then be tested by varying them one at a time and assessing how they affect performance outcomes. Less skilled decision makers formulate vague composite rules, tend to alter several factors concurrently (making it difficult to assess the source of multiply produced effects), and make less effective use of informative outcome feedback.

Self-referent factors can affect how well analytic subfunctions for rule learning, such as hypothesis construction and testing and inductive reasoning, are executed. This is especially true in the acquisition of complex functional rules, which place heavy demands on efficient cognitive processing of multidimensional information (Wood et al., in press). In the formal characteristics of the present managerial task used in this study, subjects 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 are more difficult to learn than are linear ones (Brehmer, Hagafors, & Johansson, 1980). Moreover, they 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 of this, they had to generate hypotheses about functional relations for different motivational factors, to test their judgments against outcome information, and to remember which of the hypotheses they had tested and how well they had worked.

It requires a strong sense of efficacy to deploy one's cognitive resources optimally and to remain task oriented in the face of repeated difficulties and failures. Those who judge themselves to be ineffectual in coping with environmental demands tend to become more self-diagnostic than task-diagnostic (M. Bandura & Dweck, 1987). They dwell on their personal deficiencies and cognize environmental demands as being more formidable than they really are. Such self-referent intrusive thinking creates stress and undermines effective use of capabilities by diverting attention away from how best to proceed to concerns over personal deficiencies and possible adverse outcomes (Lazarus & Launier, 1978; Meichenbaum, 1977; Sarason, 1975).

We designed this experiment to test hypotheses that conceptions of ability will influence achieved levels of organizational performance through their effects on the mediating self-regulatory mechanisms just described. Subjects engaged in managerial decision making in a simulated organization in which they had to match a set of employees to job requirements and to use goals, instructive feedback, and rewards in appropriate ways to achieve substantial gains in productivity that were difficult to fulfill. They performed the managerial task over a series of trials under instated conceptions of ability either as an acquirable skill that is improvable with practice or as a basic intellectual entity reflecting underlying cognitive capacities. At three points in the managerial simulation, we assessed subjects' perceived managerial self-efficacy and personal goals. We also measured the adequacy of their analytic strategies for discovering managerial rules and the level of organizational performance they achieved.

For reasons given earlier, we predicted that perceived managerial self-efficacy would be sustained under the conception of ability as an acquirable skill but impaired under the entity conception. We further predicted that perceived self-efficacy would enhance organizational performance both directly and indirectly by its effects on personal goal setting and on use of analytic strategies. The stronger the perceived self-efficacy, the more challenging the organizational goals subjects would set for themselves and the more systematically they would use strategies to discover the managerial rules. High self-set goals and systematic strategies would, in turn, enhance the level of organizational performance.

Method

Subjects

The subjects were 20 men and 4 women from a graduate program in business studies. Their average age was 26 years ($SD = 3.16$ years). Fifteen subjects had prior managerial experience. We randomly assigned subjects, balanced for sex, to the experimental conditions.

Simulated Organization

The study was presented to the subjects as a project in managerial decision making in which they would manage a simulated organization. The introductory 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 five 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. Subjects managed the organizational unit for a total of 18 production orders, with each order representing a performance trial in the simulation.

The subject's managerial task was to allocate workers from a five-member roster to the different production subfunctions so as to complete the work assignment within an optimal period. By correctly matching employees to job requirements, subjects could attain a higher level of organizational performance than if employees were poorly matched to jobs. To assist them in this decision task, subjects received descriptions of the effort and skill required for each of the production subfunctions and the characteristics of each employee. This information described their particular skills, experience, motivational level, preference for routine or challenging work assignments, and standards

of work quality. Both the production subfunctions and the employee attributes were selected on the basis of extensive observation of the actual manufacturing process. The employee profile descriptions were provided at the beginning of the simulation, but subjects could refer to them at any time during their organizational decision making.

In addition to allocating employees to jobs, subjects had to make several decisions about the use of various motivational factors to optimize the group's performance. They had to decide how to use goals, instructive feedback, and social rewards to enhance the job accomplishments of each employee. For each of these motivational factors, subjects had a set of options representing the types of actions that managers could take in an actual organization. We used a mathematical model to calculate the hours taken to complete a production order on the basis of the adequacy of subjects' allocation of employees to jobs 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. The 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. We next describe the logic of the simulation model and the decision options available to subjects. A more detailed description of the mathematics and logic of the model can be found in Wood and Bailey (1985).

In performing the managerial role, subjects had to allocate the employees to the various subfunctions for each manufacturing order. They could reassign employees if they felt that a particular employee would be better suited for a different job assignment. After employees had been allocated to jobs for a given trial, subjects could then assign each employee a production goal from a set of options that included urging the employees to do their best or assigning them one of three specific goals set at, above, or below the established standard. A fifth option allowed subjects 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 et al., 1981). Goals that present a moderate challenge lead to higher performance than 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 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 employee.

Instructive feedback and social rewards were given after the production order for each trial 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 that varied in the amount of direction given regarding methods of workmanship 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 feedback to performance attainments.

For decisions regarding social rewards, 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 employee 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 on how best to use social rewards to increase organizational performance.

In sum, to optimize performance of the organization the subjects were managing they had to match employee attributes to job requirements 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. To complicate matters further, the motivational factors involved both nonlinear and compound rules, which are especially difficult to learn. Knowing rules does not ensure optimal implementation of them. Subjects also had to gain proficiency in tailoring the applications of the rules to individual employees and to apply them in concert to achieve desired results.

Induction of Conceptions of Ability

We instated the entity and acquirable skill conceptions of ability through the introductory instructions that subjects read before beginning the managerial simulation task. In the acquirable skill condition, subjects were told that decision-making skills are developed through practice. In acquiring a new skill, people do not begin with faultless performance. However, the more they practice making decisions the more capable they become. They were further told that the simulation task provided a vehicle for cultivating cognitive decision-making capabilities.

In the entity condition, subjects were told that decision making reflects the basic cognitive capabilities that people possess. The higher their underlying cognitive-processing capacities, the better is their decision making. Subjects were additionally told that the simulation provided a vehicle for gauging the underlying cognitive capacities. These differential conceptions of ability were embedded in instructions for the simulation task that otherwise were identical in every respect. Construal of decisional ability as a basic capacity that is revealable by level of performance is more likely to heighten concerns about personal competence than is construal of ability as an acquirable skill.

After subjects read the introductory information, the characterization of ability as a stable personal quality or as an acquirable skill, and the descriptive profiles of the employees and subfunctions, they performed the simulation at a computer terminal. They entered all of their decisions on the keyboard of a personal computer. After subjects demonstrated that they understood how to use the computer keyboard, the experimenter left the room. Subjects received information about the weekly production orders, the roster of available employees, and feedback on the organization's level of productivity on the computer screen. During the experiment, a timer emitted an audible beep every 5 min. Subjects were informed that the timer was provided to help them pace their progress rather than to time their decision making.

After the final trial, the experimenter gave subjects a full explanation of the nature and purpose of the study. They learned that they had performed the organizational simulation against 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 keyboard. The first assessment was conducted after the sixth trial so that subjects would have some experience with the simulation before being asked to judge their perceived efficacy and to set goals for themselves.

Mediating 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 that they could get the group they were managing to perform at each of the levels of productivity described. The ratings were made in terms of a 10-point scale ranging from *no confidence at all* (1) to *total confidence* (10). 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 trials. They selected their personal goal from nine levels of possible organizational attainments ranging from 40% below to 30% above the established standard and from a tenth option of no particular goal.

We derived the adequacy of subjects' analytic strategies from their decisions regarding job assignments and how they varied the motivational factors to discern the managerial rules across each block of trials. The number of systematic tests that subjects carried out to determine how job allocations and motivational arrangements affected the performance of individual employees provided the measure of analytic strategy. The strategy score was the sum of the decisions across a block of trials in which subjects changed only a single factor (i.e., job allocation, goal level, instructive feedback, or social reward) for individual employees. 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. Five systematic tests, one for each employee, could be made in each trial. Therefore, a subject's analytic strategy score across a block of six trials could range from 0 to 30.

Another aspect of decision making is the subject's sheer level of decision activity, represented by the total number of factors changed for all employees in each trial without consideration of confounding variations. This is a quantity measure of decision-making activity, whereas systematic analytic strategy is a quality measure.

Organizational Performance

We measured organizational performance in terms of the total number of hours taken by the group of employees to complete each weekly order. The simulation model automatically calculated the number of production hours for each trial on the basis of subject's job allocations and selections of motivational factors (Wood & Bailey, 1985). The fewer the production hours, the better the subject's managerial decision making. Levels of organizational performance attained by subjects are reported as percentages of the standard, with a higher score indicating better performance. Organizational performance scores were averaged across three blocks of six trials each.

Results

Effects of Ability Conceptions on Self-Regulatory Factors

We analyzed the effects of the differential ability conceptions on self-regulatory factors using 2×3 analyses of variance (ANOVAs), with conception of ability as a between-subjects variable and assessment phase as a repeated measures variable. Figure 1 shows the mean strength of perceived managerial self-efficacy after each of the trial blocks. Subjects in the stable entity condition displayed a much less resilient sense of self-efficacy in the face of substandard organizational performances than those who regarded decision making as a skill that can be developed

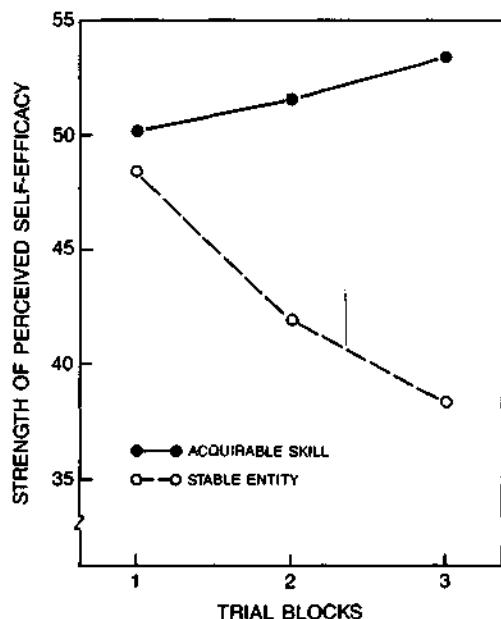


Figure 1. Changes in strength of perceived managerial self-efficacy across trial blocks under acquirable skill and entity conceptions of ability.

incrementally. This is shown in the significant interaction between ability conception and phases of assessment, $F(2, 44) = 3.64, p < .05$. Initially, subjects in both conditions expressed a moderately strong sense of managerial efficacy. However, as they continued to try to fulfill the difficult production standard, those in the stable entity condition displayed a progressive decline in perceived self-efficacy, whereas those in the acquirable skill condition maintained their sense of managerial efficacy.

Self-set goals followed a similar pattern of change under the two conceptions of ability. These changes are plotted in Figure 2. Subjects in the acquirable skill condition set for themselves more challenging organizational goals than did those in the stable entity condition, $F(2, 22) = 6.50, p < .01$. Subjects' personal goal setting became progressively more divergent as they continued to manage the simulated organization, as shown in the significant interaction effect, $F(2, 44) = 5.44, p < .01$.

Analytic Strategies

Conceptions of ability also had significant effects on subjects' use of analytic strategies (see Figure 2). Subjects who managed the simulated organization under an acquirable skill conception of ability were more systematic in their use of analytic strategies in testing the effects of job allocations and motivational factors than were their counterparts in the entity condition, $F(1, 22) = 4.94, p < .025$. As subjects continued to perform the simulation task, those who regarded errors as a natural part of developing decision-making skills became increasingly more systematic in their testing of managerial options, whereas those for whom errors implied basic cognitive deficiencies became less efficient, $F(2, 44) = 4.35, p < .05$.

As they continued to perform the task, subjects in the entity

condition changed more motivational factors in their efforts to discover optimal motivators but did so in a confounding fashion that undermined opportunities to learn from the outcome feedback. Those in the acquirable skill condition made fewer but more systematic changes in motivational factors. The more production assignments the entity subjects had to manage, the more erratic they became in their strategic thinking. The interaction effect for sheer amount of changes was $F(2, 44) = 3.83, p < .05$.

Organizational Performance

In Figure 3, the mean organizational performance that subjects achieved is plotted as a function of conceptions of ability and blocks of production assignments. Subjects in both conditions performed below the preset standard of productivity. Both groups attained similar levels of performance in the early trials of organizational management and did not differ in this respect. However, as predicted from the postulated influence of self-regulatory dynamics, organizational performance was markedly impaired under the entity conception of ability, showing a steady decline across progressive blocks of trials. In contrast, those in the acquirable skill condition sustained a high level of organizational performance. The growing divergence in organizational performance produced a highly significant interaction between conceptions of ability and trial blocks, $F(2, 44) = 9.69, p < .001$. We turn now to the mediating effects of the various self-regulatory mechanisms and their contributions to organizational performance.

Path Analysis

We conducted path analyses to test the causal ordering of variables. The direction of causality in the path model is established by theoretical considerations supported by prior research and temporal sequencing of variables. In this causal model, prior performance influences perceived self-efficacy, personal goal setting, and subsequent performance. We included prior performance as the first variable in the analyses as a proxy for a host of possible determinants other than the self-regulatory influences examined in this study.

Performance attainments and self-regulatory factors involve bidirectionality of influence (A. Bandura, 1986). That is, self-influences are changed by performance experiences and subsequent level of performance is, in turn, altered by motivational self-influences, which represent nomability factors. As a result, using unadjusted performance scores when controlling for past performance will also remove effects that are attributable to the motivational effects of self-influences. When self-influences are autocorrelated, unadjusted control for past performance will also remove effects that are attributable to self-influences in the current performance. To avoid this overcorrection for past performance, the effects of perceived self-efficacy and self-goals at Phase 1 and strategy in Block 2 were removed from Block 2 performance before it was introduced into the analyses for Block 3 performance. For the analyses of Block 2 performance, there was no prior measure of the self-regulatory influences that could be used to remove their effects from performance in Block 1. Therefore, the measure of past performance included

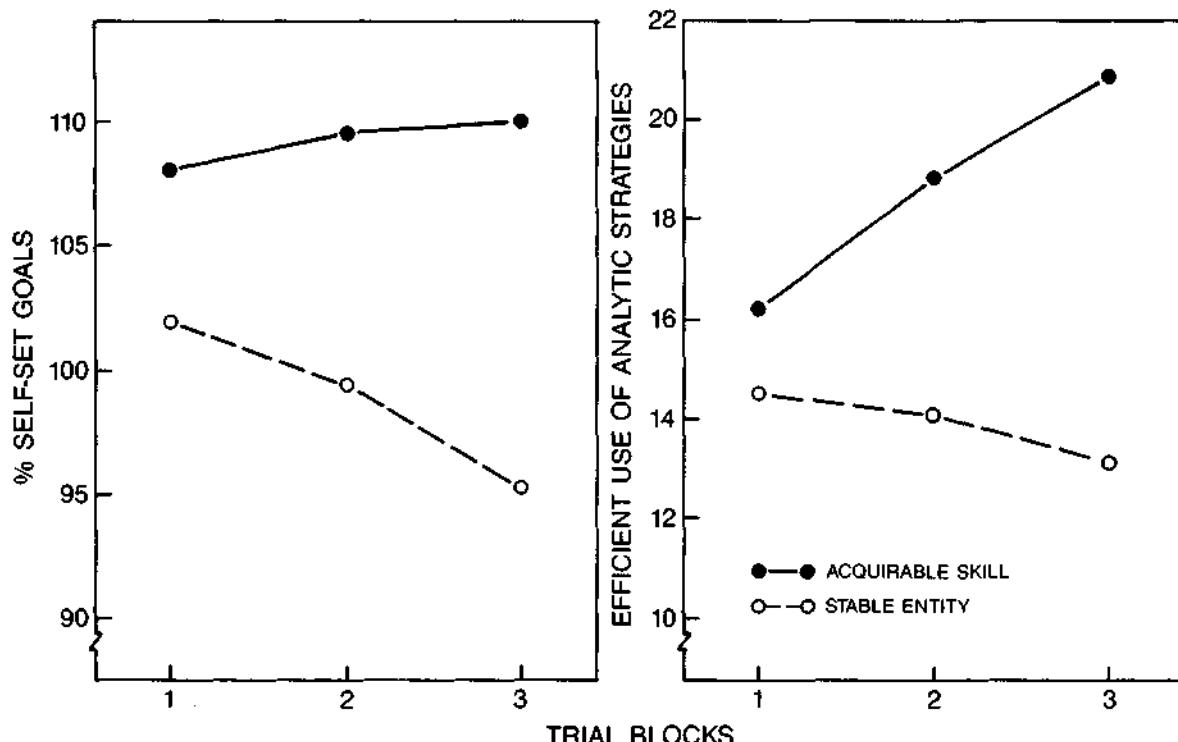


Figure 2. The left panel shows the changes in self-set goals across trial blocks under acquirable skill and entity conceptions of ability; the right panel shows the changes in effective analytic strategies across trial blocks under the different conceptions of ability.

in analysis of Block 2 performance had only the prior effects for strategy removed.

Perceived self-efficacy was entered into the equation as a second predictor because beliefs about one's capabilities influence the goals people set for themselves and how proficiently they use analytic strategies. Perceived self-efficacy also contributes independently to performance. We expected personal goals to affect subsequent performance directly and indirectly through their influence on analytic strategies. The full set of structural equations representing the hypothesized causal relations were analyzed separately for Trial Blocks 2 and 3.

The standardized path coefficients that were significant at or beyond the .05 level are shown in Figure 4. In the second block of trials, the relation of prior organizational performance to subsequent performance was mediated entirely by perceived self-efficacy, personal goals, and analytic strategies. No significant relation was found between prior and subsequent organizational performance when the combined influence of the self-regulatory factors was controlled.

Perceived self-efficacy enhanced the level of organizational performance both directly and indirectly through its effects on analytic strategies. Prior organizational performance affected the goals subjects set for themselves. Personal goals, in turn, influenced performance by their impact on analytic strategies, but they did not contribute independently to organizational performance. Effective use of analytic strategies enhanced organizational performance after controlling for all prior determinants.

The structure of the significant causal relations was replicated in the third block of trials with the exception that personal goal setting dropped out as a mediating influence. The combined set of explanatory variables in the conceptual model accounted for a major share of the variance in organizational attainments in both the second trial block ($R^2 = .75, p < .001$) and the third block ($R^2 = .78, p < .001$).

Discussion

Our findings provide supporting evidence that the conception of ability with which people approach complex decision making has substantial impact on self-regulatory mechanisms that govern performance attainments. Construing ability as an acquirable skill fostered a highly resilient sense of personal efficacy. Although the challenging preset level of organizational performance eluded the subjects, they remained steadfast in their perceived managerial self-efficacy, continued to set for themselves challenging organizational goals, and used analytic strategies in ways that aid discovery of effective managerial decision rules. Such a self-efficacious orientation, which is well suited for handling adversity, paid off in uniformly high organizational attainments.

These findings are in accord with a growing body of evidence that human attainments and positive well-being require a strong sense of personal efficacy (Alloy & Abramson, 1979; A. Bandura, 1986; M. M. Bandura, 1987; Glasgow & Arkowitz, 1975; Lewinsohn, Mischel, Chaplin, & Barton, 1980). This is

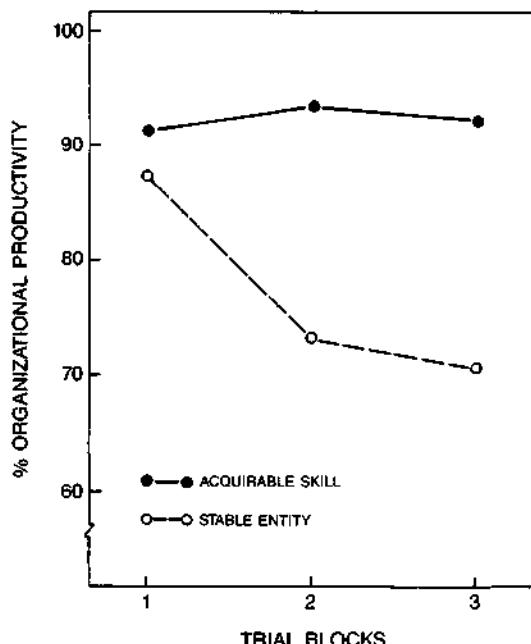


Figure 3. Level of organizational productivity achieved across trial blocks by subjects who managed the simulated organization under an induced acquirable skill conception of decision-making ability or under an induced entity conception of ability.

because ordinary social realities are usually fraught with difficulties. People must, therefore, have a robust sense of personal efficacy to sustain the productive attentional focus and perseverance effort needed to succeed.

Construing ability as reflecting an underlying personal capacity greatly increased vulnerability to the adverse effects of failure. Viewed from this cognitive perspective, substandard performances become diagnostic of personal deficiencies rather than a natural, instructive element in the acquisition of competencies. The longer the subjects with the entity orientation managed the complex task, the more they were beset with doubts about their managerial efficacy. They kept lowering their organizational aspirations and achieving progressively less with the organization they were managing.

In this study we raised evaluative concerns about personal competence by the way in which complex decision making was socially construed. Other forms of social influence that focus attention on self-evaluation rather than on task mastery—such as valuational feedback, normative grading, competitive structures, and coercive incentive systems—can similarly have adverse effects on the level of interest, motivation, performance accomplishments, and creativity (Amabile, 1983; Butler, 1987; Nicholls, 1984; Ryan, 1982). The findings of this study further reveal the substantial impact exerted by evaluatively oriented conceptions on self-percepts of efficacy, aspirations, and analytic thinking and the causal structure through which these mediating regulatory processes affect performance accomplishments.

Evidence regarding the decisional activities of subjects in the entity condition indicates that their declining organizational attainments reflect impairment in the use of decisional skills rather than simply slackening of effort or diminished involvement in the managerial activity. Subjects who performed the managerial task under the entity conception surpassed those who approached the task as an acquirable skill in sheer amount of decisional activity. However, the attempt to hit on optimal motivators by varying many factors concurrently impeded discovery of the managerial rules. The more their perceived managerial efficacy declined, the more erratic they became in their decisional activities ($r = .56, p < .05$, and $r = .76, p < .01$, in the second and third trial blocks, respectively). Their counterparts in the acquirable skill condition continued to think in a strategically effective manner.

Subjects in the entity and acquirable skill conditions did not differ initially in either their perceived self-efficacy or organizational attainments. Their subsequent growing divergence in perceived self-efficacy and inferential activity suggests that differential conceptions of ability biased how initially similar substandard performances were being cognitively processed. Construal of substandard attainments as indicants of personal deficiencies would gradually create an ineffectuous self-schema in the particular domain of functioning, whereas construal of substandard attainments as instructive guides for enhancing personal competencies would foster an efficacious self-schema. Such evolving self-beliefs can further bias cognitive processing of outcome information and promote actions that create con-

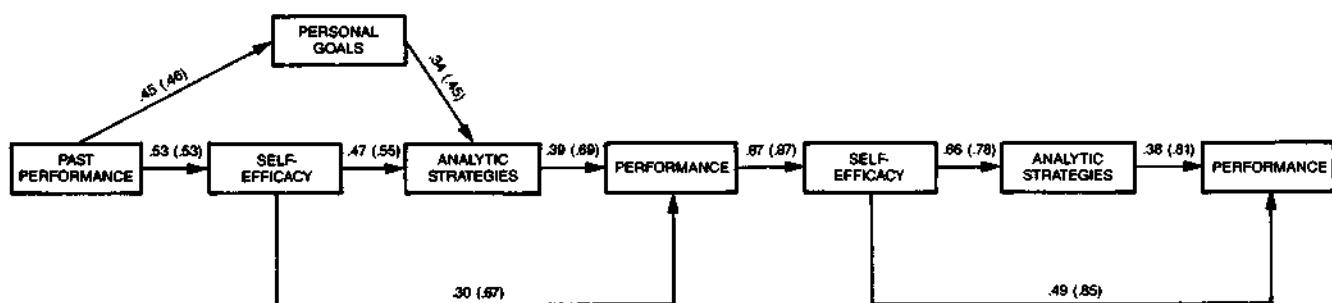


Figure 4. Path analysis for the second and third trial blocks. (The initial numbers on the paths of influence are the significant standardized path coefficients [$p_s \leq .05$]; the numbers in parentheses are the first-order correlations. The network of relations on the left half of the figure are for the second trial block, and those on the right half are for the third trial block.)

firmatory behavioral evidence for them. Indeed, the data reveal an exacerbation cycle of motivational and performance effects. These divergent changes are all the more significant because most of the subjects were seasoned managers and all were of high aptitude.

There is some evidence to indicate that in organizational milieus, low perceived self-efficacy to produce desired outcomes fosters attributions of blame and deficiencies to others. Thus, for example, teachers who have a low sense of instructional efficacy tend to regard difficult students as lacking ability and unteachable, whereas those who have a strong belief in their instructional efficacy view student problems as surmountable through extra effort and variation of educational approach (Ashton & Webb, 1986). The subjects in this experiment did not perform the managerial task dispassionately. They got deeply involved in the activity and personalized the employees. Those who suffered a loss in perceived managerial efficacy were uncharitable in their views of their employees. They regarded some of them as "unmotivatable," unworthy of supervision, and deserving of dismissal.

Although the sample size was relatively small, the temporal ordering of changes in self-regulatory factors antecedently to performance, the replication of the paths of influence in the path analyses across two series of trials, and the high degree of stability between the estimates for the two sets of parameters adds to the significance of the findings.

In accord with the proposed causal model, prior performance affected perceived self-efficacy, which, in turn, influenced subsequent level of organizational performance both directly and indirectly by its impact on analytic strategies. These findings are in accord with previous evidence that a high sense of personal efficacy fosters strategic thinking and raises organizational attainments under different levels of organizational complexity and goal assignments (Wood et al., in press). In these simulations, subjects had to regulate the actions of others. Considerable research documents the influential role played by perceived self-efficacy in the regulation of one's own motivation and actions (A. Bandura, 1986, 1988).

High personal goals also augmented organizational attainments by promoting effective problem-solving strategies, but goals did not affect performance independently. The task of exercising control over organizational outcomes differs in several important respects from that of realizing individualized outcomes. At the organizational level subjects have to rely on the aggregate efforts of others to achieve desired outcomes, whereas at the individual level one need regulate only one's own efforts. Socially mediated regulation of a group is considerably more complex than direct self-regulation. Functional relations established at the individual level may thus require qualifications at the group level.

Personal goals are readily translatable into performance attainments when people possess the knowledge and means to exercise control. Goals can affect performance directly by channelling attention and mobilizing effort and sustaining it in the face of obstacles (Locke et al., 1981). In most of the research demonstrating performance-enhancement effects of goals, subjects already possess the means and need only to intensify their efforts (Mento et al., 1987). Even on tasks that are directly controllable by effort alone, goal effects are weaker for more com-

plex activities (Wood, Mento, & Locke, 1987). In the organizational task used in this study, the managers not only had to rely on the efforts of others to achieve desired outcomes, but they had to discover complex managerial rules and how best to apply them as they tried to conduct their managerial function. Until the rules were identified, goals could produce more effortful and discerning cognitive processing of outcome information, but not necessarily immediate improvements in organizational performance. Indeed, goals exerted their impact on performance by promoting effective managerial rule-learning strategies. However, after productive analytic strategies were adopted, personal goals no longer served this mediating function.

The multifaceted nature of the managerial activities and their complex linkages to organizational outcomes may also partly explain why personal goal setting did not have a direct impact on group performance. In the postexperiment inquiry, many subjects indicated that they were attempting to realize their organizational goal by concentrating their efforts on improving particular operational aspects of the organization. These operational subgoals involved reassignment of certain production subfunctions or a concerted effort to improve the performance of a particular employee. If grounded in sound judgment, such fractional changes would eventually raise organizational attainments without necessarily producing appreciable immediate gains.

Perceived self-efficacy did not account for variance in personal goal setting. This finding is discrepant from evidence that perceived self-efficacy influences the goals people set for themselves and the strength of their commitment to them (Locke et al., 1984; Taylor et al., 1984). Variation in the temporal properties of the goals may explain this discrepancy. In previous studies subjects set themselves proximal goals, whereas in this study they selected more distal goals for an entire series of performances. The instated ability conceptions would make the challenging preset production standard a highly salient distal goal. Subjects in the entity condition would strive for it as the evidential standard of competence, whereas more modest distal accomplishments would prove disappointing. Subjects in the acquirable skill condition would also aim for a high eventual accomplishment. The substantial negative discrepancy between prior performance and self-set goals indicates that the preset standard was indeed exercising considerable influence on the distal goal setting. Although prior performance had some effect on personal goals, the ones subjects were seeking to fulfill were far in excess of their attainments. This disparity remained even for subjects in the entity condition who began to lower their sights under the cumulative impact of failure.

The factors encompassed by prior performance level had no independent influence on subsequent organizational attainments. This finding underscores the considerable extent to which nonability self-regulatory factors may contribute to performance attainments. Among highly talented individuals, much of the variation in performance may be attributable to how well they use the skills they possess. An ability is only as good as its execution. Our research indicates that the conceptions of ability with which people approach complex tasks can affect self-regulatory factors in ways that are self-enhancing or self-impeding.

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Effect of Perceived Controllability and Performance Standards on Self-Regulation of Complex Decision Making

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Tested the hypothesis that perceived controllability and stringency of performance standards would affect self-regulatory mechanisms governing performance attainments of a simulated organization. Ss who managed the simulated organization under a cognitive set that organizations are not easily controllable displayed low perceived self-efficacy, even when standards were within easy reach, and lowered their organizational goals. Ss who operated under a cognitive set that organizations are controllable maintained a strong sense of self-efficacy, set increasingly challenging goals, and exhibited effective analytic thinking. The divergent changes in these self-regulatory factors were accompanied by large differences in organizational attainments. Path analyses revealed that perceived self-efficacy, which was affected by prior accomplishments, influenced subsequent organizational performance through its effects on analytic strategies. After further experience, the performance system was regulated more extensively and intricately by Ss' self-conceptions of efficacy. Perceived self-efficacy affected subsequent organizational attainments both directly and indirectly through its influence on personal goal challenges. Personal goals, in turn, enhanced organizational attainments directly and through mediation of analytic strategies.

Research on cognitive motivators and regulators of action has been mainly concerned with how self-regulatory mechanisms operate in personal accomplishments. Many human endeavors are directed at collective goals that are achieved in organizational structures through socially mediated effort. In exercising control over organizational outcomes, decision makers have to master effective ways of mobilizing the concerted efforts of others, whereas at the individual level they need regulate only their own motivation and actions. Sheer managerial effort alone does not ensure attainment of collective goals. To complicate matters further, attempts to enhance the level of organizational functioning often require constituent changes in particular aspects of the social structure and the way in which social resources are allocated. Systematic pursuit of such operational subgoals contributes to eventual success but does not necessarily produce sizable gains in organizational performance in the short run. Socially mediated regulation of collective effort clearly involves considerably more complex paths of influence than does direct self-regulation on simple activities. Therefore, functional relationships established on individual activities may require

qualification for more complex collective activities (Wood & Bandura, 1989; Wood, Mento, & Locke, 1987).

Much of the research on human decision making examines single trial judgments in static environments (Beach, Barnes, & Christensen-Szalanski, 1986; Hogarth, 1981). Judgments under such conditions may not provide a sufficient basis for developing either descriptive or normative models of decision making in dynamic naturalistic environments that entail learning and motivational mechanisms. In such environments, decision makers must weigh and integrate a wide array of information from diverse sources. Decisions must be made during a continual flow of activity under time constraints. Moreover, many of the decisional rules for exercising control over dynamic environments must be learned through exploratory experiences in the course of managing the ongoing organizational activities. It requires a reliable knowledge base and efficacious use of cognitive skills to ferret out relevant information, construct options, and test and revise one's knowledge on the basis of results of decisional actions.

Two aspects to the exercise of control are especially relevant to organizational change (A. Bandura, 1986; Gurin & Brim, 1984). The first concerns the level of personal efficacy to effect changes by creative 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. This facet represents the level of system constraints and opportunities to exercise personal efficacy.

Neither self-efficacy nor social environments are fixed entities. Operative self-efficacy is a generative capability in which multiple subskills must be continuously improvised to manage ever-changing circumstances. Individuals with the same sub-

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skills may, therefore, perform poorly, adequately, or extraordinarily, depending on their self-beliefs of efficacy, which affect how well they use the capacities they possess (A. Bandura, 1986; Wood & Bandura, 1989). For the most part, the social environment constitutes a potentiality that is actualized by appropriate action. What parts of the potential environment come into play as the actual environment and the environmental events thus depend on how people behave. Human behavior is, of course, governed largely by perceptions of personal efficacy and social environments rather than simply by their objective properties. Thus, individuals who believe themselves to be ineffectual are likely to effect limited change even in environments that provide many opportunities. Conversely, those who have a firm belief in their efficacy, through ingenuity and perseverance, figure out ways of exercising some measure of control in environments containing limited opportunities and many constraints.

In social cognitive theory (A. Bandura, 1986), perceived self-efficacy operates as a central factor in self-regulatory mechanisms governing human motivation and action. Evidence from varied lines of research reveals that self-beliefs of efficacy can have diverse psychological effects. They influence choice of pursuits and social milieus (A. Bandura, 1982; Betz & Hackett, 1986). They affect level of motivation, both directly through mobilization and maintenance of effort and indirectly by their impact on goal setting (A. Bandura, 1988b; A. Bandura & Cervone, 1983, 1986; Cervone & Peake, 1986). The stronger the 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, & Bailey, in press). A substantial body of literature reveals that challenging goals raise motivation and performance attainments (Latham & Lee, 1986; Locke, Shaw, Saari, & Latham, 1981; Mento, Steel, & Karren, 1987).

Depending on their nature, self-efficacy beliefs also affect attentional and thinking 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 (A. Bandura, in press). In contrast, those who are beset with self-doubts of their efficacy tend to turn their attention inwardly and become self-preoccupied with evaluative concerns when they encounter difficult environmental demands. They dwell on their personal deficiencies and envision failure scenarios that beget adverse consequences. Such intrusive thinking activates 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 (Meichenbaum, 1977; Sarason, 1975).

Effective decision making in the present experiment required subjects to discover different rules of motivation and how best to combine them for each member to enhance group attainments. Some of the rules were nonlinear and compound ones, which are especially difficult to learn (Brehmer, Hagafors, & Johansson, 1980). To discover them, subjects had to construct hypotheses about the form of the rules, to test their judgments against the results of their decisional actions, and to remember which of the hypotheses they had tested and how well they had worked. If they altered too many factors at once, they could not determine which ones were responsible for the observed results. It requires a strong sense of self-efficacy to remain task oriented

during this exploratory rule learning in the face of ongoing managerial demands and deficient accomplishments. The stronger the perceived self-efficacy, the more effective is the analytic thinking in rule learning (Wood & Bandura, 1989).

Social environments vary in their potential controllability. Some contain readily accessible opportunity structures that enable people to attain desired outcomes through the development and exercise of personal efficacy. Others limit the opportunities to secure valued outcomes through efficacious action. The greater the system constraints, the stronger the perceived self-efficacy needed to effect changes.

The effects of perceived controllability have been studied experimentally most extensively in relation to stress reactions. People who are led to believe that the occurrence of aversive environmental events are personally controllable display lower autonomic arousal and less performance impairment than do those who believe the aversiveness is uncontrollable, even though they are equally subjected to the painful stimulation (Geer, Davison, & Gatchel, 1970; Glass, Singer, Leonard, Krantz, & Cummings, 1973). In correlational studies (Lefcourt, 1976), beliefs regarding controllability are generally associated with active efforts to exercise personal control. People who are convinced that there is little that can be done to change things have little incentive to exert much effort (Litt, 1988). This study extends research on perceived controllability by examining its impact on the self-regulatory mechanisms presumed to govern the management of organizational functioning.

In the transactions of everyday life, beliefs regarding self-efficacy and environmental controllability are not divorced from experiential realities. Rather, they are products of reciprocal causation (A. Bandura, 1986). Thus, when people believe the environment is controllable on matters of import to them, they are motivated to exercise fully their personal efficacy, which enhances the likelihood of success. Experiences of success, in turn, provide behavioral validation of personal efficacy and environmental controllability. If people approach situations as largely uncontrollable, they are likely to exercise their efficacy weakly and abortively, which breeds failure experiences. Over time, failures take an increasing toll on perceived self-efficacy and beliefs about how much environmental control is possible. Rates of success and failure are largely determined by the standards against which attainments are gauged. Therefore, to test the modifiability and resiliency of self-regulatory factors under difficult levels of perceived controllability, the stringency of performance standards was also varied.

The present experiment was designed to test hypotheses that perceived controllability and performance standards will influence achieved levels of organizational performance through their effects on the mediating self-regulatory mechanisms described above. Subjects engaged in managerial decision making in a simulated organization in which they had to match a set of employees to production subfunctions and to use goals, instructive feedback, and social incentives in appropriate ways to achieve gains in organizational performance that were relatively easy or difficult to fulfill. Within each of these performance standards, subjects managed the group activity over a series of trials under induced cognitive sets that organizations are difficult to control or that they are quite amenable to control.

At three points in the organizational simulation, subjects' perceived self-efficacy and personal goals 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 perceived managerial self-efficacy would be enhanced under perceived controllability, but diminished when the organizational environment is viewed as permitting only limited control. It was further hypothesized that perceived controllability would reduce the vulnerability of self-efficacy beliefs to the adverse effects of failure occasioned under high performance standards. In the causal structure of the model being tested, perceived self-efficacy would enhance organizational performance both directly and indirectly by its effects on personal goal setting and on use of analytic strategies. The stronger the perceived self-efficacy, the more challenging the organizational goals subjects would set for themselves and the more systematically they would use strategies to discover the managerial rules. High self-set goals and systematic strategies would, 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 were told that participation in the experiment would provide them with an opportunity to try their hand at managing a simulated organization. In addition, three names would be drawn by lot at the end of the study for \$100 prizes. The average age was 27 years, and the standard deviation was 2.5 years. Thirty of the subjects had prior managerial experience. The subjects were randomly assigned to four treatment conditions, balanced for sex.

Simulated Organization

The study was presented as a project in managerial decision making in which the subjects manage a simulated organization. The introductory 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 five 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. Subjects managed the group activity for a total of 18 production orders, each order representing a performance trial in the simulation.

The subject's managerial task was to allocate employees from a five-member roster to the different production subfunctions in order to complete the work assignment within an optimal period. By correctly matching employees to production requirements, subjects could attain a higher level of organizational performance than they could if employees were poorly matched to subfunctions. To assist them in this decision task, subjects received descriptions of the effort and skill required for each of the production subfunctions and the characteristics of each employee. This biographical information described their skills, experience, motivational level, preference for routine or challenging work assignments, and standards of work quality. 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. The employee profile descriptions were provided at the beginning of the simulation, but

subjects could refer to them at any time during their organizational decision making.

In addition to allocating employees to subfunctions, subjects had to make a set of decisions on how to put to use 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 job 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 level, 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 is described next. A more detailed description of the mathematics and logic of the model has been presented elsewhere (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 employees if they judged that a particular employee would be better suited for a different job. After employees had been allocated to subfunctions for a given trial, subjects could then assign each employee a production goal from a set of options that included urging the employees to do their best or assigning them one of three specific goals set at, above, or below the established standard. A fifth option allowed subjects 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 employees' performance according to the calculations of the simulation model in the manner predicted by goal theory (Locke et al., 1981). According to this theory, goals that present a moderate challenge lead to higher performance than either 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 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 employee.

Instructive feedback and social incentives were given after the production order for each trial 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 methods 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, or 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 employee 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 on how best to use social rewards to increase organizational performance.

In sum, to optimize performance of the organization, subjects had to (a) match employee attributes to subfunctions and (b) 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. Knowing rules does not ensure optimal implementation of them. Subjects also had to gain proficiency in tailoring the applications of the rules to individual employees and to apply them in concert to achieve desired results.

Organizational Controllability

The performance standards and the characterizations of the controllability of organizations were embedded in the instructions that subjects read before beginning the managerial task. The low-controllability condition portrayed organizations as difficult to predict and control. The work habits of employees were characterized as not easily changeable, and employees were depicted as not always responsive even to helpful guidance. The characterization further noted that fractional changes, though easier to achieve, do not necessarily improve the overall organizational performance. Such conditions limit how much managers can affect the performances of the organizations they direct.

The high-controllability condition referred to the same elements, but portrayed organizations as predictable and controllable. The work habits of employees were characterized as more easily changeable than is generally assumed, and employees were depicted as responsive to helpful guidance. The characterization further noted that fractional changes can set in motion facilitative processes that improve the overall organizational performance. Such conditions enable managers to exert substantial influence over the performances of the organizations they direct.

All subjects, of course, managed the same objective simulated environment regardless of the induced cognitive set concerning the controllability of organizations.

Performance Standards

The introductory instructions indicated that reliable productivity norms had been established on the basis of the attainments achieved by managers and business graduates with the simulated organization. In the high-standard condition, subjects were told that they should try to get their employees to surpass the customary productivity by 20%–25%. Subjects in the low-standard condition were told that they should try to get their employees to perform at least at a level that does not take them 20%–25% longer than the customary productivity.

Pretesting of performance attainments on the simulation had established that these were, respectively, difficult and easy standards to achieve. This is corroborated by the findings of the present study: All subjects in the low-standard condition exceeded it, whereas only 20% of the subjects in the high-standard condition matched or surpassed their recommended standard. The suggested performance standard was shown on a computer terminal in each trial in accordance with the condition to which subjects had been assigned.

After subjects read the introductory information creating the experimental conditions and the descriptive profiles of the employees and subfunctions, they performed the simulation at a computer terminal. After

subjects demonstrated that they understood how to use the computer keyboard, the experimenter left the room. Subjects received information about the weekly production orders, the roster of available employees, and feedback on the organization's level of productivity on the computer screen. During the experiment, a timer emitted an audible beep every 5 min. Subjects were informed that the timer was provided to help them pace their progress rather than to time their decision making.

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 preset level.

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 keyboard. The first assessment was conducted after the 6th trial so that subjects would have some experience with the simulation before being asked to judge their perceived efficacy and to set goals for themselves.

Mediating Self-Regulatory 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 that they could get the group they were managing to perform at each level of productivity described. The ratings were made in terms of a 10-point scale ranging from *no confidence at all*, to intermediate levels of confidence, to *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 trials. They selected their personal goal from nine levels of possible organizational attainments, ranging from 40% *below* to 30% *above the preset level*, and a 10th option of *no particular goal*.

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. The number of systematic tests that subjects carried out to determine how production allocations and motivational arrangements affected the performance of individual employees provided the measure of analytic strategy. The strategy score was the sum of the decisions across a block of trials in which subjects changed only a single factor (i.e., job allocation, goal level, instructive feedback, or social reward) for individual employees. 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. Five systematic tests, one for each employee, could be made in each trial. Therefore, a subject's analytic strategy score across a block of six trials could range from 0 to 30.

Another aspect of decision making is the subject's sheer level of decision activity, represented by the total number of factors changed for all employees in each trial without consideration of confounding variations. This is a quantity of decision-making activity, whereas systematic analytic strategy is a quality measure.

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 selections of motivational factors (Wood & Bailey, 1985).

The fewer the production hours, the better the managerial decision making by the subject. Levels of organizational performance attained by subjects are reported as percentages of the preset level, with a higher score indicating better performance. Organizational performance scores were averaged across three blocks of six trials each.

Results

Effects of Perceived Controllability and Performance Standards on Self-Regulatory Factors

The effects of the controllability set and performance standards on self-regulatory factors were analyzed by a $2 \times 3 \times 3$ analysis of variance (ANOVA) with controllability and standards as between-subjects variables and assessment phase as a repeated measures variable. Before performing univariate ANOVAs, a multivariate analysis of variance was computed as an overall test of significance. The multivariate analysis yielded significant main effects for performance standards, $F(4, 53) = 3.63, p < .05$, and trial blocks, $F(8, 218) = 7.39, p < .01$, and for the interaction between controllability set and trial blocks, $F(8, 218) = 2.08, p < .05$. There were no sex differences on any of the measures. Univariate ANOVAs were then performed on each of the self-regulatory factors.

Perceived self-efficacy. Figure 1 presents the mean strength of perceived managerial self-efficacy after each of the three trial blocks. The findings show that viewing organizations as controllable heightens perceived managerial self-efficacy, $F(1, 56) = 5.88, p < .02$. However, the strength of subjects' perceived self-efficacy across trial blocks varied as a function of controllability set and stringency of standards, resulting in a marginally significant three-way interaction effect, $F(2, 112) = 2.90, p = .06$. The high-controllability conditions were the major sources of this interaction.

A separate 2×3 ANOVA of the self-efficacy scores for subjects in the high-controllability conditions revealed a significant Trial \times Standards interaction, $F(2, 56) = 3.36, p < .05$. Subjects who had been assigned a readily attainable performance standard displayed a rising level of managerial self-efficacy, whereas those assigned a standard that is difficult to fulfill showed a weakening of perceived managerial efficacy the longer they performed the task.

Subjects who were led to believe that organizations are hard to control exhibited a low sense of self-efficacy regardless of whether they were performing under easy or difficult performance standards. They differed neither across standards, $F(1, 28) = 0.05, ns$, nor across trial blocks, $F(2, 56) = 0.73, ns$.

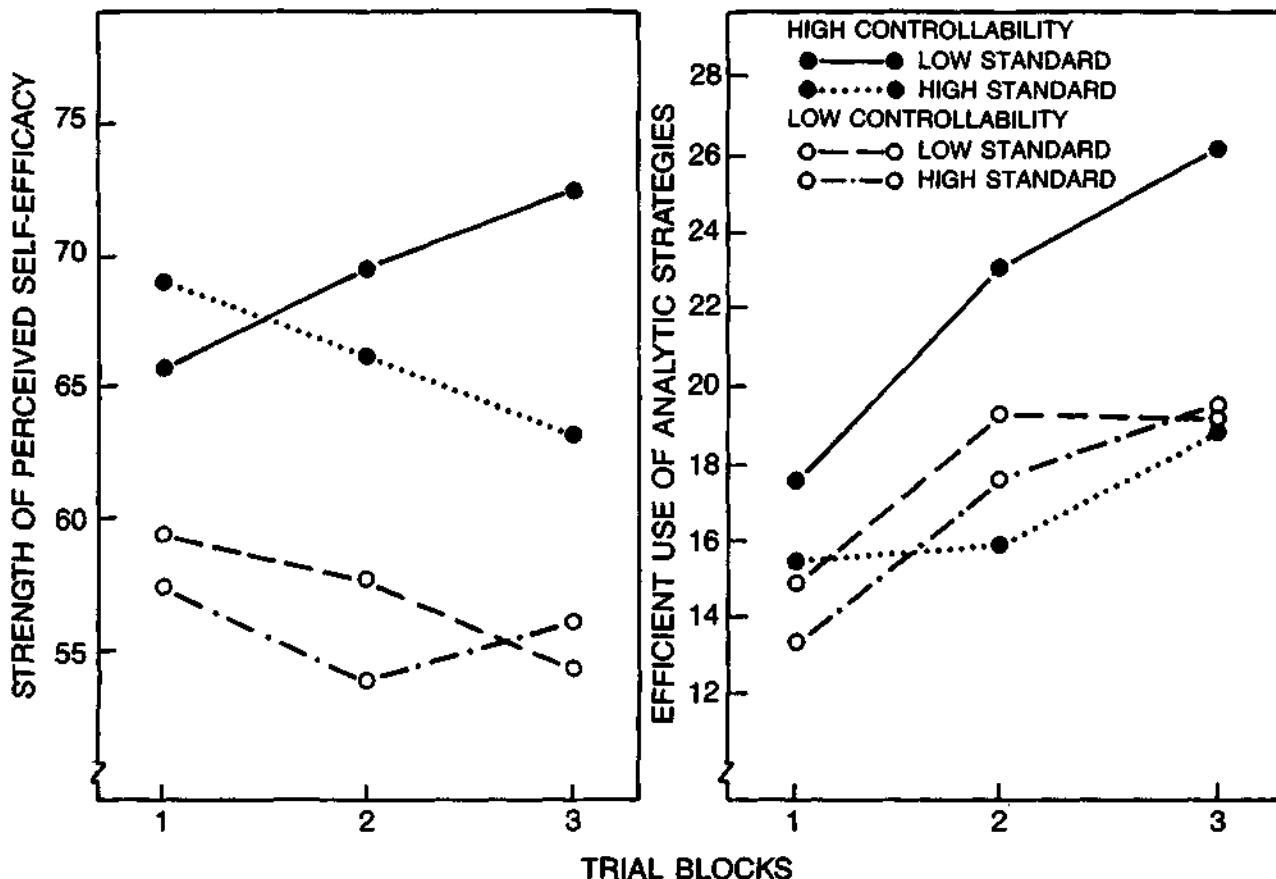


Figure 1. The left panel shows the changes in strength of perceived managerial self-efficacy across trial blocks as a function of controllability set and stringency of performance standards; the right panel shows the changes in effective analytic strategies as influenced by the same variables.

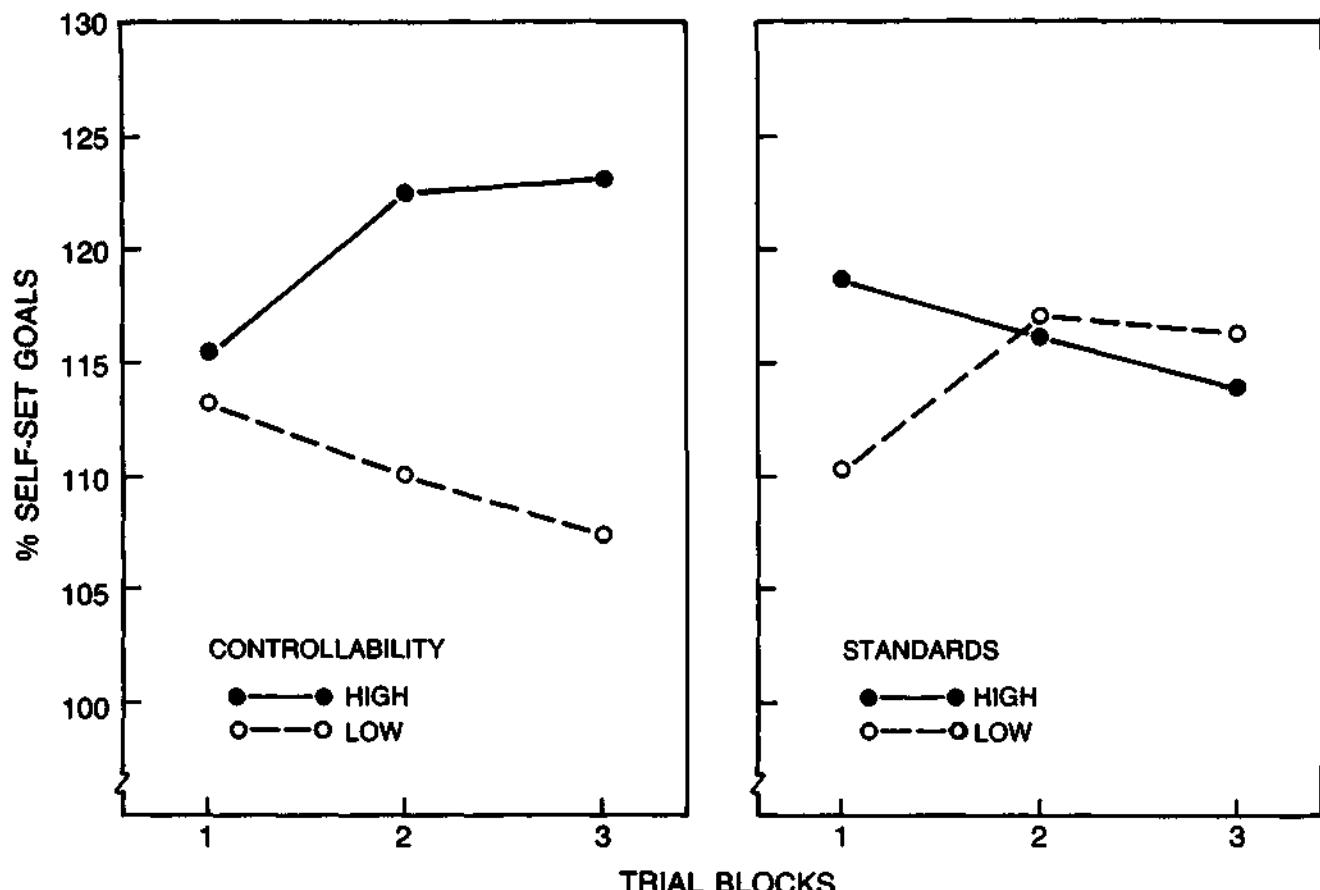


Figure 2. Changes in self-set goals across trial blocks as a function of perceived controllability and stringency of performance standards.

Self-set goals. The subjects' self-set goals for the organization were also affected by the controllability set. They adopted more challenging goals when organizations were regarded as controllable than when they were viewed as difficult to control, $F(1, 56) = 6.21, p < .02$. The difference in level of self-set goals became more pronounced as the simulation progressed, producing a significant Trial Blocks \times Controllability interaction, $F(2, 112) = 6.06, p < .01$, as shown graphically in Figure 2.

There was also a significant Trial Blocks \times Standards interaction, $F(2, 112) = 4.17, p < .02$, as can be seen in Figure 2. Subjects who were assigned a stringent performance standard set higher organizational goals initially than their counterparts in the low-standard condition, $t(28) = 2.00, p < .05$. However, the groups set comparable goals on subsequent trial blocks.

Analytic Strategies

Figure 1 presents the degree to which subjects were systematic in their use of analytic strategies in testing the effects of job allocations and motivational factors. Level of performance standards had a highly significant effect on how subjects went about testing the various options, $F(1, 56) = 6.59, p < .02$. Those who had been assigned readily achievable standards of productivity were more efficient in testing the performance

effects of their managerial decisions than those assigned a taxing standard. The results of the analysis also reveal a marginally significant triple interaction between controllability set, standards, and trial blocks, $F(2, 112) = 2.89, p = .06$. Post hoc comparisons showed that the source of the interaction effect was the increasingly better analytic activity by subjects assigned the achievable standard under a controllability set relative to subjects in the other three conditions in the first, $F(1, 56) = 4.45, p < .05$; second, $F(1, 56) = 8.66, p < .01$; and third, $F(1, 56) = 13.01, p < .001$, trial blocks.

The sheer amount of decisional activity varied as a function of both standards and controllability set. Subjects who were led to believe that organizations are difficult to influence altered more factors, $F(1, 56) = 5.41, p < .025$, as did those assigned a taxing standard, $F(1, 56) = 4.93, p < .04$.

Organizational Performance

The mean organizational performance that subjects achieved was strongly affected by the induced cognitive set regarding the controllability of organizations, $F(1, 56) = 5.43, p < .025$. Subjects who executed their managerial function with the set that organizations are influenceable achieved much higher levels of group performance than those who were led to believe that or-

ganizations are difficult to change. These differences in attained organizational performance became progressively more pronounced the longer the subjects continued the managerial activity. This is reflected in the significant two-way interaction between trial blocks and controllability set, $F(2, 112) = 3.81, p < .03$, as shown in Figure 3.

Path Analysis

The causal ordering of factors was tested by using path analyses. The direction of causality in the path model is established by theoretical considerations supported by previous research and temporal sequencing of variables (A. Bandura, in press; Wood & Bandura, 1989). In this causal model, prior performance influences perceived self-efficacy, personal goal setting, and subsequent performance. Prior performance was included as the first factor in the analyses as a proxy for a host of possible determinants other than the self-regulatory influences examined in this study. Because performance attainments and self-regulatory factors involve bidirectionality of influence (A. Bandura, 1986), past performance includes the variance contributed by these self-reactive influences. Therefore, to avoid over-correction, the past performance scores were adjusted in the second trial block for prior self-regulatory influences in the manner described fully elsewhere (Wood & Bandura, 1989).

Perceived self-efficacy was entered into the equation as a second predictor because beliefs about one's capabilities influence the goals people set for themselves and how proficiently they use analytic strategies. Perceived self-efficacy also contributes independently to performance. Personal goals were expected to affect subsequent performance directly and indirectly through their influence on analytic strategies. The full set of structural equations representing the hypothesized causal relations were analyzed separately for Trial Blocks 2 and 3.

The standardized path coefficients that are significant beyond the .05 level are shown in Figure 4. In the second block of trials, prior performance influenced self-set goals and subsequent performance both directly and indirectly through the mediating effects of perceived managerial self-efficacy. Perceived self-efficacy, in turn, affected organizational performance by means of analytic strategies. Paths of influence were also found in this block of trials between perceived self-efficacy and personal goal setting, .23(.40), and between personal goals and performance, .15(.47), but these relationships were significant at the $p < .10$ level and, therefore, were not included in the path diagram.

The structure of the significant causal relations is essentially replicated in the third block of trials, except that prior performance makes a weaker contribution and perceived managerial efficacy plays a larger causal role in organizational performance attainments. Perceived self-efficacy affects subsequent performance attainments both directly and indirectly through its substantial effect on personal goal challenges. Personal goals influence performance attainments directly and indirectly by means of analytic strategies that, in turn, have a significant impact on performance. The path of influence between perceived self-efficacy and analytic strategies, .17(.39), was significant at the $p < .10$ level. The combined set of explanatory variables in the conceptual model accounts for a major share of the variance in organizational attainments in both the second ($R^2 = .66, p < .001$) and third ($R^2 = .77, p < .001$) blocks of trials.

Discussion

The overall results of this study lend support to the major hypotheses that self-regulatory factors mediating performance attainments are significantly affected by stringency of standards and perceived controllability of organizational accomplishments. Viewing an organization as controllable increases perceived self-efficacy to manage it, whereas regarding it as relatively uninfluencable undermines self-beliefs of managerial efficacy.

An especially striking finding is the debilitating effects of assumed uncontrollability on self-efficacy even when the prevailing standards are within easy reach, thus permitting a high rate of organizational goal attainment. Approaching a collective endeavor as relatively uninfluencable instills a sense of personal inability to effect change that, in turn, makes group accomplishments difficult to realize. Litt (1988) similarly found, in a study of pain reduction, that a low sense of efficacy sponsors poor performance under conditions that in actuality are favorable to the exercise of personal control.

Whereas a sense of uncontrollability is personally and socially handicapping, viewing an organizational environment as personally influenceable fosters productive action. Indeed, the

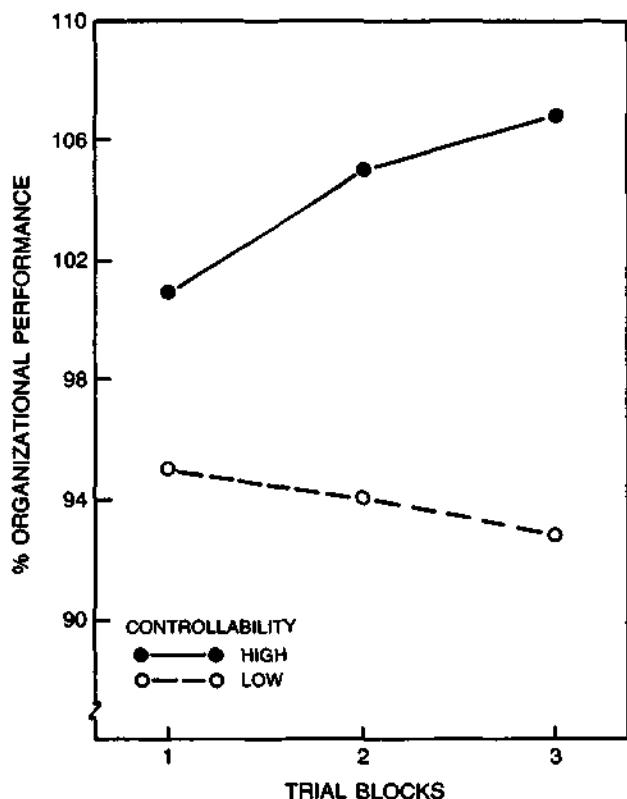


Figure 3. Level of organizational performance achieved across trial blocks by subjects who managed the simulated organization under the cognitive set that organizations are controllable or that they permit only limited control.

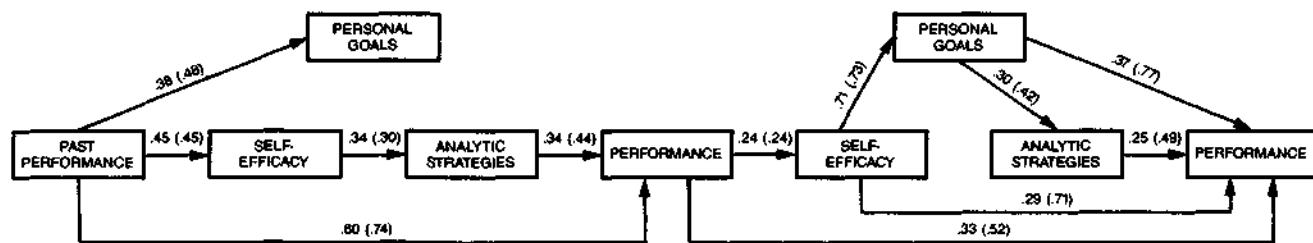


Figure 4. Path analysis for the second and third trial blocks. (The initial numbers on the paths of influence are the significant standardized path coefficients ($p < .05$); the numbers in parentheses are the zero-order correlations. The network of relations on the left half of the figure are for the second trial block, and those on the right half are for the third trial block.)

combination of perceived controllability and attainable standards set in motion a cycle in which belief in one's efficacy to influence group effort and resultant efficacious actions enhance each other. Moreover, the view that one can change the level of organizational functioning promotes resiliency of self-efficacy in the face of recurrent difficulties. Thus, subjects assigned performance standards that they could rarely fulfill showed some understandable weakening of perceived managerial efficacy over time. Nevertheless, even after extensive failures, they maintained a stronger sense of efficacy than their counterparts who managed the organization under readily attainable standards but with the view that there are severe limits on how much one can change organizational functioning.

Resiliency of self-efficacy has considerable functional value. This is because major accomplishments are rarely achieved through quick successes (White, 1982). They are realized by a self-efficacious orientation that sustains perseverance in the face of failures and setbacks, fosters a task-diagnostic focus for learning from one's mistakes, and predisposes construal of obstacles as challenges rather than as reflections of personal deficiencies (A. Bandura, in press; M. M. Bandura & Dweck, 1988). To abort one's efforts prematurely or to undermine them by self-inefficacious thinking precludes significant personal accomplishments. The findings of the present study extend the generality of the resiliency effects by showing that a resilient belief in one's ability to mobilize the efforts of others in a joint endeavor promotes organizational attainments, as well as individual accomplishments.

The conditions created by a sense of controllability were also conducive to challenging personal goal setting. Subjects began with equally high ambitions. However, as they continued the managerial task, those who viewed organizations as influenceable set themselves rising goals, whereas those who regarded organizations as difficult to change continued to lower their sights. However, it is difficult for people who take pride in achievement to forsake high pursuits. Although the subjects with a noncontrollability orientation adopted diminishing goals for their organization, at any given point they still set their goals somewhat above their prior accomplishments. The self-set goals of those with a controllability orientation also exceeded their attainments. Because goals are good self-motivators (A. Bandura & Cervone, 1986; Locke & Latham, 1984; Mento et al., 1987), self-set challenges can enhance accomplishments provided they are not completely beyond reach.

Theories of motivation through goal systems are generally founded on a negative feedback control system. In social cognitive theory (A. Bandura, in press), human self-motivation through goals relies on *discrepancy production*, as well as on *discrepancy reduction*. People initially motivate themselves through proactive control by adopting performance standards that create a state of disequilibrium and then mobilizing their effort on the basis of anticipatory estimation of what would be required to succeed. Feedback control comes into play in subsequent adjustments of effort expenditure to achieve desired results. Self-motivation thus involves a dual cyclic process of dis-equilibrating discrepancy production followed by equilibrating discrepancy reduction. Perceived self-efficacy not only heightens motivation in response to substandard performances but also reduces vulnerability to stress and depression (A. Bandura, 1988a; A. Bandura & Abrams, 1986; Kanfer & Zeiss, 1983). In this study, the high perceived self-efficacy of subjects with a controllability orientation enabled them to withstand chronically unfulfilled assigned challenges without falling victim to self-demoralization.

It is often believed that overestimation of personal control produces fruitless effort and other dysfunctions (Janoff-Bulman & Brickman, 1982). Certainly, gross miscalculations can get one into trouble. But optimistic self-appraisals of capability that are not unduly disparate from what is possible can be a practical advantage rather than a cognitive failing to be remedied. Studies of vulnerability to anxiety arousal and depression suggest that it is the so-called normals who tend to overestimate their capabilities to exercise influence over environmental events (Alloy & Abramson, 1979; Alloy, Abramson, & Viscusi, 1981; Glasgow & Arkowitz, 1975; Lewinsohn, Mischel, Chaplin, & Barton, 1980). Hopefulness is more conducive to efficacious action than is focus on personal limitations to effect change. Overoptimism leads to fruitless effort on tasks in which quality of performance can have little or no effect on outcomes. For the vast majority of tasks, however, the strategic deployment of effort and attention enhances performance. Even when success is very hard to come by, as in the high-standard condition of this experiment, strong belief in controllability promotes accomplishments by its positive effect on self-efficacy beliefs, self-set goals, and analytic thinking.

Having to learn rules in dynamic environments from the results of action alone is difficult. This is true for individual behavior and even more so at the level of collective behavior

(Brehmer, 1980; Klayman, 1984). In the present study, we found that subjects were better able to maintain strategically effective thinking under achievable standards than under taxing ones. The press for large performance gains led subjects to change many things at once, which only hindered efforts to discover how best to enlist the talents of different members in the group endeavor. The combination of reachable assigned standards and a cognitive set that one can exercise some influence over organizational functioning was most conducive to systematic analytic thinking.

Results of the path analyses corroborate the influential role played by self-regulatory factors in the postulated causal model. In the earlier block of trials, performance affected perceived self-efficacy, which, in turn, influenced subsequent organizational attainments through its impact on effective analytic activity. Prior performance affected personal goals, as did perceived self-efficacy, although at a marginal level of significance. Personal goals were marginally related to subsequent performance.

As subjects gained further experience at managing the simulated organization, the influence of prior performance diminished substantially, whereas self-regulatory factors exerted an increased impact on subsequent organizational accomplishments. Perceived self-efficacy influenced performance both directly and through its strong effect on personal goal setting. Personal goals, in turn, enhanced organizational attainments directly and by means of the mediation of analytic strategies. These factors operating in concert accounted for a major share of the variance in organizational attainment. These findings are all the more significant because the self-regulatory factors were antecedent in time to the organizational attainments, thus removing any ambiguity concerning the direction of causality. Moreover, the factors have been shown to carry essentially similar explanatory power in previous path analyses of the determinants of organizational functioning (Wood & Bandura, 1989).

The path analyses also underscore the importance of a multi-trial methodology for gauging how heavily self-regulatory factors contribute to performance in dynamic environments. When initially faced with the task of managing a complex unfamiliar environment, subjects gave significant weight to performance information in judging their efficacy and setting their goals. However, after they began to form a self-schema concerning their efficacy through further experience, the performance system was powered more extensively and intricately by self-conceptions of efficacy. This elaborated causal structure fits more closely the theoretical model than does the initial pattern of determinants.

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Representational Guidance of Action Production in Observational Learning: A Causal Analysis

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ABSTRACT. This experiment tested the hypothesis that the number of model presentations and verbal coding of modeled actions affect reproduction accuracy through their effect on cognitive representation. Subjects viewed a complex action pattern either two or eight times with or without verbal coding to highlight the dynamic structure of the component actions and their temporal sequencing. They then received, in order, a recognition test and a pictorial rearrangement test to assess the accuracy of their cognitive representations of the modeled actions. Subsequently, all subjects were tested for their ability to reproduce the action pattern from memory. Results showed that increased exposure to modeled actions enhanced the accuracy of both the cognitive representation and the behavioral reproduction. Verbal coding also increased cognitive and reproduction accuracy, but only when combined with multiple opportunities to observe the modeled actions. A causal analysis confirmed that the effects of multiple exposures and verbal coding were entirely mediated by changes produced in the accuracy of cognitive representation.

OBSERVATION OF SKILLED ACTIONS provides an effective means of accelerating their acquisition. Although the power of observational learning has been amply documented (Gould & Roberts, 1982), the reported studies, for the most part, have not been programmatic or adequately guided by theory. Moreover, they have suffered from a methodological problem in that the level of observational learning has been inferred solely from performance of the modeled actions (Newell, Morris, & Scully, 1985). People do not always enact everything they learn. Without independent measures of cognitive representations of modeled actions, it is difficult to determine how much learning has

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occurred through observation and how cognition guides skilled enactment (Adams, 1987)

According to the social cognitive theory of observational learning (Bandura, 1986) that has guided our own research, acquisition of modeled patterns of behavior is governed by four constituent processes. Information conveyed by modeled performances about the dynamic structure of action patterns is extracted through selective attention to spatial and temporal features and is transformed into a cognitive representation by symbolic coding and cognitive rehearsal. The cognitive representation both guides the production of skilled action and provides a standard against which to make corrective adjustments in performance.

In addition to attentional and representational processes that determine acquisition and retention of cognitive representations, a conception matching process governs the translation of representations into action. Monitored performance provides the necessary information for detecting and correcting mismatches between conception and action. And finally, motivational processes facilitate acquisition of cognitive representations through their effect on attentional and retentional processes and regulate performance by motivating observers to execute what they have learned observationally.

The proposition of social cognitive theory, that modeled actions are first organized cognitively before being translated into action, has received some empirical support. Previous research has shown that visual monitoring of subjects' attempts to reproduce a sequence of modeled actions consisting of many subcomponents has no beneficial effect until a cognitive representation, assessed independently, has achieved more than rudimentary development (Carroll & Bandura, 1982, 1985, 1987). Correlational analyses have further shown that the better the cognitive representation the more accurate are the subsequent reproductions of action patterns (Carroll & Bandura, 1985).

The preceding studies were primarily designed to investigate the relationship between development of cognitive representations and self-monitoring of one's enactments. All subjects, therefore, alternated between observing the modeled actions and performing them, prior to being tested for their ability to reproduce the actions from memory. Consequently, one cannot separate the effects of exposure to the modeled actions on reproduction accuracy and development of cognitive representations from the possible contributory effects of performance elements.

The present experiment was designed to examine the role of representational guidance in observational learning by inducing differential levels of cognitive representation without any intervening behavioral enactments. Cognitive representation was measured before subjects were tested for their ability to reproduce the modeled actions and was manipulated by varying the number of presentations of the modeled actions. Multiple exposures provide observers with opportunities to discern the structure of the modeled actions, to organize and verify

what they know, and to give special attention to problematic aspects in subsequent exposures. Under limited exposure, observers are much less likely to acquire knowledge of all the crucial features of the modeled actions.

A second way of manipulating cognitive representation was by verbal coding of the modeled actions as they were being exhibited. When people simply observe entire performances, they often fail to grasp crucial details that may vary in salience, discriminability, and complexity. Verbal coding that depicts in words what is being modeled behaviorally helps to channel observers' attention to essential features of modeled actions and makes them more recognizable (Bandura, 1986; Sheffield & Macoby, 1961). Additionally, verbal coding strategies provide subjects with a means of transforming modeled information into easily remembered linguistic codes (Bandura & Jeffery, 1973; Bandura, Jeffery, & Bachica, 1974).

The present experiment used a factorial design in which subjects received either two or eight model presentations of a complex action pattern. Within each of these exposure conditions, subjects observed the modeled actions either with or without concurrent verbal coding that described each of the action components and how to execute the transitional movements between them. Following the exposure trials, the accuracy of subjects' cognitive representation of the modeled activity was measured. In the final phase of the experiment, subjects reproduced the modeled action pattern from memory. It was predicted that the conditions combining multiple model presentations with verbal coding would produce the highest level of cognitive representation and that minimal modeling without the benefit of verbal coding would be least effective in this regard. It was further hypothesized that increased accuracy of cognitive representation would be accompanied by an increased level of behavioral production of the modeled action pattern.

A second, and theoretically more important, goal of the present study was to provide a stringent test of the mediating role of representational guidance of action production in observational learning. It was hypothesized that both the effect of multiple model presentations and verbal coding on accuracy of reproducing the modeled action pattern would be mediated by changes in cognitive representation. Validation of this causal model requires supporting evidence for several forms of linkage between inducing conditions, cognitive representation, and action (Judd & Kenny, 1981). First, it must be shown that multiple model presentations and verbal coding affect reproduction accuracy. Without this evidence, it would be pointless to investigate the mediating role of cognitive representation. Second, it is necessary to show that the treatment conditions affect the cognitive representation. Third, there must be an effect of cognitive representation on reproduction accuracy when the effect of the treatment variables is statistically controlled. Finally, it is necessary to show that the effect of multiple model presentations and verbal coding on reproduction ac-

curacy is eliminated when cognitive representation is statistically controlled. Support for this last effect, if the other effects are also corroborated, provides the most stringent test of the validity of the causal contribution of cognitive representation to action. Evidence of complete mediation of the treatment effects would establish cognitive representation as not only a necessary, but a sufficient factor in the causal chain.

Method

Subjects

Twenty-eight male and 28 female right-handed undergraduates, enrolled in introductory psychology classes, were randomly assigned in equal numbers to the four experimental conditions. The subjects were fulfilling a requirement for research participation.

Modeling Stimuli and Apparatus

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

Each subject watched a video monitor showing a male model performing a complex action pattern containing nine different response components that 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 presented 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, whereas 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 video monitor (48.26 cm) was used to play back the action pattern. The camera angles for recording the models' and subjects' subsequent performance 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. When subjects were not

observing the demonstration or being tested for their ability to reproduce the modeled actions, a neutral gray, imageless raster appeared on the monitor.

Experimental Conditions

Subjects were seated before the 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 when the test for reproducing it was administered. Subjects were informed by a male experimenter that the study dealt with the learning of movement patterns. He also instructed them to watch the video monitor at all times.

All subjects observed the same sequence of modeled actions, but half of the subjects observed the actions twice whereas the remainder observed them eight times. Within each of these exposure conditions, half of the subjects received concurrent verbal coding that had been recorded on the audio track of the videocassette used to present the modeled action pattern. The remaining subjects viewed the action pattern without verbal coding. The interval between model presentations was kept constant at 10 s.

The verbal coding described for each of the component actions the movement of the paddle as well as that of the wrist, arm, and shoulder. Pilot research indicated that presenting movement information using kinesiological terminology such as flexion and extension, was not effective. Consequently, the verbal information was given in a simplified form, for example "Without changing the angle of the paddle face, move it forward and down."

After subjects had completed viewing the scheduled number of demonstrations, they received a recognition test of their knowledge of the correct component responses and a pictorial-arrangement test of their knowledge of the correct sequence of component responses. Upon completion of these two tests that assessed the accuracy of cognitive representation of the modeled actions, all subjects were instructed to pick up the paddle and to reproduce the demonstration as accurately as possible. Because previous research has shown that subjects perform the action pattern used in the present study more accurately if allowed to visually monitor their actions (Carroll & Bandura, 1982, 1985, 1987), subjects were able to see their actions on the video monitor as they performed them.

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. Subjects recorded their choice of correct components by writing the alphabetic letter printed next to each photograph. Ten seconds were allowed for each of these choices. The accuracy of cognitive representation was scored by awarding 1 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 order was 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 2 min to complete this task. The accuracy of cognitive representation was scored by awarding 1 point for any two response components correctly sequenced. The maximum score was 8.

Following the tests for cognitive representation and after being told they would no longer see the modeled action pattern, all subjects were tested for reproduction accuracy.

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 2 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, or 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.

Reproductions of a sample of pilot subjects ($n = 16$) 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 were being scored. The same judges then independently rated the performance 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 interrater reliability was $r = .91$.

The mean ratings of the two judges were used for all subsequent analyses involving reproduction accuracy.

Results

The effects of number of model presentations (two or eight) and verbal coding (with or without) were analyzed by a 2×2 factorial ANOVA. 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. Since the gender factor did not approach significance on any of the three response measures, the data were pooled for subsequent analyses.

The multivariate analysis (MANOVA) yielded significant main effects for number of model presentations, $F(3, 50) = 41.84, p < .0001$, for verbal coding, $F(3, 50) = 5.54, p < .005$, and for the interaction between number of model presentations and verbal coding, $F(3, 50) = 2.87, p < .05$. Univariate ANOVAs were then performed on each of the dependent variables.

Reproduction Accuracy

As the right panel of Figure 1 shows, eight model presentations produced higher reproduction accuracy than did two, $F(1, 52) = 49.36, p < .0001$. Although the main effect of verbal coding did not approach significance, the interaction between number of model presentations and verbal coding was significant, $F(1, 52) = 6.22, p < .025$. Analysis of the simple effects of this interaction indicated that subjects did not profit from verbal coding of two model presentations, $F(1, 52) = 1.81, ns$, but they did when they had the benefit of eight exposures to the modeled actions, $F(1, 52) = 4.75, p < .05$.

Cognitive Representation

On the recognition test, subjects who had been exposed to the modeled pattern eight times were significantly more accurate at distinguishing correct response components from incorrect ones, $F(1, 52) = 43.15, p < .0001$. Neither verbal coding nor its interaction with number of model presentations approached significance.

On the pictorial-arrangement test, subjects who had received eight presentations were significantly better at sequencing the depicted response components than those who saw the modeled actions only twice, $F(1, 52) = 44.55, p < .0001$. Provision of verbal coding also enhanced the accuracy of the cognitive representation, as measured by the pictorial-arrangement test, $F(1, 52) = 6.53, p < .025$. Finally, the interaction between number of model presentations and verbal coding was also found to be significant, $F(1, 52) = 4.95, p < .05$. Analysis of the simple effects revealed that subjects who had eight

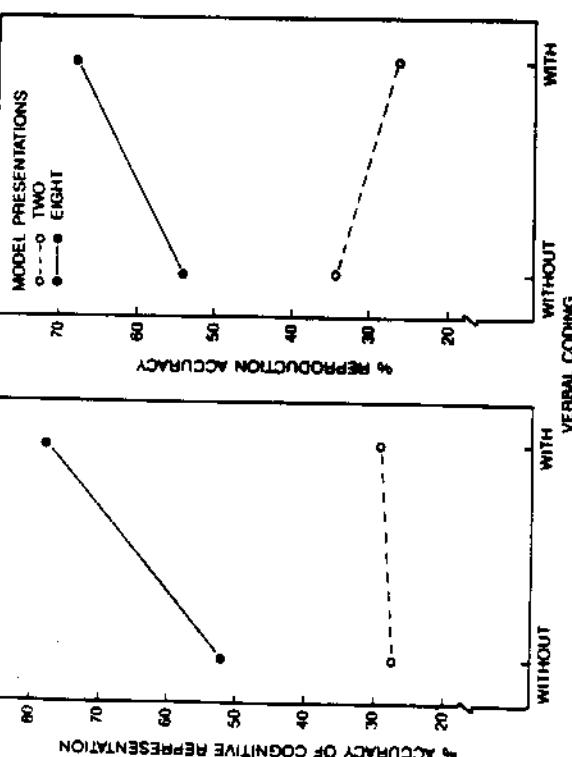


Figure 1. Percent accuracy of cognitive representation and reproduction as a function of number of model presentations and verbal coding.

model presentations with verbal coding sequenced the action components more accurately than those who had the multiple exposures without having the modeled actions verbally coded, $F(1, 52) = 11.42$, $p < .005$. In contrast, verbal coding had no effect on those who had only two model presentations.

As a comparison of the left and right panels of Figure 1 reveals, the interaction between number of model presentations and verbal coding produced highly similar effects on the pictorial-arrangement measure of cognitive representation and on reproduction accuracy.

Examination of the zero-order correlations between response measures showed that representational accuracy as measured by the recognition test, $r = .47$, $p < .005$, or the pictorial-arrangement test, $r = .73$, $p = .001$, was significantly correlated with ability to reproduce the modeled actions. The two measures of cognitive representation were also positively related, $r = .38$, $p < .005$.

Evaluation of the Causal Model

To test the causal model, that the effect of model presentations and verbal coding on reproduction accuracy is mediated by cognitive representation, procedures described earlier were applied to the data. First, as has been reported, the univariate ANOVAs indicate that the main effect of number of model presentations and its interaction with verbal coding significantly affect both accuracy of the pictorial-arrangement measure of cognitive representation and accuracy of re-

producing the modeled actions. Using orthogonally coded vectors to represent the main effects and interaction (Pedhazur, 1982), each of the response measures were regressed on the treatment variables. The standardized beta weights or path coefficients for the effect of number of model presentations and its interaction with verbal coding on the pictorial-arrangement measure of cognitive representation are, in order $b = .68$, $p < .0001$, and $b = -.20$, $p < .05$. The effect of the same variables on reproduction accuracy yielded the following standardized beta weights, $b = .68$, $p < .0001$, and $b = .24$, $p < .025$. Although number of model presentations had a significant effect on the recognition measure, $b = .67$, $p < .0001$, the beta weight for the interaction between coding and number of model presentations did not approach significance, $b = -.05$.

Second, reproduction scores were regressed on the measures of cognitive representation, after the coded vectors representing treatment effects were first entered in the multiple-regression equation. Testing the significance of the increment in explained variance due to the measures of cognitive representation indicated that the latter had a significant effect on reproduction accuracy, $F(2, 50) = 17.67$, $p < .0001$. The standardized beta weights for the recognition and pictorial-arrangement measures are, respectively, $b = .14$, $p = .22$, and $b = .56$, $p < .001$, indicating that only the latter measure has a significant effect on reproduction scores when the treatment effects are controlled. Examination of the standardized beta weights with treatment vectors and the measures of cognitive representation entered in the regression equation indicated that neither number of model presentations, $b = .20$, $p = .20$, coding, $b = .13$, $p = .18$, nor the interaction, $b = .13$, $p = .13$, had a significant effect on the reproduction measure. In examining the variance explained in the above analyses, it was found that when the measures of cognitive representation were not statistically controlled, the main effect of number of model presentations accounted for 46% of the variance in reproduction accuracy, and the interaction between this main effect and verbal coding accounted for 6%. In marked contrast, when the contribution of the cognitive representation was controlled, number of model presentations accounted for only 2%, and the interaction accounted for only 3% of the variance in reproduction accuracy. Even when treatment effects were statistically controlled, cognitive representation explained 13% of the variance in reproduction accuracy.

In sum, the results of these analyses provide strong support for the validity of the causal model, which postulates that effects of number of model presentations and verbal coding on reproduction accuracy are mediated through development of a cognitive representation.¹ The

¹ The same causal analysis, using only the pictorial-arrangement measure of cognitive representation, yielded the same pattern of results as those reported using both measures of cognitive representation.

finding that neither verbal coding nor its interaction with number of model presentations affected the recognition measure of cognitive representation, may have resulted from the failure of verbal coding to capture the more subtle, quantitative features of the movement pattern. Additionally, recognition was tested by presenting the correct components of the movement pattern in a random order rather than in the same order that they appeared in model presentations. Because temporal order appears to be an inherent part of the structure of long sequences of movements (Shaffer, 1980), the use of a random order in the present study may have attenuated the sensitivity of the recognition measure.

Discussion

In accordance with predictions, the findings of the present experiment reveal that multiple exposures to modeled actions increase the accuracy of both the cognitive representation and behavioral production of the actions. Under conditions of multiple exposure, verbal coding that highlighted the structural features of the modeled actions also enhanced the accuracy of both the cognitive representations and behavioral reproductions. Under limited exposure to the modeled actions, however, provision of verbal coding had no significant effect. Correlational analyses yielded a pattern of results that was similar to previous research using the same action pattern and the same measures of cognitive representation and performance (Carroll & Bandura, 1987). The more accurate the cognitive representation, the more accurate were reproductions of the modeled actions.

The proposition, that the effect of number of model presentations and verbal coding on behavioral production is mediated by changes in the accuracy of cognitive representation, was supported by the results of the causal analysis. Even when the contribution of the treatment variables was statistically controlled, cognitive representation still had a pronounced effect on reproduction of the modeled actions. The strongest support for the validity of the causal model, however, comes from the finding that the effect on behavioral production of multiple model exposures and verbal coding disappears when the effect of the cognitive representation is partialled out.

The conclusion, that an accurate cognitive representation is necessary for proficient action, is supported by converging evidence from other lines of research showing that subjects display little or no observational learning even after repeated exposures to the model if opportunities for symbolic coding are blocked (e.g., Bandura & Jeffery, 1973; Bandura et al., 1974).

The size of the effect of verbal coding on reproduction accuracy merits some discussion. The efficacy of verbal coding can be affected by its form, modality, and locus. Observational learning is enhanced by pretraining in reductive verbal codes symbolizing the modeled actions and by elaborative linguistic coding that imposes a meaningful

cognitive structure on movement patterns (Bandura et al., 1974). In the present study, descriptive codes were externally provided in order to standardize the form and duration of coding operation across experimental conditions. Personally generated meaningful codes, however, have greater impact on observational learning than do concrete descriptors of action patterns (Gerst, 1971).

The present study contributes to the growing body of literature that emphasizes the influential role played by cognition in the acquisition and refinement of motor skills (Adams, 1984, 1987; Annett, 1985; Newell et al., 1985). Both verbal coding (Bandura & Jeffery, 1973) and imaginal coding (Gerst, 1971) of movement features have been shown to facilitate reproduction of observationally learned actions. Previous research (Carroll & Bandura, 1987) as well as the present study show that structural features of modeled actions, such as the pattern, magnitude, direction, and sequence of those actions can be cognitively represented. Even such subtle information as the timing requirements of modeled rapid movements has recently been shown to be capable of cognitive representation (Adams, 1986). Further research is needed, however, to determine whether other motor aspects of movement patterns, such as static force and muscle tension, can be symbolically represented (Adams, 1984). To the extent that these features can be portrayed in visual, auditory, or kinesthetic form, they too are amenable to symbolic representation. Persons who are deaf and blind rely on kinesthetic matching of mouth and laryngeal muscular responses of verbalizing models (Young & Hawk, 1955). Laryngographic visual displays of larynx vibrations corresponding to speech patterns are replacing tactial modeling for hearing-impaired persons who have the benefit of sight (Fourcin & Abbott, 1972).

An important issue for future research is the contribution of motor rehearsal to the development of cognitive representations of modeled actions and to reproductive accuracy. Social cognitive theory (Bandura, 1986) has argued that motor rehearsal of modeled actions during learning provides an opportunity to practice transforming cognitive representation into action. Such behavioral enactments serve to refine the more motor aspects of modeled actions as well as to reduce discrepancies in sequence and structure between cognitive representation and performance. Detection and correction of such discrepancies, in turn, depend on the informativeness of the feedback accompanying performance. Motor rehearsals of modeled actions with impoverished feedback leads to markedly flawed performance, as compared to performance with the opportunity to monitor one's actions visually (Carroll & Bandura, 1982, 1985). Monitored enactments, however, have not been found to be effective until the cognitive representation of modeled actions has achieved at least a moderate degree of accuracy (Carroll & Bandura, 1982).

Although research bearing on the issue of motor rehearsal is sparse, motor rehearsals of modeled actions during learning can facilitate their subsequent reproduction when subjects have to create their own sym-

bolic guides to action (Bandura & Jefferay, 1973). There is also evidence that motor rehearsal can enhance cognitive representation as well as increase reproduction accuracy when conditions are not optimal for representational coding (Carroll & Bandura, 1985). Even when experimenter-provided symbolic codes are rehearsed and retained, subsequent performance is sometimes flawed because subjects are unable to accurately translate cognitive representation into action (Bandura & Jefferay, 1973). Similar findings have been reported using assembly tasks which varied in complexity. Symbolic coding of the modeled constructions facilitated their later reproduction. On the more intricate task, symbolic coding followed by motor rehearsal was found to result in the highest level of reproduction accuracy, whereas motor rehearsal alone produced the lowest level (Jefferay, 1976). Since cognitive representation was not measured, however, it remains an open question whether the effect of motor rehearsal on subsequent reproduction accuracy was mediated by cognitive representation.

Conclusive evidence bearing on the role of motor rehearsal in observational learning will require both independent assessment of cognitive representation and a comparison of observational learning with and without the opportunity for behavioral enactments during the acquisition phase. The time at which enactments are introduced during the acquisition phase may determine whether they affect representation processes. Enactments before one has at least some notion of the structure of modeled actions will produce only faulty performances. Flawed enactments are not only uninformative, but may be misleading. After a number of structural features have been cognitively represented, however, attempts to reproduce the behavior help to identify the insufficiently articulated aspects of the representation. To the extent that this heightens and channels attentiveness to the problematic aspects in subsequent modeling, it can help to refine cognitive representation of the activity.

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The Impact of Conceptions of Ability on Self-Regulatory Factors and Motor Skill Acquisition

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This study tested the hypothesis that conceptions of ability affect self-regulatory processes and the acquisition rate of a perceptual-motor skill. Subjects performed a rotary pursuit task under induced cognitive sets that task performance reflected inherent aptitude or acquirable skill. Their perceived self-efficacy, affective self-reactions, and performance attainments were measured over a series of trials. Subjects who performed the task under the inherent-aptitude conception of ability displayed no growth in perceived self-efficacy across phases, negative self-reactions to performances, low interest in the activity, and a limited level of skill development. In contrast, those who performed the task under the conception of ability as an acquirable skill displayed growth in perceived self-efficacy, positive self-reactions to their performances, widespread interest in the activity, and a high level of skill acquisition. The stronger the positive self-reactions, the greater the subsequent performance attainments.

In analyses of athletic skill development and performance, much attention has been given to physical factors such as ability level, conditioning, and practice effects. Recent years have witnessed a growing recognition of the influential role played by cognitive and self-referent influences in the rate of motor skill acquisition and the quality of athletic performance (Anderson, 1983; Fitts & Posner, 1967; Mahoney, 1979; Welford, 1988; Wilkes & Summers, 1984). These cognitive factors include such diverse processes as cognitive representations of the structural properties of motor skills (Carroll & Bandura, 1987, 1990), mental rehearsal (Feltz & Landers, 1983; Woolfolk, Murphy, Gottesfeld, & Aitken, 1985), mental imagery (Epstein, 1980), cognitive style strategies (Saintsing, Richman, & Bergey, 1988; Silva & Applebaum, 1989), and cognitive strategies normally grouped under the term *psyching-up* (Caudill, Weinberg, & Jackson, 1983; Shelton & Mahoney, 1978).

Preexisting belief systems can affect self-regulatory factors that govern the development and execution of complex skills. One such belief system is the way in which people construe ability. Recent research has identified two major conceptions of ability (M. Bandura & Dweck, 1987; Dweck & Elliott, 1983; Nicholls, 1984). Some people regard ability as an acquirable skill that can be increased by gaining knowledge and perfecting competencies. They adopt a functional learning goal, which is ideally suited for skill development. They seek challenges that provide opportunities to expand their knowledge and competencies. They regard errors as a natural part of the skill-acquisition process. They

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learn from mistakes. They judge their capabilities more in terms of personal improvement than by comparison with the achievement of others. For people who view ability as a more or less fixed inherent aptitude, performance level is regarded as diagnostic of inherent capacities. Errors and deficient performances carry a high evaluative threat. Therefore, they prefer tasks that minimize errors and permit a ready display of proficiency at the expense of expanding their competencies. High effort is also threatening because it presumably can reveal low ability. They judge their ability extensively by social comparison so that the successes of others belittle their own ability. These findings contradict attribution theory, which typically regards ability as an internal, stable factor. The results of other studies have also called into question the generality of the notion in attribution theory of inverse compensation in judging ability (Surber, 1984). People who construe ability as a changeable attribute view effort as creating ability rather than compensating for low ability.

Research on the acquisition of complex decision-making skills has attested to the powerful impact of differential conceptions of ability on psychosocial functioning (Wood & Bandura, 1989a). Individuals who were led to believe that performance on the cognitive task reflected their basic cognitive aptitude experienced increasing self-doubts concerning their personal efficacy as they encountered difficulty. They became more erratic in their analytic thinking, they lowered the performance goals they set for themselves, and their performance plummeted. In contrast, individuals who were led to believe that performance on the task reflected an acquirable skill displayed a highly resilient sense of personal efficacy. Under this belief system, the performers remained steadfast in their perceived self-efficacy even when performance standards were difficult to fulfil. They continued to set challenging goals for themselves, they used analytic strategies in efficient ways, and they achieved high performance attainments. Conceptions of ability biased from the outset whether substandard performances were construed as indicants of inherent deficiencies or as instructive guides for improving capabilities.

The present experiment was designed to test the generality of the influence of conceptions of ability in a markedly different domain of functioning, namely, the development of perceptual-motor skills. The issue of inherent talent versus an acquirable skill frequently arises in the judgment of athletic capabilities. Sports commentators are quick to ascribe the distinguished performances of prominent athletes to their "natural talents" as if athletic skills come preset by biological inheritance. For example, sportscasters frequently comment on the so-called natural batting swing of a leading baseball hitter but fail to recognize the countless hours spent perfecting that swing. During the off season, this player practices hitting about 500 pitches, day in and day out, to master any weaknesses. Athletic attainments are obviously partly dependent on physical endowment, but intricate athletic skills are not inborn; they must be developed by intensive training fostered by facilitative and supportive belief systems. In this study we investigated the contribution of conceptions of ability to the rate and level of acquisition of a perceptual-motor skill.

The findings of the prior study revealed that the effects of conceptions of ability on performances are mediated through self-regulatory mechanisms (Wood & Bandura, 1989a). These include perceived self-efficacy, personal goal setting,

and analytic strategies. In path analyses, perceived self-efficacy influenced performance directly and indirectly through its strong effects on personal goal setting and effective use of analytic strategies. Further research has shown that affective self-reactions also operate in conjunction with these self-regulatory factors in the causal structure, especially during earlier phases of cognitive skill acquisition (A. Bandura & Jourden, 1991). Negative self-reactions detract from effective performance.

There is reason to believe that the same self-regulatory mechanisms would mediate the effects of conceptions of ability on acquisition of perceptual-motor skills. Perceived self-efficacy has been shown to affect thought processes, the amount of effort expended in an endeavor, level of perseverance in the face of obstacles, affective reactions to stressors, and choice of challenges (A. Bandura, 1989). A high sense of efficacy also fosters interest in the activity (A. Bandura & Schunk, 1981).

Some progress has been made in verifying the relation of self-efficacy beliefs to different types of athletic performances (Barling & Abel, 1983; Feltz, 1988; Feltz & Albrecht, 1985; Leland, 1983; McAuley & Gill, 1983; Morelli & Martin, 1982). Laboratory studies in which the level of perceived self-efficacy is altered have corroborated the contribution of self-efficacy beliefs to motor performances under competitive conditions (Weinberg, 1985; Weinberg, Gould, Yukelson, & Jackson, 1981; Weinberg, Yukelson, & Jackson, 1980) and non-competitive ones (Gould & Weiss, 1981; McAuley, 1985). High perceived self-efficacy enhances motor skill performance and reduces vulnerability to the debilitating effects of defeat.

A vast body of research, reviewed by Locke and Latham (1990), documents that explicit, challenging goals enhance performance. There is some evidence that goal-enhancement effects are generalizable to the domain of physical and athletic activity (A. Bandura & Cervone, 1981, 1986; Hall & Byrne, 1988; Locke & Latham, 1985; Weinberg, Bruya, Longino, & Jackson, 1988). Individuals who adopt challenging goals outperform those who set no goals for themselves or who are urged to do their best.

However, studies of the effects of goal setting on physical activity have been less consistent in their findings than in applications in other domains (Hall & Byrne, 1988; Hall, Weinberg, & Jackson, 1987; Miller & McAuley, 1987; Weinberg, Bruya, & Jackson, 1985; Weinberg, Bruya, Longino, & Jackson, 1988). Many possible explanations have been proposed for the variable results, including performance ceilings, fatiguing performance durations, inclusion of competitive inducements, modeling and social-comparison confounds in assessment procedures, insufficient experimental control in field studies, and spontaneous goal setting. Spontaneous goal setting is an especially critical factor given evidence that most subjects set goals for themselves when not instructed to do so (A. Bandura & Cervone, 1983; Weinberg et al., 1985; Weinberg et al., 1988), and even under assigned goals they often adopt self-set goals that account for a substantial share of the variance in their performance (A. Bandura & Cervone, 1986).

Induction of differential conceptions of ability places severe constraints on assessment of self-regulatory influences. Adequate self-efficacy measurement must encompass a wide range of performance attainments, including decrements

from the prefatory trial as well as varying increments above it. However, in the present experiment, the range of self-efficacy levels had to be severely restricted because the inclusion of decrements from the prefatory trial could negate the induced conception of ability as an inherent, unchangeable attribute. Efficacy levels describing vast improvements beyond the prefatory-trial level could similarly undermine the previously instated conception. However, some increments above the prefatory levels had to be included to preserve the credibility of the induced acquirable-skill conception of ability.

Nevertheless, it was of interest to determine whether the different conceptions of ability would manifest themselves even in perceived self-efficacy for a restricted range of performance attainments. For similar reasons, personal goal setting was not assessed. To convince subjects that performance on a given task reflects a more or less fixed aptitude and to probe for the goals they set for themselves to enhance their performance attainments runs the risk of converting the inherent-aptitude condition to an incremental-skill condition. However, there were no constraints on assessing subjects' affective self-reactions to their performances.

Although the present experiment did not lend itself to a full analysis of the mediating self-regulatory mechanisms, the pattern of self-regulatory influences in the causal structure described earlier has been replicated across a series of prior studies involving markedly different treatment conditions (A. Bandura & Jourden, 1991; A. Bandura & Wood, 1989; Wood & Bandura, 1989a, 1989b). Therefore, evidence that conceptions of ability affect development of motor skill would not leave one entirely in doubt as to how they may have done so.

In the present experiment, subjects performed a perceptual-motor task over a series of trials under instated conceptions of physical ability as either an acquirable skill or as a more or less fixed, inherent aptitude. At periodic intervals, we measured subjects' perceived self-efficacy and their self-evaluative reactions to their performance attainments. We also measured the rate at which they gained proficiency in the perceptual-motor activity and their level of interest in it. For reasons given earlier, it was predicted that conception of ability as an acquirable skill would foster higher growth of perceived self-efficacy, more positive self-evaluative reactions, higher interest in the activity, and greater improvement in performance than would conception of ability as an inherent aptitude.

Method

Subjects

The subjects were 24 females and 24 males drawn from an introductory psychology course. They ranged in age from 17 years to 39 years, with a mean of 20.1 years. The subjects were randomly assigned, balanced for sex, to the treatment conditions.

Apparatus

A pursuit-rotor tracking task was selected because it provides a sensitive measure of motor skill learning (Jensen, 1975). The instrument was a Marietta illuminated-target pursuit apparatus, model 5-100-A, with a circular template. The instrument was set at the midpoint sensitivity level. The target, which was

approximately 10 cm in diameter, rotated in a nonvariant circle at a constant speed in a clockwise direction for a duration of 1 second per rotation. The instrument was attached to a Marietta digital timer, model 14-15-MS, which registered the total time on target in milliseconds. The instrument also emitted a tone when the light-sensitive stylus was in contact with the target. The subject's task was to track the moving light source with a light-sensitive stylus. Each trial lasted 60 seconds. Subjects were instructed to begin each trial by resting the stylus on the point of light so that all subjects began each trial from the same position.

Induction of Conceptions of Ability

The introductory orientation to the experiment emphasized the influential role played by visual-guidance capability in many occupational pursuits. The work of airline control operators was given as one such example. The pursuit rotor device was described as a sensitive instrument for measuring ability to translate cognitively processed visual information rapidly into coordinated action. Subjects were told that they should track the moving light and try to maximize the time they keep the stylus on the target. Following the orientation instructions, subjects were given the differential information about the nature of the ability being measured by the perceptual-motor device.

The inherent- and acquirable-skill conceptions of ability were instated by written instructions to insure comparability across subjects. In the *inherent aptitude* condition, subjects were led to believe that the pursuit rotor device measures one's basic natural capacity for processing and translating dynamic information into proficient action.

In the *acquirable skill* condition, subjects were informed that, like many other activities, intricate visual guidance is a learnable skill in processing and translating dynamic information into proficient action. At the outset, it is common to make errors. One can learn from errors how to perform the task better.

After the differential conceptions of ability were instated, subjects performed the pursuit rotor in a prefatory trial to assess their initial level of perceptual-motor proficiency and to remove any quick-practice effects from the formal experimental trials. To reinforce the differential cognitive sets, the brief description of the task as measuring an inherent or an acquirable visual-guidance capability was verbally repeated. The first experimenter then left the room, and a second experimenter, who was blind to the condition to which the subjects were assigned, administered the performance trials. Separate experimenters were used for the induction of conceptions of ability and for the performance tests to control for any possible experimenter bias.

Self-Regulatory Factors

Subjects recorded their *perceived self-efficacy* after the prefatory trial and after every two subsequent performance trials. Perceived self-efficacy was not measured before the prefatory trial because, in the absence of any knowledge of a pursuit rotor device, subjects would have no basis for making a self-efficacy judgment. The efficacy scale included only seven levels of performance attainments, ranging from a performance equal to the time achieved on the prefatory trial to 150% more time on target. The range of self-efficacy levels had to be curtailed for reasons given earlier. The ratings were made for each performance

level in terms of a 10-point scale ranging from *no confidence at all* (0), to *intermediate levels of confidence* (5) to *total confidence* (9). The strength of perceived self-efficacy was the mean level of confidence for the seven levels of performance attainments.

To assess *self-evaluative reactions*, subjects rated, on a 13-point scale, how self-satisfied or self-dissatisfied they were with their performance in the preceding trial and their affective self-reactions were they to attain the same performance on the next trial. The scale included a neutral point and 6 degrees of self-satisfaction above it and 6 degrees of self-dissatisfaction below it.

Perceptual-Motor Performance

Subjects completed three blocks of two trials each on the pursuit rotor device with a 1-minute rest period after each trial. At the completion of each block of trials, subjects again recorded their perceived self-efficacy and self-evaluative reactions. Subjects' perceptual-motor performance was measured in milliseconds on target as recorded by the digital timer.

In everyday life, people's conceptions of ability operate under conditions in which they can observe their performances. If subjects had no information about their performance, the robustness and generalizability of the effect of the differential conceptions of ability would be in doubt. Demonstration that alternate conceptions of ability have differential effects on skill development under conditions of veridical performance information provides an especially stringent test of their power. Subjects therefore had access to two indicants of their performance, the actual milliseconds on target and the tone emitted by the apparatus during each trial.

Interest Level

After the performance trials had been completed, subjects were told that there were 5 minutes remaining. They could choose to continue working on the task or end the session. Those who expressed an interest in continuing the task recorded the number of additional trials they wished to complete. This measure was included as an index of the level of interest developed in the activity.

At the end of the session, subjects were given a full explanation of the nature and purpose of the study. They were also told of the difficult nature of the task and assured that it did not tap basic underlying aptitudes.

Results

Subjects in the inherent-ability condition performed slightly higher ($M=4.41$ seconds) than those in the acquirable-skill condition ($M=3.08$ seconds) in the prefatory trial, $t(46)=2.35$, $p<.05$. However, the groups did not differ in either perceived self-efficacy or in affective self-reactions immediately after the prefatory trial. The significance of the changes produced by the treatment conditions was evaluated using a 2×3 analysis of covariance (ANCOVA), with conception of ability as a between-subjects variable, phases as a within-subjects, repeated-measures variable, and the prefatory performance as the covariate. The differences between subsets of means were tested by the Bonferroni procedure.

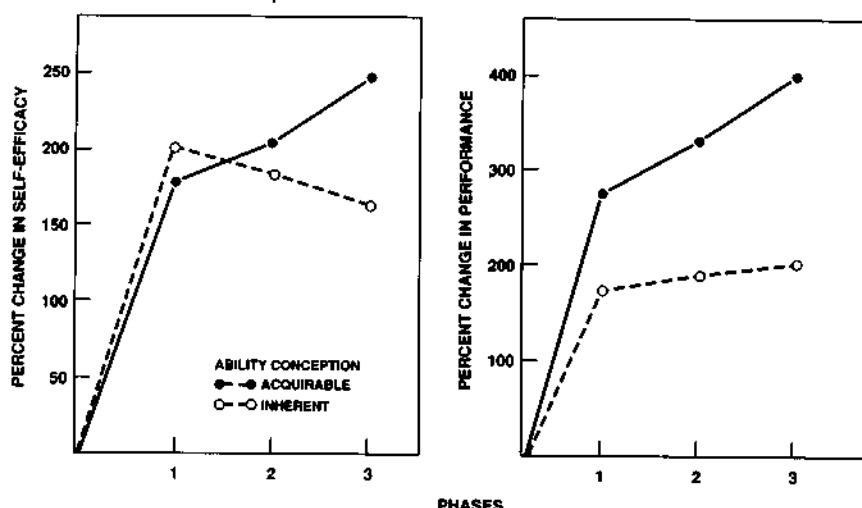


Figure 1 — Percentage changes in perceived self-efficacy (left panel) and perceptual-motor performance (right panel) across successive phases of the experiment under different conceptions of ability as an inherent aptitude or as an acquirable skill.

Effects of Conceptions of Ability on Self-Regulatory Factors

Figure 1 shows the mean percentage changes from the prefatory trial in strength of perceived self-efficacy as a function of conceptions of ability across phases of the experiment. Results of the analysis of variance show that only the interaction between conditions and phases, $F(2,92)=3.19, p<.05$, was significant. This two-way interaction achieved a slightly higher significance level, $F(2,92)=4.17, p<.02$, in the analysis of covariance.

Subjects in the inherent-aptitude condition did not gain any sense of efficacy beyond the prefatory trial. Subjects in the acquirable-skill condition demonstrated a progressive rise in perceived self-efficacy over the series of performance trials, although this change was only at a $p<.09$ level of significance. Had the self-efficacy scales included performance gains that extended at least to the levels achieved by subjects in the acquirable-skill condition, the trajectories in self-efficacy growth would undoubtedly have been more divergent.

Subjects' self-evaluative reactions to the performance they had just completed and their self-reactions were they to attain the same level of performance on the next trial were highly correlated, $r=.76$. Therefore the two sets of self-reactions were combined. The analysis yielded a highly significant phases effect, $F(3,144)=34.53, p<.001$. Initially, subjects were quite discontent with their performance, but after the prefatory trial they were more self-accepting of their achievements, $p<.001$, and did not show any further change across the trial blocks. However, the induced conceptions of ability also exerted a significant effect on the nature of subjects' affective reactions to their performances, $F(1,45)=6.02, p<.02$. This main effect is shown in Figure 2. Subjects who

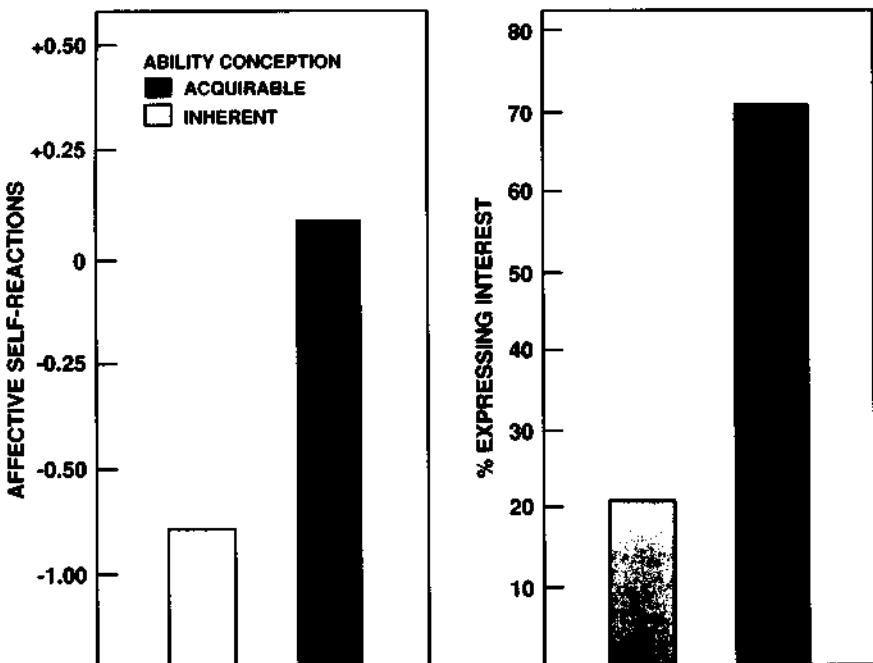


Figure 2 — Affective self-reactions (left panel) and percentage of subjects expressing an interest in the activity (right panel) as a function of conceptions of ability as an inherent aptitude or as an acquirable skill.

viewed the activity as one involving an acquirable skill expressed more positive self-reactions; those who regarded the activity as reflecting their basic aptitude responded with negative self-reactions to their performances.

Performance Attainments

Figure 1 shows the mean percentage improvement in performance plotted as a function of conceptions of ability and performance phases. The analysis yielded highly significant main effects for conditions, $F(1,45)=10.82$, $p<.002$, and phases, $F(1,92)=20.41$, $p<.0001$. These effects were qualified by a highly significant interaction between treatment conditions and phases, $F(2,92)=8.08$, $p<.001$.

In the intragroup contrasts, using the Bonferroni procedure, subjects in the inherent-aptitude condition achieved no performance gains across adjacent phases; their counterparts in the acquirable-skill condition raised their performance from the first to the second phase, $p<.07$, and achieved even larger performance improvements between the second and the third phases, $p<.001$. The intergroup differences in performance attainments were significant beyond the $p<.001$ level at each of the three phases of the experiment.

Level of Interest

The effects of conceptions of ability on level of interest were tested in terms of the number of subjects who chose to engage further in the activity and the

number of additional trials to which they committed themselves. As shown in Figure 2, 71% of the acquirable-skill subjects chose to continue the task, whereas only 21% of the inherent-aptitude subjects wished to do so. This difference in interest was highly significant $\chi^2(1) = 10.15, p < .002$.

Because only a few subjects in the inherent-aptitude condition expressed an interest in pursuing the activity further, differences in the number of additional trials subjects wanted to perform were analyzed with the nonparametric Mann-Whitney test. The medians for the inherent-aptitude and acquirable-skill conditions were 0 and 2, respectively. This difference was also significant, $z = 2.52, p < .02$.

Relation of Self-Regulatory Factors to Performance Attainments

As previously noted, only a narrow range of performance gains was included in the self-efficacy scales so as not to nullify the induced conceptions of inability. This experimental constraint markedly reduced the sensitivity of the self-efficacy measure and precluded its use in correlational analyses. For example, subjects in the acquirable-skill condition improved their performance by more than 400%, but the highest item in the self-efficacy scale measured perceived capability to attain only a 150% gain. Therefore, these subjects could not register their full sense of efficacy, which far exceeded the upper limit of the scale. However, no constraints were imposed on the other self-regulatory factor, namely, affective self-reaction. Its predictive value could be meaningfully analyzed.

Correlations were computed between affective self-reactions and level of performance attainments in the subsequent phase. This predictive relation was examined separately for each of the three performance phases. Subjects' self-reactions to their performance in the prefatory test were not systematically related to their performance in the first phase. However, their first-phase affective self-reactions predicted their second-phase performances, $r(46) = .36, p < .006$, and their second-phase affective self-reactions predicted their third-phase performances, $r(46) = .38, p < .005$. The more positive their self-reactions, the higher their subsequent performance attainments.

Discussion

The findings of the present study attest to the impact of conceptions of ability on the development of competencies. This influence is reflected in both the self-regulatory factors and the rate and level of skill acquisition. In accord with our prediction, construing ability as an acquirable skill fostered self-beliefs of physical capabilities, positive self-reactions to one's performance attainments, widespread interest in the activity, and progressive improvements in perceptual-motor skill. In contrast, construing performance as diagnostic of inherent aptitude conferred no self-efficacy benefits beyond the initial familiarization with the activity and left performers discontent with their performances, disinterested in the activity, and arrested at a relatively low level of perceptual-motor skill development.

The widespread effects of these differential conceptions of ability were also revealed in subjects' spontaneous remarks at the conclusion of the experiment. Those who approached the activity as involving an acquirable skill commented on their enjoyment of the challenge of the activity ("It was fun. I like it"), their

continued interest in it ("I would like to try some more. I was getting real good at it"), their increased sense of capability ("I got pretty good"), and their ability to exercise personal control over their performance ("If you concentrate, you can get it"). Those who regarded the activity as reflective of their inherent aptitude were more likely to express discouragement ("I tried harder and harder, and then I just gave up, especially when I got off target at the beginning of a try"), physical debility ("This really hurt my arm, and it was so tiring"), self-discontent ("I was dissatisfied"), difficulty with the task ("This was surprisingly hard"), inability to exercise control ("I thought that I'd do better, but I just couldn't"), and dispositional attributions of incapability ("I'm not very good at this sort of thing").

Several lines of evidence (M. Bandura & Dweck, 1988; Elliott & Dweck, 1988; Wood & Bandura, 1989a) are consistent in showing that construing ability as an inherent aptitude greatly increases vulnerability to the adverse effects of failure. Conversely, conceiving of ability as an acquirable skill enhances resiliency of self-efficacy that enables individuals to invest their performance difficulties with challenges for self-development.

Evidence that conceptions of ability affect self-beliefs of physical capability in the same way as they do self-beliefs of cognitive capability (Wood & Bandura, 1989a), extends the generality of this form of cognitive influence. In the present experiment, addressing markedly different competencies, subjects in the inherent-aptitude condition performed either as well as or slightly better initially than those in the acquirable-skill condition. Their growing divergence in perceived self-efficacy suggests that differential conceptions of ability biased how initial performance deficits were being cognitively processed. Construal of performance difficulties as indicants of personal deficiencies would eventually create a mediocre self-schema in the particular domain of functioning, construal of similar difficulties as instructive guides for improving one's competency would foster development of an efficacious self-schema.

Prior research has revealed that the nature of the relationship between affective self-reaction and subsequent performance depends upon the complexity of the activity and its vulnerability to intrusive disruption. In simple activities, where performance gains are attainable simply through dint of effort, self-discontent with deficient attainments is the major affective regulator of performance accomplishments (A. Bandura & Cervone, 1983, 1986). In complex activities that require heavy attentional and cognitive demands, high self-discontent has disruptive effects on performance, but positive self-reactions to personal progress provide the aidful motivational orientation for performance accomplishments (A. Bandura & Jourden, 1991; Cervone, Jiwani, & Wood, 1990).

The activity selected for study in the present experiment required close, continuous visual tracking and intricate perceptual-motor coordination, both of which are readily subject to disruption. Any lapse in attention, increased tenseness, or motoric disturbance instantly drives one off track. Given this high sensitivity to disruption, positive self-reactions are conducive to performance improvements.

Among other benefits, conception of ability as an acquirable skill created interest in the activity. Two complementary mechanisms may account for this effect. One possible explanation is in terms of enhancement of perceived self-efficacy. A sense of personal efficacy in mastering challenges is more apt to

spark interest in an activity than is self-perceived inefficacy (A. Bandura & Schunk, 1981; Zimmerman, 1985). A second possible mechanism operates through the affective reactions activated during the pursuit of an activity. When people strive for and achieve improvements in their performance, they experience a sense of self-satisfaction (A. Bandura & Jourden, 1991; Locke & Latham, 1990). The satisfactions derived from indicants of progress foster intrinsic interest.

The results of this experiment confirm that conceptions of ability differentially affect both of these mediating processes. Performers who viewed the task as an acquirable skill experienced a rising sense of personal efficacy and self-satisfaction with their attainments; those who regarded it as indicative of their inherent aptitude derived little self-efficacy or self-satisfaction from what they were doing.

In practical terms, those who would instruct others in gaining physical and motoric competencies should attend not only to the specific activity itself and the specific cognitions related to such a task (such as psyching up) but should also attend to the more global mind-sets with which individuals approach learning the task. This experimental investigation suggests that a positive approach, which emphasizes the learning nature of task acquisition, will be the most beneficial in speed and quality of skill acquisition.

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Self-Motivation for Academic Attainment: The Role of Self-Efficacy Beliefs and Personal Goal Setting

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The causal role of students' self-efficacy beliefs and academic goals in self-motivated academic attainment was studied using path analysis procedures. Parental goal setting and students' self-efficacy and personal goals at the beginning of the semester served as predictors of students' final course grades in social studies. In addition, their grades in a prior course in social studies were included in the analyses. A path model of four self-motivation variables and prior grades predicted students' final grades in social studies, $R = .56$. Students' beliefs in their efficacy for self-regulated learning affected their perceived self-efficacy for academic achievement, which in turn influenced the academic goals they set for themselves and their final academic achievement. Students' prior grades were predictive of their parents' grade goals for them, which in turn were linked to the grade goals students set for themselves. These findings were interpreted in terms of the social cognitive theory of academic self-motivation.

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In recent years, there has been a growing interest in students' self-regulation of their academic learning and performance (e.g., Corno, 1989; Harris, 1990; McCombs & Marzano, 1990; Paris & Newman, 1990; Pressley & Ghatala, 1990; and Zimmerman & Schunk, 1989). Academic self-regulation is concerned with the degree to which students are metacognitively, motivationally, and behaviorally proactive regulators of their own learning process (Zimmerman, 1986, 1990a). Self-regulated learners are not only distinguished by their proactive orientation and performance but also by their self-motivative capabilities.

From a social cognitive perspective (Bandura, 1986; 1989b; 1991a), self-regulated learners direct their learning processes and attainments by setting challenging goals for themselves (Bandura, 1989c; Schunk, 1990), by applying appropriate strategies to achieve their goals (Zimmerman, 1989), and by enlisting self-regulative influences that motivate and guide their efforts (Bandura & Cervone, 1983, 1986). Self-regulated learners exhibit a high sense of efficacy in their capabilities, which influences the knowledge and skill goals they set for themselves and their commitment to fulfill these challenges (Zimmerman, 1989, 1990b). This conception of self-directed learning not only encompasses the cognitive skills emphasized by metacognitive theorists, but also extends beyond to include the self-regulation of motivation, the learning environment, and social supports for self-directedness.

An increasing body of evidence provides support for these assumptions. Experimental studies have shown that teaching low-achieving students to set proximal goals for themselves enhances their sense of cognitive efficacy, their academic achievement, and their intrinsic interest in the subject matter (Bandura & Schunk, 1981; Schunk, 1983). Numerous studies have shown that students with a high sense of academic efficacy display greater persistence, effort, and intrinsic interest in their academic learning and performance (Schunk, 1984, 1989). Finally, a growing body of correlational research indicates that self-regulated learners make greater use of learning strategies and achieve better than do learners who make little use of self-directed learning strategies (Zimmerman & Martinez-Pons, 1986, 1988, 1990). To date, however, the causal impact of students' self-efficacy beliefs, personal goal setting, and use of learning strategies on their academic grades under natural school conditions has not been systematically examined.

According to social cognitive theory (Bandura, 1986, 1991b), goals increase people's cognitive and affective reactions to performance outcomes because goals specify the requirements for personal success. Goals also prompt self-monitoring and self-judgments of performance attainments (Bandura & Cervone, 1983, 1986; Locke, Cartledge, & Knerr, 1970). However, self-regulation of motivation depends on self-efficacy beliefs as well as on personal goals. Perceived self-efficacy influences the level of goal challenge people set for themselves, the amount of effort they mobilize, and their persistence in the face of difficulties. Perceived self-efficacy is theorized to influence performance accomplishments both directly and indirectly

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through its influences on self-set goals. This hypothesized relationship has been tested and verified in organizational research (Bandura & Wood, 1989; Wood & Bandura, 1989).

In a recent comprehensive review, Locke and Latham (1990) provide substantial evidence that externally assigned goals in organizational settings can influence personally set goals. Parental goals might be expected to have a similar impact on children's goals. Although parental aspirations for children have been found to affect children's achievement (e.g., Henderson, 1981; Majoribanks, 1978), the influences of parental goal setting have received little attention to date. From a social cognitive perspective, students' personal goal setting is influenced jointly by their self-beliefs of efficacy and the goals their parents set for them. In addition, *strategies* for regulating self-motivating processes as well as academic learning processes play an important role. Zimmerman and Martinez-Pons (1992) have reviewed evidence corroborating a close link between students' use of self-regulated learning strategies and their perceptions of academic efficacy. However, the impact of students' perceived self-efficacy for using self-regulated learning strategies has not been tested directly.

Recently Bandura (1989a) developed multidimensional scales for measuring perceived self-regulatory efficacy for academic achievement, and children's perceived self-efficacy in other domains of functioning. The scales for perceived self-efficacy for self-regulated learning assess students' perceived capability to use a variety of self-regulated learning strategies such as planning and organizing their academic activities, transforming instructional information using cognitive strategies to understand and remember material being taught, resisting distractions, motivating themselves to complete school work, structuring environments conducive to study, and participating in class. These items were developed to measure learning strategies reported by high school students during structured interviews (Zimmerman & Martinez-Pons, 1986, 1988).

Perceived self-efficacy for academic achievement items assessed students' beliefs in their capability to learn nine areas of course work, ranging from mathematics to foreign language proficiency. It was hypothesized that students' perceived efficacy to use self-regulated learning strategies would enhance their perceived efficacy to achieve in their academic courses.

The following conceptual model of self-regulated motivation and academic learning was tested: Students' perceived self-regulatory efficacy would influence their perceived self-efficacy for academic achievement, and their efficacy should, in turn, influence their personal goals and grade achievement. These causal paths are depicted in Figure 1.

Following Locke and Latham (1990), a second causal path was hypothesized linking parents' academic goals to their children's personal goals, which in turn are linked to their academic grades. Because self-efficacy beliefs and parental and student grade goals are expected to be influenced by prior academic achievement, the latter variable was entered as an antecedent in-

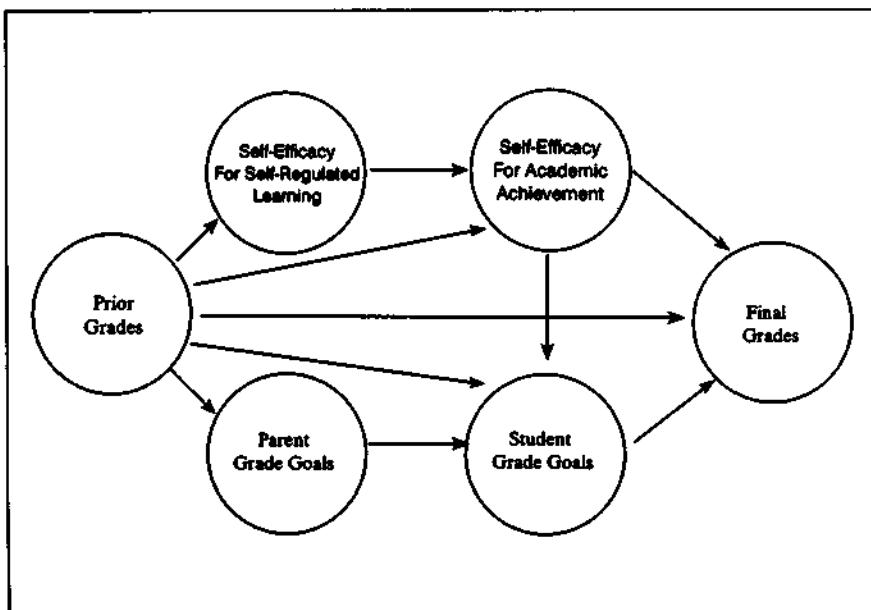


Figure 1. A causal model of student self-motivation

fluence in the causal model. The inclusion of prior achievement will indicate whether self-regulatory efficacy and goal factors make independent contributions to subsequent academic achievement. Path analysis was used to test the sociocognitive model of academic self-motivation and achievement.

Method

Sample

From two high schools in a large Eastern city, 116 ninth and tenth graders were selected to participate in this study. However, 2 students were dropped due to parental refusal to participate, and 12 students were dropped for parental failure to return their questionnaires. Thus, 102 students participated: 50 boys and 52 girls. The schools served lower middle-class neighborhoods, and the students were 17% Asian, 34% Black, 23% Hispanic, and 24% White; 2% did not report their ethnicity. Each of five teachers who taught ninth- and tenth-grade classes in social studies agreed to include one of his or her randomly selected classes in the study. Social studies was selected because the course was required of all students and was not subject to academic tracking according to ability. It thus provided a representative sample of the students attending the high schools.

Student Perceived Self-Efficacy

Two subscales from the *Children's Multidimensional Self-Efficacy Scales* (Bandura, 1989a) were selected for use in this study: self-efficacy for self-

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regulated learning and self-efficacy for academic achievement. The *self-efficacy for self-regulated learning* scale included 11 items that measured students' perceived capability to use a variety of self-regulated learning strategies. Previous research on students' use of these learning strategies revealed a common self-regulation factor (Zimmerman & Martinez-Pons, 1988), thus providing a basis for aggregating items in a single scale. The *self-efficacy for academic achievement* scale was composed of nine items that measured students' perceived capability to achieve in nine domains: mathematics, algebra, science, biology, reading and writing language skills, computer use, foreign language proficiency, social studies, and English grammar. The items of both sets of self-efficacy scales are listed in Table 1. For each item, students rated their perceived self-efficacy according to a 7-point scale. The descriptions were *not well at all* for a rating of 1, *not too well* for 3, *pretty well* for 5, and *very well* for 7.

Grade Goals

Both the students' and their parents' grade goals were assessed using rating scales developed by Locke and Bryan (1968). They examined numerous variations in question formats and found two important measures for deriving valid ratings of college students' academic grade goals: one's expected grade and the grade one regarded as minimally satisfying. Locke and Bryan found these two measures to be highly correlated, $r = .67$, and recommended using them together to provide an index of goal setting. For purposes of the present study, students rated their goal expectation and the lowest academic grade they would find satisfying in terms of 5 grade levels. Five response options were 1 = F (0-59%), 2 = D (60-69%), 3 = C (70-79%), 4 = B (80-89%), and 5 = A (90-100%). Percentages were included along with letter grades because of the widespread use of this dual system of grading in these schools. To provide the most reliable measure of students' grade goals, the two items were combined into a single measure of *students' grade goals*.

Two parallel goal items were developed for the parents regarding the goal levels they held for their children in the social studies class: (a) What academic grade do you expect your child to receive in the social studies course? and (b) What is the lowest academic grade you find satisfying for your child in this course? Parents recorded their goals using letter-grade response options. These two items were combined in a single measure of *parental grade goals*.

Procedure

The self-efficacy and goal-setting scales were included in a questionnaire that was administered in the students' social studies class. In addition, the students were asked to provide demographic information (sex, grade, age, ethnicity) and their identification number but not their names. They were assured of anonymity and that only the investigators would see their answers.

Table 1
Self-Efficacy Item Means and Standard Deviations

Items	M	SD
How well can you:		
<i>Self-efficacy for self-regulated learning</i>		
1. finish homework assignments by deadlines?	4.84	1.63
2. study when there are other interesting things to do?	3.49	1.50
3. concentrate on school subjects?	4.30	1.39
4. take class notes of class instruction?	5.34	1.52
5. use the library to get information for class assignments?	4.69	1.76
6. plan your schoolwork?	4.10	1.01
7. organize your schoolwork?	4.85	1.63
8. remember information presented in class and textbooks?	4.67	1.50
9. arrange a place to study without distractions?	4.16	1.84
10. motivate yourself to do schoolwork?	4.42	1.79
11. participate in class discussions?	4.88	1.71
<i>Self-efficacy for academic achievement</i>		
1. learn general mathematics?	5.33	1.66
2. learn algebra?	4.81	1.91
3. learn science?	5.35	1.43
4. learn biology?	4.83	1.72
5. learn reading and writing language skills?	5.97	1.30
6. learn to use computers?	5.63	1.50
7. learn foreign languages?	4.41	1.85
8. learn social studies?	5.01	1.49
9. learn English grammar?	5.14	1.47

The questionnaires were administered shortly after the semester began in their social studies class. The parents' questionnaires were sent home with the students with instructions. The parents' completed forms were returned to the school by the students in a sealed envelopes.

At the end of the semester, the teachers provided the final grades for their students in the social studies course. Each student's grade in social studies for the prior year was obtained from school records. Prior academic achievement was selected because it was the most recent indicant of achievement and was identical in numerical form and academic content to each student's final grade in social studies. From a social cognitive perspective, this measure provided the most relevant previous academic experience that could influence students' perceptions of their efficacy and goal setting.

Results

Cronbach alpha reliability tests were performed for each of the scales used in the present study. The two self-efficacy scales proved to be highly reliable. A coefficient of .87 was found for the 11-item self-efficacy for self-regulated learning scale, and a coefficient of .70 was found for the 9-item self-efficacy

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for academic achievement scale. The two student grade goal items correlated .65, which was similar to the correlation of .60 reported by Locke and Bryan (1968) by college students. The two parent grade goal items correlated .45. The Cronbach reliability coefficients were .80 for the student goal items and .63 for the parent goal items.

The means and standard deviations for the two self-efficacy scores are presented in Table 1. With regard to self-efficacy for self-regulated learning, students rated their efficacy lowest for being able to get themselves to study when there were other more interesting things to do ($M = 3.49$) and highest for being able to take notes on class instruction ($M = 5.34$). With regard to self-efficacy for academic achievement, they rated their efficacy lowest for learning foreign languages ($M = 4.41$) and highest for learning reading and writing language skills ($M = 5.97$).

The means and standard deviations for each of the variables in the causal model are presented in Table 2. The mean for the final grade in the social studies course was 3.75, which falls between a B (4) and a C (3). The students' mean grade in their prior social studies course was slightly lower at 3.43. The average perceived self-efficacy for self-regulated learning was 4.53, which was below the *pretty well* level. The average perceived self-efficacy for academic learning was 5.16, slightly above the rating of *pretty well*. Students' grade goals were 3.21 for their expected grade and 3.16 for the lowest satisfying grade. Their parents' expected grade was 4.22, and the lowest satisfying grade was 3.74. The parents' grade goals were significantly higher than their children's mean for both these two items ($t(101) = 8.16, p < .01$).

Correlation coefficients for the different variables are in Table 3. Students' prior grade in social studies correlated significantly with their perceived academic self-efficacy, $r = .22$, their grade goal, $r = .23$, their parents' grade goal, $r = .26$, and their final grade in the course $r = .23$. Students' perceived efficacy for academic achievement correlated significantly with their grade goals, $r = .41$, and with their final grades in social studies, $r = .39$. The grade goals of the parents correlated significantly with their

Table 2
Means and Standard Deviations for Self-Efficacy, Goals, and Grades

Variables	<i>M</i>	<i>SD</i>
1. Prior grades	3.43	.91
2. Efficacy for self-regulated learning*	4.53	1.07
3. Efficacy for academic achievement*	5.16	.86
4. Parent grade goals	7.96	1.08
5. Student grade goals	6.37	1.61
6. Final grades	3.75	.81

Note. $N = 102$.

*Average item rating.

Table 3
Correlations Among Measures of Self-Efficacy, Goals, and Grades

Variables	1	2	3	4	5	6
1. Prior grades	1.00					
2. Efficacy for self-regulated learning	.14	1.00				
3. Efficacy for academic achievement	.22*	.51*	1.00			
4. Parent grade goals	.26*	.15	.14	1.00		
5. Student grade goals	.23*	.30*	.41*	.41*	1.00	
6. Final grades	.23*	.16	.39*	.26*	.52*	1.00

Note. N = 102.

* $p < .05$.

child's grade goals, $r = .41$. The students' personal grade goals were related to their final grades in social studies, $r = .52$. Finally, students' perceived efficacy for self-regulated learning correlated significantly with their self-efficacy for academic achievement, $r = .51$.

Before testing the proposed model of self-motivation, two background factors were examined, namely, the students' school and class membership. The scores of the students on each of the variables in the model were compared between the two schools and between each class and the remaining four classes in a series of regression analyses. None of these comparisons yielded any significant differences for students' prior grades for their grade goals or their parents' goals, for students' self-regulatory and academic self-efficacy, or for their final grades. The largest unstandardized beta weight, $-.65$, was nonsignificant. As a result neither of these two background factors was included in the final path model. The causal structure of the path model is presented in Figure 2.

The path analysis was conducted using SPSS (Statistical Package for the Social Sciences) procedures (Nie, Hull, Jenkins, Steinbrenner, & Bent, 1975). A multivariate test for the fit of the model indicated no significant divergence, chi-square (8) = 3.78, ns. Thus, none of the causal paths excluded from the model was statistically significant. The model of self-motivation and students' prior grade achievement was predictive of their final grade in their social studies course, $R = .56$, $p < .01$, and accounted for 31% of the variance in their academic attainment.

The path between students' prior grade in social studies and their parents' grade goal for them was significant, $P = .26$, but none of the other paths between the students' prior grade and motivation factors attained significance. Nor was the direct path between prior grade and final grade in social studies significant when the impact of self-motivation factors was controlled statistically.

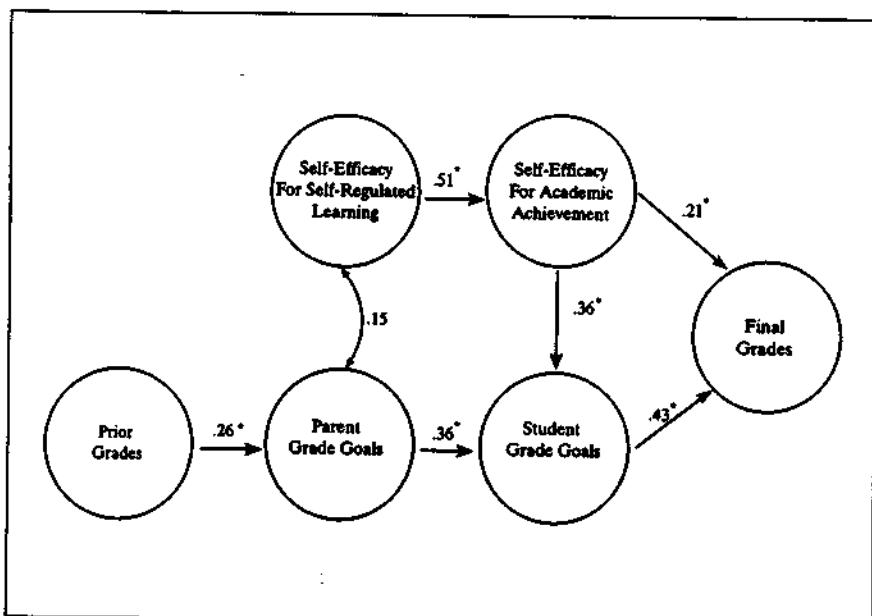


Figure 2. Path coefficients between variables in the sociocognitive model of students' self-motivation and class grades (* $p < .05$)

As hypothesized, a significant causal path was found between students' perceived efficacy for self-regulated learning and their efficacy for academic achievement, $P = .51$. Students' perceived self-efficacy for academic achievement predicted both their final grade in the course, $P = .21$, and their personal goals, $P = .36$. Students' grade goals were significantly predictive of their grades in social studies, $P = .43$. The combined direct and indirect (i.e., via student goals) causal effect of students' perceived self-efficacy for academic achievement on their final grades was $P = .37$, $p < .05$. Parental grade goals were also causally related to student personal goal setting, $P = .36$. The direct paths from student self-efficacy for self-regulated learning to their grade outcomes and from their parents' grade goals to students' grade outcomes were not significant.

Discussion

The present investigation tested the predictiveness of several self-motivational factors of students' academic achievement in the naturalistic context of a high school social studies class. It was an initial effort to test a social cognitive model of academic self-motivation for subsequent academic achievement in a regular class. The proposed model provided a statistically adequate fit for the obtained data, with perceived self-efficacy for academic achievement and student goals accounting for 31% of the variance in the students' academic course attainment. Although the selected self-motivational factors make a significant contribution to academic attainment,

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a major portion of the variance in student grades under these natural conditions remains unexplained. Social cognitive theory encompasses additional motivators and guides for performance (Bandura, 1986; 1991b). For example, outcome expectations in the form of anticipatory social and self-evaluative consequences operate as significant contributions to personal attainments. The fully expanded sociocognitive model would most likely account for even more of the variance in academic attainment.

Inferences about causality are often difficult to make in field research because of many uncontrolled background sources of variance. However, two key extraneous variables in this study, students' school and class membership, were eliminated through a series of regression analyses as alternative explanations for the results. Students' prior achievement was entered first in the path model as a potential determinant of perceived self-efficacy, students' and parental goals, and their final academic attainment. The use of this measure of prior achievement provided a particularly stringent test of the independent contribution of the self-regulatory factors because this measure (prior course grade) was obtained recently, was directly relevant to the current course, and was identical metrically for the two academic learning periods. Although prior grade attainment correlated with student academic self-efficacy and goal setting, it operated only through parents' academic goals for their children. Apparently, parents rely on their children's prior grade accomplishments when they set goals for their children; however, their children rely on their self-efficacy beliefs as well as their parents' aspirations for them when setting their goals.

Interestingly, the direct path of influence between students' prior grades and final grades was not significant. This suggests that self-regulatory factors not only mediated the influence of prior achievement, but also contributed independently to students' academic attainment. Whereas prior grades were correlated, $r = .23$, with subsequent grades, perceived self-efficacy and academic goals combined to produce a multiple correlation of .56. This represents an increase of 26% in predicted variance in final academic attainment.

It might be questioned whether the size of these self-motivation results was affected by the low correlation between students' prior grades and their final grades in the course. Would a standardized test measure of prior achievement correlate better and correspondingly reduce the relative predictiveness of self-regulation measures? Recently, a highly regarded standardized test was compared with another academic self-regulation measure, time-management ratings. Britton and Tesser (1991) found that college students' Scholastic Aptitude Test (SAT) scores correlated $r = .20$ with their cumulative grade point during the freshman and sophomore years. In contrast, time-management questionnaire items predicted substantially more variance ($R^2 = .21$) than SAT items did ($R^2 = .05$). These researchers concluded that the best predictor, a time attitude factor, "seems very much like self-efficacy. Subjects report feelings of being in charge of their own

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time" (Britton & Tesser, 1991, p. 409). Although this issue merits further study, there is no reason to assume that the results would have been affected substantially by using standardized test scores in place of prior grades in the same subject matter area.

The path analyses provided support for a social cognitive view of academic self-regulation. As expected, personal goals played a key role in students' attainment of grades in school. These self-set goals committed the students to specific grade achievements for positive self-evaluation. In accord with prior research, the higher the perceived self-efficacy, the higher the goals students set for themselves (Bandura, 1992; Locke & Latham, 1990). Self-efficacy influenced not only students' setting of academic goals for themselves, but also their achievement of these goals. The direct and indirect influence of students' perceived academic self-efficacy on academic attainment produced a combined effect of .37.

As might be anticipated, parents' academic goals for their children were significantly higher than those their children set for themselves. However, the influence of parents' grade goals on their children's goals was tempered by the youngsters' beliefs in their academic efficacy. This finding indicates that academic attainment is regulated, in large part, through self-motivating influences. Further research is needed to determine how parents socially influence their children's goal setting.

The findings of this study correspond with what many parents and teachers have learned from frustrating personal experiences: Students often do not adopt the high academic aspirations imposed upon them. Clearly, a determinant of student aspirations is their belief in their academic efficacy. Efforts to foster academic achievement need to do more than simply set demanding standards for students. They need to structure academic experiences in a way that enhances students' sense of academic efficacy as well.

The significant path between parents' grade goals and their children's provides some initial evidence of a causal linkage of goal setting in the academic domain. Previously, most of the assigned and participant goal setting research had been conducted on performance in the organizational domain. The evidence of parental social influence is important because parents can only monitor their children's goal setting and performance in school indirectly. As might be expected, the size of the strength of parental influence on their children's goal setting, $r = .41$, is lower than that reported in research in nonacademic settings, $r = .58$, by Locke and Latham (1990). In organizational applications, goals are used primarily to enhance use of preexisting skills; in the academic domain, goals are used to develop knowledge and cognitive skills. It is easier to use skills than to develop them originally. Additionally, the social dynamics of the two settings are different. Nevertheless, the present results show that social influences on motivational processes underlying academic self-regulated learning are similar to those underlying performance in nonacademic settings.

A sizable body of research demonstrates that students' use of learning

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strategies promotes academic achievement (Pressley, Borkowski, & Schneider, 1987; Weinstein, Goetz, & Alexander, 1988; Zimmerman & Martinez-Pons, 1986, 1988, 1990). However, there is also evidence (Borkowski & Cavanaugh, 1979; Kramer & Engle, 1981) that knowledge of learning strategies does not ensure their effective and consistent use. The present results indicate that student self-beliefs of efficacy to strategically regulate learning play an important role in academic self-motivation. A significant causal path was found between efficacy for self-regulated learning, efficacy for academic achievement, and academic attainment. Students who perceived themselves as capable of regulating their own activities strategically are more confident about mastering academic subjects and attain higher academic performance.

In conclusion, perceived efficacy to achieve motivates academic attainment both directly and indirectly by influencing personal goal setting. Self-efficacy and goals in combination contribute to subsequent academic attainments. However, substantial variance in student achievement remains to be explained, and future research efforts need to focus on additional self-regulatory factors, such as self-monitoring, judgmental processes, and self-reactive influences (Zimmerman, 1989), as well as other influences, such as reading ability and home environment measures, that might affect children's academic pursuits. Research also needs to be extended to include interviews and behavioral measures of academic studying as well as survey rating scales. Such an expanded model is likely to provide a more complete picture of the relative role of self-regulatory factors in student academic achievement.

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Impact of Self-Regulatory Influences on Writing Course Attainment

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The role of self-efficacy beliefs concerning the academic attainment and regulation of writing, academic goals, and self-standards on writing course achievement was studied with college freshman using path analysis. These self-regulatory variables were measured at the beginning of a writing course and related to final course grades. Students' verbal scholastic aptitude and level of instruction were also included in the analysis. Perceptions of self-efficacy for writing influenced both perceived academic self-efficacy and personal standards for the quality of writing considered self-satisfying. High personal standards and perceived academic self-efficacy, in turn, fostered adoption of goals for mastering writing skills. Neither level of writing instruction nor verbal aptitude had any direct link to course grades. Verbal aptitude affected writing course outcomes only indirectly by its influence on personal standards. Perceived academic self-efficacy influenced writing grade attainments both directly and through its impact on personal goal setting. These paths of influence were interpreted in terms of a social cognitive theory of academic self-regulation.

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The mechanisms through which students regulate their own motivation and academic learning have been the subject of increasing research (Cornu, 1989; Harris, 1990; McCombs & Marzano, 1990; Paris & Newman, 1990; Pressley & Ghatala, 1990; Zimmerman & Schunk, 1989). Much of the research on self-regulated learning has centered on task-related cognitive and metacognitive strategies, such as mnemonic encoding and self-monitoring. In the social cognitive theory of academic self-regulation, students regulate the motivational, affective, and social determinants of their intellectual functioning as well as the cognitive aspects (Zimmerman, 1986, 1990a, 1990b). The exercise of self-regulatory skills produces beneficial results. Good self-regulators do better academically than poor self-regulators even after controlling for other potentially influential factors.

Skill in formulating ideas and expressing them well in written form contributes importantly to success in all types of academic activities. However, writing presents special challenges to self-regulation (Bandura, 1986; Bereiter & Scardamalia, 1987; Wason, 1980). This is because writing activities are usually self-scheduled, performed alone, require creative effort sustained over long periods with all too frequent stretches of barren results, and what is eventually produced must be repeatedly revised to fulfill personal standards of quality. Not surprisingly, even professional writers have to resort to varied techniques of self-discipline to promote their writing activities (Barzon, 1964; Gould, 1980; Wallace & Pear, 1977). A recent national assessment of the quality of students' writing reveals major deficits in this vital skill (De Witt, 1992). The processes governing writing course attainment are, therefore, a matter of considerable import.

Instruction in writing strategies and verbal self-guidance has been shown to enhance perceived self-efficacy and to improve the schematic structure and quality of compositions (Graham & Harris, 1989a, 1989b; Schunk & Swartz, 1993). The present study sought to clarify the self-regulatory mechanisms through which instruction in strategies for creative writing fosters writing course attainment.

In social cognitive theory, self-regulation operates through a set of psychological subfunctions (Bandura, 1986, 1991b). These include self-monitoring of one's activities, applying personal standards for judging and directing one's performances, enlisting self-reactive influences to guide and motivate one's efforts, and employing appropriate strategies to achieve success (Zimmerman & Martinez-Pons, 1986, 1988, 1990). It is one thing to possess self-regulatory skills but another thing to be able to get oneself to apply them persistently in the face of difficulties, stressors, or competing attractions. Indeed, students register the highest sense of efficacy to manage the content aspects of instruction, but a low sense of efficacy to manage themselves to get their academic activities done (Zimmerman, Bandura, & Martinez-Pons, 1992). Thus, the aspect of self-regulated learning that plays a central role—the capability to mobilize, direct, and sustain one's instructional efforts—has received relatively little attention in studies of academic self-directedness.

In social cognitive theory, regulation of one's own motivation and learning is codetermined by many interacting factors that would be expected to affect the self-management of writing activities. Perceived self-efficacy is one of the influential determinants in the proposed causal structure governing writing course attainment. Two aspects of efficacious agency are examined: Belief in one's capabilities to regulate one's own writing activities and to master particular academic subjects. These two forms of efficacy are considered to be causally linked, such that a high sense of self-regulation enhances belief in one's academic efficacy (Zimmerman & Martinez-Pons, 1992). Children's beliefs in their academic efficacy have been shown to contribute to their motivation and academic attainments over and above their academic skills. Children who have a strong belief in their academic capabilities set higher goals for themselves, apply themselves more persistently to academic tasks in the face of difficulties, exert better control over their work time, are more flexible in testing problem-solving strategies, and achieve higher levels of performance on academic activities than do their counterparts who have a weaker sense of efficacy (Bandura, 1993; Bouffard-Bouchard, Parent, & Larivee, 1991; Collins, 1982; Schunk, 1984). Recent evidence confirms that perceived self-regulatory efficacy affects academic attainments, in large part, through its impact on perceived academic self-efficacy (Zimmerman, Bandura, & Martinez-Pons, 1992).

The self-regulation of academic activities also operates partly through internal standards and evaluative reactions to one's own performances (Bandura, 1991a). Adaption of standards of merit creates self-evaluative involvement in the activity that serves motivational functions. The anticipated self-satisfaction gained from fulfilling valued standards provides one source of incentive motivation for personal accomplishments. Self-dissatisfaction with substandard performances serves as another incentive motivator for enhanced effort. Thus, students who are self-satisfied only with superior attainments exert greater effort in revising written compositions than those who are content with lesser attainments (Simon, 1979). Even in the face of attractive incentives to sacrifice quality for quantity, those who subscribe to standards of excellence continue to strive for quality in their written productions, even though they reduce their prospects of material benefits.

The capacity to exercise self-influence by cognized aspirational goals provides a major cognitive mechanism of motivation. The findings of diverse lines of research, involving both laboratory and field studies, show that explicit challenging goals enhance motivation and performance attainments (Locke & Latham, 1990). Goals operate largely through self-processes, rather than regulate motivation and behavioral attainments directly. Both perceived self-efficacy and self-evaluative standards affect aspirational goal setting. The higher the sense of personal efficacy, the higher the goals people set for themselves, and the firmer their commitment to them is (Bandura, 1991a; Locke & Latham, 1990). High self-evaluative standards similarly promote high goal setting.

Personal efficacy and self-evaluative standards influence not only the level at which goals are set but also the response to performances that fall short of adopted goals (Bandura & Cervone, 1983, 1986). People who harbor self-doubts about their capabilities are easily dissuaded by obstacles or failures. Those who are assured of their capabilities intensify their efforts when they fail to achieve what they seek, and they persist until they succeed. Similarly, people are motivated by self-satisfactions from fulfilling valued standards and are prompted to intensify their efforts by discontent with deficient performances.

In the present study, college students received instruction in English composition in either a regular or an advanced course. The self-regulatory determinants reviewed above were measured at the beginning of the academic quarter and evaluated for their predictive contribution to writing course grades assessed at the end of the quarter. This research was designed as a field study, and no effort was made to change the criteria the teachers normally used for assigning grades in writing, such as substituting formal research analyses of a written project. Rather, we selected the regular course grades as outcome measures because (a) they are the basis on which the students set their writing goals for the course, (b) they take into account a broader range of course activities than a project, and (c) they are the actual standard of academic success in writing courses. Figure 1 presents the paths of influence in the proposed causal structure governing writing attainments.

For reasons given earlier, it was predicted that perceived self-regulatory efficacy influences both self-evaluative standards and perceived academic self-efficacy. Personal standards of excellence and perceived academic efficacy, in turn, affect writing attainments both directly and indirectly through

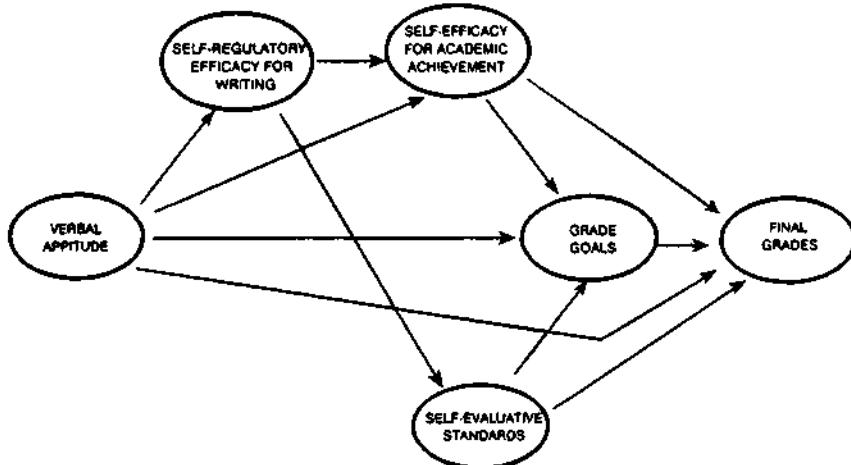


Figure 1. A causal model of student self-regulation of writing achievement

their impact on aspirational goal setting. High goals foster writing course attainment. Because self-beliefs of efficacy for writing activities, standards of excellence, and aspirational goals might be influenced by verbal aptitude, it was entered as an antecedent for each of the self-regulatory factors in the causal model. This ordering of variables permits evaluation of the contribution of self-regulatory factors to writing attainment beyond the prediction provided by verbal aptitude.

Method

Sample

A total of 95 freshmen students from a highly selective university participated in this study. Forty-three of the students were males, and fifty-two were females. The students ranged in age from 17 to 20 years with a median age of 18 years. They were enrolled in a quarterly course on writing with 47 students attending regular classes and 48 attending advanced classes. Approximately 25% of the students were minorities (Black, Hispanic, and Asian). Enrollment in the advanced class was based on a score of 4 or 5 on the SAT advanced placement test in English Language and Composition or English Literature and Composition. Both of these advanced tests included a section on essay writing under timed conditions. The instruction provided in the advanced classes was similar to that in regular classes except that former students were given the same material during one quarter that the latter students completed in two quarters. The present study was conducted during the second quarter in the curriculum sequence for the regular students but during the first and only quarter for the advanced students. Students in both regular and advanced classes were required to write a formal research paper during the quarter of this study. Four male instructors and four female instructors were contacted, and each agreed to include a randomly selected class in the study. They had not previously taught the students who were enrolled in their class.

Self-Efficacy Scales

Two scales were developed to measure perceived self-efficacy. They include beliefs about personal efficacy to regulate writing activities and perceived efficacy for academic attainment in the writing course. The Writing Self-Regulatory Efficacy Scale contained 25 items that assessed students' perceived capability (a) to execute strategic aspects of the writing process such as planning, organizing, and revising compositions; (b) to realize the creative aspects of writing such as generating good topics, writing interesting introductions and overviews; and (c) to execute behavioral self-management of time, motivation, and competing alternative activities. These items, as shown in Table 1, were developed from formal analyses of the writing process (Murray, 1990), consultation with faculty in the writing program, and knowledge of self-regulation of motivation. Students rated the strength of their perceived efficacy for each item on a 7-point scale ranging from belief that they could

Table 1

**Means and Standard Deviations for Individual Items in the Scale
Measuring Perceived Self-Regulatory Efficacy for Writing**

Items		M	SD
1.	When given a specific writing assignment, I can come up with a suitable topic in a short time.	4.40	1.21
2.	I can start writing with no difficulty.	3.74	1.31
3.	I can construct a good opening sentence quickly.	3.71	1.30
4.	I can come up with an unusual opening paragraph to capture readers' interest.	3.99	1.48
5.	I can write a brief but informative overview that will prepare readers well for the main thesis of my paper.	4.51	1.22
6.	I can use my first attempts at writing to refine my ideas on a topic.	4.72	1.09
7.	I can adjust my style of writing to suit the needs of any audience.	4.19	1.27
8.	I can find a way to concentrate on my writing even when there are many distractions around me.	3.48	1.59
9.	When I have a pressing deadline on a paper, I can manage my time efficiently.	4.63	1.50
10.	I can meet the writing standards of an evaluator who is very demanding.	4.13	1.24
11.	I can come up with memorable examples quickly to illustrate an important point.	4.30	1.25
12.	I can rewrite my wordy or confusing sentences clearly.	4.48	1.28
13.	When I need to make a subtle or an abstract idea more imaginable, I can use words to create a vivid picture.	4.31	1.27
14.	I can locate and use appropriate reference sources when I need to document an important point.	4.98	1.45
15.	I can write very effective transitional sentences from one idea to another.	4.56	1.29
16.	I can refocus my concentration on writing when I find myself thinking about other things.	3.82	1.41
17.	When I write on a lengthy topic, I can create a variety of good outlines for the main sections of my paper.	3.78	1.41
18.	When I want to persuade a skeptical reader about a point, I can come up with a convincing quote from an authority.	4.48	1.43
19.	When I get stuck writing a paper, I can find ways to overcome the problem.	4.34	1.22
20.	I can find ways to motivate myself to write a paper even when the topic holds little interest for me.	3.78	1.41
21.	When I have written a long or complex paper, I can find and correct all my grammatical errors.	4.44	1.35
22.	I can revise a first draft of any paper so that it is shorter and better organized.	4.50	1.33
23.	When I edit a complex paper, I can find and correct all my grammatical errors.	4.72	1.54
24.	I can find other people who will give critical feedback on early drafts of my paper.	4.81	1.63
25.	When my paper is written on a complicated topic, I can come up with a short informative title.	4.63	1.38

not perform the designated activities (score of 1) to the belief that they could perform them very well (score of 7). The scores ranged between 1.68 and 5.80, with a mean of 4.30. The Cronbach alpha reliability test yielded a coefficient of + .91.

In the scale measuring self-efficacy for academic achievement, students rated the strength of their belief that they could achieve each of 12 academic grades ranging from A to F including + and - gradations. They rated the strength of their efficacy belief on a 7-point scale with high uncertainty (1) anchoring one end of the scale and high certainty (7) anchoring the other end. It was assumed that this scale would yield a negative, monotonic curve in which strength of perceived self-efficacy would decrease systematically for progressively higher grade attainments (from F to A). Inspection of the ratings revealed that the patterns of efficacy strength were, in fact, negatively monotonic for all students. Of particular interest is the highest grade that each student felt somewhat certain of achieving (Rating 5). This score represented the change point on the monotonic curve where each student began to report positive efficacy.¹ As shown in Figure 2, the students, as a group, were somewhat certain of attaining at least a B in the writing course. They

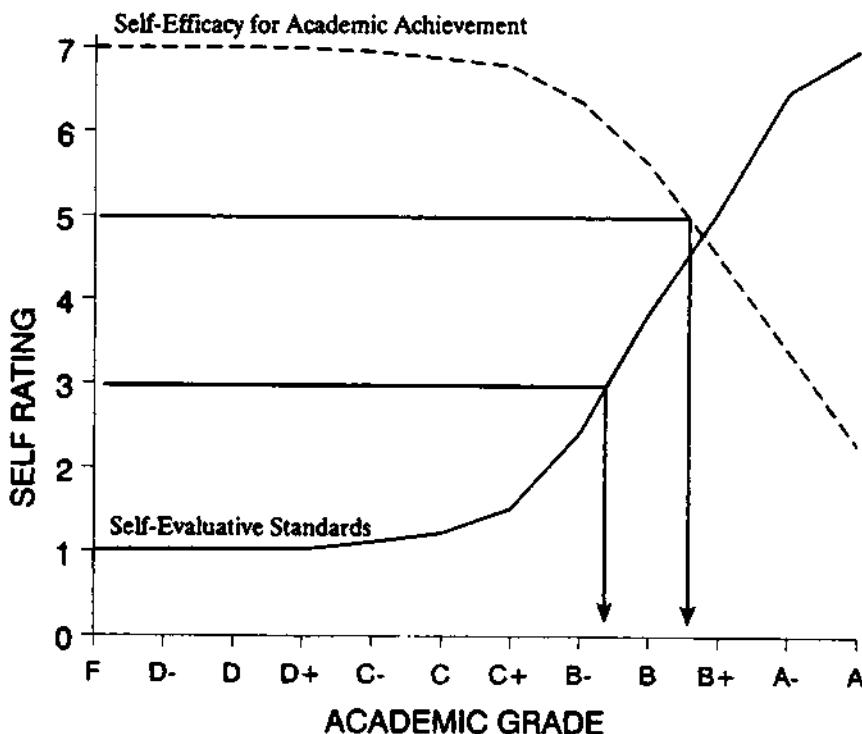


Figure 2. **Self-efficacy for academic achievement and self-evaluative standards for course grades**

reported grade scores that ranged between C- and an A. These grade levels were transformed to a 12-point numerical scale (A = 12, A- = 11, B+ = 10, B = 9, . . . , F = 1). The corresponding numerical scores are presented in Table 2. The Cronbach reliability coefficient for this scale is .87.

Grade Goals Scale

The students' grade goals for their writing course were assessed using a 12-point scale. They were asked, "What academic grade are you striving for in this course?" They were instructed to check one of 12 grades that ranged from an A to a F. The students' grade goals ranged between A and B- with a mean of an A-.

Table 2
Principal Components Analysis of Self-Regulatory Efficacy for Writing Items, Verbal Ability, and Final Course Grades

Items	Factors							b^2
	1	2	3	4	5	6	7	
1	.46	-.44	-.41	.15	-.38	.15	.06	.77
2	.33	-.37	.22	.51	-.09	.25	-.21	.76
3	.65	.18	-.22	.31	-.25	-.24	.15	.76
4	.72	.34	.28	-.17	-.19	.07	.03	.79
5	.66	.20	-.05	-.25	.29	-.01	-.12	.66
6	.73	-.05	.04	-.38	.10	.12	-.03	.71
7	.41	.75	.24	-.02	.10	-.25	.07	.87
8	.50	-.22	.44	-.23	.51	-.02	-.09	.82
9	.24	-.14	.28	.43	.39	.30	.37	.74
10	.65	.56	.12	.07	.06	.28	.00	.84
11	.61	-.01	.19	.26	-.30	.37	.00	.72
12	.61	-.02	-.08	-.15	-.20	-.07	-.36	.69
13	.70	.47	.13	.00	-.09	.28	-.17	.87
14	.59	-.49	.23	-.23	-.32	.04	.20	.84
15	.68	.19	-.23	.07	-.17	.14	.34	.73
16	.46	-.53	.49	.09	.24	-.05	.12	.83
17	.48	.19	-.53	.13	.42	-.28	.14	.84
18	.62	-.16	-.25	-.19	.11	-.25	.40	.75
19	.77	-.17	.03	.35	-.20	-.16	-.22	.86
20	.25	.23	.12	.71	.04	-.52	.10	.92
21	.69	.06	-.50	-.01	.14	.25	.07	.83
22	.66	-.35	-.23	-.35	-.18	-.20	-.25	.88
23	.30	-.37	.09	-.19	-.52	.00	.47	.77
24	.60	-.02	.42	.22	-.13	-.32	-.26	.78
25	.70	-.20	-.34	-.11	.26	-.03	-.25	.80
Verbal aptitude	-.12	.07	-.47	.79	.39	.30	-.18	.79
Course grades	-.01	.79	.17	-.21	-.11	.12	.10	.73

Self-Evaluative Standards Scale

The students' standards for self-satisfaction and self-dissatisfaction for quality of writing were assessed in relation to the graduation of grade attainments used in the assessment of perceived academic self-efficacy. Students rated how satisfied they would be for each of the 12 grade levels spanning grades A through F. They rated their level of satisfaction on a 7-point scale ranging from very dissatisfied (1) to very satisfied (7). It was expected that this scale would yield a positive, monotonic curve in which self-satisfaction ratings would increase systematically with progressively higher levels. Inspection of the ratings revealed that the self-satisfaction ratings were, in fact, positively monotonic in form. Of particular conceptual interest was the highest grade level at which each student displayed some dissatisfaction (Rating 3). This grade represented the change point on the monotonic curve where students began to report some dissatisfaction.² As revealed in Figure 2, the students as a group were somewhat dissatisfied if they attained less than a grade of B ($M = 8.27$ on the 12-point scale). The Cronbach reliability coefficient for the scale is .84.

Procedure

Students were administered the measures of the different self-regulatory factors at the beginning of the academic quarter. They were asked to provide demographic information (sex and age), their SAT verbal aptitude score, and their student identification number but not their name. Students were assured of anonymity and assured that only the investigators would have access to the data. The students' verbal aptitude scores ranged between 450 and 780 with a mean of 633. The accuracy of these self-reported SAT scores was compared with those in their school records for 20 randomly selected students from the sample. A Spearman correlation of .97 was obtained indicating a high level of accuracy in recall. The instructors provided the final grades at the end of the academic quarter as the measure of the students' writing attainment.

Results

The means and standard deviations for items in the self-efficacy scale for writing are presented in Table 1. Students rated their efficacy lowest for concentrating on their writing when there are many distractions around ($M = 3.48$) and highest for locating and using appropriate reference sources to document important points ($M = 4.98$). The former finding corroborates previous evidence that a major facet of academic self-regulation is the ability to withstand competing attractions (Zimmerman, Bandura, & Martinez-Pons, 1992). Students also expressed a low sense of efficacy to get themselves to start a writing project and to generate suitable outlines and engaging introductions.

The factor structure of the Self-Regulatory Efficacy for Writing Scale was studied using principal components procedures. The results are presented

In Table 2. The final course grades and SAT verbal scores were included as marker variables in the analysis along with the 25 items of the scale. Seven factors were found that accounted for 79% of the total variance. The first and major factor, which accounted for 32% of the variance, was labeled self-regulatory efficacy for writing. All self-efficacy items loaded above .40 on this factor except for Items 2, 9, 20, and 23. Items 2, 9, and 20 loaded primarily on the fourth factor, which was labeled verbal aptitude because the SAT total score loaded most heavily on it, whereas Item 23 loaded mainly on Factor 5. Factor 4 accounted for 8.4% of the total variance. Factor 2, which accounted for 13% of the variance, was labeled writing skill because the final course grades loaded heavily on it. The third factor (which accounted for 8.7% of the variance) dealt with concentration and self-evaluation during writing. Factors 5 through 7 (which accounted for between 4.7% and 7% of the variance) were not easily labeled. It should be noted that Items 2 and 23 did load above .30 on the first factor and thus did contribute to its measurement as well other factors. In summary, the principal components analysis indicated that the self-regulatory efficacy for writing items (except for 9 and 20) comprised a single and factorially distinct scale.

The means and standard deviations for each of the variables in the causal model are presented in Table 3. The intercorrelations among the variables are provided in Table 4. Students' verbal aptitude correlated significantly with their self-evaluative standards, grade goals, and their writing achievement as reflected in the final grade in the writing course. Perceived self-regulatory efficacy for writing was significantly related to perceived self-efficacy for academic achievement, self-evaluative standards, and grade goals. Students' perceived self-efficacy for academic achievement was similarly positively related to grade goals, self-evaluative standards, and final grades. Self-evaluative standards were correlated with their grade goals and final grades. Grade goals were also correlated with final course grades.

Before testing the causal structure of the proposed model of self-regulation of writing activities, two background factors—namely, the students' gender and enrollment in the advanced writing class—were related to each

Table 3
Ranges, Means, and Standard Deviations for Verbal Aptitude, Self-Regulation Factors, and Final Course Grade for Writing (*N* = 95)

Variables	Range	<i>M</i>	<i>SD</i>
1. Verbal aptitude	450-780	633.26	74.47
2. Self-regulatory efficacy for writing	1.7-5.8	4.30	.78
3. Self-efficacy for academic ach.	5-12	9.64	1.26
4. Grade goals	8-12	11.17	.90
5. Self-evaluative standards	6-10	8.27	.99
6. Final course grade	5-12	10.54	1.28

Table 4
Correlations Among Measures of Verbal Aptitude, Self-Regulation, and Course Grades

Variables	1	2	3	4	5
1. Verbal aptitude					
2. Self-regulatory efficacy for writing	.17				
3. Self-efficacy for acad. ach.	.08	.36***			
4. Grade goals	.22*	.36***	.50***		
5. Self-evaluative standards	.26*	.39***	.42***	.57***	
6. Final grades	.25*	.14	.46***	.53***	.39***

Note. N = 95.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

of the variables in the model. Only two correlations proved to be significant. Class membership was correlated with SAT scores, $r = .37$, $p < .01$, and students' self-regulatory efficacy for writing, $r = .19$, $p < .05$. Students in the advanced section had higher verbal aptitude ($M = 660$) than those in the regular section ($M = 605$), and students in the advanced section had a higher sense of efficacy for managing writing activities ($M = 4.42$) than students in the regular section ($M = 4.15$). Neither class membership nor gender was related to any other variables in the model. Only class membership was retained in the path analysis because of its significant relationship to verbal aptitude and perceived self-efficacy.

A multivariate test for the fit of the model revealed no significant divergence: chi-square (10) = 11.07, not significant (ns). To simplify the presentation of these relations, nonsignificant causal paths were deleted from Figure 3.

As shown in Figure 3, students' class membership was linked to their verbal aptitude scores and their perceived self-regulatory efficacy for writing. Students' verbal aptitude influenced their self evaluative standards. Interestingly, no direct path emerged between verbal aptitude and writing course grades. Rather, verbal aptitude influenced writing grade achievement indirectly through its effects on self-evaluative standards.

Perceived self-regulatory efficacy for writing influenced both perceived self-efficacy for academic achievement and self-evaluative standards which, in turn, were linked to grade goals. Perceived academic self-efficacy affected writing grade achievement both directly and through its impact on personal goal setting. The combined direct and indirect effects of perceived academic self-efficacy on final grades were $P = .38$, $p < .05$. The full set of predictive variables accounted for 35% of the variance in writing course grades.

Discussion

The present study examined the predictiveness of the social cognitive theory of self-regulation for academic achievement in the field context of college

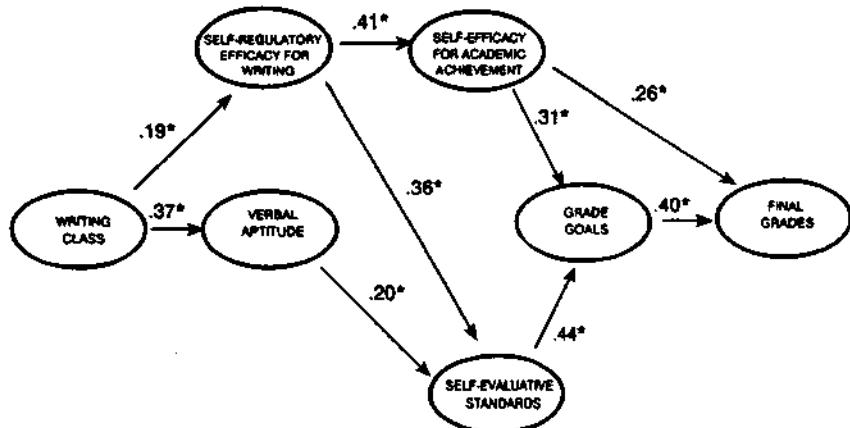


Figure 3. Path coefficients for the significant paths of influence between variables in the model of self-regulation and final academic grades (* $p < .05$)

courses in writing. In this empirical test, the model of self-regulation was expanded to include measures of verbal aptitude and self-evaluative standards.

In a previous study of academic achievement, two of the main factors—namely, perceived academic self-efficacy and personal goal setting—accounted for 31% of the variance in level of academic attainment in social studies (Zimmerman, Bandura, & Martinez-Pons, 1992). In the present study, these same two factors accounted for 35% of the variance in writing grades. This replication of the pattern of causal relations among the self-regulatory factors and the size of their contribution to academic achievement is especially noteworthy in view of the major differences between the two studies. They varied in the educational level of the students, the ethnic composition of the samples, academic subject matter, and the measures of self-efficacy and goal-setting, which were tailored to the different subject matters and populations. The replication of the magnitude of the predictive contribution to academic achievement adds confidence to the validity of the self-regulation model. The relatively weak and indirect role of verbal aptitude in attainment of writing course grades was unanticipated. Verbal aptitude is widely assumed to provide the basis for learning academic subjects that depend heavily on language writing skills. Verbal aptitude was, therefore, expected to contribute substantially and directly to the attainment of writing course grades as well as indirectly through its effects on perceived self-efficacy. However, when self-regulatory factors were included, no direct effect was found. Rather, the influence of verbal aptitude was mediated through self-evaluative standards and personal goal setting. These findings suggest that verbal aptitude may primarily contribute to enhancement of writing by raising students' standards of quality of writing and their academic aspirations.

The self-regulatory factors in the path model not only mediated the influence of verbal aptitude but added substantially to the attainment of writing course grades. Verbal aptitude correlated $r = .25$ with grades, whereas perceived academic self-efficacy and goal setting combined to produce a multiple correlation of $R = .59$. This represents an incremental contribution of 29% in the final grades in writing.

Two factors may have diminished the size of the correlation between verbal aptitude and final grades in writing. They include restrictions in the ranges of verbal aptitude and course grades. The SAT scores averaged 633, well above the national mean of 500, with a standard deviation of 75, which is smaller than the national norm of 100. The final grades ranged from a B- to an A. However, it should be noted that the self-regulatory factors achieved notable predictiveness with the existing level of variability in the dependent measure. The self-regulation model accounted for more than one third of the variance in writing grade attainment in a field study, using a range-restricted measure of writing skill with a highly selective group of college students. Greater variability in writing attainments might have yielded even higher predictability for the self-regulatory factors. In future research, it is important to include multiple, componential measures of writing skill with diverse populations of students to understand better the predictiveness of these self-regulatory factors.

It is interesting that class membership predicted perceived self-regulatory efficacy for writing, whereas verbal aptitude did not. Assignment to the advanced section of the course was based on a timed test of writing. Writing performances correlated, $r = .37$, with verbal SAT scores. Writing attainments would be expected to correlate more highly with perceived self-regulatory efficacy than with general verbal aptitude. An aptitude that students cannot get themselves to apply efficiently, persistently, and creatively will have limited impact on performances, regardless of how good it might be. Moreover, the instruction in both the advanced and regular class sections transmitted a great deal of information on strategies and styles of writing. Such knowledge might be more salient for judging one's writing efficacy than one's general verbal aptitude.

The path analysis provided support for the social cognitive theory of academic self-regulation. As hypothesized, students' perceived self-efficacy to manage their writing activities predicted their self-efficacy for academic achievement. The more assured students are in their capabilities to structure and communicate ideas and to overrule competing impediments, the more reason they have to believe in their capability for academic achievement. Perceived self-efficacy was especially low to initiate the first steps in writing a composition. In a previous study (Zimmerman, Bandura, & Martinez-Pons, 1992), perceived self-efficacy to regulate one's own learning activities similarly predicted perceived self-efficacy for academic achievement. In accord with the hypothesized causal structure, perceived self-regulatory efficacy for writing predicted self-evaluative standards. Students who had a high sense of efficacy to manage their writing not only set high writing aspirations for

themselves but were discontent with substandard performances. These forms of self-influence serve to enhance and sustain motivation (Bandura, 1991a; Locke & Latham, 1990). It is important in future research on the self-regulation of writing to determine whether these path findings for college students extend to a younger sample as well.

Perceived academic self-efficacy affected writing course grades both directly and indirectly through its effects on personal goal setting. The combined direct and indirect impact on writing grade achievement was a path coefficient of .38. Self-evaluative standards influenced writing grades only indirectly through personal goal setting. These findings are in accord with those of other studies showing that aspirational goals bear a more direct relation to performance attainments than do self-evaluative reactions (Bandura & Jourden, 1991).

As previously noted, it is one thing to possess self-regulatory skills for academic learning; it is another thing to be able to adhere to them when other activities hold greater interest. A high sense of self-regulatory efficacy is needed to override distracting influences. In both the present research with college students and in previous research with high school youth (Zimmerman, Bandura, & Martinez-Pons, 1992), students registered their weakest sense of efficacy to stick to academic activities when there were other interesting things to do. These findings suggest that, in promoting self-directed learning, students need to be taught skills and strategies for managing not only the cognitive aspects of managing learning but also methods in which to motivate themselves for academic pursuits in the face of difficulties or attractive alternatives (see also Corno, 1989). The aspect of self-regulated learning that plays a crucial role in academic achievement—the capability to mobilize, direct, and sustain one's efforts—has received much less attention in research on academic self-directedness (Zimmerman, Bandura, & Martinez-Pons, 1992).

The present results have important pedagogical implications for collegiate writing instructors. Because students' self-regulatory efficacy for writing beliefs are linked directly to their perceived efficacy to succeed in their writing courses and indirectly to their final grades, teachers should consider making diagnostic assessments of students' self-regulatory efficacy for writing at the outset of courses. This information can reveal specific areas where each student feels incapable as well as the areas where the class as a whole feels ineffectual. Strategies for self-regulating the deficient component of writing can be modeled by the teacher, and specific training exercises can be prescribed. For example, students who report having problems managing their writing time could be shown time planning and self-recording strategies (Zimmerman, Greenspan, & Weinstein, 1994) and given opportunities to control their writing time—first under structured conditions and later under more dynamic conditions. Detailed descriptions of a social, cognitive, mastery approach to instruction have been provided elsewhere (Bandura, 1986; Schunk, 1989; Zimmerman, in press).

The results also provide support for other theories of motivation. The prediction that self-efficacy affects achievement performance both directly and indirectly through goal setting has been made by goal theorists (Locke & Latham, 1990). Volition theorists (Corno, 1989; Kuhl, 1992) have suggested also that self-regulative strategies that sustain intentions through self-enhanced concentration, task management, and completion are critical to academic success. In addition, evidence that self-efficacy for writing predicts self-efficacy for academic achievement coheres with predictions by self-system theorists, such as McCombs and Marzano (1990), who have also emphasized the influence of self-perceptions of academic competence on achievement expectancies.

To summarize, the different facets of perceived self-efficacy played a key role in writing course attainment. They raised the goals students set for themselves and the quality of writing with which they would be self-satisfied. Through their direct and indirect influence, beliefs of personal efficacy had substantial impact on level of writing attainments. Although the contribution of the full set of self-regulatory factors makes a substantial predictive contribution, a fair amount of variance in writing grade attainment remains to be explained. Other self-regulatory factors that have been shown to contribute to cognitive performance—such as, perceived self-efficacy for self-directed learning and analytic strategies—were not included in the present study (Schunk & Hanson, 1989; Wood & Bandura, 1989; Zimmerman, Bandura, & Martinez-Pons, 1992). The types of positive outcomes expected for writing literacy would also be relevant. The inclusion of these additional sociocognitive factors would provide a more complete picture of the magnitude of the contribution of self-processes to academic achievement.

Notes

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¹The decision to use the change point or leading edge of the positive self-efficacy interval in Figure 2 to represent this scale instead of some other feature of this curve was based on the assumption that the highest grade students felt some certainty of achieving would be their key reference point for setting optimal grade goals and motivating themselves. This appears to have been the case: The students' average grade goal of A- was closer to the leading edge grade (B) than any other part of the positive efficacy interval.

²The decision to use the change point or leading edge of the self-dissatisfaction interval in Figure 2 to represent this scale instead of some other feature of this curve was based on the assumption that the highest grade for which students felt some dissatisfaction would be their key minimum evaluative standard for setting grade goals and motivating themselves. This appears to have been the case: The students' average grade goal of A- was closer to the leading edge grade (B-) than any other part of the dissatisfaction interval.

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COMMENTS ON THE CRUSADE AGAINST THE CAUSAL EFFICACY OF HUMAN THOUGHT

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Summary — Hawkins reiterates the familiar behavioristic doctrine that psychology should banish factors that cannot be directly observed. He seems to be unaware that the very operant theory he is espousing is heavily invested in internal determinants that do not lend themselves to direct observation. Because behavior is often unaffected by its immediate situational antecedents and consequences, operant analysts are turning increasingly to internalized determinants of behavior, such as the residues of past reinforcements. These internalized determinants are not directly observable or measurable. They are inferred organismic states. Hawkins invokes the standard behavioristic arguments that, like other cognitive events, beliefs of personal efficacy are epiphenomenal by-products of conditioned responses. The paradigms used to verify the causal contribution of efficacy beliefs to performance renders this claim empirically baseless. Efficacy beliefs are systematically raised to differential levels by means that involve no performances or by bogus feedback that is either unrelated to performance or is contrary to performance. In none of these paradigms are instated efficacy beliefs reflections of performance, but they are uniformly good predictors of subsequent performance. Epiphenomenal assertions are self-destruct arguments.

In self-efficacy theory, people's beliefs in their capabilities to manage environmental demands affect the courses of action they choose to pursue, how much effort they put forth in a given endeavor, how long they persevere in the face of obstacles and failure experiences, how much anxiety and depression they experience in coping with stressors and the level of accomplishments they realize. These relationships have been amply verified by converging evidence from divergent methodologies applied to diverse areas of functioning (Bandura, 1992a, b, in press; Lent, Brown & Hackett, 1994; Maddux & Stanley, 1986; Schunk, 1989; Schwarzer, 1992). In a forthcoming book (Bandura, in press), I review the vast programs of interdisciplinary research stimulated by self-efficacy theory in the fields of

educational development, clinical dysfunction, behavioral medicine and organizational functioning, to mention a few. The findings attest to the explanatory and predictive power of the theory and to its utility in guiding programs that contribute to human betterment.

Hawkins (1992) concedes that the empirical relationships between perceived self-efficacy and different aspects of functioning are well established. However, arguing from the view that thought has no effect on human motivation or action, he regards perceived self-efficacy variously as a "hypothetical construct," and "metaphorical," and as an "epi-phenomenon of performance." Hawkins provides no empirical evidence in support of his position. Rather, he invokes post-hoc explanations that, we shall see

shortly, have in fact been tested and disconfirmed. He also rests his case on disputable arguments of others, some of whom (Corcoran, 1991) make claims that have been refuted empirically (Bandura, 1991). Critiques of the commentaries Hawkins draws upon have been presented elsewhere and will not be reviewed here (Bandura, 1984, 1986b, 1991).

Hawkins reminds readers of the sin of mentalism and the virtues of Skinnerian functionalism in which human behavior is shaped and controlled by contiguous external stimuli. The model of contingency control has not fared well, although one would not know it from Hawkin's portrayal. Estes (1971) summarized the evidence succinctly when he reported that "*the frequency with which animals and men in nonlaboratory situations repeat punished acts and fail to repeat rewarded ones is so great that, as a statistical generalization, the empirical law of effect is all but vacuous.*" In espousing the contingency model of causation, I believe Hawkins ignored the large body of evidence that people's beliefs about what leads to what largely determine whether paired experiences and response consequences have any effect on human behavior (Bandura, 1986a; Brewer, 1974; Dawson & Biferno, 1973; Dulaney, 1968; Estes, 1972; Farber, 1963; Speilberger & DeNike, 1966).

Even behavior analysts are beginning to discard the basic three-element model ($S^d \rightarrow R \rightarrow S'$), which maintained that behavior is shaped and controlled by contingent stimuli. In the words of Lacey and Rachlin (1978), "*The idea that factors which cause an event are immediately antecedent or temporally contiguous to it dies hard.*" With mounting evidence that behavior is often unaffected by its immediate antecedents and consequences, proponents of the contingency model of causation increasingly place the explanatory burden on a conjectured internal surrogate, namely, the residue of the "history of reinforcement." Now that behavior analysts are including internal surrogates in their explanatory schemes, the theoretical issue has come down to whose internal determinants have greater explanatory and predictive power.

The present commentary will first address the issue of the causal contribution of perceived self-efficacy to human motivation and action. I am using the term causation in this context as functional dependence between perceived self-efficacy and other events. This issue has been extensively investigated by a variety of experimental strategies in which perceived self-efficacy is systematically varied, whereupon its effects on subsequent performance are measured. Behavior analysts typically single out studies in which perceived self-efficacy is altered by enactive modes of influence because there is a behavior to latch onto. They then claim that perceived self-efficacy is a reflection of prior performance. This claim has long lost its credibility by evidence from countless studies demonstrating that perceived self-efficacy contributes independently to subsequent performance when variations in prior performance are controlled. I shall return to this matter later. In addressing the issue of causality I will first present evidence from experimental paradigms in which perceived self-efficacy is altered by nonperformance means. Such modes of influence provide no relevant performance information for judging one's personal capabilities.

One approach to the test of causality through nonperformance means is to introduce a trivial factor devoid of information to affect competency, but that can alter perceived self-efficacy. Studies of anchoring influences show that arbitrary reference points from which judgments are made bias judgmental processes because the adjustments from the arbitrary starting points are usually insufficient (Tversky & Kahneman, 1974). For example, in judging the size of the crowd in a stadium, people will judge a smaller crowd from an arbitrary starting point of 1000 than from a starting point of 20,000. Cervone and Peake (1986) biased self-efficacy judgment either in a positive or negative direction by varying the level of arbitrary starting numbers. The higher the instated perceived self-efficacy the longer individuals persevered on difficult and unsolvable problems before they quit.

The same environmental influences rarely, if

ever, produce uniform effects in different individuals. Theories that place the cause of behavior in environment stimuli cannot account for variation in performance accompanying the same external input. Hawkins regards influences that operate through a nonperformance modality as verbal persuasion that supposedly explain behavior without needing to consider their impact on people's beliefs in their personal capabilities. This is a nonexplanatory "explanation" of performance that rests on the illusion of uniformity of effects. In a mediational analysis, Cervone and Peake demonstrate that anchoring influences have no effect on performance unless they alter perceived self-efficacy. When variations in perceived self-efficacy are partialled out, the external anchoring influence has no independent predictive power. These findings are replicated when perceived self-efficacy is biased simply by having people judge their efficacy on scales of ascending or descending levels of possible attainments. Self-judged efficacy is lower for ascending than for descending scale formats. This environmental input is simply a physical arrangement of scale items that neither provides any differential information concerning capabilities nor involves any social influences. As in the anchoring input, scale formats are related to performance only to the extent that they affect perceived self-efficacy.

People partly judge their efficacy through social comparison. Litt (1988) varied perceived self-efficacy by bogus normative comparison. After being tested for pain tolerance on a cold-pressor test, individuals were led to believe that they were either at a high (90th) or low (37th) percentile rank in pain tolerance compared to an ostensibly normative group, regardless of their actual performance. The bogus normative information produced differential levels of perceived self-efficacy which, in turn, were accompanied by corresponding changes in pain tolerance. The greater the changes in perceived self-efficacy, the larger the changes in pain tolerance.

In the second phase of the experiment, the bogus normative feedback was the opposite to that

provided originally, presumably reflecting enduring capability to bear pain. Individuals who were led to believe that they had lost their comparative superiority lowered their perceived self-efficacy, whereas those led to believe they had allegedly gained comparative superiority raised their belief in their capability to tolerate pain. Their subsequent level of pain tolerance changed in the direction of their efficacy beliefs. The condition involving alleged change from high to low normative standing is especially interesting because perceived self-efficacy overrode past performance as a predictor of subsequent performance. If perceived self-efficacy is an epiphenomenon of prior performance it should have remained high. The regulatory role of perceived self-efficacy instated by fictitious normative comparison has been replicated in markedly different domains of functioning (Bouffaard-Bouchard, 1990; Jacobs, Prentice-Dunn & Rogers, 1984).

Another nonperformance paradigm for verifying the causal contributions of perceived self-efficacy to human functioning relies on the vicarious mode of efficacy induction (Bandura, Reese & Adams, 1982). Phobics observe coping strategies being modeled until their perceived self-efficacy is raised to different preselected levels but they themselves perform no actions. Higher levels of perceived self-efficacy are accompanied by higher performance attainments. Microanalysis of efficacy-action congruences reveals a close fit between perceived self-efficacy and performance on individual tasks. 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 pretest behavior could tell them is that they could do nothing.

Hawkins attributes changes in performance to extinction of anxiety. This post-hoc explanation not only invokes the type of inner cause repudiated by the operant conditioning theory he is espousing, but also manages to disregard completely the vast body of evidence

demonstrating that anxiety arousal does not control avoidance behavior. Behavior analysts reject anxiety as a cause of behavior. They regard anxiety as a name for behavioral effects, not an explanation of behavior (Catania, 1979). It is the height of irony to see Hawkins exorcising inner causes in the name of Skinnerian functionalism while simultaneously invoking alternative inner causes that would astound behavior analysts. In another context in his article, Hawkins accepts "willingness" as another alternative inner cause of behavior. The effort to score points against self-efficacy theory apparently takes precedence over conceptual coherence. Having gotten himself into a self-negating predicament, Hawkins is now faced with the choice of either disavowing the theory he is espousing or disavowing anxiety as a cause of behavior.

The notion that anxiety regulates avoidance behavior has been extensively tested and repeatedly disconfirmed (Black, 1965; Bolles, 1975; Herrnstein, 1969; Rescorla & Solomon, 1967; Schwartz, 1978). Moreover, assessments conducted during the course of treatment of phobic behavior reveals no consistent relations between changes in anxiety arousal and phobic behavior. Elimination of phobic behavior can be preceded by increases, reductions, or no change in anxiety arousal (Barlow, Leitenberg, Agras & Wincze, 1969; Leitenberg, Agras, Butz & Wincze, 1971). Neither the pattern nor magnitude of change in anxiety arousal accompanying treatment correlates significantly with changes in avoidance behavior (O'Brien & Borkovec, 1977; Orenstein & Carr, 1975; Schroeder & Rich, 1976).

The nonpredictiveness applies equally to expected anxiety. Williams (1992) has analyzed by partial correlation numerous data sets from studies in which perceived self-efficacy, expected anxiety, and phobic behavior were all measured. As shown in Table 1, 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. The predictive superiority

Table 1

Comparison of the Relation Between Perceived Self-Efficacy and Coping Behavior when Anticipated Anxiety is Controlled, and the Relation Between Anticipated Anxiety and Coping Behavior when Perceived Self-Efficacy is Controlled

	Coping behavior	
	Anticipated anxiety with self-efficacy controlled	Perceived self-efficacy with anticipated anxiety controlled
Williams and Rappoport (1983)		
Pretreatment 1*	-.12	.40†
Pretreatment 2	-.28	.59‡
Posttreatment	.13	.45†
Follow-up	.06	.45†
Williams et al. (1984)		
Pretreatment	-.36†	.22
Posttreatment	-.21	.59§
Williams et al. (1985)		
Pretreatment	-.35†	.28†
Posttreatment	.05	.72§
Follow-up	-.12	.66§
Telch et al. (1985)		
Pretreatment	-.56§	-.28
Posttreatment	.15	.48‡
Follow-up	-.05	.42†
Kirsch et al. (1983)		
Pretreatment	-.34†	.54§
Posttreatment	-.48‡	.48‡
Arnow et al. (1985)		
Pretreatment	.17	.77§
Posttreatment	-.08	.43†
Follow-up	-.06	.88‡
Williams et al. (1989)		
Midtreatment	-.15	.65§
Posttreatment	.02	.47‡
Follow-up	-.03	.71§

*The pretreatment phases of some of these experiments include only subjects selected for severe phobic behavior. They have a uniformly low sense of coping efficacy. In such instances, the highly restricted range of self-efficacy scores tends to lower the correlation coefficients in pretreatment phases.

† $p < .05$. ‡ $p < .01$, § $p < .001$.

of perceived self-efficacy is replicated in other domains of functioning. People's beliefs in their capabilities predict their performance attainments, whereas their level of anxiety bears little or no relationship to their performances on stressful academic tasks (Meece, Wigfield & Eccles, 1990; Pajares & Miller, 1994) and athletic activities (McAuley, 1985). Beliefs of personal efficacy

similarly predict willingness to perform threatening activities, but anticipatory anxiety makes no independent contribution (Arch, 1992a).

Adopting the widely used argument by behavior analysts against cognitive determinants, Hawkins alleges the perceived self-efficacy is inferred from the behavior it seeks to explain. However, this handy argument happens to be inappropriate to causal tests of self-efficacy theory because self-percepts of efficacy are conceptually and operationally distinct from the behaviors to be explained. Indeed, in most of these experiments there is no relevant or informative behavior from which to infer personal efficacy.

A theory that denies that thoughts can affect motivation and action does not lend itself readily to the explanation of complex human behavior. Although cognitive determinants are disavowed by behavior analysts, the causal contributions of such determinants cannot be excised all that easily. Therefore, adherents of radical environmentalism translate cognitive determinants into convoluted behavioristic terms, move the determinants outside the organism, and then ascribe their effects to the direct action of the externally relocated events. I have described elsewhere the forms these relabeling and external relocation exercises take (Bandura, 1986a). Self-efficacy is a broadly integrative determinant, that predicts human functioning, regardless of whether it involves behavioral attainments, self-regulation of motivation, learning activities or refractory habits, coping with threatening or taxing situational demands, stress, depression, pain tolerance, autonomic activation, catecholamine secretion, changes in the immune system, career choice and development, collective organizational functioning and political activism, just to mention a few (Bandura, 1992a, b). Whatever post hoc explanations Hawkins might invoke, they will surely be less parsimonious than perceived self-efficacy, which successfully predicts not only the behavioral changes accompanying different environmental inputs, but variations in behavior between individuals receiving the same environmental input, and even variations within the same individual in the tasks performed

successfully and those shunned or attempted but failed.

Another strategy for verifying the causal contribution of perceived self-efficacy to human functioning is to test the multivariate relations between relevant determinants and performance in the theoretical causal model by hierarchical regression analysis or causal modeling techniques. These analytic tools for theory testing indicate how much of the variation in performance is explained by perceived self-efficacy when the influence of a host of other determinants is simultaneously controlled.

Many of the multivariate investigations involve panel designs in which perceived self-efficacy and performance attainments are measured on two or more occasions to determine how the factors affect each other. In some of these studies, perceived self-efficacy is altered by naturally occurring influences during the intervening period. More often, perceived self-efficacy is altered experimentally by appropriate influences. The temporal ordering and systematic variation of perceived self-efficacy 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 changes in perceived self-efficacy, controls are applied for other potentially influential factors. The results of such studies reveal that perceived self-efficacy contributes significantly to variations in motivation and performance attainments (Bandura & Jourden, 1991; Dzewaltowski, 1989; Locke, Frederick, Lee & Bobko, 1984; Ozer & Bandura, 1990; Wood & Bandura, 1989; Zimmerman, Bandura & Martinez-Pons, 1992). The causal contribution of perceived self-efficacy 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).

The diverse causal tests, of which only a small sample could be presented here, have been conducted with different modes of efficacy induction, varied populations, all sorts of domains

of functioning and response systems, with intergroup and intraindividual experimental designs, and analyzed by microlevel and macrolevel relations. Moreover, perceived self-efficacy is measured by different formats and domain-linked scales so that the results are not peculiar to a particular instrument. The evidence is consistent in showing that perceived self-efficacy contributes significantly to level of motivation and performance attainments. Evidence that divergent procedures produce convergent results across heterogeneous domains of functioning adds to the explanatory and predictive generality of the efficacy determinant.

Hawkins appears to misunderstand the real distinction between the information conveyed by a given mode of influence and the analysis of that information in the formation of self-efficacy judgments. In addressing this distinction I have explained that performance information is simply raw data that is not inherently enlightening. Rather, it becomes instructive only through cognitive processing. This is because a host of nonability factors affect performance. Self-appraisal of efficacy is, therefore, a judgmental process in which the relative contribution of different factors operating at the time must be considered and weighted. The degree to which people alter their perceived self-efficacy on the basis of performance experiences will depend upon such factors as the perceived difficulty of the task, the amount of effort they had to expend, their physical and psychological condition at the time, the amount of external aid they received, the situational circumstances under which they performed, the quality of the apparatus, the temporal pattern of their successes and failures, and the adequacy with which they monitor and recall their experiences. In short, efficacy beliefs are not simply implants of past actions. In fine-grain analyses of performance attainments and shifts in perceived self-efficacy at each step in the process of change, perceived self-efficacy often exceeds, only occasionally matches, and sometimes remains below past performance attainments, depending on how people read their experiences (Bandura, 1982).

In a line of reasoning at odds with logic, Hawkins contends that I adopted the view that performance information is cognitively processed in judging personal efficacy in anticipation of the criticism that people's beliefs in their capabilities are "superfluous" to how they behave. In quoting a brief sentence in which I distinguish between the conveyance and the processing of performance information, Hawkins strangely deletes an important qualifier in that sentence.

Following the altered quotation, Hawkins goes on to tell us that not only is perceived self-efficacy unnecessary for learning but "a veritable plethora of operant conditioning experiments" has shown that you do not even need consciousness. These assertions would suggest that evolutionary forces really went astray in encumbering people with the capacity for thought and consciousness, neither of which has any functional value. However, the problem resides in Hawkins' assertions, which fail to fit the facts, rather than in the nonutility of thought. He seems to be completely unaware that a "plethora" of studies reveal that learning does not occur without awareness of what is being reinforced (Bandura, 1986a; Brewer, 1974; Dulaney, 1968; Gholson, 1980; Karpf & Levine, 1971; Phillips & Levine, 1975; Speilberger & DeNike, 1966). People also learn little, if anything, from repeated paired experiences, unless they recognize that the events are correlated (Dawson & Biferno, 1973; Dawson & Furedy, 1976; Dawson & Reardon, 1973).

It is fortunate that outcomes do not automatically strengthen every response they follow. If behavior were reinforced by every immediate effect it produced, people would be overburdened with so many competing response tendencies that they could become immobilized. Limiting learning to events that are sufficiently telling to gain recognition has considerable adaptive value. Intelligent action often requires the disregard of immediate positive outcomes. Innovation requires prolonged perseverance in the face of repeated failure, setbacks and rejection. For lower organisms possessing limited symbolizing capacities, there are evolutionary advantages to being biologically preprogrammed

so that stimulus events will reliably activate species-specific behavior without requiring much, if any, symbolic processing of experience. However, extensive innate preprogramming, which makes it easy to shape behavior by noncognized experience, extracts a huge price by its behavioral fixedness. Outcomes can facilitate the stereotyped behavior characteristic of a species and bring it under the control of new stimuli, but, unlike the extraordinary serviceability of cognitively based learning, it is exceedingly difficult to get animals to behave in new ways. It comes as no surprise, as Bolles (1972) has pointed out, that most of the research on learning in animals is concerned with altering the rate of responses they naturally perform rather than building complex behaviors. The latter requires some capacity for symbolic coding and cognitive organization of experience.

Hawkins' assertion that perceived self-efficacy has no impact on learning similarly has no foundation in fact. Exposure of children to videotaped peers solving mathematical problems raises observers' beliefs in their learning capabilities (Schunk & Hanson, 1989). The higher the level to which their perceived learning efficacy is raised, the more they learn new material in subsequent self-directed instruction and the higher is their terminal performance attainments in mathematics. The strong predictiveness of perceived learning efficacy is consistently replicated in other experiments varying the characteristics of the videotaped models such as their sex, age, and whether they exhibit mastery or coping behavior (Schunk & Hanson, 1985; Schunk, Hanson & Cox, 1987). Perceived learning efficacy cannot be dismissed as a reflection of performance because children's sense of learning efficacy is enhanced simply by watching models without performing any mathematical activities during the influential exposure.

In another odd line of reasoning, Hawkins argues that perceived self-efficacy can be dismissed as a determinant of human motivation and action because "it is not useful to suppose that a rat in a Skinner box improves during magazine training because of a blossoming sense of self-

efficacy (p. 253)." Our poor rat is restrained in a tiny box stripped of everything except for a bar that can be depressed. Consider by contrast, the extensive applications of self-efficacy theory to human pursuits in complex unrestrained environments providing numerous options, such as career choice and development in college students (Betz & Hackett, 1986; Lent, Brown & Hackett, 1994). Perceived self-efficacy predicts the range of career options seriously considered and the perseverance and academic performance in the chosen fields of study when the influence of scholastic aptitude, vocational interests and level of prior academic achievement are controlled (Lent, Brown & Larkin, 1986). When Hawkins finds a group of rats who have succeeded in gaining entry to college, I shall be happy to verify that perceived self-efficacy is an influential contributor to career choice and development.

Behavior analysts have to demonstrate that their model of contingency control can account for complex human activities rather than keep pointing to modification of rate of trivial responses emitted by animals in barren controlled settings. People were led to believe that applications of operant principles to problematic behavior would verify that human behavior is fully predictable and controllable by contingent stimuli. However, evidence that the actual accomplishments of operant technology fall far short of claims in producing generalized and enduring behavioral changes (O'Leary & Wilson, 1987), only underscored that there is more to the determinants of human behavior than contingencies of reinforcement.

Contrary to Hawkin's declaration, thoughts about personal efficacy are not a "hypothetical construct." Hawkins may fervently believe that his thoughts have no functional value, but surely he would not deny that his thoughts are quite real phenomenally. Although cognitive processes are not publically observable, they do have indicants through which they can become known indirectly. The indicants of thought are separate from the behavior to be explained. Verbal probes provide one indirect means of access. Orderly functional relationships are being established between

indirectly gauged thought and subsequent action (Bandura, 1986a; Ericsson & Simon, 1980).

By focusing on the verbal mode of the thought probe, rather than on what it reveals about content of thought that guides and motivates action, behavior analysts dub thought as merely verbal responses in an effort to divest it of any causal efficacy. When people report the cognitive activities they go through as they generate solutions and then execute them, it is not vocal sounds, but the content of the thought processes they reveal that predict how they behave. A major function of thought is to enable people to predict events and to develop ways to control those that affect their lives. Serious efforts to refine thought probes (Ericsson & Simon, 1980) contribute more to the understanding of human behavior than behavioristic relabelling schemes that discourage research into the nature, structure and function of thought.

Other sciences have made rapid strides in explaining and predicting events from the verifiable properties of postulated determinants that are not directly observable. For example, physicists have been remarkably successful in accounting for physical phenomena by testing the postulated properties of atoms, which are not given to direct public view. In commenting on the observability of factors in the natural sciences, Nagel (1961) put it well when he noted that, "many laws employed in some of the most impressively comprehensive systems of the physical sciences are notoriously not about matters that would ordinarily be characterized as 'observable'."

I was surprised to read that perceived self-efficacy is supposedly a "derivation" of Rotter's (1966) locus of control. Again, Hawkins (1992) conceptions and facts on this issue are not accurate. Perceived self-efficacy and locus of control not only represent different phenomena but are founded on entirely different conceptual schemes. Perceived self-efficacy is concerned with people's beliefs about their capabilities to produce certain performances; locus of control refers to people's beliefs about whether the outcomes they experience are dependent on their actions or are

the result of chance, fate, or luck. Research shows that locus of control and perceived self-efficacy bear little or no relation to each other. The correlations are, $r = .11$ (Smith, 1989), $r = -.01$ (Manning & Wright, 1983), and $r = -.22$ averaged across self-efficacy subscales (Taylor & Popma, 1990). With regard to the pattern of correlates, perceived self-efficacy predicts such diverse events as academic performance, proneness to anxiety, level of pain tolerance, career decision making, and political activism, whereas locus of control is a weak predictor or nonpredictor of these events (Grossman, Brink & Hauser, 1987; Manning & Wright, 1983; Smith, 1989; Taylor & Popma, 1990; Wollman & Stouder, 1991).

Rotter regards locus of control as a generalized trait. Self-efficacy theory rejects the trait approach to human behavior. Self-efficacy is conceptualized and assessed in terms of particularized judgments of capability that vary across realms of activity, different levels of task demands within a given activity domain, and under different situational circumstances. Perceived efficacy is not a contextless global disposition assessed by an omnibus test like the locus of control. Because of their theoretical incompatibility and concern with dissimilar phenomena, perceived self-efficacy cannot, by any stretch of the imagination, be a derivative of locus of control. If it were, it would lose most of its explanatory and predictive value.

Social cognitive theory identifies different classes of expected outcomes and measures them in discriminative ways linked to performances situated in contexts rather than in general decontextualized ways. Outcome expectations take three major forms (Bandura, 1986a). One class of expected outcomes includes the direct physical and social effects that performances produce. Human behavior is also regulated by observed outcomes experienced by others. Social cognitive theory rejects the crude functionalist view that behavior is regulated solely by external rewards and punishments. People adopt personal standards and regulate their behavior by their self-sanctions. They do things that give them self-satisfaction and a sense of self-pride and self-worth and refrain from behaving in ways that give rise to self-

satisfaction, self-devaluation and self-censure. Social cognitive theory adopts a functionalist view, but one that is more complex and befitting humans. Anticipated direct, vicarious and self-evaluative outcomes operate in concert to influence the course of human behavior. The triadic system of interacting anticipatory outcomes cannot be a derivation from locus of control because the outcome expectations are highly contextualized and two of them — vicarious outcomes and self-reactive outcomes — are nowhere to be found in locus of control.

Hawkins cites a pretend study by Kirsch in which students who said they feared snakes persuaded themselves they could handle a snake for make-believe payments of a million dollars, to save another's life or to spare one's own life. Many of them similarly persuaded themselves that they could marshall sufficient dexterity to toss a wad of paper into a wastepaper basket at some distance (46%) or at 50 feet (24%). Kirsch concluded from the higher persuadability for snake handling than paper tossing, that efficacy reflects "willingness" rather than skill. I have commented on the conception and methodology of this make-believe study elsewhere (Bandura, 1986b), and will not repeat my critique here, except to note that the findings of this pretend exercise have little to say of interest regarding perceived self-efficacy.

Social persuasion can raise perceived self-efficacy, especially in make-believe situations. The differential influence of the pretend inducements on snake handling and paper throwing are uninterpretable because the two activities are confounded with differential accuracy criteria. Tossing a wad of paper into a small remote target involves a stringent criterion of accuracy, whereas merely holding a snake does not. One could add a similarly stringent criterion to snake handling as, for example, being able to hold it without it moving at all and demonstrate that people could not persuade themselves that they could do it even for a million bucks.

Willingness essentially refers to intention. Belief that I can do something (*self-efficacy*) is theoretically, operationally, and empirically

distinct from whether I intend to do so (*intention*). Studies in which both factors are measured verify that perceived self-efficacy is a major determinant of intention and willingness to perform threatening activities (Arch, 1992a, b; deVries & Backbier, 1994; deVries, Dijkstra & Kuhlman, 1988; Dzewaltowski, Noble & Shaw, 1990; Kok, deVries, Mudde & Strecher, 1991; Schwarzer, 1992). Perceived self-efficacy influences performance both directly and through its effects on intention. The view that efficacy beliefs are intentions is conceptually incoherent and empirically refuted. As an avowed behaviorist, it is most surprising that Hawkins sees nothing problematic with a study relying entirely on make believe unlinked to any behavior and that he accepts uncritically an alleged inner factor, "willingness," as the regulator of behavior. Neither pretended behaviorless exercises, nor "willingness," which refers to the will of choosing, would be acceptable to behavior analysts. The overzealous effort to refute self-efficacy theory seems to blind Hawkins to his own contradictions.

It is somewhat comic to observe an ardent proponent of the view that thoughts are by-products of conditioned responses arguing the rightness of his conceptions in an effort to sway the beliefs of others to his view. Hawkins does not seem to realize that, in so doing, he is propounding a self-negating argument. If thoughts are merely functionless accessories of conditioned responses, and proponents regard their own thoughts as such, they can hardly argue the truth value of their views. One can analyze how the conditioned responses that give rise to such a cognitive by-product were acquired. But it becomes pointless, from this perspective, to champion the rightness of the cognitive by-products of a behaviorist's conditioned responses over those of a cognitivist's conditioned responses. Any more than one could argue that a conditioned pecking response is truer than a conditioned bar press. If Hawkins really believes that thoughts are simply accessories of conditioned responses devoid of any functional value, he should be describing his conditioning history that spawned the behavior of which his

views are accessories rather than proclaiming the rightness of Skinnerian functionalism.

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Social Cognitive Theory of Human Development

Theories of human development differ in their conceptions of human nature and what they regard as the basic determinants and mechanisms of personal adaptation and change. This entry analyzes human development from the perspective of social cognitive theory (Bandura 1986). Development is not a monolithic process. Human capabilities vary in their psychobiologic origins and in the experiences needed to develop and maintain those capabilities. Human development, therefore, includes many different types and patterns of changes. Diversity in social practices produces substantial individual differences in the competencies, interests, and values that are cultivated and those that remain underdeveloped.

1. Model of Causation

Prior to an analysis of the capabilities that govern human development, the model of causation on which social cognitive theory is founded is reviewed briefly. This theory explains human adaptation and change in terms of triadic reciprocal causation. In this causal model, environmental influences, behavior, and cognitive, biological, and other personal factors operate as interacting determinants that alter each other. Through this process of two-way causation, people are both producers and products of their environment.

When human development is viewed from a life-span perspective, the influential determinants include a varied succession of life events that differ in their power to affect the direction lives take (Brim and Ryff 1980). Many of these determinants include age-graded social influences that are provided by custom within familial, educational, and other institutional systems. Some life events involve biological conditions that contribute to the course of human development. Other life events are unpredictable occurrences in the physical environment. Still others involve irregular life events such as career changes, divorce, migration, accidents and illnesses.

Social and technological changes alter, often considerably, the kinds of life events that become customary in the society. Major sociocultural changes that make life markedly different, such as economic adversities that alter livelihoods and opportunity structures, military conflicts, cultural upheavals, new technologies, and political changes that modify the character of the society can have strong impact on life courses. Life experiences under the same sociocultural conditions at a given time will differ for people who encounter them at different points in their life span (Elder 1981).

Whatever the social conditions might be, there is still the task of explaining the varied directions that personal lives take at any given time and place. This

requires a personal, as well as a social, analysis of life paths. In addition to the prevailing sociocultural influences, people are often brought together through a fortuitous constellation of events that can shape the course of their lives (Bandura 1982). There are many fortuitous elements in the events people encounter in their daily lives. Indeed, some of the most important determinants of life paths often arise through the most trivial of circumstances.

Psychology does not have much to say about the occurrence of fortuitous encounters, except that personal attributes and particular social affiliations and milieus make some types of encounters more probable than others. However, psychology can provide the basis for predicting the nature, scope, and strength of the impact that fortuitous encounters will have on human lives. Many chance encounters touch people only lightly, others leave more lasting effects, and still others thrust people into new trajectories of life. The power of fortuitous influences to initiate enduring personal changes is determined by the reciprocal influence of personal attributes and social factors. These interactive determinants have been extensively analyzed elsewhere (Bandura 1982).

In social cognitive theory, people are neither driven by inner forces nor shaped and controlled by the environment. As already seen, people function as influential contributors to their own development and psychosocial functioning within a network of reciprocally interacting influences. Individuals are characterized within this theoretical perspective in terms of a number of basic capabilities, which are reviewed next.

2. Symbolizing Capability

Social cognitive theory assigns a central role to cognitive, vicarious, self-regulatory, and self-reflective processes in human development and functioning. The remarkable capacity 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. Most environmental influences operate through cognitive processes. Cognitive factors partly determine which environmental events will be observed, what meaning will be conferred on them, whether they leave any lasting effects, what emotional impact and motivating power they will have, and how the information they convey will be organized for future use. It is with symbols that people process and transform transient experiences into cognitive models that serve as guides for reasoning and action. With the aid of symbols, people give structure, meaning, and continuity to their experiences.

People gain understanding and expand their knowledge by operating symbolically on the information derived from personal and vicarious experi-

ences. The remarkable flexibility of symbolization enables people to create ideas that transcend their sensory experiences. Through the medium of symbols they can communicate with others at any distance in time and space. However, in keeping with the interactional perspective, social cognitive theory devotes much attention to the social origins of thought and the mechanisms through which social factors exert their influence on cognitive functioning.

3. Vicarious Capability

Psychological theories have traditionally emphasized learning through the effects of exploratory actions. If knowledge and skills could be acquired only by direct experience, human development would be greatly retarded, not to mention exceedingly tedious and hazardous. A culture could never transmit its language, mores, social practices, and adaptive competencies if they had to be shaped laboriously in each new member by response consequences without the benefit of models who exemplify the cultural patterns. The abbreviation of the acquisition process through modeling is vital for survival as well as for human development because natural endowment provides few inborn skills, and errors can be hazardous. Moreover, the constraints of time, resources, and mobility impose severe limits on the situations and activities that can be directly explored for the acquisition of new knowledge and competencies.

3.1 Primacy and Scope of Modeling Differences

Humans have evolved an advanced capacity for observational learning that enables them to expand their knowledge and skills rapidly on the basis of information conveyed by modeling influences. Indeed, virtually all behavioral, cognitive, and affective learning resulting from direct experience can occur vicariously by observing people's behavior and its consequences for them (Bandura 1986, Rosenthal and Zimmerman 1978).

Much learning occurs either deliberately or inadvertently by observation of people in one's environment. However, a vast amount of information about human values, thinking skills, and behavior is gained from models in the mass media. A major significance of symbolic modeling lies in its wide-reaching influence. Unlike learning by doing, which requires shaping the actions of each individual through repeated trial-and-error experiences, in observational learning a single model can transmit new ways of thinking and behaving simultaneously to many people in widely dispersed places. People's conceptions of social reality depend heavily on vicarious experiences, by what they see and hear (Adoni and Mane 1984, Signorielli and Morgan 1990). The more their images of reality rely upon the media's symbolic environment, the greater is its social impact (Ball-Rokeach and DeFleur 1976).

Most psychological theories were formulated long before the advent of the enormous advances in the technology of communication. As a result, they ignore the increasingly powerful role the symbolic environment plays in present-day human lives. Whereas previously, modeling influences were largely confined to the behavior patterns exhibited in a person's immediate environment, televised modeling has vastly expanded the range of models to which members of society are exposed day in and day out. By drawing on these modeled patterns of thought and behavior, observers transcend the bounds of their immediate environment. New ideas and social practices are now being rapidly diffused by symbolic modeling within a society and from one society to another (Bandura 1986, Rogers 1982). Because television occupies a large part of people's lives, the study of acculturation in the present electronic era must be broadened to include electronic acculturation.

3.2 Subfunctions of Observational Learning

Observational learning is governed by four subfunctions. *Attentional processes* determine what is observed and extracted from the profusion of modeling influences. People cannot be greatly influenced by models if they do not remember what they have seen. A second major subfunction governing observational learning involves cognitive *representational and memory processes*. In the third subfunction in modeling—the *behavioral production process*—symbolic conceptions are translated into appropriate courses of action. This is achieved through a conception-matching process in which conceptions guide the construction and execution of behavior patterns. Skills are then perfected by corrective adjustments until actions match conceptions. The fourth subfunction in modeling concerns *motivational processes*. People do not perform everything they learn. Performance of observationally learned behavior is influenced by three major types of incentive motivators: *direct outcomes*, *vicarious outcomes* of observed consequences of others, and *self-evaluative outcomes* toward one's own conduct.

Modeling is not a process of behavioral mimicry. Rather, modeling influences convey rules for generative and innovative behavior. This higher-level learning is achieved through abstract modeling in which observers extract the rules governing the modeled judgments and action. Through abstract modeling, people acquire linguistic rules of communication, standards for categorizing and judging events, thinking skills on how to gain and use knowledge, gender role conceptions and personal standards for regulating one's own motivation and conduct (Bandura 1986, Rosenthal and Zimmerman 1978).

3.3 Diverse Effects of Modeling

The discussion thus far has centered on the acquisition of knowledge, cognitive skills, and new styles of behavior through observational learning. Modeling has diverse effects, each governed by different determinants and underlying mechanisms. In addition to cultivating new competencies, modeling influences can strengthen or weaken restraints over behavior patterns that have been previously learned. Modeling affects restraints by the information it conveys about the probable rewarding or punishing consequences of modeled courses of action (Walters 1968).

People are easily aroused by the emotional expressions of others. What gives significance to vicarious emotional arousal is that observers can acquire lasting attitudes, emotional reactions, and behavioral proclivities toward persons, places, or things that have been associated with modeled emotional experiences. Individuals learn to fear the things that frightened others, to dislike what repulsed them, and to like what gratified them (Bandura 1986). The actions of models can also serve as social prompts that activate, channel, and support previously learned behavior. Thus, the types of models that prevail within a social milieu partly determine which human qualities, from among many alternatives, are selectively encouraged. In sum, modeling influences serve diverse functions as tutors, inhibitors, disinhibitors, social promoters, emotion arousers, and shapers of values and conceptions of reality.

4. Forethought Capability

Another distinctive human characteristic is the capability for forethought. People do not simply react to their immediate environment, nor are they steered by 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 prospective actions, they set goals for themselves, and they plan courses of action that are likely to produce desired outcomes and avoid detrimental ones. Through exercise of forethought, people motivate themselves and guide their actions anticipatorily. The capacity for intentional and purposive action is rooted in symbolic activity. Future events cannot be causes of current motivation and action because they have no actual existence. However, by being represented cognitively in the present, foreseeable future events are converted into current motivators and regulators of behavior.

Human behavior is extensively regulated by its effects. Behavior patterns that produce positive outcomes are readily adopted and used, whereas those that bring unrewarding or punishing outcomes are generally discarded. However, external consequences are not the only kind of outcomes that

influence human behavior. People profit from the successes and mistakes of others as well as from their own experiences. As a general rule, they do things they have seen succeed and avoid those they have seen fail. However, observed outcomes exert their influence through perceived similarity that one is likely to experience similar outcomes for similar courses of action and that one possesses the capabilities to achieve similar performances (Bandura 1986). People also influence their own motivation and behavior by the positive and negative consequences they produce for themselves. This mode of self-regulation will be considered later.

Because outcomes exert their influence through forethought, they have little or no impact until people discover how outcomes are linked to actions in their environment. This is no easy matter. In everyday life, actions usually produce mixed effects, they may occur immediately or far removed in time, the same behavior may produce different effects depending on where, when, and toward whom it is performed, and many situational factors influence how actions affect the environment. Such causal ambiguity provides a fertile ground for misjudgment. When belief about the effects of actions differs from actuality, behavior is weakly controlled by its actual consequences until repeated experience instills realistic beliefs. Yet it is not always one's beliefs that change in the direction of social reality. Acting on erroneous beliefs can alter how others behave, thus shaping the social reality in the direction of the misbeliefs (Snyder 1981).

5. Self-regulatory Capability

People are not simply knowers and performers. They are also self-reactors with a capacity for self-direction. Successful development requires the gradual substitution of internal regulation and direction for external sanctions and mandates. Once the capability for self-direction is developed, self-demands and self-sanctions serve as major guides, motivators, and deterrents. In the absence of internal standards and self-sanctions, individuals would behave like weather vanes, constantly shifting direction to conform to whatever momentary influence happened to impinge upon them.

The self-regulation of motivation, affect, and action operates partly through internal standards and evaluative reactions to one's own behavior (Bandura 1991a). The anticipated self-satisfaction gained from fulfilling valued standards provides one source of incentive motivation for personal accomplishments. Self-dissatisfaction with substandard performances serves as another incentive motivator for enhanced effort. The motivational effects do not stem from the standards themselves, but rather from the fact that people respond evaluatively to their own behavior.

5.1 Motivational Standards

Most theories of 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. However, self-regulation by negative discrepancy tells only half the story and not necessarily the more interesting half. In fact, people are proactive, aspiring organisms. Human self-regulation relies on discrepancy production as well as discrepancy reduction. People motivate and guide their actions by setting themselves challenging goals and then mobilizing their skills and effort to reach them. 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.

5.2 Social and Moral Self-regulatory Standards

In areas of functioning involving achievement strivings and cultivation of competencies, the internal standards that are selected as a mark of adequacy are progressively raised as knowledge and skills are acquired and challenges are met. In many areas of social and moral behavior the internal standards that serve as the basis for regulating one's conduct have greater stability. In other words, people do not change from week to week what they regard as right or wrong or good or bad. After they adopt a standard of morality, their self-sanctions for actions that match or violate their personal standards serve as the regulatory influences (Bandura 1991b). People do things that give them self-satisfaction and a sense of self-worth. They refrain from behaving in ways that violate their moral standards because it will bring self-disapproval. Self-sanctions thus keep conduct in line with internal standards.

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 moral reactions can be disengaged from inhumane conduct (Bandura 1986, 1991b). Selective activation and disengagement of internal control permits different types of conduct with the same moral standards. One set of mechanisms disengages moral control by moral justification. What is culpable is made personally and socially acceptable by portraying it in the service of moral purposes. Self-deplored acts can also be made righteous by advantageous comparison with more flagrant inhumanities. Euphemistic language provides another convenient device for masking reprehensible activities or even conferring a respectable status upon them.

Self-sanctions are activated most strongly when personal causation of detrimental effects is apparent. Another set of disengagement practices operates by obscuring or distorting the relationship between actions and the effects they cause. This is achieved by displacement of responsibility for detrimental conduct to others, or by diffusing responsibility through

division of labor, group decision-making and group action. Additional ways of weakening deterring self-sanctions operate through disregard or distortion of the consequences of action. 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.

The final set of disengagement practices operates on how perpetrators view the people they harm. Self-sanctions against cruel conduct can be disengaged or blunted by dehumanization, which divests people of human qualities or invests them with bestial qualities. Attribution of blame to victims is still another expedient that can serve self-exonerative purposes. By blaming victims or circumstances, not only are one's own actions excusable but one can even feel self-righteous in the process. Because internalized controls can be selectively activated and disengaged, marked changes in moral conduct can be achieved without altering people's personality structures, moral principles or self-evaluative systems.

6. Self-reflective Capability

The capability for self-reflection concerning one's own thinking and personal efficacy is another attribute that receives prominent attention in social cognitive theory. Effective cognitive functioning requires ways of distinguishing between accurate and faulty thinking. In verifying thought by self-reflective means, people monitor their ideas, act on them or predict occurrences from them, then judge from the results the adequacy of their thoughts, and change them accordingly. Judgments concerning the validity and functional value of one's thinking are formed by comparing how well thoughts match some indicator of reality. Four different modes of thought verification can be distinguished: *enactive*, *vicarious*, *persuasory*, and *logical* forms.

6.1 Modes of Verifying the Adequacy of Thought

Enactive verification relies on the adequacy of the fit between thought and the results of one's actions. Good matches verify their reasoning; mismatches tend to refute it. In the *vicarious* mode of thought verification, observing other people's behavior and its effects serves as a way of checking the correctness of one's own thinking about what leads to what. The *persuasory* mode of thought verification relies on comparing one's thoughts to the judgments of others. When experiential verification is either difficult or impossible, people evaluate the soundness of their views by checking them with what others believe. This mode of verification often arises in matters involving specialized knowledge or beliefs concerning things with which one has little or no contact. In the course of development, people acquire rules of inference. This enables them to detect certain errors in thought by logical verification. By reasoning

from what is already known, they can derive knowledge about things that extend beyond their experience and check the validity of their reasoning.

Self-reflectivity entails shifting the perspective of the same agent rather than reifying different internal agents or selves regulating each other. Thus, in their daily lives people act on their thoughts and later analyze how well their thoughts have served them in managing events. But it is the one and the same person who is doing the thinking and later evaluating the adequacy of his or her knowledge, thinking skills, and action strategies. The shift in perspective does not transform a person from an agent to an object; one is just as much an agent reflecting on one's experiences as in executing the original courses of action.

6.2 Self-efficacy Appraisal

Among the types of thoughts that affect human development and functioning, none is more central or pervasive than people's judgments of their capabilities to exercise control over their own functioning and over events that affect their lives. The self-efficacy mechanism plays a central role in human agency (Bandura 1986). People's beliefs in their efficacy influence how they think, feel, act, and motivate themselves. Such beliefs influence what people choose to do, how much effort they invest in activities, how long they persevere in the face of obstacles and failure experiences, whether their thought patterns are self-hindering or self-enhancing, and how much stress and despondency they experience during anticipatory and actual transactions with the environment. A high sense of self-efficacy pays off in performance accomplishments and personal well-being.

Beliefs of personal efficacy are based on four principal sources of information. These are: (a) performance mastery experiences; (b) vicarious experiences for judging capabilities in comparison with performances of others; (c) verbal persuasion and related types of social influences that lead to the belief that one possesses certain capabilities; and (d) physiological states and reactions from which people partly judge their capableness, strength, and vulnerability. These different sources of efficacy information must be cognitively processed, weighted, and integrated into self-beliefs of efficacy.

Different periods of life present certain prototypic competency demands for successful functioning. Changing aspirations, time perspectives, and cultural variations over the course of the life-span alter how people structure, regulate, and evaluate their lives. Normative changes in required competencies with age do not represent lock-step stages through which everyone must inevitably pass. There are many pathways through life and, at any given period, people vary substantially in how efficaciously they manage their lives.

Each of the distinctive human capabilities

reviewed in the preceding sections requires certain conditions for its development and undergoes characteristic developmental changes over the course of the life-span. Analysis of the developmental determinants and mechanisms of these capabilities falls beyond limits of this entry, but are reviewed elsewhere in considerable detail (Bandura 1986).

7. Characteristics of Human Nature

Viewed from the social cognitive perspective, human nature is characterized by a vast potentiality that can be developed by direct and vicarious experience into a variety of forms within biological limits. To say that a major distinguishing mark of humans is their endowed plasticity is not to say that they have no nature or that they come structureless. The plasticity, which is intrinsic to the nature of humans, depends upon specialized neurophysiological mechanisms and structures that have evolved over time. These advanced neural systems, which are specialized for processing, retaining, and using coded information, provide the capacity for the very characteristics that are distinctly human, that is, generative symbolization, forethought, evaluative self-regulation, reflective self-consciousness, and symbolic communication.

Most patterns of human behavior are organized by individual experience and retained in neural codes, rather than being provided ready-made by extensive inborn programming. Although human thought and conduct may be developed largely through experience, innate endowments enter into every form of behavior to some degree. Genetic factors and neural systems affect behavioral potentialities and place constraints on capabilities. Because behavior contains mixtures of inborn elements and learned patterns, dichotomous thinking, which separates activities into innate and acquired categories, is seriously inaccurate.

Humans have an unparalleled capability to become many things. As life-span theorists have observed (Baltes and Reese 1984), human development is a heterogeneous phenomenon that encompasses different types of abilities that follow different trajectories of change and are modifiable throughout the life course. The human qualities that are cultivated and the life paths that realistically become open to members of a society are partly determined by the nature of the cultural agencies to which their development is entrusted. Social systems that cultivate competencies, create opportunity structures, provide adequate resources, and permit leeway to develop diverse aspects of personal potentialities, increase the likelihood that people will realize what they wish to become.

See also: Lifespan Development: Learning across the Lifespan, Development of: Learning Theories: Historical Over-

view and Trends: Learning Processes and Learning Outcomes

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A. Bandura

9

Cultivate Self-Efficacy for Personal and Organizational Effectiveness

ALBERT BANDURA

Human behavior is extensively motivated and regulated anticipatorily by cognitive self-influence. Among the mechanisms of self-influence, none is more focal or pervading than belief of personal efficacy. Unless people believe that they can produce desired effects and forestall undesired ones by their actions, they have little incentive to act. Whatever other factors may operate as motivators, they are rooted in the core belief that one has to power to produce desired results. That self-efficacy belief is a vital personal resource is amply documented by meta-analyses of findings from diverse spheres of functioning under laboratory and naturalistic conditions (Holden, 1991; Holden, Moncher, Schinke, and Barker, 1990; Multon, Brown, and Lent, 1991; Stajkovic and Luthans, 1998).

Perceived efficacy occupies a pivotal role in causal structures because it affects human functioning not only directly, but through its impact on other important classes of determinants. These determinants include goal aspirations, incentives and disincentives rooted in outcome expectations, and perceived impediments and opportunity structures. Figure 9.1 presents the structure of the causal model.

Efficacy beliefs affect self-motivation through their impact on goals and aspirations. It is partly on the basis of efficacy beliefs that people choose what goal challenges to undertake, how much effort to invest in the endeavor, and how long to persevere in the face of difficulties (Bandura, 1997; Locke and Latham, 1990). When faced with obstacles, setbacks, and failures, those who doubt their capabilities slacken their efforts, give up, or settle for mediocre solutions. Those who have a strong belief in their capabilities redouble their effort to master the challenges.

Perceived efficacy, similarly, plays an influential role in the incentive and disincentive potential of outcome expectations. The outcomes people anticipate depend largely on their beliefs of how well they can perform in given situations. Those of high efficacy expect to gain favorable outcomes through good performance, whereas those who expect poor performances of themselves conjure up negative outcomes.

In theories of motivation founded on the incentives of cognized outcomes, such as expectancy-value theories, motivation is governed by the expectation that a given behavior will produce certain outcomes and the value placed on those outcomes. This

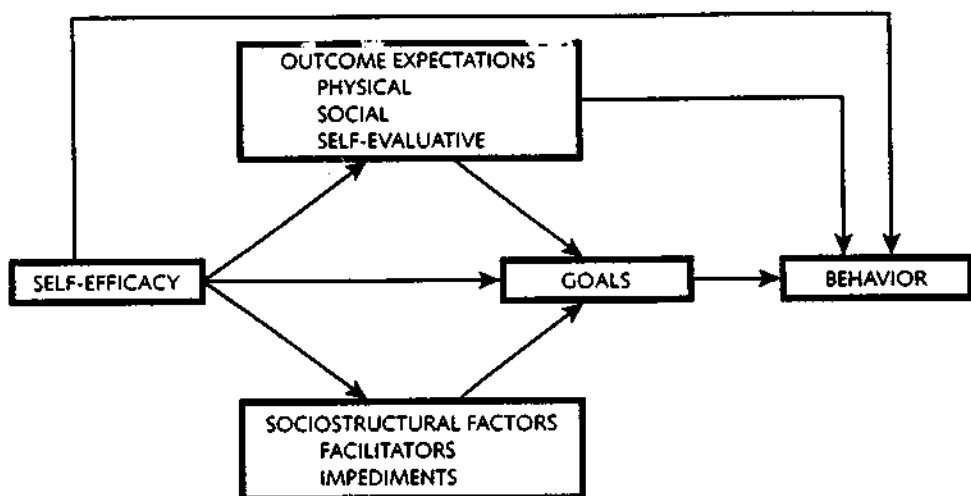


FIGURE 9.1 Paths of influence through which perceived self-efficacy and other key social cognitive factors regulate motivation and performance accomplishments.

type of theory includes only one of the two belief systems governing motivation. People act on their beliefs about what they can do, as well as on their beliefs about the likely outcomes of performance. There are countless activities 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 exclude entire classes of options rapidly on self-efficacy grounds without bothering to analyze their costs and benefits. Conversely, those of high efficacy expect their efforts to bring success and are not easily dissuaded by negative outcomes.

Rational models of motivation and decision-making that exclude efficacy judgment sacrifice explanatory and predictive power. Perceived self-efficacy not only sets the slate of options for consideration, but also regulates their implementation. Making a decision in no way ensures that individuals will execute the needed course of action successfully, and stick to it in the face of difficulties. A psychology of decision-making requires a psychology of action grounded in enabling and sustaining efficacy beliefs. One must add a performative self to the decisional self, otherwise the decider is left stranded in thought.

Beliefs of personal efficacy shape whether people attend to the opportunities, or to the impediments that their life circumstances present and how formidable the obstacles appear, Krueger and Dickson, 1993, 1994. People of high efficacy focus on the opportunities worth pursuing, and view obstacles as surmountable. Through ingenuity and perseverance they figure out ways of exercising some control even in environments of limited opportunities and many constraints. Those beset with self-doubts, dwell on impediments which they view as obstacles over which they can exert little control, and easily convince themselves of the futility of effort. They achieve limited success even in environments that provide many opportunities.

Diverse organizational impact of perceived self-efficacy

The scope of the organizational impact of perceived self-efficacy will be summarized briefly before presenting the strategies for altering efficacy belief systems. To begin with, perceived self-efficacy is an influential determinant of career choice and development. The higher a person's perceived efficacy to fulfill educational requirements and occupational roles the wider the career options they seriously consider pursuing, the greater the interest they have in them, the better they prepare themselves educationally for different occupational careers, and the greater their staying power in challenging career pursuits (Lent, Brown, and Hackett, 1994).

New employees receive training designed to prepare them for the occupational roles they will be performing. Those of low perceived efficacy prefer prescriptive training that tells them how to perform the roles as traditionally structured (Jones, 1986; Saks, 1995). Employees of high perceived efficacy prefer training that enables them to restructure their roles innovatively by adding new elements and functions to the customary duties. Self-efficacious employees take greater initiative in their occupational self-development and generate ideas that help to improve work processes (Speier and Frese, 1997). Organizations that provide their new employees with guided mastery experiences, effective co-workers as models, and enabling performance feedback enhance employees self-efficacy, emotional well-being, satisfaction, and level of productivity (Saks, 1994, 1995). Other organizational practices, such as job enrichment and mutually supportive communication, also build employees' perceived efficacy to take on broader functions and a proactive work role (Parker, 1998). Self-efficacy theory provides a conceptual framework within which to study the determinants in effective work design and the mechanisms through which they enhance organizational functioning.

Work life is increasingly structured on a team-based model in which management and operational functions are assigned to the workers themselves. A self-management work structure changes the model of supervisory management from hierarchical control to facilitative guidance that provides the necessary resources, instructive guidance, and support that teams need to do their work effectively (Stewart and Manz, 1995). Enabling organizational structures build managers' efficacy to operate as facilitators of productive team work (Laschruger and Shamian, 1994). The perceived collective efficacy of self-managed teams predicts the members' satisfaction and productivity (Lindsay, Mathieu, Heffner, and Brass, 1994; Little and Madigan, 1994).

The development of new business ventures and the renewal of established ones depends heavily on innovativeness and entrepreneurship. With many resourceful competitors around, viability requires continual ingenuity. Entrepreneurs have to be willing to take risks under uncertainty. Those of high efficacy focus on the opportunities worth pursuing, whereas the less self-efficacious dwell on the risks to be avoided (Krueger and Dickson, 1993, 1994). Hence, perceived self-efficacy predicts entrepreneurship and which patent inventors are likely to start new business ventures (Chen, Greene, and Crick, 1998; Markman and Baron, 1999). Venturers who achieve high growth in companies they have founded, or transform those they bought, have a vision of what they wish to achieve, a firm belief in their efficacy to realize it, set challenging growth goals, and come up with innovative production and marketing strategies (Baum, 1994).

Effective leadership and workforces require receptivity to innovators that can improve

the quality and productivity of organizations. Managers' perceived technical efficacy influences their readiness to adopt electronic technologies (Jorde-Bloom and Ford, 1988). Efficacy beliefs affect not only managers' receptivity to technological innovations, but also the readiness with which employees adopt them (Hill, Smith, and Mann, 1987; McDonald and Seagall, 1992). Efficacy-fostered adoption of new technologies, in turn, alters the organizational network structure and confers influence on early adopters within an organization over time (Burkardt and Brass, 1990).

Perceived self-efficacy to fulfill occupational demands affects the level of stress and physical health of employees. Those of low efficacy are stressed both emotionally and physiologically by perceived overload in which task demands exceed their perceived coping capabilities, whereas those who hold a high belief in their efficacy and that of their group are unfazed by heavy workloads (Jex and Bliese, 1999). Perceived self-efficacy must be added to the demands-control model of occupational stress to improve its predictability. High job demands with opportunity to exercise control over various facets of the work environment is unperturbing to job-holders of high perceived efficacy, but cardiovascularly stressful to those of low perceived efficacy (Schaubroeck and Merritt, 1997). Efforts to reduce occupational stressfulness by increasing job control without raising efficacy to manage the increased responsibilities will do more harm than good. For the self-efficacious, job underload can be a stressor. Indeed, employees of high efficacy are stressed by perceived underload in which they feel thwarted and frustrated by organizational constraints in developing and using their potentialities (Matsui and Onglatco, 1992). Exposure to chronic occupational stressors and with a low sense of efficacy to manage job demands and to enlist social support in times of difficulty, increases vulnerability to burnout (Brouwers and Tomic, *in press a, b*; Leiter, 1992). This syndrome is characterized by physical and emotional exhaustion, depersonalization of clients, lack of any sense of personal accomplishment, and occupational disengagement through cynicism about one's work.

A resilient sense of efficacy provides the necessary staying power in the tortuous pursuit of innovation and excellence. Yet the very undaunted self-efficacy that breeds success in tough ventures may perpetuate adherence to courses of action that hold little prospect of eventual success. Thus, for example, managers of high perceived efficacy are more prone than those of low efficacy to escalate commitment to unproductive ventures (Whyte and Saks, 1999; Whyte, Saks, and Hook, 1997), and to remain wedded to previously successful practices despite altered realities that place them at competitive disadvantage (Audia, Locke, and Smith, *in press*). The corrective for the perils of success is not enfeeblement of personal efficacy. Such a disenabling remedy would undermine aspiration, innovation, and human accomplishments in endeavors presenting tough odds. Individuals who are highly assured in their capabilities and the effectiveness of their strategies are disinclined to seek discordant information that would suggest the need for corrective adjustments. The challenge is to preserve the considerable functional value of resilient self-efficacy, but to institute information monitoring and social feedback systems that can help to identify practices that are beyond the point of utility.

It is easy to achieve veridical judgment. Simply punish optimism. The motivational belief system that fosters accomplishments in difficult endeavors combines realism about tough odds, but optimism that through self-development and perseverant effort one can beat those odds. We study intensively the risks of over-confidence, but ignore the

prevalent personal and social costs of under-confidence. This bias probably stems from the fact that the costs of lost opportunities and underdeveloped potentialities are deferred and less noticeable than those of venturesome missteps. The heavy selective focus on the risk of over-confidence stands in stark contrast to the entrepreneurial spirit driving the modern workplace in our rapidly changing world.

The functional value of veridical self-appraisal depends on the nature of the venture. In activities where the margins of error are narrow and missteps can produce costly or injurious consequences, one is best served by veridical efficacy 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. People have to decide whether to invest their efforts and resources in ventures that are difficult to fulfill, and how much hardship they are willing to endure in formidable pursuits that may have huge payoffs but are strewn with obstacles and uncertainties. Turning visions into realities is an arduous process with uncertain outcomes. Societies enjoy the considerable benefits of the eventual accomplishments in the arts, sciences, and technologies of its persisters and risk-takers. Realists trade on the merchandizable products that flow from the creations of innovative persisters. To paraphrase the astute observation of George Bernard Shaw, since reasonable people adapt to the world and unreasonable ones try to to alter it, human progress depends on the unreasonable ones.

Given the generality and centrality of the self-efficacy mechanism in the causal structures governing diverse aspects of organizational functioning, programs aimed at developing a resilient sense of efficacy can yield significant dividends in performance accomplishments and personal well-being. The strategies for developing and strengthening beliefs of personal efficacy are addressed in the sections that follow. Social cognitive theory lends itself readily to personal and social applications, which are extensively reviewed elsewhere (Bandura, 1986, 1997). The present chapter summarizes the relevant principles of change and provides some examples in the organizational field for purposes of illustration.

SOURCES OF SELF-EFFICACY

Self-efficacy beliefs are constructed from four principal sources of information: they include enactive mastery experiences; vicarious experiences that alter efficacy beliefs through transmission of competencies and comparison with the attainment of others; verbal persuasion and allied types of social influences that one possesses certain capabilities; and physiological and affective states from which people partly judge their capableness, strength, and vulnerability to dysfunction. Any given influence may operate through one or more of these forms of efficacy conveyance.

Information for judging personal 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.

TABLE 9.1 The distinctive sets of factors within each of the four modes of influence that can affect the construction of efficacy beliefs

Enactive Efficacy Information	Vicarious Efficacy Information
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	
Persuasory Efficacy Information	Somatic and Affective Efficacy Information
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

Social cognitive theory specifies the set of efficacy indicators that are unique to each of the four major modes of influence. These are summarized in table 9.1. For example, judgments of efficacy based on performance attainments may vary depending on people's interpretive biases, the perceived 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.

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 weight and integrate efficacy information from the diverse sources in forming their efficacy judgments. The informativeness of the various efficacy indicants will vary for different spheres of functioning. The various sources of efficacy information may be integrated additively, multiplicatively, configurally, or heuristically. This judgmental process is not entirely dispassionate. Strong preconceptions and affective proclivities can alter self-efficacy appraisals positively or negatively.

The multiple benefits of a strong 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. A sense of personal efficacy is constructed through a complex process of self-persuasion based on constellations of efficacy information conveyed enactively, vicariously, socially, and physiologically.

Enablement through guided mastery

Guided mastery provides one of the most effective ways of cultivating competencies. However, a skill is only as good as its execution, which is heavily governed by self-regulatory and motivational factors. Individuals may, therefore, perform poorly, adequately, or highly with the same set of skills depending on the beliefs they hold about their capabilities in given situations (Bandura, 1997). As previously noted, mastery experiences, especially those gained through perseverant effort and ability to learn from setbacks and mistakes, builds a resilient sense of efficacy.

The method that produces the best gains in both self-efficacy and skill combines three components (Bandura, 1986). First, the appropriate skills are modeled to convey the basic rules and strategies. Second, the learners receive guided practice under simulated conditions to develop proficiency in the skills. Third, they are provided with a graduated transfer program that helps them to apply their newly learned skills in work situations in ways that will bring them success.

Instructive modeling. Modeling is the first step in developing competencies. Complex skills are broken down into sub-skills, which can be modeled on videotape in easily mastered steps. Subdividing complex skills into sub-skills produces better learning than trying to teach everything at once. After the sub-skills are learned by this means, they can be combined into complex strategies to serve different purposes. Effective modeling teaches general rules and strategies for dealing with different situations rather than only specific responses or scripted routines. Voice-over narration of the rules and strategies as they are being modeled, and brief summaries of the rules enhances development of generic competencies.

The execution of skills must be varied to suit changing circumstances. People who learn rules in the abstract usually do a poor job in applying them in particular situations. Teaching abstract rules with varied brief examples promotes generalizability of the skills being taught by showing how the rules and strategies can be widely applied and adjusted to fit changing conditions. A single lengthy example teaches how to apply the rule in that particular situation but provides no instruction on how to adapt its application to varying situations.

People also fail to apply what they have learned, or do so only half-heartedly, if they distrust their ability to do it successfully. Therefore, modeling influences must be designed to build a sense of personal efficacy as well as to convey knowledge about rules and strategies. The impact of modeling on beliefs about one's capabilities is greatly increased by perceived similarity to the models. Learners adopt modeled ways more readily if they see individuals similar to themselves solve problems successfully with the modeled strategies than if they regard the models as very different from themselves. The characteristics of models, the type of problems with which they cope, and the situations in which they apply their skills should be made to appear similar to the trainees' own circumstances.

Guided skill perfection. Factual and procedural knowledge alone will not beget proficient performance. Knowledge structures are transformed into proficient action through a conception-matching process. The feedback accompanying enactments provides the information needed to detect and correct mismatches between the generic conception of requisite skills and action. This comparative process is repeated until a close match is achieved. Putting into practice what one has learned cognitively can also reveal gaps and flaws in the guiding conception. Recognizing what one does not know contributes to the refinement of cognitive representations by further modeling and verbal instruction regarding the problematic aspects of the representation.

In the transformational phase of competency development, learners test their newly acquired skills in simulated situations where they need not fear making mistakes or appearing inadequate. This is best achieved by role rehearsal in which they practice handling the types of situations they have to manage in their work environment. Mastery of skills can be facilitated by combining cognitive and behavioral rehearsal. In cognitive rehearsal, people rehearse mentally how they will translate strategies into what they say and do to manage given situations.

In perfecting their skills, people need informative feedback about how they are doing. A common problem is that they do not fully observe their own behavior. Informative feedback enables them to make corrective adjustments to get their behavior to fit their idea of how things should be done. Videotape replays are widely used for this purpose. Simply being shown replays of one's own behavior, however, usually has mixed effects (Hung and Rosenthal, 1981). To produce good results, the feedback must direct attention to the corrective changes that need to be made. It should call attention to successes and improvements and correct deficiencies in a supportive and constructive way so as to strengthen perceived efficacy. Some of the gains accompanying informative feedback result from raising people's beliefs in their efficacy rather than solely from further skill development.

The feedback that is most informative and achieves the greatest improvements takes the form of corrective modeling. In this approach, the sub-skills that have not been adequately learned are further modeled and learners rehearse them until they master them.

Effective functioning requires more than learning how to apply rules and strategies for managing organizational demands. The transactions of occupational life are littered with impediments, discordances, and stressors. Many of the problems of occupational functioning reflect failures of self-management rather than deficiencies of knowledge and technical skills. Therefore, an important aspect of competency development includes training in resiliency to difficulties. As we shall see later, this requires skill in cognitive self-guidance, self-motivation, and strategies for counteracting self-debilitating reactions to troublesome situations that can easily unhinge one. Gist, Bavetta, and Stevens (1990) augmented a guided model training in negotiation skills with a self-management component. In the latter phase, trainees were taught how to anticipate potential stressors, devise ways of overcoming them, monitor the adequacy of their coping approach, and use self-incentives to sustain their efforts. Trainees who had the benefit of the supplemental self-management training were better at applying learned negotiation skills in new contractual situations presenting conflictual and intimidating elements and negotiated more favorable outcomes than trainees who did not. The self-managers made

flexible use of the wide range of strategies they had been taught, whereas their counterparts were more likely to persevere with only a few of the strategies when they encountered negative reactions.

Transfer training by self-directed success. Modeling and simulated enactments 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 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. Learners are assigned selected problems they often encounter in their everyday situations. After they try their hand at it, they discuss their successes and where they ran into difficulties for further instructive training. As learners 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 experience difficulties.

Mastery modeling is now increasingly used, especially in videotaped form, to develop competencies. But its potential is not fully realized if training programs do not provide sufficient practice to achieve proficiency in the modeled skills or if they lack an adequate transfer program that provides success with the new skills in the natural environment. Such programs rarely include training in resiliency through practice on how to handle setbacks and failure. When instructive modeling is combined with guided role rehearsal and a guided transfer program, this mode of organizational training usually produces excellent results. Because trainees learn and perfect effective ways of managing task demands under lifelike conditions, problems of transferring the new skills to everyday life are markedly reduced.

A mastery modeling program devised by Latham and Saari (1979) to teach supervisors the interpersonal skills they need to work effectively through others is an excellent case in point. Supervisors have an important impact on the morale and productivity of an organization. Yet they are often selected for their technical competencies and job-related knowledge, whereas their success in the supervisory role depends largely on their interpersonal skills to guide, enable, and motivate those they supervise.

Latham and Saari used videotape modeling of prototypic work situations to teach supervisors how to manage the demands of their supervisory role. They were taught 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 (Goldstein and Sorcher, 1974). Summary guidelines defining key steps in the rules and strategies being modeled were provided to aid learning and memorability. The group of supervisors discussed and then practiced the skills in role-playing scenarios using incidents they previously had to manage in their work. They received instructive feedback to help them improve and perfect their skills.

To facilitate transfer of supervisory skills to their work environment, they were instructed to use the skills they had learned on the job during the next week. They later reviewed their successes and difficulties in applying the skills. If they encountered problems, the incidents were re-enacted and the supervisors received further training

through instructive modeling and role rehearsal on how to manage such situations. Supervisors who had received the guided mastery training performed more skillfully both in role-playing situations and on the job assessed a year later than did supervisors who did not receive the training. Because the skills proved highly functional, the supervisors adhered to them. The effects of weak training programs, relying heavily as they often do, on enthusiastic persuasion, rapidly dissipates as the initial burst of enthusiasm fades through failure to produce good results. Simply explaining to supervisors in the control group the rules and strategies for how to handle problems on the job without modeling and guided role rehearsal did not improve their supervisory skills. Because this approach provides supervisors with the tools for solving the problems they face, they express favorable reactions to it.

Supervisory skills instilled by guided mastery improve the morale and productivity of organizations (Porras and Anderson, 1981; Porras et al., 1982). Compared to the productivity of control plants, the one that received that guided mastery program improved supervisory problem-solving skills, had a significantly lower absentee rate, lower turnover of employees, and a 17 percent increase in the monthly level of productivity over a six-month period. This surpassed the productivity of the control plants. Mastery modeling produces multiple benefits in sales similar to those in production as reflected in enhanced productivity, and a lower rate of turnover in personnel (Meyer and Raich, 1983).

There are no training short-cuts or quick fixes for perceived ineffectiveness, dysfunctional work habits, and deficient self-regulatory and occupational competencies. As is true in other pursuits, the methods that are least effective are most widely used for ease of delivery, whereas enablement methods of proven value are used less often because they require greater investment of time and effort.

The application of guided mastery for markedly different purposes, such as the elimination of anxiety, stress reactions, and phobic dysfunctions, further illustrates the power and generality of this approach. To overcome distress and phobic avoidance people have to confront their perceived threats and gain mastery over them. When people avoid what they fear, they lose touch with the reality they shun. Guided mastery provides a quick and effective way of restoring reality testing. It provides disconfirming tests of faulty beliefs. But even more important, mastery experiences that are structured to develop coping skills provide persuasive confirmatory tests that one can exercise control over potential threats. However, individuals are not about to do what they dread. Therefore, one must create enabling environmental conditions so that individuals who are beset with profound self-doubt can perform successfully despite themselves. This is achieved by enlisting a variety of performance mastery aids (Bandura, 1997).

Feared activities are first modeled to show people how to cope effectively with threats and to disconfirm their worst fears. Difficult or intimidating tasks are broken down into sub-tasks of readily mastered steps. The change program is conducted in this step-wise fashion until the most taxing or threatening activities are mastered. Joint performance of intimidating activities with the implementor further enables ineffectacious individuals to attempt activities they resist doing by themselves. Another method for overcoming resistance is to have individuals perform the feared activity for only a short time. As they become bolder, the length of involvement is extended. With gains in mastery the provisional performance aids are withdrawn to verify that coping attainments stem from

the exercise of enhanced personal efficacy rather than from mastery aids. Dysfunctional styles of thinking that arise in the coping transactions are corrected and coping strategies that foster successful performance are suggested. In the final phase, self-directed mastery experiences are arranged that provide the newly emboldened individuals with opportunities to confront their nemeses and succeed entirely on their own to strengthen and generalize their sense of coping efficacy.

This mastery-oriented approach instills a robust sense of coping efficacy, eliminates anxiety arousal, activation of stress-related hormones, perturbing ruminations and nightmares, and wipes out phobic behavior (Bandura, 1997; Williams, 1992). Guided mastery is ideally suited for ridding oneself of other dysfunctional mindsets that create emotional distress and impair interpersonal effectiveness.

Cognitive mastery modeling

A great deal of professional work involves making judgments and finding solutions to problems by drawing on one's knowledge, constructing new knowledge structures, and applying decision rules. Competency in problem-solving requires the development of thinking skills for how to seek reliable information and put it to good use. People can learn thinking skills and how to apply them by observing the decision rules and reasoning strategies models use as they arrive at solutions.

Over the years, organizational training relied almost exclusively on the traditional lecture format despite its limited effectiveness. Mastery modeling works much better than lectures (Burke and Day, 1986). With the advent of the computer, talking heads are being replaced by self-paced instructional diskettes that provide step-by-step instruction, structured drills, and feedback of accuracy.

Comparative tests indicate that cognitive modeling may provide a better approach to the development of higher-order cognitive competencies. In teaching reasoning skills through cognitive modeling, performers verbalize their strategies aloud as they engage in problem-solving activities (Meichenbaum, 1984). The thoughts guiding their decisions and actions are thus made observable. During cognitive modeling, the models verbalize their thoughts as they analyze the problem, seek information relevant to it, generate alternative solutions, judge the likely outcomes associated with each alternative, and select the best way of implementing the chosen solution. They also verbalize their strategies for handling difficulties, how to recover from errors, and how to motivate themselves.

Modeling thinking skills and action strategies together can aid development of reasoning skills in several ways. Watching models verbalize their thoughts as they solve problems commands attention. Hearing the rules verbalized as the action strategies are implemented produces faster learning than only being told the rules or seeing only the actions modeled. Modeling also provides an informative context in which to demonstrate how to go about solving problems. The rules and strategies of reasoning can be repeated in different forms as often as needed to develop generative thinking skills. Varied application of reasoning strategies increases understanding of them.

Observing models verbalize how they use their cognitive skills to solve problems highlights the capacity to exercise control over one's thought processes, which can boost observers' sense of efficacy over and above the strategic information conveyed. Similarity to succeeding models boosts the instructional impact. And finally, modeling how to

manage failures and setbacks fosters resilience to difficulties.

Gist (1989) taught managers how to generate ideas to improve the quality of organizational functioning and customer service by providing them with guidelines and practice in innovative problem-solving. Cognitive modeling, in which models verbalized strategies for generating ideas, proved superior to presenting the same guidelines solely in the traditional lecture format. Managers who had the benefit of cognitive modeling expressed a higher sense of efficacy and generated considerably more ideas and ideas of greater variety. Regardless of format of instruction, the higher the instilled efficacy beliefs, the more abundant and varied were the generated ideas.

The advantages of cognitive mastery modeling are even more evident when the effectiveness of alternative instructional methods are examined as a function of trainees' pre-existing level of perceived efficacy. Gist, Rosen, and Schwoerer (1988) taught managers with a computerized tutorial how to operate a spreadsheet program and use it to solve business problems. Cognitive modeling provided the same information and the same opportunities to practice the computer skills but used a videotape of a model demonstrating how to perform the computer task.

Videotaped cognitive modeling instilled a uniformly high sense of efficacy to acquire computer software skills regardless of whether managers began the training self-assured or self-doubting of their computer capabilities. A computerized tutorial exerted weaker effects on efficacy beliefs and was especially ineffective with managers who were insecure in their computer efficacy. Cognitive modeling also promoted a high level of computer skill development. The higher the pre-existing and the instilled efficacy beliefs, the better the skill development. The benefits of mastery modeling extend beyond development of technical skills. Compared to the computer tutorial training, mastery modeling produced a more effective working style, less negative affect during training, and higher satisfaction with the training program. Mastery modeling provides an instructional vehicle that lends itself well for enlisting affective and motivational determinants of competency development.

We are entering a new era in which the construction of knowledge and development of expertise will rely increasingly on electronic inquiry. Much information is currently available only in electronic rather than print form. The electronic network technologies greatly expand opportunities to attain expertise. Skill in electronic search is emerging as an essential competency. Knowledge construction through electronic inquiry is not simply a mechanical application of a set of cognitive operators to an existing knowledge base. Rather, it is a challenging process in which affective, motivational, and self-regulatory factors influence how information is gathered, evaluated, and integrated into knowledge structures.

Information seekers face an avalanche of information in diverse sources of varying value and reliability. The amount of information on the Internet and the number and types of sites are doubling rapidly. Concepts with interrelated elements must be used to organize and guide efforts to find the most relevant information. Small changes in strategies can lead down radically different information pathways, many of which may be unfruitful. It is hard to know whether one is on the right track, or on an unproductive one. It requires a robust sense of efficacy to find one's way around this mounting volume and complexity of information. People who doubt their efficacy to conduct productive inquiries, and to manage the electronic technology, can quickly become overwhelmed.

In developing the cognitive skills for untangling the Web, individuals were taught how

to frame the electronic inquiry by selecting key constructs and finding reliable sources; how to broaden the scope and depth of inquiry by using appropriate connectors; and how to sequence the inquiry optimally (Debouski, Wood, and Bandura, 1999). Compared to a group that received a computer tutorial, those who had benefit of cognitive modeling that conveyed the same search rules gained higher perceived efficacy and satisfaction in knowledge construction. They spent less time in errors and redundancies, used better search and sequencing strategies, learned more, and were more successful in constructing new knowledge. Putting a human face with whom one can identify in electronic instructional systems substantially boosts their power.

Cultivation of self-regulatory competencies

People have the capacity for self-directedness through the exercise of self-influence. The accelerated growth of knowledge and rapid pace of social and technological change are placing a premium on capabilities for self-motivation and self-development. Indeed, to keep up with a world that is rapidly changing, people have to develop, upgrade, and reform their competencies in continual self-renewal. To achieve this, they must develop skills in regulating the cognitive, motivational, affective, and social determinants of their functioning.

Self-management is exercised through a variety of interlinked self-referent processes including self-monitoring, self-efficacy appraisal, personal goal-setting, and enlistment of motivating incentives (Bandura, 1986, 1991; Locke and Latham, 1990). Knowledge of how these various sub-functions of self-regulation operate provides particularized guides on how to develop and implement this capability.

People cannot influence their own motivation and actions very well if they do not keep track of their thought patterns and performances, their situational influences, and the immediate and distal effects they produce. Therefore, success in self-regulation partly depends on the fidelity, consistency, and temporal proximity of self-monitoring. Observing one's pattern of behavior is the first step toward doing something to affect it, but, in itself, such information provides little basis for self-directed reactions.

Goals and aspirations play a pivotal role in the exercise of self-directedness. Goals motivate by enlisting self-evaluative involvement in activities rather than directly. Once people commit themselves to goal challenges two types of affective motivators come into play – people seek *self-satisfaction* from fulfilling valued goals, and are prompted to intensify their efforts by *discontent* with sub-standard performances. Activation of evaluative self-influence operates through a comparator process in which perceived performance is judged against one's personal standard. Self-motivation through goal challenges, therefore, requires explicit goals and informative feedback on how one is doing. Neither goals without knowing how one is doing, nor knowing how one is doing without any goals is motivating (Bandura, 1991).

Motivational goal effects are mediated by three types of self-influences – perceived self-efficacy for goal attainment, evaluative self-reactions, and adjustment of personal standards in light of one's attainments. The more people bring these self-influences to bear on themselves, the greater the effort they exert and sustain to accomplish what they seek.

Goals do not automatically activate the self-reactive influences that govern level of motivation. Certain properties of goal structures determine how strongly the self-system

will become enlisted in any given endeavor. These properties include goal specificity, proximity, and level of challenge.

Goals often have little impact because they are too general and personally noncommittal. To create productive involvement in activities, goals must be explicit so as to indicate the type and amount of effort needed to attain them. The amount of effort enlisted and satisfaction that accompany different goals depends on the level at which they are set. Strong interest and involvement in activities is sparked by challenges. The effectiveness of goals in regulating motivation and performance depends on how far into the future they are projected. Long-range goals provide the vision and give direction to one's activities. But they are too distant to serve as current motivators. There are too many competing activities at hand for distant futures to exert much impact on current behavior. It is too easy to put off serious efforts in the present, to the tomorrows of each day. Self-motivation is best sustained by attainable sub-goal challenges that lead to distant aspirations. Short-term sub-goals motivate and guide effort in the here and now. Challenging sub-goals are a good way of building perceived efficacy and intrinsic interest where they are lacking (Bandura, 1991, 1997). There are several ways they achieve these effects. Sustained effort builds competencies. Sub-goal attainments provide clear markers of increasing mastery. Evidence of progress builds efficacy. Sub-goal attainments also bring self-satisfaction. Satisfying experiences build intrinsic interest in activities.

Goal systems structured along the lines described above function as remarkable robust motivators across diverse activity domains, environmental settings, populations, and time spans (Bandura, 1997; Locke and Latham, 1990). Chapter 8 above provides further guidelines on how to structure and implement goal systems for productive engagement in personal and organizational pursuits.

Effective self-regulation is also central to personal management of emotional states and problem behaviors that have a negative spillover on work performance. Employee absenteeism costs United States industries billions of dollars each year. It is a serious problem that disrupts work schedules, raises costs, and decreases productivity. Frayne and Latham (1987) provide the elements for an effective self-management system to reduce absenteeism. Employees who often missed work were taught in groups how to manage their motivation and behavior more effectively. They kept a record of their work attendance. They analyzed the personal and social problems that prevented them from getting to work, and were taught strategies for overcoming these obstacles. They set themselves short-term goals for work attendance, and rewarded themselves for meeting their goals. Training in self-regulation increased employees' beliefs in their efficacy to overcome the obstacles that led them to miss work. They improved their work attendance and maintained these changes over time (Latham and Frayne, 1989). The stronger they believed in their self-management capabilities, the better was their work attendance. A control group of employees who did not receive the program in self-regulation continued their absentee ways.

The guiding principles and applications reviewed in the preceding sections underscore the centrality of perceived self-efficacy as a personal resource that yields dividends in motivation, performance attainments, and emotional well-being. Social cognitive theory embeds perceived efficacy within a broad network of sociocognitive factors. Because these factors are modifiable and the theory specifies their determinants and modes of operation, it lends itself readily to diverse social applications.

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Impact of Adolescents' Perceived Self-Regulatory Efficacy on Familial Communication and Antisocial Conduct

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The present study tested the hypothesis that perceived self-efficacy to resist peer pressure for high-risk activities is related to transgressive conduct, both directly and through the mediation of open familial communication. Adolescents rated their self-regulatory efficacy, openness of communication with parents, and their involvement in delinquent conduct and substance abuse. Results of structural equation modeling confirmed that a high sense of efficacy to ward off negative peer influences was accompanied by open communication with parents about activities outside the home and by low engagement in delinquent conduct and sub-

stance abuse. Both the posited direct and mediated paths of influences were replicated for males and females, although girls exhibited a slightly weaker direct relationship between self-regulatory efficacy and transgressive conduct. The combined influence of self-regulatory efficacy and supportive parental communication and monitoring accounted for a substantial share of the variance in delinquent conduct and substance abuse. A test of an alternative causal model, that engagement in transgressive activities undermines self-regulatory efficacy and familial communication and monitoring practices, provided a poor fit to the data.

Keywords: Self-efficacy, familial communication, antisocial conduct.

The beliefs that people hold about their efficacy to exercise influence over events that affect their lives play a major role in shaping the course of personal development. In this agentic sociocognitive view (Bandura, 1986, 1997a), people are self-organizing, proactive, and self-regulating agents in their own development rather than just recipients of socialization influences. This self-directive capacity operates through mechanisms of personal agency. Among the mechanisms of agency, none is more central or pervasive than people's beliefs in their own efficacy. Unless they believe they can produce desired results through their actions they have little incentive to act or to persevere in the face of difficulties.

The findings of diverse lines of research support the role of perceived self-efficacy in intellectual development (Bandura, Barbaranelli, Caprara, & Pastorelli, 1996a; Pajares, in press; Schunk, 1989; Zimmerman, Ban-

dura, & Martinez-Pons, 1992); creativity (Zimmerman & Bandura, 1994); social development and well-being (Bandura, Pastorelli, Barbaranelli, & Caprara, 1998a); choice and development of career paths (Bandura, Barbaranelli, Caprara, & Pastorelli, 1998b; Hackett, 1995; Lent, Brown, & Hackett, 1994); group performance (Bandura, 1991); and health functioning (Bandura, 1997b).

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The present research is designed to clarify the paths of influence through which adolescents' beliefs in their self-regulatory efficacy affect their level of involvement in antisocial activities and substance abuse.

Although the belief of personal efficacy serves a regulatory function in all major transitions of life, it is especially important during adolescence. The passage through adolescence to adulthood has become more stressful and riskier than in the past (Hamburg, 1992; Leffert & Petersen, 1995). Physical maturation occurs earlier, though adolescence is socially prolonged because of the extended educational obligations and delayed entry into occupational roles. Moreover, it is a time of exploratory engagement in high-risk activities, substance abuse, unprotected sexuality, and transgressive conduct. Heavy involvement in these types of activities can seriously jeopardize personal development. Negative peer modeling and pressures increase developmental risks by promoting activities that can foreclose pathways conducive to prosocial development or provide pathways conducive to antisocial conduct.

Most adolescents negotiate the important transitions of this period without undue disturbance or discord (Bandura, 1997a; Elliott, 1993; Loeber, 1990; Moffit, 1993). But some get deeply involved in high-risk activities that give rise to detrimental lifestyles. A comprehensive theory of personality development must explain why some people persist in detrimental conduct, whereas most disengage from risky experimentations. This requires specification of the sociocognitive mechanisms through which control over peer pressures for transgressive conduct is exercised.

Social cognitive theory specifies classes of determinants and mechanisms that operate in concert to produce coherent and stable patterns of conducts (Bandura, 1997a, in press). Given that perceived self-regulatory efficacy has proved to be an important contributor to success in a variety of domains, it is likely to be critical in mastering successfully the various task demands, risks, and challenges in the passage through adolescence to adulthood. Youngsters who enter adolescence beset by a disabling sense of inefficacy transport their vulnerability to stress and dysfunction to new environmental demands, they are less able to enlist familial guidance and support, and they are more likely to be exposed to peer pressures conducive to various hazardous and transgressive activities (Bandura, 1997a). In contrast, youngsters who have a high sense of self-regulatory efficacy are better equipped to cope with the transitional stressors of adolescence, to pursue activities that build competencies, to voice effectively their opinions and aspira-

tions with parents and adults, and to resist peer pressures to engage in risky or antisocial conducts (Bandura, 1997a).

The present research is part of an extended longitudinal project aimed at identifying the developmental determinants and mechanisms of social adaptation during the transitions from childhood to adolescence to adulthood (Bandura et al., 1996a,b; Caprara, 1996). Previous studies have focused mainly on academic achievement, problem behavior, and emotional well-being in late childhood and early adolescence. This research analyzes how self-regulatory efficacy affects communication with parents and engagement in antisocial behavior during middle adolescence. In the conceptual model guiding this research, perceived self-regulatory efficacy influences engagement in antisocial conduct both directly and indirectly by its effects on parental communication and monitoring patterns.

A vast literature underscores the importance of familial relationships and open communication about matters of concern in successful adolescent adjustment (Bandura & Walters, 1957; Grotevant, 1983; Noller, 1994; Steinberg, 1989; Youniss & Smollar, 1985). The greater the mutuality is in familial relationships, the more the parents promote achievement of the developmental tasks that adolescents face. The more open the communication among parents and children, the greater the consensus on reciprocal obligations and expectations. The more parents encourage the expression of personal needs and aspirations, the more children turn to them for guidance and support. Open communication fosters parental trust in their children's freedom and autonomy, reduces their vigilance as their children become more self-directive, and enhances their confidence and affective support.

Familial relationships grounded in mutual acceptance and open communication enable adolescents to weather transitional stressors in a variety ways (Marta, in press; Scabini, 1995). Mutuality fosters children's need for differentiation and individuation. As a consequence they are less inclined to seek to prove their identity by challenging parental guidance through involvement in high-risk transgressive activities. Mutually supportive relationships not only buffer the adverse effect of transitional stressors, but serve an enabling function (Bandura, 1997b).

The role of parental involvement and monitoring as protective means against the development of problem behaviors has been documented in diverse programs of research (Patterson, Reid, & Dishion, 1992; Robins & Rutter, 1990; Rolf, Masten, Cicchetti, Neuchterlein, &

Weintraub, 1990). The influence that parental control beliefs exert on children's socialization has been emphasized as well (Schneewind, 1995). But little attention has been paid to the role that children's efficacy beliefs exert on communication with parents and on antisocial conduct.

As children increase in maturity and development, family management practices change in form and locus of influence. In childhood, the interactions are centered heavily in the family. This enables parents to influence directly the course of their children's development. As children move increasingly into the larger social world outside the home, parents cannot be present to guide their behavior. They rely on their children's behavioral standards and self-regulatory sanctions to serve as guides and deterrents in nonfamilial contexts. To provide further guidance and support to adolescents as they try to manage major biological, educational, and social role transitions, parents need knowledge of their activities and choice of associates outside the home. Parents have to depend largely on the adolescents themselves to tell them what they are doing when they are on their own away from home. Adolescents, therefore, play a major agentic role in this distal guidance process.

For the reasons already given, it was hypothesized that perceived efficacy to resist peer pressures for risky activities would facilitate open communication with parents and reduce proclivity to antisocial conduct. By acting on beliefs that they can manage peer pressures, adolescents reduce the likelihood of engaging in substance abuse and antisocial activities. To the extent that they believe they can manage such pressures they feel free to discuss with their parents the predicaments they face. Open familial communication enables parents to provide guidance and social support, and identifies potential problem situations that may warrant some monitoring. Supportive parental communication and monitoring, in turn, operate as social safeguards against detrimental involvement in risky activities. By contrast, adolescents who have a weak sense of self-regulatory efficacy are not only less successful in resisting detrimental peer pressures, but are reluctant to discuss their transgressive activities with their parents.

Given the differential opportunities and consequences of engaging in antisocial conduct for females, the role of gender in the postulated conceptual scheme is examined separately. Although males are typically more heavily involved in antisocial behavior than are females, the posited paths of influence were expected to be similar across gender.

Method

Participants

The participants in this study were 162 males and 162 females ranging age from 14 to 18 years with a mean age of 15.7 for males and 15.6 for females. They were enrolled in various grades of high schools in a residential community located near Rome. The community represents a socioeconomic microcosm of the larger society, containing the families of skilled workers, farmers, professionals, local merchants and their services staff. The adolescents were contacted by telephone and invited to participate in the study, for which they received a small payment. Ninety percent of the adolescents agreed to participate in the study.

Measures

Participants completed a set of scales measuring the variables of theoretical interest. The scales were administered by three female researchers during specially scheduled sessions in the school to groups of about 50 participants at a time.

Self-Regulatory Efficacy

Adolescents' perceived capability to resist peer pressure to engage in high-risk activities that can get them into trouble was measured by five items. "How well can you resist peer pressure to drink beer, wine, or liquor?" provides one example. For each item, participants rated on a 5-point scale their beliefs in their level of efficacy withstand pressure to engage in the designed activity. The Cronbach reliability coefficient was .75. This subset of items was shown in factor analysis to be a separate factor in a larger set of multifaceted self-efficacy scales (Bandura et al., 1996a).

Open Communications with Parents

Communication with parents was measured by a 10-item subscale from the 20-item Parent-Adolescent Communication Scale (PACS) developed by Barnes and Olson (1982) to assess adolescents' open and problematic communication with both parents. The adolescents rated, on a 5-point scale, the extent to which they felt free to discuss problems with their parents and that they would respond in an understanding, supportive way. Factor analysis of the full scale confirmed the two-factor structure: one factor representing open communication

and the other problematic communication. For purposes of the present study, only the open communication subscale was used. The α coefficient was .83 for communication with both the mother and the father.

Monitoring

The extent to which adolescents kept their parents informed about their activities and associates outside the home was assessed with seven items, each rated using a 5-point scale. They rated how often parents asked them about their activities when they were off on their own. This scale was developed by Capaldi and Patterson (1989). Factor analysis confirmed the presence of a single factor explaining about the 52% of the variance. The α coefficient for the scale was .84.

Delinquent Behavior

Delinquent behavior was measured by the relevant items from the Child Behavior Checklist developed by Achenbach and Edelbrock (1978). The Delinquency subscale, comprising 22 items for males and 19 items for females, assesses a wide range of transgressive behaviors, including theft, cheating, lying, destructiveness, truancy, and use of alcohol and drugs. Each item was rated on a 3-point scale. The α coefficient for the scale was .87 for males and .86 for females.

Substance Abuse

The extent to which the adolescents used alcohol, cigarettes, marijuana or other drugs in the last year was assessed by six items rated using a 2-point scale. The α coefficient for the scale was .70.

Results

Table 1 presents the means and standard deviations, respectively, for boys and girls for the different variables in the conceptual model. Boys were equally open with both their parents about their outside activities, whereas girls were more disclosing to their mothers than to their fathers, $t(146) = 8.07$, $p < .001$. Compared to boys, girls had a stronger sense of self-regulatory efficacy, but experienced a higher level of parental monitoring of their activities and associates outside the home. Boys engaged in more substance abuse and delinquent conduct than did the girls.

Table 2 shows the correlation matrix for the different variables. Perceived self-regulatory efficacy is accompanied by open communication with both parents, high parental monitoring, and a low level of delinquent

Table 1

Means, standard deviation and F test for gender differences for the variables of the conceptual model.

Variable	Boys (n = 151)		Girls (n = 147)		F	p
	M	SD	M	SD		
1. Self Efficacy	3.59	.97	3.80	.98	3.49	.06
2. Openness (M.)	3.72	.67	3.99	.72	12.05	.001
3. Openness (F.)	3.66	.67	3.60	.80	.46	.50
4. Monitoring	3.69	.71	4.13	.75	27.46	.0001
5. Delinquency	.46	.31	.26	.25	37.21	.0001
6. Substance Abuse	.42	.26	.24	.24	38.49	.00001

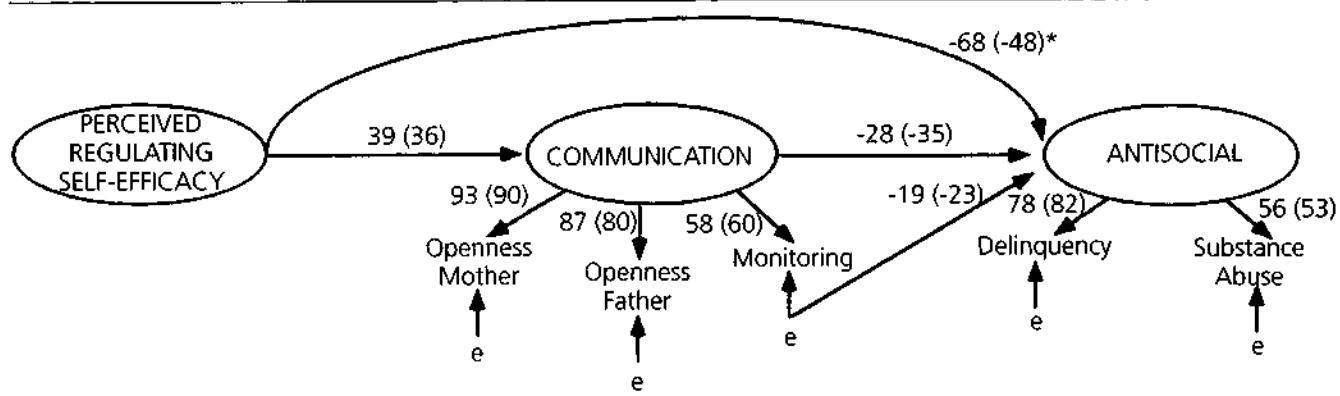
Note. Degrees of freedom for the F test were (1,296). The number of subjects differs slightly from that reported in the method section because only subjects with no missing values on any of the scales were included.

Table 2

Correlation matrix for self-regulatory efficacy, familial communication, and transgressive conduct.

	1	2	3	4	5	6
1. Self-Efficacy		.19*	.27***	.27***	-.47***	-.27***
2. Openness (M.)	.38***		.71***	.53***	-.39***	-.22**
3. Openness (F.)	.30***	.81***		.50***	-.33***	-.24**
4. Monitoring	.30***	.53***	.46***		-.42***	-.31***
5. Delinquency	-.54***	-.41***	-.39***	-.43***		.45***
6. Substance Abuse	-.46***	-.19*	-.19*	-.19*	.43***	

Note. Correlation coefficients for boys ($n = 151$) are below the principal diagonal, those for girls ($n = 147$) are above the principal diagonal. * $p < .05$, ** $p < .01$, *** $p < .001$.

**Figure 1**

Structural Equation Model of the patterns of influence through which perceived self-regulatory efficacy affects delinquent conduct and substance abuse. The coefficients in parentheses are for girls, the coefficients not in parentheses are for boys. All the path coefficients are significant beyond the $p < .05$ level. All the path coefficients are not significantly different across gender, except the one with the asterisk (*). The letter "e" indicates the error term for the observed variables.

cy and substance abuse in both boys and girls. Open communication with both parents is highly and positively related to parental monitoring and negatively related to delinquent conduct and substance abuse.

The pattern of relationships among the variables was examined by means of structural equation modeling (Bollen, 1989) using the EQS program (Bentler, 1995). Following Bollen (1989), self-regulatory efficacy was posited as a "single-indicator" latent variable to take into account measurement error and thus obtain more precise estimates of structural parameters. Following the recommendation of Bollen (1989), error variance for this variable was estimated by fixing it at 1 minus the reliability estimate of self-regulatory efficacy obtained in our sample.

Open communication was represented by a latent variable combining open communication with both parents and their level of monitoring of outside activities. Antisocial behavior was also represented by a latent variable combining delinquent conduct and substance abuse. Analyses of the paths of influence were conducted within a *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 is true for the populations involved. In the present study, the equality constraints were imposed on path coefficients across boys' and girls' groups.

The results of the structural equation modeling are shown in Figure 1. One modification in the model was introduced to improve the model's fit. It included a direct path from the error term of monitoring to antisocial conduct. This supplementary path reflects the fact that parental monitoring affects antisocial behavior independently of open communication.

All path coefficients depicted in Figure 1 were equivalent across gender. However, the direct link from self-regulatory efficacy to antisocial behavior was slightly weaker for girls than for boys. The constraint related to this path was relaxed and the model reestimated. The goodness of fit of the model to the data was corroborated by all the fit indices considered. These tests yielded a nonsignificant $\chi^2 (18,298) = 23.35$, a normed fit index (NFI) of .96, a nonnormed fit index (NNFI) of .97, a comparative fit index (CFI) of .99, and a root mean square error of approximation (RMSEA) of .03.

All the posited paths of influence were significant for both boys and girls. In accordance with the conceptual model, perceived self-regulatory efficacy was directly related to engagement in antisocial behavior and substance abuse. The higher the self-regulatory efficacy, the lower the antisocial conduct. Perceived self-regulatory efficacy also had an impact on communication with parents, which in turn was related to antisocial behavior. The higher the children beliefs in their self-regulatory efficacy, the more openly they talked to their parents.

about their activities when they are away from home and the less they engaged in antisocial conduct.

The model accounted for a substantial amount of variance in antisocial behavior, although it was somewhat higher for boys ($R^2 = .73$) than for girls ($R^2 = .53$).

An alternative conceptual model was tested in which the direction of causation was reversed. For this causal scheme, involvement in antisocial activities and substance abuse undermines adolescents' perceived efficacy to withstand peer pressures to engage in transgressive activities, curtails disclosure to their parents what they are doing when they are out of their own and impairs parents' ability to monitor their adolescents' activities and associates outside the home. The test of this causal model revealed that it does not fit the empirical data.

Discussion

The results of the present study attest to the influential role of perceived efficacy to manage peer relationships and familial communication in counteracting involvement in delinquent conduct and substance abuse. Adolescents who had a strong sense of efficacy to exercise control over adverse peer pressures refrained from anti-social conduct and substance abuse. These findings lend further support to the contribution of perceived personal efficacy to self-management of transgressive conduct found with younger children (Bandura et al., 1996a). The conceptual model positing that adolescent self-regulatory efficacy and parental communication affect transgressive conduct fits the empirical data well, whereas the alternative model that transgressive conduct drives perceived efficacy and familial communication practices does not provide an acceptable fit to the data.

Perceived self-regulatory efficacy operates not only directly on transgressive conduct, but in concert with supportive parental communication. The findings of this study show that peer relationships do not disembody adolescents from their families. Moreover, adolescents function agentically rather than just reactively in their transactions with peers. To the extent that adolescents are assured in their capability to withstand peer pressure to pursue troublesome activities, they feel free to discuss sensitive and problematic matters with their parents. Open communication with parents provides a source of support and guidance for managing conflictual situations in peer relationships (Bandura & Walters, 1959; Scabini, 1995). Adolescent who have a low sense of

efficacy to resist peer pressure for transgressive activities are unlikely to talk freely with their parents about what they are up to outside the home. Communicative avoidance shuts out a source of assistance on how to manage an expanding social world centered heavily around peers, many of whom get themselves into highly risky situations.

Experimentation with risky activities is common in the passage out of childhood status (Elliot, 1993; Jessor, 1986). Most adolescents who experiment with problem behaviors quit them after a while, but some become deeply and chronically involved in them. Social cognitive theory specifies a number of factors that determine the depth of involvement in high-risk activities and the ease of disengagement from them (Bandura, 1997a). Among these factors is the amount of social guidance and development of self-regulatory capabilities to manage potentially risky situations and to extricate oneself from detrimental ones. The findings of this study show that, indeed, a secure sense of self-regulatory efficacy and supportive familial communication enable adolescents to elude hazardous and antisocial pathways.

In earlier phases of child development, parents contribute to acquisition of self-regulatory efficacy (Bandura et al., 1996a). With growing independence, adolescents go off on their own much of the time and have to rely on their self-regulatory capabilities in dealing with the social world outside the home. With this change in the balance of influence, further parental guidance becomes conditional on adolescents informing them about their outside activities and associates. Unless parents are kept well informed, they cannot provide much guidance on how to manage troublesome situations away from home. For this reason, adolescents' perceived self-regulatory efficacy assumed priority in the conceptual model and analysis of self-management of transgressive activities.

A strong sense of self-regulatory efficacy was accompanied by parental monitoring of the activities their adolescents are engaging in outside the home. Parental monitoring was, in turn, associated with low involvement in antisocial activities. Failure to keep track of where their adolescents were going, what they would be doing, and with whom they would be associating can give license to engagement in transgressive conduct. The findings are in accord with those of Patterson, Dishion, and Bank (1985), underscoring the growing importance of parental monitoring as a vehicle of guidance as children's social life extends increasingly into the larger community.

This study extends the research on parental monitoring by highlighting the agentic aspects of this distal

guidance process. It is the adolescents who feel most secure in their self-regulatory efficacy who are highly disclosing of their predicaments and outside activities to their parents. Confiding behavior creates the understanding for constructive guidance. In contrast, adolescents who have a low sense of self-regulatory efficacy reveal little to their parents about what they are doing away from home. As a consequence, parents provide little supervision. Monitoring efforts in the absence of mutual understanding are apt to be viewed as intrusive surveillance to be circumvented.

Both the direct and familiarly mediated paths of influence from perceived self-regulatory efficacy to antisocial conduct were replicated across gender status. But the efficacy direct path was somewhat weaker for girls. Boys were more extensively involved than girls in anti-social activities and substance abuse. This most likely accounts for the difference. Restricted ranges lower the magnitude of relationships.

Although girls were less transgressive, they were more heavily monitored. The risk of pregnancy with its long-term consequences is of central concern to parents of adolescent girls. This may explain the apparent paradox. An appropriate next stage for research is microanalyses of gender differences in types of peer pressures exerted, the classes of activities that parents monitor most closely, and the ways in which perceived self-regulatory efficacy operates in these transactions. Mycroanalytic studies can further our understanding of causal structures (Bandura, 1997a).

Although the test of alternative conceptual models shed some light on possible directions of the paths of influence, the findings must be interpreted with caution because the processes were examined cross-sectionally with the adolescents providing the data for the factors of interest. However, there is evidence that children's perceived self-regulatory efficacy predicts transgressive conduct over time (Bandura, 1997a). With regard to the familial environment, how children perceive their parents' expectations and socialization practices are usually most predictive of the effects they exert because it is the construed environment that constitutes their social reality (Phillips and Zimmerman, 1990). Parents and teachers are rarely present in the setting in which the adolescents engage in transgressive activities with their peers. The adolescents are the ones who are in the best position to report the extent to which they are using alcohol and other drugs and are involved in various types of antisocial activities. Nevertheless, the pattern of relationships obtained cross-sectionally needs to be tested longitudinally. As adolescents become more independent, partic-

ular behavior patterns become lifestyle orientations with distinctive social affiliation that are more publicly observable and measurable.

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MUCH ADO OVER A FAULTY CONCEPTION OF PERCEIVED SELF-EFFICACY GROUNDED IN FAULTY EXPERIMENTATION

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Cahill, Gallo, Lisman, and Weinstein (2006) adopt a conception of "ability" as possessing rudimentary components in a behavioral repertoire. This view is at odds with what constitutes an ability and misrepresents the construct of perceived self-efficacy. To verify their hypothesis concerning the relation between ratings of ability and willingness in "fear-based" and "skill-based" tasks, they deliberately instruct participants in the hypothesis before testing it. This is an egregious violation of the scientific method. The present commentary clarifies the construct of self-efficacy, documents flaws in the Cahill et al. experimentation, reviews diverse lines of research that disputes their causal claims, and comments on their expansive generalizations and recommendations to extend their intentionally biasing rating procedure to other activity domains.

In a paper concerning the construal and assessment of perceived self-efficacy, Cahill et al. (2006) present a simplistic conception of self-efficacy examined with flawed experimentation. Their study of the construct provides an opportunity to restate the conceptualization of this self-belief system and to evaluate the methodology of the study they conducted.

TRIVIALIZATION OF THE CONSTRUCT OF SELF-EFFICACY

Let us first consider the construal of perceived self-efficacy. Cahill and his colleagues adopt a conception of self-efficacy as possessing rudimentary components in a behavioral repertoire. For example, in their view of perceived self-efficacy in the self-management of alcohol abuse, self-efficacy consists of being able to ask a bartender for a liquid

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refreshment and being able to pour it in a glass. Let us now examine the logical reasoning flowing for their conception of the construct. As they state their basic premise, the skill involved in asking a bartender for ginger ale is no different than asking for a beer, nor is the skill in pouring orange juice in a glass different from pouring a glass of whiskey. Moreover, alcoholics possess the skill to put down a glass of whiskey, to pour it out, or to walk out of the place. Hence, they argue that alcohol abuse is a matter of will rather than perceived efficacy to manage drinking behavior.

In the case of substance abuse, perceived self-efficacy has never been defined as the ability to execute the mechanics of asking, pouring, and walking. Indeed, to do so would be superficial. The self-management of alcohol involves perceived self-regulatory capabilities to manage instigators to drink alcohol. Contrast the Cahill et al. conceptualization of self-efficacy with the programs of research designed to clarify the role of people's belief in their self-regulatory efficacy in their management of alcohol. Marlatt and Gordon (1985) identified three clusters of problematic conditions in the self-regulations of substance abuse. They include inability to manage negative emotional states such as stress, depression, loneliness, boredom and restlessness; social pressures to use the substance; and interpersonal conflict, as when arguments eventuate in a drunken episode. Efficacy assessments confirm that such conditions tax perceived self-efficacy to resist the use of the substances (Barber, Cooper, & Heather, 1991; Barrios & Niehaus, 1985). Moreover, the emotional and situational strains on the exercise of perceived self-efficacy are very similar across cultures (Sandhal, Lindberg, & Rönnberg, 1990). Lapses are more likely to occur under conditions where individuals have the lowest perceived self-efficacy to mobilize their resources to resist use of the substances (Gwaltney et al., 2002). Moreover, daily self-efficacy predicts progression from lapse to relapse even after controlling for baseline self-efficacy and concurrent substance use (Shiffman et al., 2000).

Research conducted within the sociocognitive framework demonstrates that perceived self-regulatory efficacy is an important operative factor in the initiation, attainment, and maintenance of changes in drinking behavior. Alcoholics who have a low sense of self-regulatory efficacy become resigned to their condition and do not even consider doing anything about their drinking problem (DiClemente & Hughes, 1990). In a comparison of multiple possible determinants, Schimmel (1986) found that a low sense of self-regulatory efficacy is one of the best predictors of premature termination of treatment for alcoholism. Those beset with severe self-doubt in their efficacy see little point in pursuing a prescribed treatment. Among those who enter treatment, the more the program raises their perceived efficacy to resist the urge to drink in

high-risk situations the better they control alcohol consumption over follow-up periods, regardless of how dependent they had become on alcohol (Sitharthan, 1989; Sitharthan & Kavanagh, 1990; Solomon & Annis, 1989).

To evaluate the regulative role of outcome expectancies, which is also relevant to Cahill et al.'s research (2006), Solomon and Annis (1990) compared the relative contribution of efficacy beliefs and outcome expectancies to the maintenance of sobriety following treatment. Efficacy beliefs predicted success in controlling alcohol consumption. Outcome expectancies did not account for variation in drinking behavior when the influence of self-efficacy is controlled. Efficacy beliefs remain a significant predictor of future drinking behavior when severity of drinking at intake is held constant. When outcome expectations do emerge as independent predictors, they generally contribute less to variation in drinking behavior than do efficacy beliefs (Young, Oei, & Grook, 1991). Perceived self-efficacy to resist social pressure to drink distinguishes between abstainers and relapsers following training in resistive social skills but anticipatory stress in such situations does not (Rist & Watzl, 1983).

This is but a small sample of how research conducted within the conceptual framework of self-efficacy theory is adding to our understanding of the role self-efficacy plays in the self-management of alcohol abuse. Detailed reviews of the relevant literature are available elsewhere (Bandura, 1999; DiClemente, Fairhurst, & Piotrowski, 1995; Marlatt, Baer, & Quigley, 1995). Perceived self-efficacy has been shown to play a similar functional role in the self-management of drug use and smoking (Bandura, 1997). Perceived skill in the mechanical execution of asking, pouring, and walking away is a Cahill et al., 2006) simplistic conception of self-efficacy not the construct as defined and operationalized in social cognitive theory.

There is more to self-regulation of substance abuse, of course, than resisting pressures to consume an addictive substance. Most of the research in this domain of functioning focuses on perceived resistance self-efficacy. DiClemente, Marlatt and their colleagues identify other facets of self-efficacy that come into play in the development and successful self-management of substance abuse (DiClemente et al., 1995; Marlatt et al., 1995). These include, in addition to *resistance self-efficacy*, *coping self-efficacy* in managing interpersonal conflicts, perturbing affective states, and social inducements that increase risk of heavy drinking; *harm reduction self-efficacy* through the exercise of controlled drinking; *recovery self-efficacy* from slips and setbacks; and *maintenance self-efficacy*, the belief that one can sustain self-regulatory control over the long-term.

Self-efficacy theory not only sheds light on the self-regulation of drinking behavior but also provides guides for treatment and for devel-

opment of resilience to relapse. This is well illustrated in the work of Annis and Davis (1989). Self-efficacy assessments are used to identify the types of situations in which individuals express doubts in their efficacy to control their drinking behavior. These situations are then ranked from lowest to highest vulnerability for heavy drinking. After the participants develop self-regulative skills and rehearse flexible plans of action, they carry out mastery assignments in which they deal with progressively more risky drinking situations in their natural environment until they can manage them without recourse to alcohol. Drinking slips provide opportunities to remedy remaining vulnerabilities. A program of relapse management guided by microanalytic assessment of perceived coping self-efficacy coupled with corrective mastery experiences provide the staying power in the maintenance of sobriety.

Severe alcoholics who undergo a residential treatment program are usually scheduled for periodic follow-up sessions designed to assess their status and bolster their coping efforts. Those with a high sense of efficacy keep up their aftercare contacts and achieve a relatively high rate of sobriety over the course of a year (Rychtarik, Prue, Rapp, & King, 1992). By contrast, virtually all of those low in both perceived self-efficacy and participation in aftercare revert to drinking by the third month. Efficacy beliefs at intake predict maintenance of abstinence after controlling for age, marital and employment status, and degree of alcohol dependence. None of these factors except self-efficacy beliefs predict abstinence.

From their conception of self-efficacy, Cahill and his colleagues (2006) similarly dismiss the role of perceived self-efficacy in the regulation of self-protective behavior to prevent HIV infection. They begin with the premise that, "the skills needed to purchase and apply a condom are relatively simple and easily acquired (p. 207)." Males are "fully able to do so." Hence, the problem is weak will not perceived inefficacy. Here, too, if self-efficacy theory defined self-regulatory efficacy in AIDS prevention in this simplistic way it would be considered the height of superficiality.

Effective self-protection against AIDS infection requires social and self-regulatory capabilities to exercise control over sexual and drug activities, the two main modes of transmission of the HIV virus. To succeed, individuals have to override the influence of coercive allurements, desire for social acceptance, social pressures, and situational constraints. For example, women have the lowest perceived self-efficacy to exercise control over pressures by a desirable partner to engage in unprotected intercourse that potentially places them at risk of infection (Kasen, Vaughan, & Walter, 1992).

In the self-efficacy scales devised to assess the self-management of sexual and drug activities, individuals rate the strength of their efficacy

to exercise self-protective behavior in the face of these various social pressures (Bandura, 1994). Exercise of personal control over sexual behaviors that carry risk of infection calls on self-efficacy in communicating frankly about sexual matters, negotiating protective sexual methods, and ensuring their use. Therefore, perceived efficacy to talk candidly about self-protective sexual practices is part of the assessment.

The role of perceived self-efficacy in the adoption and maintenance of self-protective behavior is corroborated in diverse lines of research. Even though individuals acknowledge that safer sex practices reduce risk of infection, they do not adopt them under a low sense of efficacy to exercise control in sexual relations (Siegel, Mesagno, Chen, & Christ, 1989). Perceived self-efficacy to negotiate condom use predicts safer sex practices in adolescents (Basen-Engquist & Parcel, 1992; Jemmott, Jemmott, & Fong, 1992; Jemmott, Jemmott, Spears, Hewitt, & Cruz-Collins, 1992; Kasen et al., 1992) and adults alike (Brafford & Beck, 1991; Heinrich, 1993; McKusick, Horstman, & Coates, 1985; O'Leary, Goodhart, Jemmott, & Boccher-Lattimore, 1992).

Drugs and alcohol lower perceived self-efficacy to adhere to safer sex practices (Kasen et al., 1992; Rosenthal, Moore, & Flynn, 1991). Among drug users, perceived self-efficacy predicts success in regular use of clean needles and condoms with sexual partners (Kok, deVries, Mudde & Strecher, 1991). Perceived self-efficacy is related to self-protective behavior both concurrently and longitudinally and to exercise control while under the influence of alcohol and drug use.

In AIDS preventive programs using the major modes of efficacy development, participants are taught, through modeling and enactive mastery, how to communicate frankly about sexual matters and contraceptives, how to deal with conflicts regarding sexual practices, and how to resist unwanted sexual advances. They practice applying these strategies by role-playing in simulated situations and receive enabling feedback. Such self-regulative programs significantly enhance perceived self-efficacy in managing sexuality (Gilchrist & Schinke, 1983; Jemmott, Jemmott, Spears, Hewitt, & Cruz-Collins, 1991).

The unique contribution of perceived self-efficacy to the exercise of control over HIV infection is extensively reviewed elsewhere (Bandura, 1994).

PERCEIVED SELF-EFFICACY AS OPERATIVE CAPABILITY

No credible theory of ability characterizes it solely as possession of rudimentary elements in one's behavioral repertoire. For example, oratorical ability cannot be reduced to possessing phonemes in one's vocal repertoire. Ability involves synthesizing varied component skills into new forms of activities that must be flexibly orchestrated to manage changing

situational demands. However, the behavioral construction aspect of an ability is only half the story, and in many respects, the less interesting half. An ability is only as good as its execution. Adaptive and flexible execution of abilities requires enlistment of cognitive, motivational, self-regulatory, and affect regulation skills. Because efficacy beliefs affect these diverse constituent contributors to quality of functioning, the same individual may perform poorly, adequately, or well with the same ability depending on fluctuations in their perceived self-efficacy (Bandura, 1990). In short, ability is not a collection of fixed rudimentary components.

Perceived self-efficacy is conceptualized as *perceived operative capability*. It is concerned not with what one *has* but with belief in what one *can do* with whatever resources one can muster. The operative nature of perceived self-efficacy is an integral feature of the procedure used to access people's efficacy beliefs. Individuals are not asked to rate the *ability they possess*, but rather the strength of their assurance that they *can execute* given activities under designated situational demands.

FALSE DICHOTOMY IN PARTITIONING TASKS

The Cahill et al. partition of activities into "ability" and "non-ability" is a false dichotomy. All activities involve abilities but different activity domains call on different types and blends of constituent skills. The events over which personal influence is exercised can vary widely in the constellation of skills they require. It may entail regulating one's thought processes, motivation, performance level, emotional states, or altering environmental conditions. The nature of the challenges against which personal efficacy is judged will vary depending on the sphere of activity. Challenges may be graded in terms of level of creativity, exertion, accuracy, productivity, threat, or the self-regulation required, just to mention a few dimensions of performance demands.

As explained in the guide for constructing self-efficacy scales (Bandura, 2006), perceived self-efficacy should be measured against levels of task demands that represent gradations of challenges or impediments to successful performance. Self-efficacy appraisals reflect the level of difficulty individuals believe they can surmount.

FAILURE TO RECOGNIZE SELF-REGULATION AS AN ABILITY

Many areas of functioning are primarily concerned with self-regulatory efficacy to guide and motivate oneself to get things done that one knows how to do. In such instances, self-regulation is the capability of interest. The issue is not whether one can perform the mechanics of an activity, but whether one has the efficacy to get oneself to do the activity regularly in

the face of different types of dissuading conditions. For example, in the measurement of perceived self-efficacy to stick to a health-promoting exercise routine, it is perceived self-regulatory capability, not ability to walk, that is the essential ability. In measuring individuals' self-regulatory efficacy, they judge how certain they are that they can get themselves to exercise *regularly* under various impediments, such as when they are under pressure from work, are tired or depressed; in foul weather; and when they have other commitments or more interesting things to do.

Self-regulation is not an act of will. It is a skill that must be developed. Different models of self-regulation have been proposed but they are all rooted in several generic subfunctions through which human agency is exercised (Bandura, 1991; Zimmerman & Schunk, 1989). In the applications of this knowledge, individuals are taught how to monitor their behavior and the cognitive and situational conditions under which they engage in it; how to create proximal goals for exercising control over their behavior in the here and now; how to draw from an array of coping strategies rather than relying on a single technique; and how to enlist motivating incentives to sustain their efforts. It is one thing to possess self-regulatory skills but another to get oneself to apply them consistently and persistently in the face of difficulties, stressors and competing attractions. Firm belief in one's self-regulatory efficacy provides the staying power in the face of such impediments (Bandura, 1997).

Arguing from their conception of ability and failure to recognize self-regulation as an ability, Cahill and his colleagues assign "drug/tobacco/alcohol abstinence, condom use, weight loss, exercise" to their dichotomized non-skill category. Based on this faulty classification, the self-management of these conditions is claimed to be a matter of will not self-efficacy. The prior analysis of the diverse impact of perceived self-efficacy on functioning in these domains, exposes the superficial view of ability embraced by Cahill and his colleagues. People are helped to manage substance abuse, to adopt habits that promote health and discard those that impair it, to advance their self-development, and to manage their negative affective states not by willing themselves to success but by cultivating their self-management skills and building a resilient sense of self-regulatory efficacy to sustain their efforts in the face of difficulties and setbacks (Bandura, 1999, 2004; DiClemente, et al., 1995; Rehm, 1981; Zimmerman & Cleary, 2006.)

PERCEIVED COPING EFFICACY OVERRIDES ANTICIPATORY ANXIETY

Cahill et al. (2006) argue that self-efficacy measures assess perceived ability in "skill-based" tasks, but willingness governed by anticipated

anxiety in "fear-based" tasks. As previously noted, this line of reasoning is based on their odd conception of ability as possessing elementary motor elements in one's behavioral repertoire. In tests of progressively closer contact with a snake, which is the main subject of the article under discussion, they report that phobics possess the ability to walk toward a cage, place their hand on it, and reach in. Their ratings of perceived self-efficacy, therefore, reflect anxiety-based unwillingness rather than perceived inefficacy.

Commerce with snakes involves *coping skills*. In the powerful guided mastery treatment, which eliminates snake-phobic behavior in everyone in a few hours, phobics are taught how to handle a snake in ways that enables them to exercise full control over it (Bandura, 1977; Bandura & Adams, 1977; Bandura, Adams, & Beyer, 1977; Bandura, Adams, Hardy, & Howells, 1980). With a strong sense of coping efficacy, former phobics are willing to do anything you ask them with a snake in intimidating behavioral tests. These remarkable outcomes were achieved by enhancing controlling efficacy not by will enhancement.

In follow-up assessments the participants reported that they had undergone transformative changes in beliefs in their personal efficacy. They expressed deep gratitude to be rid of their phobia, but then explained that the treatment had a much more profound impact. Their lives had been debilitated socially, recreationally, and occupationally for 20 to 30 years. To add to their torment they were plagued by recurrent nightmares and perturbing ruminations they were helpless to control. To overcome, within a few hours, a phobic dread that had constricted and tormented their lives was a transformational experience that radically altered their beliefs in their efficacy to exercise control over their lives. They were acting on their new self-efficacy belief and enjoying their successes, much to their surprise. These preliminary findings pointed to a common mechanism through which personal agency is exercised (Bandura, 2005).

I mounted a multifaceted program of research to gain a deeper understanding of the nature and function of this belief system. To guide this new mission, the theory addressed the key aspects of perceived self-efficacy (Bandura, 1997). These include the origins of efficacy beliefs; their structure and function; their diverse effects; the cognitive, motivational, affective, and decisional processes through which they produce these effects; and the modes of influence by which efficacy beliefs can be created and strengthened for personal and social change. Diverse lines of research, conducted by a variety of investigators, in diverse disciplines, provided new insights into the role of perceived self-efficacy in the fields of education, health promotion and disease prevention, clinical dysfunctions such as anxiety disorders, depression, eating disorders,

substance abuse, personal and team athletic attainments, organizational functioning, and the efficacy of our social and political systems to make a difference in our lives (Bandura, 1995; 1997; Pajares & Urdan, 2006; Schwarzer, 1992; Maddux, 1995).

Cahill et al. claim that phobic behavior is governed by willingness based on anticipatory anxiety rather than by perceived self-efficacy. This notion has been long retired empirically. Numerous studies have been conducted with severe agoraphobics in which the independent contribution of perceived efficacy and anticipated anxiety to phobic behavior is analyzed (Williams, Dooseman, & Kleifield, 1984; Williams & Rappoport, 1983; Williams and Watson, 1985; Williams and Zane, 1989). The findings consistently show that perceived self-efficacy predicts phobic behavior when anticipated anxiety is controlled, whereas the relation between anticipated anxiety and phobic behavior essentially disappears when perceived self-efficacy is controlled. Schoenberger, Kirsch, & Rosengard (1991) further confirm that snake phobic behavior is governed by perceived coping efficacy rather than by anticipatory anxiety.

It is commonly believed that agoraphobics constrict their lives because they fear they will become anxious, overcome by a panic attack, or that catastrophic consequences will befall them. The findings, however, show that neither anticipated panic nor perceived danger predicts agoraphobic behavior after controlling for the influence of efficacy beliefs. In contrast, efficacy beliefs are highly predictive of agoraphobic behavior when variations in anticipated panic, anticipated anxiety, and perceived danger are controlled (Williams, Turner, & Peer, 1985; Williams & Watson, 1985; Williams & Zane, 1989).

The predictive superiority of efficacy belief over anxiety arousal is corroborated across a variety of threats. Perceived self-efficacy accounts for variation in academic performances that entail threats but anxiety arousal does not (Meece, Wigfield, & Eccles, 1990; Pajares & Johnson, 1994; Pajares & Miller, 1994; Pajares, Urdan, & Dixon, 1995; Siegel, Galassi, & Ware, 1985). Efficacy beliefs predict performances on intimidating athletic tasks, anxiety arousal does not (McAuley, 1985). Belief in one's problem-solving efficacy predicts catastrophic worrying, anxiety level does not (Davey, Jubb, & Cameron, 1996). Perceived physical efficacy in elderly persons predicts engagement in a physically active lifestyle, whereas fear for one's safety in carrying out vigorous activities does not (Tinetti, Mendes de Leon, Doucette, & Baker, 1994).

In the treatment of phobic behavior by systematic desensitization (Wolpe, 1974), relaxation is repeatedly paired with increasingly menacing threats until they cease to arouse any anxiety. In a test of the governing mechanisms of change (Bandura & Adams, 1977), all the snake phobics were completely desensitized and exhibited no anxiety to the

most intimidating visualized threats, but their perceived self-efficacy at the end of treatment differed markedly. Their belief in their coping efficacy was highly predictive of their level of coping behavior. Indeed, the microlevel congruence between self-efficacy belief and corresponding coping behavior was a high 82 %.

The lives of many women are distressed and constricted by the pervasive threat of sexual assault. A mastery modeling program empowers women to exercise control over their social threat by equipping them with dependable self-protective skills and a robust sense of efficacy to use them effectively (Ozer & Bandura, 1990). They learned through modeling how to create an opening and disable an unarmed assailant instantly by delivering powerful strikes to vital areas of the body—the eyes, temple, throat, knees, groin. They mastered the self-defense skills in repeated simulated assaults by an assailant wearing heavily padded gear. They practiced how to disable their assailant when ambushed frontally, from the back, when pinned down, in the dark.

Were one to use the Cahill et al. (2006) trivial conception of self-efficacy it would be judged as an irrelevant because all women possess the rudimentary components to punch and kick. Path analyses of the causal structure revealed two paths of regulation of increased participation in outside activities and decreased avoidant behavior. One path of influence flows from perceived physical efficacy to ward off an assault through lowered personal vulnerability and increased ability to distinguish between risky and safe situations. Perceived self-efficacy to defend oneself physically also enhances cognitive control efficacy to turn off perturbing ruminative thoughts. In this second path of influence, high thought control efficacy reduces perturbing ruminations that lower anxiety and avoidant behavior. Here, too, self-protective behavior is predicted by perceived behavioral and thought control efficacy, but anticipated anxiety arousal does not predict avoidant behavior when the influence of the two forms of perceived self-efficacy is controlled.

Cahill et al. (2006) cite only three studies showing that anticipated anxiety loses its predictiveness when variation in perceived coping efficacy is controlled. However, in the very next paragraph they surprisingly resurrect the anxiety control view despite the evidence to the contrary. They continue to maintain throughout their paper that "Theoretically, people's decisions about whether or not to perform a particular behavior within their repertoire are strongly influenced by the anticipation of the emotional consequences of those actions, such as experiencing anxiety, which is a type of outcome expectancy" (Cahill et al., 2006, p. 197–198). Conceptual advocacy trumps evidence that negates their belief.

It is interesting to speculate about why the belief that anticipatory anxiety controls avoidant behavior remains firmly entrenched despite massive evi-

dence to the contrary. A possible answer may lie in the force of confirmatory biases in human judgment of causality (Nisbett & Ross, 1980). Confirming instances in which anxiety and avoidance occur together are likely to remain highly salient in people's minds. Nonconfirming instances, in which approach behavior occurs with anxiety or avoidance occurs without anxiety, are less noticeable and memorable.

It is not that the nonconfirming instances are any less prevalent. Quite the contrary. As the findings from the diverse lines of research show, people do not inhibit or avoid activities just because they feel anxious. It would be highly dysfunctional to do so. People regularly perform activities for which they have a sense of efficacy despite high anxiety. For example, actors appear on stage even though they may be intensely anxious while waiting to go on. Athletes engage in competitive athletic activities despite a high level of precompetition anxiety. Students take intimidating examinations although they may be beset by aversive anticipatory anxiety. If individuals gave up because they felt anxious, their personal development would be severely stunted and they would be unable to manage their everyday life. Perceived self-efficacy enables individuals to handle pressures and stressors, which are part and parcel of the coping process of everyday life (Bandura, 1997).

As previously noted, self-efficacy measures are scaled in terms of the level of impediments or complications given activities present. Individuals rate their degree of assurance that they can surmount them. They are not instructed to judge their "ability." Rather, they are asked whether they believe they "can" get themselves to perform given activities, whatever resources they may have at their command or the amount of stress they may experience in doing so. In short, self-efficacy is concerned with perceived operative capability. The operative issue is not whether a snake phobic has the "ability" to walk into a room containing a snake in a cage but whether they can override their distress to do it. The tests of unique predictiveness reviewed earlier confirm that if individuals believe they can do it they will attempt it despite anticipated anxiety.

DELIBERATE INSTRUCTION IN THE HYPOTHESIS BEING TESTED

Let us now turn to the experimentation. In an important program of research on experimenter biasing effects, Rosenthal (2006) demonstrated across a wide range of research activities that without proper safeguards experimenters can unwittingly lead participants to respond in accordance with the hypothesis they are testing. The research conducted by Cahill and his colleagues is unique in that they deliberately coached the participants for the very results they hypothesized! They characterize

this social coaching practice in the high-sounding prose of a "double dissociation" rating procedure.

They set out to test the hypothesis that in "skill-based" tasks individuals are willing to try tasks that exceed their ability. In a "fear-based" task, which individuals are allegedly fully able to do so because they have the motor components in their repertoire, but are unwilling to do them because of anticipatory anxiety. To test this hypothesis requires, in their view, "disambiguating instructions" to differentiate between willing to try and able to do so. This is achieved by "persuasive communications describing his (Kirsch) hypothesis with vivid examples" (p. 200).

In the study, undergraduate students completed a questionnaire in groups for academic course credit. They rated what they "*feel able to do*" and what they "*would be willing to try*" in progressively closer interactions with a snake, and tossing a wadded piece of paper into a waste paper basket at increasingly greater distances. In the standard rating format for self-efficacy scales (Bandura, 2006), individuals rate what they believe they "*can do*" not what they are "*able to do*." Able denotes mere possession of ability or capacity. As previously noted, for Cahill et al. this means possessing elementary components in one's behavioral repertoire. "*Can do*" denotes assurance to execute given levels of performance, which is in keeping with the operative conception of perceived self-efficacy. They used Kirsch's (1982) conceptual descriptor for the ratings not the one used in self-efficacy theory. Cahill et al. do not explain why they changed the key wording, which undermines the relevance of their findings to the standard rating format used in self-efficacy theory.

In the design of the study, the participants in one condition were not taught the hypothesis. In the second so-called "double dissociation" "disambiguating" condition, the students were coached in the hypothesis. It was "vividly illustrated with two vignettes" (p. 202). In the "skill" vignette, designed to instill the mindset that willingness exceeds ability, a young man tells a friend who loads weights onto a barbell that he can't lift that much weight but is willing to try anyway. In the "fear" vignette, a counselor tells a lonely student how to invite a female classmate for coffee. The vignette then proceeds to instruct the participants in the second half of the hypothesis that ability exceeds willingness because of anxiety. The lonesome student in the vignette not only recites this hypothesis, but even voices the simplistic conception of ability that he can speak the counselor's recommended words so he has the ability but anxiety curbs his willingness (Cahill, personal communication, 2006). He tells the counselor that "of course, he had the ability to say those particular words" . . . "It's not that I can't say those words. It's just that I get real anxious around people I don't know . . ." As the coaching proceeds, "The vignette continues with clarification that, in fact, the young man

has the ability to ask the classmate for coffee but experiences anxiety about the prospect of being rejected, which inhibits him from approaching the classmate" (Cahill, et al. 2006, p. 203).

The participants are further instructed that the term ability means willingness: "In the above example, Jim had the behavioral capacity to ask Jenny out for a date. Therefore, when he said that he couldn't ask her out, what he really meant was that he hadn't been willing to do so. This was to avoid feeling anxious and facing the possibility that she might turn him down." In portraying anxiety as the controller of avoidant behavior, Cahill and his colleagues are busily instilling an erroneous causal belief.

To further shape the participants' ratings, the concluding paragraph in the scenario restates the hypothesis a fourth time that in a "fear-based" activity ability exceeds willingness but in a "skill-based" activity willingness exceeds ability. This is an egregious violation of the scientific method.

Following the experimental manipulation the participants were simply asked to imagine tossing a wad of paper and interacting with a snake and to rate their ability and willingness to do so. The ratings in this pretend situation constituted the dependent measure. Despite all the talk about phobias, the undergraduate students were never tested for phobic behavior. Their high rating of ability clearly shows that this is not a phobic sample. The same experimenter presided over both the written "persuasive communication" and assessment of rating behavior. In the scenario the experimenter tells the diffident student that when he said he could not invite the student for coffee "what he really meant was that he hadn't been willing to do so." This correction of the student's alleged misjudgment creates a strong social demand for participants to provide ratings in accordance with what the experimenters want.

Under conditions in which the students are not taught the hypothesis they rated only willing to do what they believe they are able to do with a snake. This is in keeping with self-efficacy theory that, in activities involving performance demands, people's beliefs in their efficacy is a major determinant of what they are willing to do. In the trifling task the students rated willingness to try tossing the wad of paper into the basket at virtually all distances. This unusually high level of rated willingness is most likely an artifact of the trivialness of a task requiring no effort or labor. Tossing a wad of paper is no sweat. In significant activities people are not going to waste their time, effort, and resources on tasks they are sure they cannot do.

What has this "double dissociation" manipulation yielded? Not much. The students rated willingness to try tossing the wad of paper whatever the distance, regardless of whether or not they were instructed that willingness exceeds ability in a "skill task." Being repeatedly told

that in a "fear task" ability exceeds willingness ekes out a slight increase in rated ability and a small drop in rated willingness to try.

Cahill and his colleagues do not provide a theory of will that specifies the nature of this psychic force, its determinants, the mechanisms through which it operates, and how one would will severely debilitated phobics to masterful functioning. Unwillingness to perform coping behavior is said to be anxiety-based. However, evidence that anxiety has no effect on avoidant behavior when perceived self-efficacy is controlled strips it of its ascribed motivator. The findings of research that Cahill et al. never cite, demonstrate that willingness to perform a fear-laden activity is governed by perceived self-efficacy not anticipatory anxiety. Using public speaking, a prevalent social anxiety, Arch (1992a, b) examined the determinants of students' willingness to deliver a public lecture to a large audience followed by a question session. They rated their anticipatory anxiety, their efficacy that they can deliver a good lecture, and their efficacy to manage perturbing thoughts and anxiety reactions in the situation. In a simultaneous multiple regression analysis, perceived task efficacy predicted willingness to deliver a lecture regardless of level of anticipatory anxiety and amount of prior experience. In addition, women's beliefs in their efficacy to manage their anxiety reactions in the situation further increased their willingness to deliver a public lecture. Anticipatory anxiety was unrelated to willingness when perceived self-efficacy is controlled.

PRETENTIOUS GENERALIZATIONS

In the discussion section Cahill and his colleagues present sweeping generalizations based on the proclaimed import of their findings yielded by their improved rating procedure. They dismiss the negative findings that willingness mirrors perceived ability on the grounds that a rating procedure that does not teach the hypothesis suffers "methodologized limitations." They further reject the "hypothesis" that people are willing to try activities with potentially aversive aspects if they believe they are able to do them because "participants who were informed of Kirsch's hypothesis" endorsed higher levels of ability than willingness. Cahill and his colleagues appear blissfully unaware that prior instruction in a hypothesis to be tested is an unpardonable scientific violation. That people who believe in their efficacy are willing to undertake potentially aversive activities is not a "hypothesis." As shown by the large body of evidence reviewed earlier, which Cahill et al. do not cite, it is a common occurrence in everyday life. Even simple self-reflection would reveal that one often performs activities that are stressful and taxing as long as one believes one can surmount the difficulties.

The discussion continues with expansive conclusions that the "immediate implications" of the data not only call into question the self-efficacy analysis of fear-based behavior, but their theoretical analysis and "careful instructions" have general implications for self-efficacy analysis of "drug/tobacco/alcohol abstinence, condom use, weight loss, exercise" (p. 207). The rationale for the "logical extension" of this program of research is founded on the trivialized conception of ability in these domains of self-regulation. Coaching in the hypothesis to be tested under the cloak of a "disambiguating" rating procedure is not "careful instructions." It is a scientific prohibition. However, the major points at issue are not only the seriously flawed experimentation, but the simplistic view of self-efficacy that misrepresents the construct.

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Albert Bandura, the David Starr Jordan Professor of Social Science in Psychology, is internationally known for his experimental and theoretical work on social learning theory. He has been on the faculty since 1953, and his teaching focuses on the application of social learning theory to personality development, psychopathology, psychotherapy, and social change. He is a graduate of the University of British Columbia and earned his Ph.D. at the State University of Iowa.

The following is adapted from a talk given on the campus to alumni.

Human aggression is a growing social problem. At the societal level, the spread of technological capacity for massive destruction threatens vast numbers of people. At the personal level, violence increasingly encroaches on daily human affairs to impair the quality of life. A notable example is the public's growing fear of becoming a victim of violence. Physical assaults against strangers do not occur often. Nevertheless they arouse widespread anxiety.

There are several aspects of criminal victimization that enable a few violent incidents to instill widespread public fear:

- * **Unpredictability:** There are no forewarnings on when, or where, one might be victimized.

- * **Gravity:** The consequences can involve crippling injury, or death. People would not restrict their daily activities if the risk was merely loss of one's wallet or watch. But they are unwilling to risk being maimed for life, or killed, even though the chance of being victimized by a stranger is relatively low (less than two per thousand people).

- * **Helplessness:** People feel a lack of control over whether or not they might be victimized. The risk of personal injury or death from driving an automobile is much higher. But people fear the streets more than their automobiles, because they feel they can exercise some personal control over the chance of personal injury by how they drive.

Fear for one's own personal safety permeates all aspects of people's lives—they live behind locked doors, avoid most downtown areas, desert their streets at night, and more and more people are arming themselves.

A society is faced with a dual task: first, how to reduce the level of violence. The second, is how to combat the fear of violence. With the mass media magnifying the threat by over-reporting isolated criminal acts, it may be easier to reduce criminality, than the public fear of crime.

Terrorism

The rising use of terrorist tactics is adding a new source of public apprehension.

When people were widely dispersed in small communities, the consequences of any given act affected mainly the persons toward whom the behavior was directed. Under conditions of urbanized life the welfare of entire populations depends upon a functional transportation system and safe power, water, and food supplies. A single destructive act, that is easy to perform, and requires no elaborate apparatus, instantly can harm vast numbers of people.

At present, most terrorist acts are directed at political leaders and wealthy individuals. Since the acts have proven highly profitable through large ransom payments, such means will undoubtedly become more common.

As in other criminal activities, the disquieting prospect is that isolated acts, magnified by the media, will create widespread public fear. A frightened public is willing to buy protection against potential threats with enormously

expensive security measures and curtailment of personal liberties.

Airline hijacking is a good case in point. By the time the electronic surveillance systems were instituted, hijacking was on the wane for several other reasons. Airlines developed improved ways of identifying and coping with hijackers. Because of international agreements, hijackers could find few, if any, friendly hosts. The security cost alone, for the period 1973-76, was \$194 million. With rapidly escalating costs, the financial burden will continue to grow.

Some terrorist activities are partly designed to provoke police-state countermeasures that breed public disaffection with the system. In such cases, the overreaction to a few isolated acts may be a greater danger than the acts themselves.

Theories of Aggression

Aggression means different things to different people. There are few disagreements about direct, assaultive behavior. But disputes over the labeling of aggression arise in the case of societal practices that are injurious to many people, and over the use of coercive power for social control and for social change.

In conflicts of power, one person's violence is another person's benevolence. One group's terrorists are another group's freedom fighters. This is why moral appeals against violence usually fall on deaf ears. People do not ordinarily engage in collective violence until they have justified to themselves the morality of their actions.

Aggression has been explained in several different ways.

Instinct Theory

According to the instinct doctrine, people are by nature aggressive. Presumably they come innately equipped with a biological mechanism that generates an aggressive drive, requiring periodic discharge through some form of injurious behavior. Freud invoked a death instinct that keeps regenerating itself. More recently, Lorenz postulated a fighting drive that automatically builds up with time in the absence of environmental releasers.

The instinct theory, however does not correspond with the facts. Researchers have been unable to find any evidence for an inborn autonomous drive of the type proposed by the instinctivists. Nevertheless, ascribing aggression to innate forces gains some popular appeal, by relieving people of the responsibility for their inhumanities toward each other.

Frustration-Aggression Theory

For years aggression was viewed as a product of frustration. Frustration is said to generate an aggressive drive which, in turn, motivates aggressive behavior. Frustration replaced instinct as the motivator of aggression, but the two theories are much alike in their social implications. Since frustration is ever present, in both views people are continuously burdened with aggressive energy that must be

drained from time to time. The belief that aggression is a product of frustration is widely accepted even though research findings dispute it. Frustration produces different types of reactions. Aggression does not require frustration.

Consider the social learning theory of aggression. What people call frustration includes a variety of distressing experiences. Distress produces emotional arousal, rather than an aggressive drive. Arousal can activate any number of responses, depending on how one has learned to cope with troublesome situations, and their relative effectiveness.

When frustrated, some people seek assistance. Others display withdrawal, and resignation. Some aggress. Others respond with psychosomatic disturbances. Still others anesthetize themselves with drugs or alcohol against a miserable existence. But most people intensify constructive efforts to modify the sources of distress.

The frustration theory assumes that the aroused aggressive drive remains active until discharged by some form of aggression. Actually, anger arousal dissipates rapidly, but it can be easily regenerated on later occasions, by ruminating on anger-provoking incidents.

Many of people's distresses arise because, in their thoughts, they live more in the past, and in the future, than in the present. They ruminate about the past, and they worry about the future. By thinking about past insulting treatment, people can work themselves into a rage long after their emotional reactions have subsided. Persisting tension comes from the head, not from an undischarged reservoir of aggressive energy.

Consider the example of a person who becomes angered by the thought that he has been excluded from a party. He receives the invitation in the next day's mail. The person will show an immediate drop in anger, without having to assault, or denounce someone, to drain a roused drive.

Aggression-prone individuals are helped more by developing constructive ways of thinking, and better ways of coping with conflict, than by venting aggression. The hydraulic metaphor of pent-up aggressive energy pressing for release suggests misleading causes, and erroneous solutions, to human aggression.

Emotional arousal is not necessary for aggressive behavior. A great deal of human aggression is prompted by the benefits anticipated by such actions. Here, the instigator is the pull of expected gains, rather than the push of distress. The anticipated rewards of aggression constitute the second source of motivation for aggressive behavior.

Three Aspects of Aggression

A complete account of aggression must explain how aggressive patterns are developed; what provokes people to behave aggressively; and what determines whether they will continue to resort to aggressive behavior, on future occasions. I should like to comment on each of these aspects of aggression. Let us first consider how aggressive conduct is developed.

People do not come equipped with inborn aggressive skills. They must learn them. Most behavior is learned observationally through the power of example. This is particularly true of aggression, where the dangers of crippling, or fatal consequences, limit the value of learning by trial and error. By observing the aggressive conduct of others, people learn the behavior, and on later occasions, the example can serve as a guide for action.

Familial Sources

In a modern society, aggressive styles of conduct may be adopted from three primary sources—the family, one's subculture, and the media.

One origin is the aggression modeled, and reinforced, by family members. Studies show that parents who favor aggressive solutions to problems have children who tend to use similar aggressive tactics in dealing with others.

That familial violence breeds violence is confirmed by longitudinal studies of child abuse over several generations. Children who suffer brutal treatment at the hands of assaultive parents are themselves inclined to use abusive behavior in the future.

Subcultural Sources

Although familial influences play a major role in setting the direction of social development, the family is embedded in a network of other social systems. The subculture in which people reside provides a second important source of aggression. Not surprisingly, the highest incidence of aggression is found in communities in which aggressive models abound, and fighting prowess is a valued attribute.

Because of insufficient attention to the human consequences of societal projects, living environments are often inadvertently created that are conducive to criminal victimization. A study of public housing projects, conducted by Oscar Newman, illustrates this point. The high-rise tower, with apartments lining both sides of a long central corridor, invites crime. In this building design:

- Vast numbers of people share the same entrance, so that the residents can't distinguish occupants from intruders.
- Residents are most vulnerable to assault in the interior public spaces of the building—the corridors, lobbies, stairs, and the elevators. These spaces are public, yet hidden from public view. Numerous ~~multiple~~ stairwells provide convenient escape routes. The chances of

being caught committing crimes on the project grounds are more than twice as high as being apprehended for crimes within the building.

• Parents are fearful of letting their children out of the apartment because the playground is far removed, they cannot oversee their children's activities, and the lack of security poses risks in navigating through the building.

In the low, walk-up apartment, a few families share an entry so they come to know each other. They regard the interior public space, and even the street in front, as a semi-private extension of their dwelling. Children enjoy greater freedom of movement because recreational areas are easily accessible, and parents can continually keep track of what's going on outside. Public surveillance deters criminal activities.

The effects of urban design on criminal victimization are most clearly revealed in a comparison of two housing projects located across the street from each other.

They have the same population density, socioeconomic levels, ethnic and racial distributions, and

comparable proportions of elderly, and teenage residents. They differ only in the height of the residential buildings—14 story slabs in one case, and low building apartments (3–6 stories) in the other.

the high-rises produced 66% more crime. The impersonal, inhospitable buildings suffer as well. The high-rises required 72% more maintenance repair work. These findings are confirmed in an urban redevelopment project in London. The high-rise tower produced more violence and physical destruction than the old houses across the street.

Media Sources

The third source of aggressive conduct is the abundant modeling provided by the mass media. The advent of television has greatly expanded the range of models available to a growing child. Whereas their predecessors had limited occasions to observe brutal aggression, both children and adults today have unlimited opportunities to learn the whole gamut of homicidal conduct from television, within the comfort of their homes.

A considerable amount of research has been conducted during the past 10 years on the effects of television. The overall findings show that exposure to televised violence can have at least four different effects on viewers:

- It teaches aggressive styles of conduct. Learning from aggressive example has been well documented in studies with children and adults.

- A recent study of inmates in a maximum-security prison revealed that they improve their criminal skills by watching crime programs.

- They learn better burglary techniques, how to hot-wire cars, and how to pull off bunco frauds.

- They learn how cops work in apprehending transgressors; how alarm systems operate; they are brought up to date on modern police procedure,

For the inmates, crime shows are educational TV. Many take notes while they are watching. If they act on insufficient information, their attempts may prove unsuccessful. An 18-year old learned from a crime show how to break open pay-phone coin boxes. However, the script writers failed to explain that Ma Bell has a silent alarm system built into her pay phones. He was arrested on his first attempt.

In addition to teaching aggressive conduct, televised violence reduces restraints over aggressive behavior. This is because physical aggression is often shown to be the preferred solution to interpersonal conflicts.

- Violence is portrayed as acceptable, successful, and relatively clean.

- Superheroes are doing most of the killing. When good triumphs over evil by violent means, viewers are more strongly influenced than when aggressive conduct is not morally sanctioned by admired characters.

Results of numerous studies show that adults behave more punitively after they have seen others act aggressively, than if they had not been exposed to aggressive models. This is especially true if the modeled aggression is socially justified.

Heavy exposures to televised violence desensitize and habituate people to human cruelty.

Image Production

In addition, television shapes people's images of reality, upon which they base many of their actions. During the course of our daily lives, we have direct contact with only a small sector of the environment. In our daily routines we travel the same limited routes, visit the same places, and see the same group of friends and associates. Consequently, people partly form impressions from televised representations of society or the social realities with which they have little or no contact.

Communication researchers have found that heavy viewers of television are less trusting of others and overestimate their chances of being criminally victimized than do light viewers. Many of the misconceptions that people develop about certain occupations, ethnic groups, sex roles, and other aspects of life are cultivated, in part, through modeling of stereotypes by the media.

Being an influential tutor, television can foster humanitarian qualities, as well as injurious conduct. Programs that portray positive attitudes and social behavior encourage cooperativeness and sharing, and reduce aggressiveness, in young children. It is regrettable that television does not provide more such experiences to cultivate positive potentialities in the developing child.

Social Diffusion

Modeling through the media plays an especially significant role in the shaping and rapid spread of collective aggression. Social diffusion of new styles of aggression conforms to the generalized pattern of most other contagious activities: new aggressive behavior is initiated by salient example. It spreads rapidly in a contagious fashion. After it has been widely adopted, it is discarded, often in favor of a new form that follows a similar course.

Airline hijacking provides a recent example of the rapid diffusion and decline of aggressive tactics. Air piracy was unheard of in the United States until an airliner was hijacked to Havana in 1961. Prior to that incident, Cubans were hijacking planes to Miami. These incidents were followed by a wave of hijackings, both in the United

States and abroad, eventually involving over 70 nations.

When Cubans were hijacking planes to Miami they were hailed as heroes. When Americans were hijacking planes to Havana, they were diagnosed, as mentally deranged people driven by inner turmoil arising largely from sexual disorders. Diagnoses changed radically depending on the direction of the unscheduled flight.

An inventive hijacker, C.D. Cooper, devised an extortion technique in which he exchanged passengers for a parachute and a sizeable bundle of money. He then parachuted from the plane in a remote area in Oregon. This episode temporarily revived a declining phenomenon in the United States, as others became inspired by his successful example.

The example of punishment is intended to serve as a deterrent. But punishment is also informative. Publicized failures can promote innovative improvements in antisocial behavior.

* Colorado: The first hijacker was apprehended because he parachuted over Colorado because the Air Force planted an electronic signal device on the parachute he demanded. The Air Force announced that this failure should serve as a lesson to others. It did.

* Utah: The next hijacker brought his own parachute aboard the plane and tossed out the bugged Air Force one. This sent the pursuit planes astray as he descended unmolested on the sweeping plains of Utah.

* Honduras: The third extortionist parachuted over a Honduras jungle, which does not provide a good landing surface for pursuit planes.

The extortion component was added to international hijackings. The first time it was tried the hijacker was overpowered by the money courier, who was an FBI agent. This led to further refinements in the hijacking-extortion procedure. Hijackers insisted that the money couriers be nude. The public display of nudity did not improve the already tarnished image of the FBI.

Deterrence through Prosocial Alternatives

For people who lack socially acceptable means of getting what they want, the best mode of prevention is to combine deterrents with development of prosocial options. Most law abiding behavior relies more on deterrence through prosocial options, than on threat of punishment.

Linear Projection Error

The course of collective aggression is often misjudged on the linear projection error; when it is assumed that events will continue to increase at the same, or accelerating rates. Expecting a continuing heightening of troublesome activities, certain countermeasures are applied at the point at which the activities have already declined.

This is because a society does not recognize it has a problem on its hands until the incidence rates become high. By the time it cranks up its political and legal machinery, the behavior is usually brought under control by other means. In the case of airline hijacking, the electronic search procedures were introduced in January 1973 after hijackings already had dropped markedly.

Strict laws are usually passed after the problematic behavior is on the decline. The countermeasures take the credit for the decline.

Direct Experience

Aggressive behavior also can be learned through a more rudimentary form of learning, relying on rewarding and punishing experiences. Passive children can be shaped into aggressors through a process of victimization and successful counteraggression. Passive children who were mistreated by peers, but occasionally halted attacks by defending themselves aggressively, eventually become ready aggressors. Passive children who were maltreated, and whose counteraggression proved unsuccessful, remained submissive.

Cross-Cultural Studies

The way in which modeling and reinforcement influences operate jointly in producing aggression, is graphically revealed in cross-cultural comparisons of societies that pursue a warlike mode of life, with those that follow pacific styles of behavior. In cultures that do not provide aggressive models and devalue injurious conduct, people live peaceably. In other societies that provide extensive training in aggression, attach prestige to it, and make its use rewarding, people threaten, fight, maim, and kill each other.

Instigators of Aggression

Aggression elicitors take many forms. Social interchanges are often escalated into physical violence by threats and insults. Humiliating affronts and challenges to reputation emerge as major

precipitants of violence in assault prone individuals. People who are easily embarrassed and lack verbal skills for resolving disputes and restoring their self-esteem, are prone to dispose of their antagonists physically.

Adverse conditions of life can provoke people to aggressive actions. Explanations of collective aggression usually include discontent arising from privations as a principal cause.

The view that discontent breeds violence requires qualification, however. Most discontented people do not aggress. In fact, severe privation is more likely to produce feelings of hopelessness and apathy, rather than aggression. Additional social conditions determine whether discontent will give rise to aggression, or to other forms of behavior.

Researchers have examined three factors that determine the severity of civil disorder in nations:

* First, the level of social discontent, arising from economic declines, oppressive restrictions, and social inequities.

* Second, the traditional acceptance of force to achieve desired goals. In some societies aggressive tactics are disavowed; in others, mass protests and coups d'etats are considered acceptable ways of forcing change.

* Third, the balance of coercive power between the system and the challengers. This is measured by the amount of military, police, industrial, labor, and foreign support the protagonists can enlist on their side.

When aggressive tactics are considered acceptable, and challengers possess coercive power, they will use collective force to change social practices within a system without requiring much discontent. Revolutionary violence, however, requires widespread discontent, and strong coercive power by challengers, while tactical traditions are of less importance.

Obedient Aggression

In the course of development, people are trained to obey orders. By rewarding compliance and punishing disobedience, directives elicit obedient behavior. After this form of social influence is

established, authorities can secure obedient aggression from others, especially if the actions are presented as justified and necessary, and the authorities possess coercive power. As Snow has perceptively observed, "When you think of the long history of man, you will find more hideous crimes have been committed in the name of obedience, than in the name of rebellion.

Psychological studies of obedient aggression corroborate historical evidence: It requires particular social conditions, rather than monstrous people, to produce heinous deeds.

Delusional Control

In addition to the various external instigators, bizarre beliefs can give rise to aggression of appalling proportions. Every so often tragic episodes occur in which individuals are led by delusional beliefs to commit acts of violence.

A study of American Presidential assassins shows that, almost without exception, the assaults were delusionally instigated. Assassins tend to be loners, who have experienced serious personal failures. They acted either under divine mandate, through alarm that the President was in conspiracy with treacherous foreign agents, or on the conviction that their own problems resulted from presidential persecution. Being unusually seclusive, the assassins had few opportunities to correct their beliefs by discussing them with others.

Maintaining Conditions

Thus far we have discussed how aggressive behavior is learned, and what activates it. The third major issue concerns the conditions that sustain aggressive tendencies. Injurious conduct, like other forms of social behavior, is strongly influenced by the effects it produces.

People aggress for many different reasons. Some resort to force to gain material things they desire. Some behave aggressively because it wins them approval, or status. Still others may rely on aggressive conquests to bolster their self-esteem, and sense of manliness. Under certain conditions people may derive satisfaction from seeing the expressions of suffering they inflict on their victims.

Defensive forms of aggression are often reinforced by their capacity to terminate humiliating, and painful treatment.

People repeatedly observe the behavior of others, and the occasions on which their actions are rewarded, ignored, or punished. Seeing what happens to others can influence behavior in much the same way as experiencing consequences personally. People can, therefore, profit from the successes and mistakes of others as well as from their own experiences. As a general rule, seeing aggression rewarded in others increases, and seeing it punished, decreases, the tendency to behave in similar ways.

Observed punishment, however, is informative, as well as inhibitory. Given strong instigation to aggression and limited options, a person witnessing the failures of others more likely will refine the prohibited behavior to improve its chances of success, than the deterred by the punishment.

People can, and do, regulate their behavior to some extent by the consequences they produce for themselves. They do things that give them self-satisfaction, and a feeling of self-worth. They refrain from behaving in ways that result in self-condemnation. Because of self-reactive tendencies, people must contend with themselves as well as with others, when they act in injurious ways. Most individuals acquire, through example and precept, negative sanctions against cruelty. As a result, they are restrained from injurious acts by self-censure.

But moral codes do not function as fixed internal regulators of behavior. There are various means by which moral reactions can be disengaged from reprehensible conduct. Social justifications and self-exonerations permit variations in conduct with the same moral principles.

Dissociative Processes

People do not behave in ways they consider reprehensible until they interpret such activities as serving worthy purposes. Through moral justification, activities that are ordinarily self-disapproved become personally acceptable. Over the years, much cruelty has been perpetrated by decent, moral people, in the name of religious principles, righteous ideologies, and social policies.

In everyday transactions, euphemistic language is a handy device for masking reprehensible activities, or according them a respectable status. Self-deplored acts can also be made to appear acceptable by contrasting them with flagrant inhumanities. One's own acts appear trifling by comparison. Such justifications serve as especially effective disinhibitors because they not only eliminate self-deterrents, but engage self-reward in the service of inhumane conduct. What was reprehensible becomes, through redefinition, a source of self-pride.

Self-censure is activated most strongly when the causal connection between moral behavior and its consequences is apparent. Self-prohibitions can be dissociated from conduct 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 assumes responsibility for what they do. By displacing responsibility elsewhere, people need not hold themselves accountable for their actions, and are thus spared self-prohibiting reactions.

Exemption from self-censure is likewise facilitated by diffusing responsibility for culpable behavior. Through division of labor, group decision making, and group action, people can behave reproachfully, without feeling personally responsible.

Attributing blame to the victim is still another exonerative expedient. Victims are faulted for bringing suffering on themselves, or extraordinary circumstances are invoked, as vindications for injurious conduct. One need not engage in self-reproach for committing acts dictated by compelling circumstances.

A further means of weakening self-prohibitions is to dehumanize the victims. Mistreatment of people reduced to a subhuman level is less apt to arouse self-reproach than if they are regarded as sensitive individuals.

Many conditions of contemporary life are conducive to dehumanizing behavior. Bureaucratization, automation, urbanization, and high social mobility all lead people to relate to each other in anonymous, impersonal ways. In addition, social practices that divide people into in-group and out-group members, produce human estrangement, conducive to dehumanization. Strangers can be more easily cast as subhuman villains, than can personal acquaintances.

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Additional ways of weakening personal deterrents operate by misrepresenting the results actions produce. As long as detrimental effects are disregarded, misconstrued, or minimized, there is low likelihood of self-reprimands.

Given the variety of self-exonerating devices, a society cannot rely solely on individuals, however noble their convictions, to protect against brutal deeds. Just as aggression is not rooted in the individual, neither does its control reside only there. Humaneness requires, in addition to moral codes of conduct, safeguards built into social systems that discourage cruelty and uphold compassionate behavior.

Remedial Measures

Like so many other problems confronting people, there is no single grand design for lowering the level of destructiveness within a society. It requires both individual corrective effort, and group action aimed at changing the practices of social systems.

Space does not permit a detailed discussion of remedial measures. In a recently published book on aggression, I discuss ways in which social systems that contribute to violence can be changed to function in more constructive ways.

* **Familial Practices:** We now possess the knowledge and means for helping families to reduce the level of aggression in the home.

* **Educational Systems:** Given our present knowledge, educational systems should not be turning out large numbers of students so lacking in basic skills that their choices of livelihood are essentially restricted to dependent subsistence, or a life of crime. Methods exist for creating learning environments that can transform academic failure to success.

* **Mass Media:** Different courses of action are available by which the public can reduce the commercial marketing of violence on television, and change it into an instrument of human betterment.

* **Correctional Systems:** Almost everyone acknowledges that present correctional systems are antiquated. High recidivism

rates attest to the fact that they do not accomplish the purposes by which they are justified. Although the need for drastic reforms is repeatedly voiced by insiders and outsiders alike, the corrosive practices remain.

It is difficult to alter huge malfunctioning agencies by internal modification alone. Agencies can be changed faster by devising successful programs on a limited scale outside the traditional structure, and then using the power of superior alternatives as the instrument of influence.

Change through superior alternatives is illustrated in home-style programs that are being developed for juvenile offenders as a substitute for correctional facilities. In these programs, two adults who know how to create home environments conducive to positive development live with a group of delinquents in homes located in the community. Within this atmosphere, children develop their potentialities and learn to assume responsibility for their behavior. By setting up home-based incentives for learning in the classroom, the children begin to learn and work productively in school.

Such homestyle treatment programs are more humane, much more effective in changing attitudes and behavior, and considerably less expensive. It costs about \$15,000 to incarcerate a child in a institution. It costs less than half that amount to treat a child in a home-style program.

* **Enforcement Agencies:** Programs can be devised for modifying provocative police practices, that arise, either from individual ineptitude in the exercise of authority, or through official sanction.

* **Community Services:** In public agencies that enjoy monopolies over given services, the practices that evolve are more likely to serve the interests, and convenience of those who run the services, than to maximize benefits for the people the agencies are designed to serve. Systems of accountability are needed for making public agencies more responsive to the needs of those they serve.

* **Legal System:** The law can be used as an instrument of constructive social change, as well as to preserve existing practices.

* **Political System:** The political system is a major agency of social change. People improve their society through reform legislation. They rely on the sanctions of agencies to enforce rules that affect their everyday life. The governmental apparatus, however, is often diverted from its public function by the pressure of vested interests. Efforts to improve the functioning of society must also be directed at governmental practices to make them serve the public more equitably.

Aggression is not an inevitable, or unchangeable aspect of people, but a product of conditions operating within a society. One can hold an optimistic view of people's power to reduce their level of aggressiveness. But much greater effort is needed to ensure that this capability is used beneficially, rather than destructively.

'Doomsday Flight' TV Story leads to copies

Sometimes it is the fictional media that provides the example for the spread of an aggressive style of conduct. A program called "Doomsday Flight" provides one example. In this plot, an extortionist threatens airline officials that an altitude sensitive bomb will be exploded on a transcontinental airliner as it descends below 5,000 ft. for the landing. In the end the pilot outwits the extortionist by selecting an airport located at an elevation above the critical altitude.

There was a substantial rise in extortion attempts using threats of altitude sensitive bombs:

- For two months following the telecasting of the program, there was an 8-fold increase in attempted extortions using the same scenario (16 vs. 2 per month).
- Airlines were subjected to extortion threats a day or two after the program was shown as a rerun in different cities in the U.S. and abroad.
- Western Airlines paid \$25,000 to an extortionist in Anchorage the day after the rerun was shown.
- A San Francisco rerun was followed by an extortion threat to United on a flight to Hawaii. The extortionist was apprehended as he picked up the money package dropped from a helicopter.
- Miami experienced an extortion attempt the day after the rerun.
- The day after the program was shown in Sydney, Australia, an extortionist informed Quantas officials that he had placed an altitude sensitive bomb on a flight in progress. He also directed the officials to a locker containing such a bomb to prove that he was not bluffing. Quantas paid \$560,000 only to learn that the airliner contained no bomb.
- Following a showing of the "Doomsday Flight" on Montreal television, an extortionist used the bomb plot in an effort to extract a quarter of a million dollars from British Overseas Airways by warning that a barometric bomb was set to explode on a jet bound from Montreal to London when it descended below 5,000 ft. The hoaxter was unsuccessful because the airline officials, knowing the oft-repeated scenario, diverted the plane to Denver which is at the 5,339 ft. elevation.
- TWA bound from Madrid for New York was rerouted to the Air Force base in South Dakota, when a Madrid viewer called in the bomb hoax.
- A rerun in Paris produced the same extortion scenario.



Albert Bandura



The Top 25 Most Cited Articles in Personality and Social Psychology Review

By Angela Nierman

Dialogue recently featured an article listing highly-cited articles from *Personality and Social Psychology Review*. This listing was based on Thomson Scientific's *Web of Science* (WoS) which misses some citations, and does not cover all of PSPR's publication history. The difference between this count and other counts made available to the Editors prompted an updated, more complete accounting. For these tables, the number of citations for all PSPR articles was obtained from two citation index databases, *Web of Science* and *Google Scholar*. Due to missing data in WoS for articles published before 2000, some citation counts for WoS were estimated by regressing WoS citations on Google Scholar citations. The top 25 most cited PSPR articles according to Google Scholar are listed with their corresponding WoS ranks and the total citations the article received in each database. A second ranking lists the top 25 most cited articles controlling for number of years since publication. Using only the numbers from Google Scholar, the total number of citations was divided by the number of years since publication. ■

Google Rank	Web of Science Rank	Authors and Article Titles	Total Citations (Google Scholar)	Total Citations (Web of Science)
1	4	McKenna & Bargh (2000). Plan 9 From Cyberspace: The Implications of the Internet for Personality and Social Psychology	280	144
2	2	Cacioppo, Gardner, & Berntson (1997). Beyond Bipolar Conceptualizations and Measures: The Case of Attitudes and Evaluative Space.	249	155§
3	1	Smith & DeCoster (2000). Dual-Process Models in Social and Cognitive Psychology: Conceptual Integration and Links to Underlying Memory Systems	244	164
4	3	Strack & Deutsch (2004). Reflective and Impulsive Determinants of Social Behavior	215	152
5	7	Bandura (1999). Moral Disengagement in the Perpetration of Inhumanities	182	114§
6	6	Blair (2002). The Malleability of Automatic Stereotypes and Prejudice	172	131
7	5	Rozin & Royzman (2001). Negativity Bias, Negativity Dominance, and Contagion	170	137
8	8	Sellers, Smith, Shelton, Rowley, & Chavous (1998). Multidimensional Model of Racial Identity: A Reconceptualization of African American Racial Identity	164	102§
9	10	Hogg (2001). A Social Identity Theory of Leadership	148	92
10	9	Ajzen (2002). Residual Effects of Past on Later Behavior: Habituation and Reasoned Action Perspectives	144	100
11	11	Rubin & Hewstone (1998). Social Identity Theory's Self-Esteem Hypothesis: A Review and Some Suggestions for Clarification	142	89§
12	18	Niedenthal, Barsalou, Winkielman, Krauth-Gruber, & Ric (2005). Embodiment in Attitudes, Social Perception, and Emotion	133	70
—	19	Tesser (2000). On the Confluence of Self-Esteem Maintenance Mechanisms	88	69
13	22	Baumeister, Catanese, & Vohs (2001). Is There a Gender Difference in Strength of Sex Drive? Theoretical Views, Conceptual Distinctions, and a Review of Relevant Evidence	132	65
—	23	Fraley (2002). Attachment Stability From Infancy to Adulthood: Meta-Analysis and Dynamic Modeling of Developmental Mechanisms	77	63
14	27	Helweg-Larsen, & Shepperd (2001). Do Moderators of the Optimistic Bias Affect Personal or Target Risk Estimates? A Review of the Literature	129	59
15	13	Caporael (1997). The Evolution of Truly Social Cognition: The Core Configurations Model	124	78§

VICARIOUS PROCESSES: A CASE OF NO-TRIAL LEARNING¹

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Research and theoretical interpretations of learning processes have focused almost exclusively on a single mode of response acquisition which is exemplified by the operant or instrumental conditioning paradigm. In this procedure the organism is impelled, in one way or another, to perform responses under specific stimulus conditions and, through differential reinforcement of spontaneously emitted variations in behavior, new response patterns are developed or existing repertoires are brought under new discriminative stimulus control. It is generally assumed that the principles

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governing the latter mode of response acquisition account also for social learning phenomena occurring under naturalistic conditions.

The continued adherence to a relatively narrow range of learning principles and procedures stems primarily from the fact that certain critical conditions that obtain in real-life situations are rarely, if ever, reproduced in laboratory studies of learning. Thus, in laboratory investigations experimenters arrange comparatively benign environments in which errors will not produce fatal consequences for the organism. By contrast, naturalistic environs are loaded with potentially lethal consequences that unmercifully befall those who happen to perform hazardous errors. For this reason, it would be exceedingly injudicious to rely primarily upon trial-and-error and successive approximations methods in teaching children to swim, adolescents to drive automobiles, or adults to master complex occupational and social tasks. If rodents and pigeons toiling in Skinner boxes and various mazes could likewise get electrocuted, dismembered, or extensively bruised for errors that inevitably occur during early phases of learning, it is a reasonably safe prediction that few of these venturesome subjects would ever survive the shaping process. Apart from the questions of efficiency (Bandura and McDonald, 1963) and survival, it is doubtful if many classes of responses would ever be acquired if social training proceeded solely by the method of approximations through differential reinforcement of emitted responses (Bandura, 1962).

It is evident from informal observation that vicarious-learning experiences and response-guidance procedures involving both symbolic and live models are utilized extensively in social learning to short-circuit the acquisition process, and to prevent one-trial extinction of the organism in potentially hazardous situations. Although historically, learning by vicarious experience has been generally labeled "imitation," in the contemporary literature essentially the same phenomena are subsumed under other terms such as "observational learning," "copying," "social facilitation," "vicarious learning," "contagion," "identification," and "role-playing." The diversity in constructs reflects the arbitrary distinctions between vicarious learning events that have been proposed, at one time or another, based on the types of response classes modified (Lazowick, 1955; Osgood *et al.*, 1957), the antecedent variables supposedly governing the occurrence of matching responses (Parsons and Shils, 1951), the fidelity with which modeling stimuli are reproduced (N. E. Miller and Dollard, 1941; Riopelle, 1960), the specificity and generality of observational learning (Parsons and Shils, 1951), and in terms of whether matching responses are performed in the presence or absence of the model (Mowrer, 1950). While it is possible to draw distinctions between descriptive terms based on certain stimulus, mediating, or terminal-response variables, one might

question whether it is advantageous to do so, since essentially the same learning process is involved regardless of the content and generality of what is learned, the models from whom the response patterns are acquired, and the stimulus situations in which the relevant behavior is subsequently performed. Therefore, the terms imitative, observational, and vicarious learning will be employed interchangeably to refer to behavioral modifications resulting from exposure to modeling stimuli.

For the purposes of the present discussion, a vicarious learning event is defined as one in which new responses are acquired or the characteristics of existing response repertoires are modified as a function of observing the behavior of others and its reinforcing consequences, without the modeled responses being overtly performed by the viewer during the exposure period. In demonstrating vicarious learning phenomena, it is therefore necessary to employ a nonresponse acquisition procedure in which a subject simply observes a model's behavior, but otherwise performs no overt instrumental responses, nor is administered any reinforcing stimuli during the period of acquisition. Any learning that occurs under these limiting conditions is purely on an observational or covert basis. This mode of response acquisition is accordingly designated as no-trial learning, since the observer does not engage in any *overt responding trials* although, as will be shown later, he may require multiple *observational trials* in order to reproduce the modeled stimuli accurately. Moreover, the development of mediational responses, in the form of imaginal and implicit verbal representations of the perceived stimulus events, may play a critical role in the vicarious learning process.

I. Theories of Response Acquisition through Observation

The concept of imitation in psychological theory has an extended history dating back to Morgan (1896), Tarde (1903), and MacDougall (1908), who regarded imitativeness as an innate propensity. These early instinctive interpretations of the imitative process not only impeded empirical investigations of probable controlling variables, but due to the vehement reaction against the instinct doctrine, even the phenomena subsumed under the concept were, until recent years, either widely ignored or repudiated.

A. ASSOCIATIVE AND CLASSICAL CONDITIONING THEORIES

As the instinct doctrine fell into disrepute, a number of psychologists, notably Humphrey (1921), Allport (1924), and Holt (1931), attempted to account for imitative behavior in terms of associative or Pavlovian conditioning principles. According to Holt's conceptualization, for example,

when an adult copies a response made by a child, the latter tends to repeat the same behavior, and, as this circular associative sequence continues, the adult's matching behavior becomes an increasingly effective stimulus for the child's response. If, during this spontaneous mutual imitation, the adult performs a response that is novel for the child, the latter will copy it. Piaget (1951) is a more recent exponent of essentially the same point of view, according to which the imitator's response serves initially as the stimulus for the model in alternating imitative sequences. Allport similarly presented imitative responses as instances of classical conditioning of verbalizations, motoric responses, or emotions to matching social stimuli with which they have been contiguously associated.

Although the associative theories account adequately for the imitator's repetition of his own behavior, they fail to explain the psychological mechanisms governing the emergence of *novel* responses during the model-observer interaction sequence. Moreover demonstrations of observational learning in animals and humans do not ordinarily commence with a model's matching a semi-irrelevant response of the learner. Thus, in utilizing modeling procedures to teach a mynah bird to talk, the trainer does not engage initially in circular crowing behavior; instead, he begins by emitting verbal responses that he wishes to transmit, but which clearly do not exist in integrated form in the bird's vocal repertoire.

B. INSTRUMENTAL CONDITIONING THEORIES

As theoretical explanations of learning shifted the emphasis from classical conditioning to instrumental learning based on rewarding and punishing response consequences, theories of imitation similarly assumed that the occurrence of observational learning is contingent upon the administration of reinforcing stimuli either to the model or to the observer. This point of view was most clearly expounded by Miller and Dollard (1941) in the classic publication, *Social Learning and Imitation*. According to this theory, the necessary conditions for learning through imitation include a motivated subject who is positively reinforced for matching the correct responses of a model during a series of initially random, trial-and-error responses.

The experiments conducted by Miller and Dollard involved a series of two-choice discrimination problems, in each of which a trained leader responded to environmental stimuli that were concealed from the subject; consequently, he was totally dependent upon the cues provided by the leader's behavior. The model's choices were consistently rewarded and the observing subject was similarly reinforced whenever he matched the choice responses of the imitatee. This form of imitation was labeled by the authors "matched-dependent behavior" because the subjects relied on the

leader for relevant cues and matched his responses. Based on this paradigm, it was shown that both rats and children readily learn to follow their respective models, and generalize imitative responses to new stimulus situations, new models, and different motivational states.

While these experiments have been widely accepted as demonstrations of learning by imitation, they in fact represent only the special case of discrimination place-learning, in which the behavior of others provides discriminative stimuli for responses that already exist in the subject's behavior repertoire. Indeed, had the relevant environmental cues been made more distinctive, the behavior of the models would have been quite irrelevant and perhaps even a hindrance in the acquisition process. By contrast, most forms of imitation involve *response* rather than *place* learning, in which subjects combine behavioral elements into relatively complex novel responses solely by observing the performance of social models, without any opportunity to perform the model's behavior in the exposure setting and without any reinforcers administered either to the models or to the observers (Bandura, 1965a). In the latter instance, modeling cues constitute an indispensable aspect of the learning process. Moreover, since the S-R reinforcement paradigm for observational learning requires the subject to perform the imitative response before he can learn it, the theory propounded by Miller and Dollard evidently accounts more adequately for the emission of previously learned matching responses than for their acquisition. Continuing with our example of language learning, in order for our mynah bird to learn the words *social psychology* imitatively it would first have to emit the words *social psychology* in the course of random vocalization, match them accidentally with the trainer's verbal responses, and secure a positive reinforcement. It is evident from the foregoing discussion that the conditions assumed by Miller and Dollard to be necessary for learning by imitation place severe limitations on the types of behavioral changes that can be attributed to the influence of social models.

The operant-reinforcement analysis of imitative behavior (Baer and Sherman, 1964; Skinner, 1953, 1957) is in many respects similar to one originally advanced by Miller and Dollard. According to the former interpretation, if matching responses are positively reinforced and divergent responses are either nonrewarded or punished, the model's behavior comes to serve as discriminative stimuli for reinforcement. Given an adequate reinforcement history for behavioral reproduction of modeling stimuli, matching responses per se may gradually acquire secondary reinforcing properties. After a generalized imitative repertoire has been developed on the basis of consistent rewarding consequences in a variety of situations, the individual will tend to display a high incidence of precisely

imitative behavior which, due to its acquired reward value, may be maintained at least temporarily in the absence of externally administered reinforcers.

Reinforcement control of generalized imitation is well illustrated in a recent study conducted by Baer and Sherman (1964). Three imitative responses (head nodding, mouthing, and novel verbalizations) were strongly established in young children by social reinforcement from a puppet who had instructed the subjects to match his modeling behavior. After a stable rate of imitative responding had been achieved, the puppet displayed nonreinforced bar-pressing interspersed among the other three matching responses, which were maintained in the children on a continuous schedule of reinforcement. Under these conditions, the subjects showed an increase in imitative bar-pressing behavior over their operant levels. In order to further demonstrate the dependence of generalized imitative bar-pressing on direct reinforcement of other matching responses either social reinforcers were no longer presented following imitative head nodding, mouthing, and verbalization, or the puppet ceased to exhibit these responses. Both the extinction and the time-out from modeling procedures resulted in decreased imitative bar-pressing. Moreover, reinstatement of the other three modeling cues and reinforcement of the corresponding matching responses produced increased imitative bar-pressing behavior.

It should be noted that, like the Miller and Dollard theory, the operant-reinforcement interpretation of modeling processes accounts satisfactorily for the discriminative and reinforcing stimulus control of previously learned matching responses, but it throws no light on the variables governing the acquisition of novel responses through observation. Such responses are learned during the period of exposure to modeling stimuli prior to the operation of the reinforcement practices. Indeed, had the children in the experiment cited above been tested for imitative learning immediately following demonstration of the four critical responses, it is a safe prediction that they could have reproduced the modeled repertoire without undergoing any imitation contingent reinforcement. In evaluating the role of reinforcement in modeling processes, it is therefore important to distinguish *acquisition* from *performance*.

Numerous investigations, differing considerably in the choice of reinforcing stimuli, types of matching responses, and age status of the subjects, have shown that the presentation of imitation-contingent positive or negative reinforcers either to the model (Bandura, 1965; Bandura *et al.*, 1963c; Kanfer, 1965; Walters *et al.*, 1963; Walters and Parke, 1964) or to the subject (Kanareff and Lanzetta, 1960a,b; Lanzetta and Kanareff, 1959; Metz, 1964; Schein, 1954) have a facilitative or a suppressive

effect on the subject's subsequent performance of matching responses. However, results from a recent experiment (Bandura, 1965b) lend support to the theory that the *acquisition* of matching responses results primarily from stimulus contiguity and associated symbolic processes, whereas reinforcing consequences to the model or to the observer have a major influence on the *performance* of imitatively learned responses.

In the above study, children observed a film-mediated model who exhibited a sequence of novel physical and verbal aggressive responses. In one treatment condition the model was severely punished following the

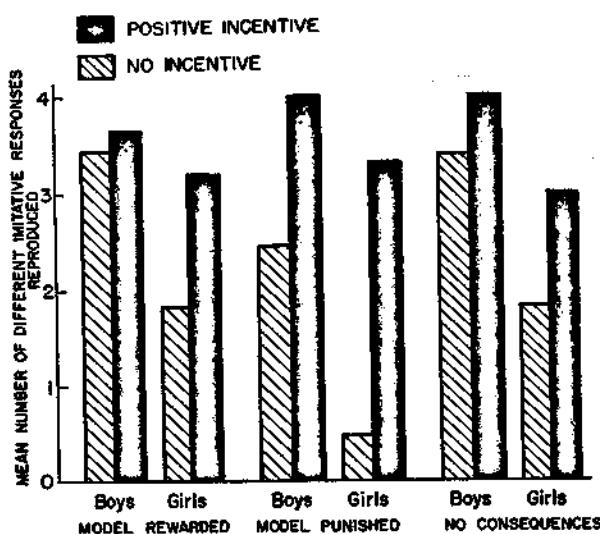


FIG. 1. Mean number of different matching responses reproduced by subjects as a function of incentive conditions and the model's reinforcement contingencies. (Adapted from Bandura, 1965b.)

display of aggressive behavior; in the second, the model was generously rewarded with delectable treats and lavish praise; the third condition presented no response consequences to the model. A postexposure performance test of imitation revealed that the reinforcement contingencies applied to the model's responses resulted in differential degrees of matching behavior. Relative to subjects in the model-punished condition, children in the model-rewarded and the no-consequence groups spontaneously performed a significantly greater variety of imitative responses. Moreover, boys reproduced substantially more of the model's behavioral repertoire than girls, the differences being particularly marked in the model-punished treatment (Fig. 1).

Following the performance test, children in all three groups were offered highly attractive incentives contingent upon their reproducing the model's responses, so as to activate into performance what the children had acquired through observation. Although learning must necessarily be inferred from performance, it was assumed that the responses reproduced under positive incentive conditions would provide a relatively accurate index of acquisition.

As shown in Fig. 1, the introduction of positive incentives completely wiped out the previously observed performance differences, revealing an equivalent amount of learning among children in the model-rewarded, model-punished, and the no-consequences conditions. Similarly, the initially large sex difference was substantially reduced.

While there is ample evidence that reinforcing stimuli can significantly alter the probability of future occurrence of preceding matching responses, consequent events can hardly serve as a necessary precondition for their acquisition. However, under conditions where reinforcers are repeatedly administered to a model as he displays an ongoing series of responses, observation of reinforcing consequences occurring early in the sequence might be expected to increase the vigilance of the observer toward subsequently modeled behavior. The anticipation of positive reinforcement for reproducing matching responses by the observer may therefore, indirectly influence the course of vicarious learning by enhancing and focusing the subject's observing responses.

C. SENSORY FEEDBACK THEORY

Mowrer's proprioceptive feedback theory of imitation (1960) similarly highlights the role of reinforcement but, unlike the preceding approaches which reduce imitation to a special case of instrumental learning, Mowrer emphasizes the classical conditioning of positive and negative emotions to matching response-correlated stimuli. Mowrer distinguishes two forms of imitative learning in terms of whether the observer is reinforced directly or vicariously. In the former case, the model performs a response and at the same time rewards the observer. Through the repeated contiguous association of the model's behavior with rewarding experiences, these responses gradually take on positive value for the observer. On the basis of stimulus generalization, the observer can later produce self-rewarding feedback experiences, simply by reproducing as closely as possible the model's positively valenced behavior.

In the second or "empathetic" form of imitative learning, the model not only exhibits the responses but also experiences the reinforcing consequences. It is assumed that the observer, in turn, experiences empathetically the sensory concomitants of the model's behavior, and also intuits his

satisfactions or discomforts. As a result of this higher-order vicarious conditioning, the observer will be predisposed to reproduce the matching responses for the attendant positive sensory feedback.

There is considerable research evidence that imitative behavior is enhanced by increasing the rewarding qualities of a model (Bandura and Huston, 1961; Grusec, 1965; Grusec and Mischel, 1965; Hanlon, 1964; Henker, 1964; Mussen and Parker, 1965), and by positive reinforcers administered to a model (Bandura, 1965b; Bandura *et al.*, 1963c; Walters *et al.*, 1963). Although the sensory feedback conception of imitation does not require a response to be performed before it can be learned, it nevertheless fails to explain the acquisition of matching responses when reinforcers are not dispensed either to the model or to observers.

There is some reason to believe that the acquisition, integration, facilitation, and inhibition of responses are in large part centrally, rather than peripherally, mediated. For example, preliminary findings from curare-conditioning experiments—in which animals are skeletally immobilized during aversive conditioning or extinction—demonstrate that conditioned emotional responses can be readily acquired and extinguished independently of skeletal responding and its correlated proprioceptive feedback (Black, 1958; Black *et al.*, 1962). Moreover discriminative classical conditioning, established under curare, can subsequently control discriminative instrumental avoidance responses in the normal state (Leaf, 1964; Solomon and Turner, 1962). Although the mediators of this discriminative transfer have not been identified, the data bring into question theories of learning that rely heavily upon differential proprioceptive cues as explanatory factors.

A peripheral feedback theory would also require highly differential proprioceptive cues to be associated with practically identical overt response patterns. It is more likely that proprioceptive stimulation arising from hitting responses directed toward parents and toward peers may differ little, if at all; nevertheless, physically aggressive responses toward parents are generally strongly inhibited, whereas physical aggression toward peers is much more readily expressed (Bandura, 1960; Bandura and Walters, 1959). One could therefore predict more accurately the expression or inhibition of aggression from knowledge of the stimulus context (e.g., church, athletic gymnasium), the object (e.g., parent, priest, policeman, or peer), and other cues that signify predictable reinforcement contingencies, than from any direct assessment of the type of sensory feedback correlated with the agent's aggressive responses. Thus, in most social interaction sequences, proprioceptive cues constitute only a small portion of the total stimulus complexes. It is therefore necessary to take account also of external stimulus elements and their cognitive correlates,

which probably serve as important discriminative stimuli in the regulation of both matching and nonimitative behavior.

It is also evident that rapid selection of responses from among a varied array of alternatives cannot be governed by proprioceptive feedback since relatively few responses could be activated, even incipiently, during characteristically brief pre-decision periods (N. E. Miller, 1964). In recognizing this problem, Mowrer (1960) has conjectured that the initial scanning and selection of responses may occur primarily at the symbolic rather than at the action level.

In this same connection, behavior is influenced by models even when the responses in question do not generate cues possessing motivational properties. This is best exemplified by studies of observational learning of perceptual-motor tasks from filmed demonstration (Sheffield and Maccoby, 1961) that do not contain positive or aversive stimuli essential for the classical conditioning of emotional responses. Mowrer has, of course, pointed out that sensory experiences not only classically condition positive or negative emotions, but also produce conditioned sensation or images. In most cases of observational learning, such perceptual or imaginal responses may be the only important mediating processes. Mowrer's sensory-feedback theory of imitation may therefore be primarily relevant to instances in which the modeled responses incur relatively potent reinforcing consequences capable of endowing response-correlated stimuli with motivational properties.

D. STIMULUS CONTIGUITY AND MEDIATIONAL THEORIES

Recent theoretical analyses of observational learning (Bandura, 1962; Sheffield, 1961) place primary emphasis on the role of stimulus contiguity and associated cognitive response-stimulus events in the acquisition process. According to contiguity theory, during the period of exposure modeling stimuli elicit in observing subjects configurations and sequences of sensory experiences which, on the basis of past associations, become centrally integrated and structured into perceptual responses.

There is some research evidence in the sensory conditioning literature (Conant, 1964; Leuba, 1940; Naruse and Abonai, 1953) that, as a function of contiguous stimulation, an antecedent stimulus can acquire the capacity to elicit imaginal representations of associated stimulus events even though they are no longer physically present. These findings indicate that imaginal responses are conditionable, and presumably extinguishable, as are overt classes of behavior. It is therefore reasonable to suppose that, in the course of observation, transitory sensory and perceptual phenomena are converted to retrievable images of the modeled sequences of behavior. Indeed, a reader could readily elicit, through verbal self-

instruction, vivid imagery of the stylistic social responses, physical attributes, role behaviors, and skilled performances of close acquaintances, instructors, entertainers, and a host of other models either encountered in actual social situations or provided in audiovisual displays.

In addition to the acquisition of imaginal responses, once verbal labels have become attached to objective stimuli, the observer acquires, during the period of exposure, verbal equivalents of the model's behavior. Recent modeling experiments (Bandura, 1965b; Bandura *et al.*, 1963c), for example, revealed that children who had observed a model exhibit novel patterns of aggressive responses subsequently described the entire sequence of aggressive acts with considerable accuracy. The above findings thus provide some basis for assuming that symbolic or representational responses in the form of images and verbal associates of the model's behavior constitute the important residues of observational experiences.

The discussion has so far been concerned with the process whereby different forms of representational responses are acquired on the basis of observation. A mediational theory must also account for the nature of the linkage between cognitive representation, on the one hand, and behavioral reproduction, on the other. There is ample evidence (Dollard and Miller, 1950; Mowrer, 1960; Staats and Staats, 1963) that implicit responses provide cues which can serve as discriminative stimuli for directing and controlling instrumental responses in the same way as environmental events. It is likewise assumed that symbolic matching responses possess cue-producing properties that are capable of eliciting, some time after observation, overt responses corresponding to those that were modeled. However, it should be noted here that although the stimuli generated by symbolic behavior can become discriminative for overt action, it does not mean that the observer will necessarily be able to execute skillfully the matching patterns of behavior. This issue will be discussed later.

In order to test the proposition, advanced in the above theory, that symbolization facilitates vicarious learning, a modeling study was conducted (Bandura *et al.*, 1965a) in which symbolic responses were directly manipulated. During the response-acquisition phase of the experiment, children observed a film-mediated adult model exhibit an extended sequence of relatively novel responses, projected on a lenscreen in a television console. The following three conditions of observation were employed. In the *facilitative symbolization* condition, subjects verbalized the modeling stimuli as they were presented on the lenscreen. The purpose of the concurrent verbalization was to enhance the development of imaginal and verbal associates for the model's behavior. Children in the *passive observation* group were instructed simply to observe the film care-

fully. A third experimental treatment was designed to counteract the establishment of representational responses by having subjects produce interfering verbal responses throughout the period of exposure. In the latter *competing symbolization* condition, subjects were instructed to count rapidly while attending closely to the film.

The degree of observational learning may also be partly governed by incentive-related sets which exert selective control over the type, intensity, and frequency of observing responses. It is likewise entirely possible that different symbolization instructions could create in observers differential anticipations as to whether or not they might later be called upon to demonstrate what they had learned from the filmed presentation. Such self-induced sets, if operative, might affect attentive behavior and thus confound the effects of symbolization processes. Hence, in the present study half of the subjects in each of the three observational treatments were assigned to a positive incentive-set condition. These children were informed that following the movie, they would be asked to reproduce the model's responses and given candy treats for each behavioral element performed correctly. The remaining subjects, assigned to the no-incentive nonperformance condition, were told that immediately after viewing the film they would return to their classroom, thus providing them with little or no incentive to learn the model's repertoire.

An incentive set may influence the amount of behavioral reproduction by either (1) augmenting and channeling the observing responses during acquisition, or (2) actuating deliberate, implicit rehearsal of matching responses immediately after exposure. Since the present experiment was primarily concerned with issues of response acquisition, and the occurrence of differential anticipatory rehearsal would obscure results, children in all groups were assigned the task of counting out loud during the brief period intervening between the end of the movie and reproduction. By this procedure, interpolated activities were held constant for all groups and facilitative symbolic rehearsal was prevented.

In the test for acquisition, children in all treatment conditions were offered candy reinforcers and social rewards for each matching response that they reproduced correctly.

Table I presents the mean number of matching responses achieved by children in the various treatment conditions. In each incentive condition for both boys and girls, the mean reproduction scores attained by the active symbolizers exceeds the corresponding means for the passive observers who, in turn, show a higher level of acquisition than subjects in the competing symbolization treatment. Analysis of variance of these data reveals that symbolization is a highly significant source of variance. Further comparisons of pairs of means indicate that subjects who

generated verbal equivalents of the modeling stimuli during presentation subsequently reproduced significantly more matching responses than children who either observed passively or engaged in competing symbolization. The latter two groups also differ significantly. However, observational learning was not influenced by incentive set, nor were there any significant interaction effects.

Although the results of the present study provide confirmatory evidence for the facilitative role of symbolization in observational learning, alternative interpretations of these findings might be examined. It is conceivable that the method utilized for preventing the acquisition of representational responses may have interfered with observation of the pertinent

TABLE I
MEAN NUMBER OF MATCHING RESPONSES REPRODUCED AS A FUNCTION
OF SYMBOLIZATION AND INCENTIVE CONDITIONS

Incentive set	Observational conditions		
	Facilitative symbolization	Passive observation	Competing symbolization
No incentive set			
Boys	16.8	14.5	11.5
Girls	17.5	13.2	6.0
Total	17.2	13.8	8.7
Incentive set			
Boys	16.2	15.3	13.0
Girls	14.8	11.7	9.8
Total	15.5	13.5	11.4

stimuli. Considering, however, that the modeling stimuli were projected on a large television screen directly in front of the subject, seated in a dark room, it is improbable that, under such conditions of highly focused attention, concurrent competing verbalization could appreciably reduce the occurrence of observing responses. Indeed, the marked external control of observing responses in all likelihood accounts for the absence of a significant incentive effect on the acquisition of matching behavior.

In situations where a person is exposed to multiple models exhibiting diverse patterns of behavior, knowledge of the reinforcement contingencies associated with the corresponding response patterns, and anticipation of positive or negative reinforcement for subsequent reproduction may exert selective control over the nature and frequency of attending responses.

The effects of incentive set on observational learning would, therefore, be most clearly elucidated by a comparative study involving (a) highly focused observation of a single sequence of modeling stimuli, (b) controlled exposure to multiple models requiring selective attentiveness to the different cues presented simultaneously, and (c) self-selection of frequency and duration of exposure to specific types of models. The latter condition, which corresponds most closely to observational learning in naturalistic situations, would probably maximize the influence of reinforcement-oriented set.

Simultaneous competing verbalizations during observation of pictorial displays would not be expected to interfere too extensively with the development of visual imagery, particularly when the modeling stimuli are highly salient, as in the present experiment. It would therefore be of considerable theoretical significance to determine whether any matching responses could be reproduced if, in addition to preventing the development of verbal associates, visual imaginal responses were likewise precluded masked, or obliterated. Such imagery interference procedures would provide the most decisive evidence as to whether representational mediators are necessary for the achievement of delayed, behavioral reproduction.

II. Behavioral Effects of Exposure to Modeling Stimuli

Results of numerous investigations (Bandura, 1962, 1965a; Bandura and Walters, 1963a) reveal that observation of models' responses and their reinforcing consequences may have several different behavioral effects, some of which have been mentioned earlier. As shown in preceding sections, an observer may acquire topographically novel responses that did not previously exist in his behavioral repertoire. Second, observation of response consequences to the model may produce incremental or decremental changes in existing classes of behavior by modifying the strength of inhibitory responses. Third, observation of another person's behavior may facilitate the occurrence of previously learned but non-inhibited responses through the stimulus enhancement and discriminative functions of modeling cues. In the following sections some of the variables controlling these diverse behavioral outcomes and associated mediating processes will be discussed at length.

A. MODELING EFFECTS

In order to demonstrate experimentally the acquisition of new response patterns through observation, it is necessary for a model to exhibit highly novel responses, and the observer must later reproduce them in a substantially identical form. Any behavior that has a very low or zero probability of occurrence given the appropriate stimulus conditions fulfills the criterion of a novel response.

The basic components that enter into the development of more complex integrated units of behavior are usually present in subjects' behavioral repertoires as products either of maturation or of prior observational learning and instrumental conditioning. Thus, while most of the elements in activities that are typically modeled in imitation experiments have undoubtedly been previously learned, the particular pattern of components in each response may be unique. For example, children can manipulate objects, sit on them, and punch them, and they can produce vocal responses, but the likelihood that a young child would spontaneously place a Bobo doll on its side, sit on it, punch it in the nose, and remark "Pow . . . boom . . . boom" is exceedingly remote (Bandura, 1965b; Bandura *et al.*, 1961). It is likewise highly improbable that children who possess even an extensive linguistic repertoire would ever emit verbal responses such as "weto-smacko" or "lickit-stickit" (Bandura *et al.*, 1963b) in the absence of exposure to a model who exhibited these unique word combinations.

In addition to response formation, acquisition outcomes are revealed when existing integrated patterns of behavior are brought under new stimulus control as a function of observational experiences.

The social transmission of novel responses is demonstrated in a series of experiments (Bandura *et al.*, 1961, 1963a) in which nursery-school children observed adults exhibit unusual forms of physical and verbal aggression, while other groups witnessed nonaggressive models, or had no exposure to any social cues. In a post-exposure test for imitative learning, children who had observed the aggressive models displayed a large number of precisely matching aggressive responses (Fig. 2), whereas such patterns of behavior rarely occurred in either the nonaggressive-model condition or the control group. Additional evidence of modeling effects is provided by experiments employing similar classes of responses (Bandura, 1965b; Hicks, 1965) as well as considerably more complicated patterns and sequences of behavior (Bandura *et al.*, 1965; Bandura *et al.*, 1963b; D. Ross, 1962). At an even higher level of complexity, it has been shown that children can acquire contingencies for self-reinforcement and self-evaluative responses (Bandura and Kupers, 1964; Bandura and Whalen, 1965), judgmental orientations (Bandura and McDonald, 1963), self-imposed delay-of-reward patterns (Bandura and Mischel, 1965), self-directed aversive behavior (Mischel and Grusec, 1965), linguistic structures (Bierman, 1965), and distinctive phonetic variation in verbal behavior (Hanlon, 1964), as a function of brief exposure to the behavior of models. Moreover, responses acquired observationally may be retained over an extended period of time (i.e., six months) even though there is little or no occasion to perform the novel patterns of behavior during the interval (Hicks, 1965).

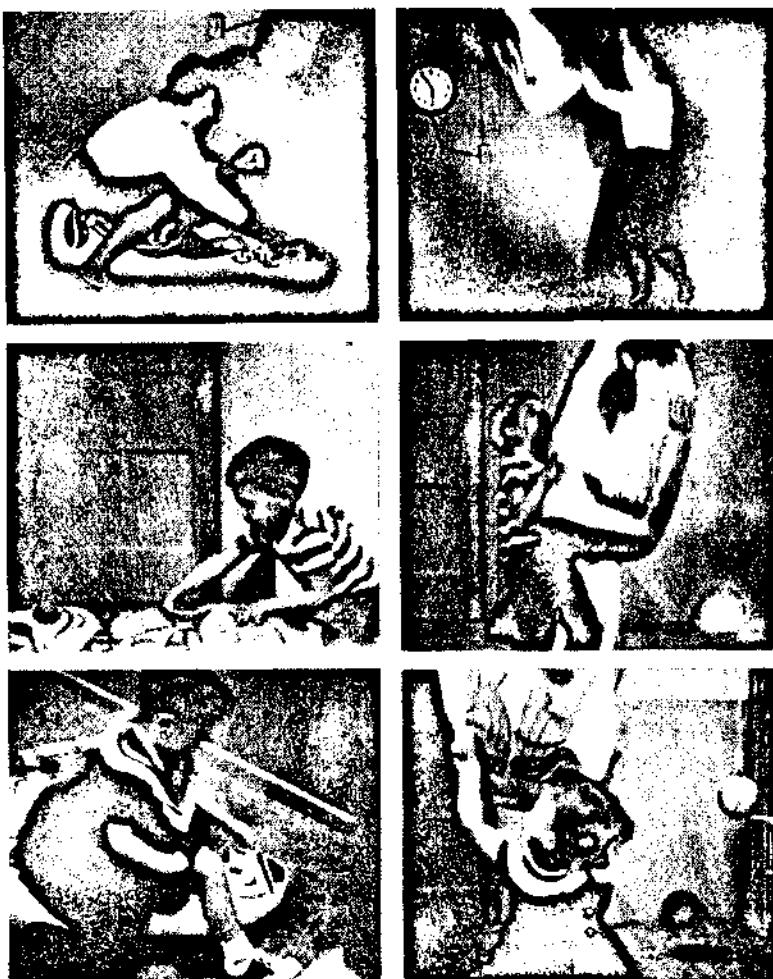
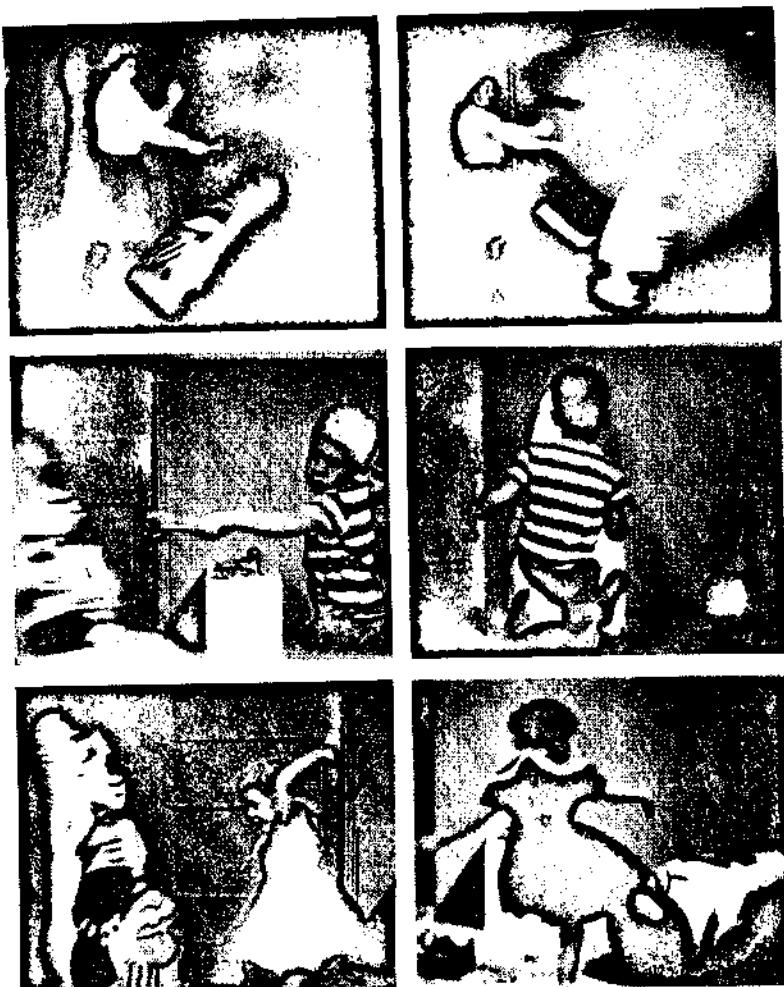


FIG. 2. Photographs of children spontaneously reproducing the behavior exhibited by an aggressive model. (Adapted from Bandura, 1962.)

Considering that the subjects in the experiments cited above had no opportunities to practice the models' responses during the acquisition stage, the process of combining and chaining matching responses must be primarily achieved through central integrative mechanisms.

There have been numerous experiments of observational learning in infrahuman species dating back to the early studies of Thorndike (1898) and Watson (1908). These initial investigations, which were conducted at a time when instinctive interpretations of imitation were in vogue, summarily dismissed the existence of observational learning

FIG. 2. (*Continued*)

on the basis of disappointing results from a few animals tested under weak incentives and conditions that failed to ensure adequate observation of the demonstrator's performance. Subsequent studies conducted under more favorable experimental conditions have generally shown that primates can learn to solve manipulative problems (Hayes and Hayes, 1952a; Warden *et al.*, 1940; Warden and Jackson, 1935), and animals of lower order can acquire discriminations (Bayroff and Lard, 1944; Church, 1957; Miller and Dollard, 1941; Solomon and Coles, 1954) and master relatively complex tasks (Herbert and Harsh, 1944) more rapidly through observa-

tion than the original models achieved by trial and error. Moreover, the results of several experiments (Darby and Riopelle, 1959, Herbert and Harsh, 1944) show that the increments in performance resulting from observation are not attributable to the fact that the model's demonstration may have simply enhanced the relevant aspects of the stimulus situation.

The animal experiments, with few exceptions, have involved relatively simple responses that were reproduced either simultaneously or immediately after demonstration. Although relevant comparative data are lacking, it is highly probable that, unlike humans who are capable of acquiring observationally and retaining large, integrated units of behavior, lower species would display a limited capacity for delayed reproduction of modeling stimuli due to sensory-motor deficiencies. Delayed imitation also requires some capacity for symbolization, since the absent modeling stimuli must be retained in representational form. As might be expected, the most striking evidence of observational response learning in animals comes from naturalistic studies of both immediate and delayed imitation of human responses by primates reared in human families (Hayes and Hayes, 1952a, 1952b; Kellogg and Kellogg, 1933). Field studies of primate social behavior (Imanishi, 1957; Kawamura, 1963) likewise provide dramatic illustrations of the manner in which idiosyncratic patterns of behavior can be acquired and transmitted to other members of the subculture through observation.

The available cross-species data thus suggest that the rate and level of observational learning will be governed by the extent to which subjects possess the requisite *sensory capacities* for accurate receptivity of modeling stimuli, the *motor capabilities* necessary for precise behavioral reproduction, and the *capacity for representational mediation and covert rehearsal* which is crucial for successful acquisition and long-term retention of extended, complex sequences of behavior.

Although the findings from studies with humans lend support to a stimulus contiguity theory of observational learning, the fact that the majority of subjects fail to reproduce the entire repertoire of behavior exhibited by the model indicates that contiguity of sensory stimulation is a necessary but not a sufficient condition for imitative response acquisition.

Exposing a person to a complex sequence of modeling stimuli is no guarantee that he will attend closely to the cues, that he will necessarily select from a total stimulus complex only the most relevant stimuli, or that he will even perceive accurately the cues to which his attention is directed. Motivational conditions, prior training in discriminative observation, and the presence of incentive-oriented sets may be influential in

channeling, augmenting, or reducing observing responses. Indeed, the wide individual differences frequently noted in the classes of matching responses that are acquired and reproduced by viewers are probably attributable to differences in these types of subject variables.

Procedures that alter the affective valence (Grusec and Mischel, 1965) and that enhance the distinctiveness (Sheffield and Maccoby, 1961) of modeling stimuli have also been shown to affect the degree of observational learning.

In addition to attention-directing variables and factors influencing rehearsal processes, stimulus input conditions (i.e., the rate, number, distribution, and complexity of modeling stimuli presented to viewers) will regulate acquisition outcomes to some extent. The observer's capacity to process information sets definite limits on the number of modeling cues that can be acquired during a single exposure. Therefore, if modeling stimuli are presented at a rate or level of complexity that exceeds the viewer's receptive capabilities, imitation will necessarily be limited and fragmentary. Under such conditions repeated presentations of the modeling stimuli would be required in order to produce complete and precise response matching. The acquisition of matching responses through observation of lengthy sequences of behavior, and their retention, are also likely to be governed by traditional principles of associative learning such as frequency and recency, serial organization, and multiple sources of associative interference (McGuire, 1961).

Finally, the availability of necessary component responses in the observer's behavioral repertoire will partly determine the rate and level of observational learning. Responses of higher-order complexity are produced by combinations of previously learned components which may, in themselves, represent relatively intricate compounds. Therefore, a person who lacks some of the necessary behavioral elements will, in all probability, display only partial reproduction of the model's behavior, even though the corresponding representational responses have been established. If, on the other hand, the relevant components are already present in the observer's repertoire, he is likely to perform well integrated matching responses following several demonstrations. It is perhaps for this reason that young children, who have greater motor than verbal development, could reproduce a substantially higher percentage (67%) of imitative motor responses (Bandura, 1965b) than matching verbalizations (20%). A similar pattern of differential imitation was obtained in a previous experiment (Bandura and Huston, 1961) in which preschool children served as subjects.

It is evident from the foregoing discussion that an observer does not function as a passive video-tape recorder that registers indiscriminately

and stores cognitive representations of all modeling stimuli encountered in everyday life. Motivational and other attention-directing variables, associative and rehearsal processes, and numerous other factors facilitate or impede observational learning.

B. INHIBITORY AND DISINHIBITORY EFFECTS

In addition to the transmission of novel responses, exposure to the behavior of others may strengthen or weaken observer's inhibitions of existing behavioral repertoires. The occurrence of *inhibitory effects* is indicated when, as a function of observing aversive response consequences to a model, observers exhibit either decrements in the same class of behavior or a general reduction of responsivity. In the experiment to which reference was made earlier (Bandura, 1965b), for example, children who had observed a model's aggressive behavior severely punished performed significantly fewer matching responses than subjects who observed the same behavior either rewarded or associated with no evident consequences. Indeed, the vicarious punishment produced virtually complete suppression of imitative aggression in girls, whose inhibitions over physical forms of aggression are relatively strong to begin with. The inhibited responses were, however, restored to the level of the model-rewarded and no-consequences treatments when the children were offered, under highly permissive conditions, positive reinforcers contingent upon the performance of matching responses.

The findings of a related experiment (Bandura *et al.*, 1963c) reveal that the effects of punishment administered to a model may be quite selective. Whereas the frequency of emission of matching aggressive responses by observers was significantly reduced as a function of witnessing such responses negatively reinforced, other classes of aggressive behavior were essentially unaffected. It might be supposed that more severe intensities of aversive consequences to the model, and longer durations of exposure to the punishment condition, might result in more generalized suppression of responsivity in observing subjects.

The studies referred to above demonstrate the inhibitory effects of observed, negative consequences to a model on the aggressive behavior of viewers. Walters and his associates (Walters *et al.*, 1963; Walters and Parke, 1964) have likewise shown that witnessing a peer model undergo punishment for engaging in prohibited play activities increased observers' resistance to deviation in a similar temptation situation.

In the foregoing experiments the negative reinforcers were administered to the performing model by an external social agent. A highly important but less well understood reinforcement phenomenon characteristic of humans is evident in situations in which a person imposes a

particular response-reinforcement contingency upon his own behavior, and self-administers reinforcers which are under his own control on occasions when he attains or surpasses the self-prescribed standards of behavior. Results of investigations concerned with self-reinforcing processes provide some evidence (Bandura and Kupers, 1964; Bandura and Whalen, 1965) that discriminative patterns of inhibition of self-rewarding behavior can be acquired without the mediation of direct reinforcement, through observation of achievement-contingent rewards and punishments *self-administered* by a model.

Partial or complete inhibition of social responses, established through previous modeling or aversive conditioning, may also be reduced on the basis of observational experience. Such *disinhibitory effects* are evident when observers display increments in socially disapproved behavior as a function of viewing a model either rewarded or experiencing no adverse consequences for performing the prohibited responses.

The reduction of inhibitions through modeling has been demonstrated most clearly in studies of aggression involving intense physical forms such as kicking, striking with mallets, and other pain-producing responses that are likely to be inhibited in viewers as a result of past social training. In a series of experiments Bandura *et al.*, (1961, 1963a) found that children who had observed adult models behaving in a highly aggressive manner subsequently displayed twice as much nonimitative aggression as subjects who either witnessed inhibited adults or had no exposure to social cues (Fig. 3). Numerous other laboratory investigations (Larder, 1962; Lövaas, 1961; Mussen and Rutherford, 1961; Siegel, 1956), differing considerably in choice of both aggressive stimuli and dependent measures, have consistently shown that observation of models displaying aggressive behavior with no untoward consequences increased the incidence of aggressive responses in viewers. Moreover, Walters and Llewellyn Thomas (1963) have demonstrated that the disinhibitory effect of exposure to aggressive models, as measured in terms of subjects' increased willingness to administer painful electric shocks to another person, occurs among adolescents and adults as well.

I. Vicarious Participation in Aggression and Cathartic Processes

According to the widely accepted catharsis hypothesis, vicarious participation in aggressive activities presumably reduces hostile impulses and thereby decreases the probability of subsequent aggressive behavior. The largely negative experimental findings (Bandura and Walters, 1963b; Berkowitz, 1962), however, have led some writers to propose a revision of the original formulation (Buss, 1961; Feshbach, 1961, 1964). They contend that the cathartic or drive-reducing function of aggressive model-

ing stimuli obtains only under certain, specified conditions. Witnessing the behavior of aggressive models supposedly produces decrements in subsequent aggression when the observer has been aggressively aroused at the time of exposure. If, on the other hand, the aggressive drive has not been activated during the period of vicarious participation, such exposure augments ensuing aggressive responses. The revised catharsis theory thus presupposes that the functional properties of modeling stimuli can be radically altered by transitory emotional states of the observer.

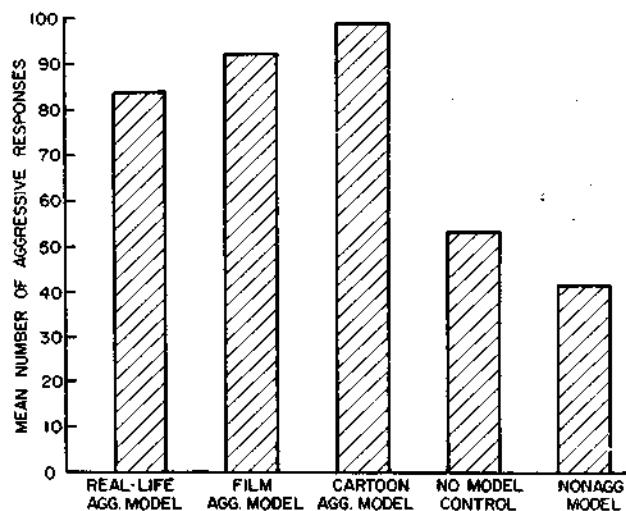


FIG. 3. Mean frequency of aggressive responses performed by control children and by those exposed to aggressive and inhibited models. (Adapted from Bandura, 1963.)

A recent investigation by Hartmann (1965), employing an experimental design in which pre-exposure level of instigation to aggression and types of aggressive cues were both varied, provides data that help to clarify the nature of the relationship between arousal and response to modeled aggression.

An aggressive response sequence generally contains two important stimulus events, i.e., the instrumental aggressive response of the agent, and the pain cues exhibited by the object of the attack. Although a number of investigators have reported changes in subjects' aggressive behavior after viewing film clips depicting fight sequences, no attempt has been made to determine whether the depicted instrumental aggression or the pain cues are primarily responsible for the obtained differences.

It is apparent from the findings of experiments employing inanimate targets such as plastic dolls that observation of instrumental aggression in the absence of pain cues can produce substantial increases in aggressive behavior. The important question, therefore, is whether expressive pain reactions augment or counteract the effects of aggressive displays.

According to the theory of aggression proposed by Sears *et al.* (1957), signs of pain and injury resulting from a child's aggressive behavior occur sufficiently often in conjunction with the removal of his frustrations to have acquired secondary reinforcing properties. Pain cues could, therefore, serve as positive reinforcers to enhance aggressiveness. On the other hand, it would be predicted on the basis of the principle of stimulus generalization that a victim's pain reactions will tend to elicit conditioned emotional responses in the observer and thus lead to aggression inhibition. The problem of determining the functional value of witnessed pain cues is further complicated if conditions of anger arousal affect their reinforcing and anxiety-eliciting properties.

The study conducted by Hartmann objectively assessed the independent and interactive effects of anger instigation, aggressive displays, and pain cues on subsequent interpersonal punitiveness. In the first phase of the experiment, adolescent delinquent boys overheard an anonymous partner (actually a tape-recording) make evaluative statements about their performance on an ego-involving task. The boys in the *aggression-arousal* condition were subjected to a number of unwarranted and disparaging criticisms by the "partner"; in contrast, subjects assigned to the *nonarousal* condition received essentially neutral comments.

Following the experimentally induced arousal the subjects were further subdivided into one of three conditions. In each condition a film was shown which portrayed two adolescent boys shooting baskets on a basketball court. In the *control* film the boys engage in an active but cooperative basketball game, whereas in the other two films the boys get into an argument that develops into a fist fight. The *pain-cues* film focuses almost exclusively on the victim's pain reactions as he is vigorously pummeled and kicked by his opponent. The *instrumental-aggression* film, on the other hand, focuses on the aggressors' responses including angry facial expressions, foot thrusts, flying fists, and aggressive verbalizations.

After exposure to the film sequences the subjects were asked to assist the experimenter in a study ostensibly of the effects of performance feedback on learning rate. The aggression performance task, which was patterned after the device originally designed by Buss (1961), contained a panel with ten shock switches arranged in increasing intensity, and lights that signaled right or wrong responses presumably made by the subject's "partner" in the adjacent room. After the boys sampled several of the

shock intensities to apprise them of the magnitude of aversive stimulation associated with the different switches, the subjects were asked to administer the pain-producing shocks to their partner whenever he made an error on the learning task. They were free, however, to vary the intensity and duration of shock administration. During the series of learning trials, the subjects' panel signaled a number of errors according to a prearranged program controlled by the experimenter, and the length and intensities of shocks inflicted upon the partner were recorded.

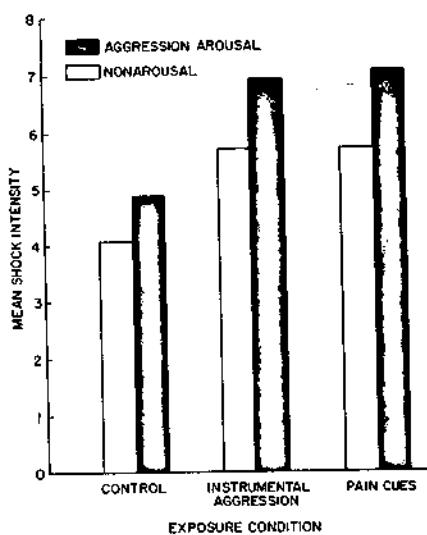


FIG. 4. Mean shock intensities administered by aroused and nonaroused subjects after observing either instrumental aggression, pain cues, or a nonaggressive control film. (Adapted from Hartmann, 1965.)

The results of this experiment, based on several indices of punitiveness, are contrary to the catharsis hypothesis, but entirely consistent with social-learning theory. Subjects who had observed either the aggressive acts or the pain cues selected significantly higher shock levels, both under aroused and nonaroused conditions, than subjects who watched the control film (Fig. 4). Moreover, angered viewers behaved more aggressively than nonangered observers following exposure to the aggressive film sequences, a finding that is directly counter to prediction from a catharsis hypothesis. Prior arousal also produced an increase in aggression in control subjects, but not of statistically significant magnitude. The latter finding provides additional suggestive evidence for the influential role of the aggressive

stimulus value of the target person and modeling cues in determining aggressive modes of response to emotional arousal (Bandura and Walters, 1963a; Berkowitz, 1964; Schachter and Singer, 1962).

In the present experiment, the initially offensive behavior of the "partner" was not only anger-provoking, but also served to increase his aggressive cue value. According to a recent theory proposed by Berkowitz (1964), the effects of pictorially modeled aggression are a joint function of the observer's level of internal arousal and the target person's cue properties which are treated as eliciting stimuli analogous to the ethological concept of "releaser." Under low arousal a powerful releaser is presumed to be necessary to elicit aggressive responses, whereas a relatively weak external stimulus will suffice under high instigation to aggression. The importance of external stimuli in governing the effects of exposure to film-mediated models is clearly demonstrated in a series of experiments by Berkowitz (Berkowitz, 1965; Berkowitz and Geen, 1965; Geen and Berkowitz, 1965) in which the aggressive cue value of the target person was varied by assigning him either an aggressive vocational label (e.g., boxer, speech major) or the first name of the aggressive film model. The findings reveal that witnessing assaultive behavior significantly increased viewers' aggressiveness only when they were aroused and provided a target possessing cue properties. The fact, however, that modeling augmented the intensity of punitive behavior in Hartmann's study in nonaroused subjects toward a considerate target suggests that the generality of Berkowitz's findings may be primarily confined to highly socialized college samples.

Although subjects in the instrumental-aggression and pain-cues conditions administered virtually identical intensities of pain-producing responses, the latter two groups displayed differential patterns of punitive behavior based on the shock-level \times duration index (Fig. 5).

Aroused subjects in the instrumental-aggression and the control groups did not differ from their nonangered counterparts in overall level of aggressiveness. On the other hand, nonaroused subjects who had observed the suffering victim subsequently exhibited a relatively low degree of pain-producing behavior, and did not differ significantly in this respect from the controls. In marked contrast, angered viewers became extremely punitive as a function of witnessing another person beaten severely.

In a study of cathartic effects through vicarious experience, Feshbach (1961) found that adults who had been initially subjected to critical remarks and then had viewed a prize fight sequence, produced fewer aggressive responses to a word association test and questionnaire than insulted subjects who had watched a film depicting the consequences of the spread of rumors. No significant differences were obtained, however, between groups of subjects exposed to the aggressive film or to the rumor movie

under nonaroused conditions. While these findings are frequently cited as evidence for the cathartic reduction of aggression, alternative interpretations should be considered, particularly in view of the fact that some of the findings are inconsistent with both the catharsis hypothesis and the results of numerous investigations published in recent years.

Considering that exposure to aggressive stimuli has generally been shown to increase aggressive behavior in young children (Bandura *et al.*, 1961, 1963a; Larder, 1962; Lövaas, 1961; Mussen and Rutherford, 1961),

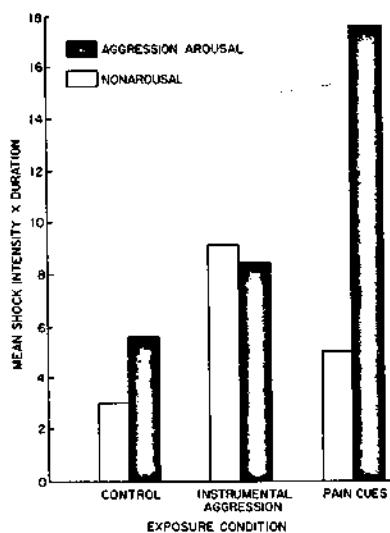


FIG. 5. Mean pain-producing responses (shock level \times duration) displayed by aroused and nonaroused subjects after observing either instrumental aggression, pain cues, or a nonaggressive control film. (Adapted from Hartmann, 1965.)

adolescents (Hartmann, 1965; Walters and Llewellyn Thomas, 1963), and adults (Walters and Llewellyn Thomas, 1963), the failure to obtain an enhancement effect of an aggressive film under *nonaroused* conditions in Feshbach's experiments suggests that either the dependent measure has serious limitations, or the content of the control film did not provide a sufficiently neutral stimulus. The interpretation of the difference obtained between subjects in the *aroused* condition is similarly complicated by the fact that the control movie, which was concerned with the negative effects of rumors, may have been somewhat anger-provoking to the viewers.

The experiments cited above have, almost without exception, employed measures of overt physical aggression. In contrast, verbal responses

to questionnaires or word association tests, and measures obtained from ratings of attitudes toward psychological experiments and toward the experimenter, are not only somewhat ambiguous indices of aggressive behavior, but also subject to social desirability response sets which may seriously affect results (Bandura and Walters, 1963b).

It is also by no means clear whether decrements in aggression, when they occur under certain circumstances as a function of witnessing physical violence, reflect a genuine drive-reduction process, the effects of an inhibitory process generated by displays of violence and its injurious consequences, or some other mechanism (Berkowitz, 1962; Berkowitz and Rawlings, 1963). A study of vicarious reduction of hostility by Rosenbaum and deCharms (1960), for example, demonstrated that insulted subjects who heard a third person reply to the original aggressor later evaluated the aggressor less negatively. This outcome, however, is certainly not attributable to a reduction of hostility, since, as the authors point out, the replies rarely contained any aggressive verbalizations.

The growing body of research provides considerable evidence that vicarious participation in aggressive activities can be highly effective in modifying observers' aggressive behavior, but not in the direction predicted by the catharsis hypothesis. These findings are perhaps not too surprising. It is highly improbable that even advocates of vicarious drive reduction would recommend community programs in which sexually aroused adolescents are shown libidinous movies at drive-in theatres as a means of reducing sexual behavior; famished persons are presented displays of gourmands dining on culinary treats in order to alleviate hunger pangs; and assaultive gangs are regularly shown films of assailants flogging their antagonists in an attempt to diminish aggressive behavior. Such procedures would undoubtedly have strong instigative rather than reductive consequences.

The persistence of the belief in cathartic energy discharges through vicarious participation despite substantial, negative experimental findings, is probably supported by frequent subjectively experienced "tension" reduction following exposure to aggressive content provided in films, televised programs, and other audiovisual displays. There is no disputing the fact that a person who is in a state of heightened emotionality resulting from stressful and frustrating everyday events is apt to undergo some reduction in general arousal level as a function of observing aggressive performances. While such an outcome is generally interpreted as evidence of vicarious reduction in "pent-up" affects and impulses, a more plausible alternative explanation is in terms of stimulus-change processes.

After a person has been insulted, unjustly criticized, or otherwise thwarted, the resultant emotional arousal is typically revivified and even

augmented on later occasions through symbolic reinstatement of the anger-provoking incidents. Thus, by brooding over the ill treatment and possible negative consequences of disturbing episodes, intense feelings can be reinstated long after the initial reactions to the situation have subsided. The persistence of elevated arousal, according to this social-learning view, is attributable to self-generated stimulation rather than to the existence of an undischarged reservoir of "aggressive drive." If the person should become immersed in new activities that supersede the preoccupying, internal eliciting stimuli, a noticeable degree of "tension" reduction will, in all likelihood, take place. On the supposition that the diminution of emotional arousal is a consequence of *attentional shifts* rather than a cathartic effect of having experienced aggression vicariously, one would expect aroused subjects to experience equally salutary effects from getting involved in an absorbing book, a movie, a stage play, or a televised program containing few, if any, aggressive stimuli. In order to test predictions derived from the *stimulus-change* and the *energy-discharge* conceptualizations of emotional "cathartic" effects, a study is planned in which decrements in physiological arousal will be compared in angered subjects who are exposed to movies either depicting aggression, with equally absorbing but nonaggressive content, or are presented no pictorial stimuli. The results of this experiment should throw some light on the influence of aggressive stimulus events and attentional shifts to nonaggressive competing stimuli in reducing viewers' pre-existing levels of emotional arousal.

2. *Modification of Resistance to Deviation Through Modeling*

The preceding discussion has been specifically concerned with changes in the incidence of aggressive responses resulting from observation of the behavior of aggressive models and its response consequences. Inhibitory and disinhibitory effects, however, are not confined to aggression. The frequency of other socially disapproved classes of behavior has likewise been experimentally modified through witnessing models violating prohibitions.

Studies by Grosser *et al.* (1951) and by S. A. Ross (1962), for example, have demonstrated that exposure to transgressors increases the probability that the observer will likewise deviate. On the other hand, conforming models tend to strengthen the observer's self-controlling responses, and thereby reduce conflictive behavior in temptation situations (Ross, 1962). Blake and his associates (Blake, 1958) have conducted investigations of some of the conditions determining the influence of noncompliant and conforming models on observers' inhibitions in prohibition situations. In one study, Freed *et al.* (1955) found that, although exposure to a non-

compliant model lowered students' resistance to deviation, transgressions occurred most frequently if the restriction was weak and the model violated the prohibitory signs, whereas the combination of a strong restriction and a conforming model produced the lowest incidence of deviation. A second experiment (Kimbrell and Blake, 1958) demonstrated that the efficacy of modeling cues for modifying inhibitions varies with the observer's level of instigation to transgression. That is, under extreme provocation, subjects disregarded both the imposed restriction and the conforming model. However, under conditions where the instigation was not so strong as to force deviation, students who observed a conforming model displayed more compliant behavior than subjects who witnessed a model violate the prohibition.

In the studies referred to above, the probability of deviation was significantly altered simply as a result of witnessing the model's behavior. Inhibitory and disinhibitory effects can be greatly influenced by observation of rewarding and punishing consequences associated with deviant responses. For example, in experiments cited earlier (Walters *et al.*, 1963; Walters and Parke, 1964) children who observed a peer model either being rewarded or experiencing no evident consequences for performing a prohibited act were more likely to deviate than children who witnessed the model being punished for engaging in the same behavior.

In naturalistic situations the observer often actually witnesses the rewards or punishments immediately following the model's transgressions. At other times, however, he can only infer probable consequences from discriminative symbols and attributes of the model that tend to be correlated with differential reinforcements. The manner in which distinctive modeling cues signifying likely reinforcing outcomes may increase a model's effectiveness in reducing inhibitions is illustrated in an experiment conducted by Lefkowitz *et al.* (1955). Traffic signal violations by a high-status person attired in a freshly pressed suit, shined shoes, white shirt and tie produced a higher pedestrian violation rate than the same transgression performed by the same model dressed in soiled, patched trousers, scuffed shoes, and a blue denim shirt. The differential reduction in restraints noted in the latter experiment is probably attributable to the fact that transgressions by persons who occupy a high position in a prestige hierarchy are likely to be punished less frequently and less severely than those performed by low-status transgressors. The differential leniency is apt to apply to the imitator as well, provided that the matching behavior is performed in the presence of the deviating model.

Other discriminative properties of the model, such as age, sex, socio-economic status, social power, ethnic background, and intellectual and vocational status, which are associated with predictable contingencies of

reinforcement, may likewise influence the extent to which prohibited acts will be imitated.

3. Conceptualization of "Vicarious Reinforcement"

A number of the studies discussed in preceding sections provide evidence of vicarious reinforcement effects, as shown by the fact that the behavior of observers is modified as a function of witnessing reinforcing stimuli administered to performers. Indeed, systematic investigations of the relative efficacy of vicarious and direct reinforcement reveal that the changes exhibited by observers are of the same magnitude (Kanfer and Marston, 1963) or, under certain conditions, may even exceed those achieved by reinforced performers (Berger, 1961). Moreover, vicarious reinforcement processes are governed by variables such as the percentage (Kanfer, 1965; Marston and Kanfer, 1963), intermittency (Rosenbaum and Bruning, 1961), and magnitude (Bruning, 1965) of reinforcement in essentially the same manner as when they are applied directly to a performing subject.

While the efficacy of vicarious reinforcement procedures is well established, the response changes exhibited by observers may be interpreted in several ways. One possible explanation is in terms of the discriminative function of reinforcing stimuli presented to the model. Response consequences experienced by another person undoubtedly convey information to the observer about the probable reinforcement contingencies associated with particular performances in similar situations. Knowledge concerning the types of responses that are likely to meet with approval or disapproval can later serve as discriminative stimuli in facilitating and inhibiting overt behavior. The information gained from witnessed consequent events may be particularly influential in regulating behavior under conditions where there is considerable ambiguity as to what constitutes permissible or punishable actions.

In most investigations of vicarious reinforcement the model merely performs a prearranged sequence of responses in the absence of any discriminative environmental cues. In many situations, however, the model responds differentially to certain salient or ambiguous cues within a total stimulus complex. Under these circumstances, observation of the pattern of reinforcement associated with the model's responses helps to direct the observer's attention to the critical environmental stimuli which would be difficult to distinguish without the observed informative feedback. The observer's responses may thus become conditioned not only to the model's responses, but also to the relevant environmental stimuli. The resultant discrimination learning can later facilitate the performance of matching

responses by the observer in the presence of cues to which the model previously had been responding (Church, 1957; McDavid, 1962).

Observation of reinforcing stimuli presented to a model and his concomitant affective reactions may also have important motivational effects on the observer. The mere sight of highly valenced reinforcers can produce anticipatory arousal which, in turn, will affect the level of imitative performance. Thus, for example, witnessing a performer rewarded with a succulent beefsteak for executing a given sequence of responses will convey the same amount of information about the probable reinforcement contingencies to a famished and to a sated observer, but their subsequent imitative performances will, in all likelihood, differ radically because of the differential effects of deprivation state on the activating power of the anticipated incentive. Similarly, variations in the magnitude of observed reinforcers, while providing equivalent information about the permissibility of matching responses, have different motivational effects on observers (Bruning, 1965). As in the case of direct reinforcement, incentive-produced motivation in observers is most likely to affect the speed, intensity, and persistence with which matching responses are executed.

A vicarious reinforcement event not only provides (1) information concerning probable reinforcement contingencies, (2) knowledge about the controlling environmental stimuli, and (3) displays of incentives possessing activating properties, but it also includes affective expressions of the rewarded or punished performer. As will be shown later, the pleasure and pain cues emitted by a model generally elicit corresponding affective responses in the viewer. These vicariously aroused emotional responses can readily become conditioned, through repeated contiguous association, either to the modeled responses themselves, or to environmental stimuli (Bandura and Rosenthal, 1965; Berger, 1962) that are regularly correlated with the performer's affective reactions. As a consequence, the subsequent initiation of matching responses by the observer or the occurrence of the correlated environmental stimuli is likely to generate some degree of emotional reactivity. It is therefore possible that the facilitative or suppressive effects of observing the affective consequences accruing to a performer are partly mediated by the arousal of vicariously acquired emotional responses.

In similar manner, witnessing the nonoccurrence of anticipated aversive consequences to a model can extinguish in the observer previously established conditioned emotional responses (Bandura and Rosenthal, 1965). It is informative to note in this connection that, when socially disapproved behavior exhibited by a model is followed by neither reward nor punishment, the incidence of matching deviant behavior is comparable

to that produced by observation of rewarding consequences (Bandura, 1965b; Walters and Parke, 1964). These data suggest that nonreaction to formerly prohibited activities takes on, through contrast, positive qualities. Similar contrast-of-reinforcement effects have been demonstrated in studies of direct reinforcement (Buchwald, 1959a,b; Crandall, 1963; Crandall *et al.*, 1964) in which nonreward following punishment had functioned analogously to a positive reinforcer, whereas the occurrence of nonreward subsequent to a series of rewards had functioned as a negative reinforcer. In fact, even a weak, positive reinforcer, when contrasted with more rewarding prior events, may acquire negative reinforcing value (Buchwald, 1960).

The incremental changes produced in observers by the omission of anticipated punishment of the model may, of course, be attributed to several factors that are difficult to separate. In addition to weakening inhibitions through vicarious extinction, nonreactions also have informative value concerning the permissibility of the modeled responses.

C. RESPONSE FACILITATING EFFECTS

The behavior of models often serves merely as discriminative stimuli for the observer in facilitating the occurrence of previously learned responses in the same general class. Response facilitating effects are distinguished from disinhibition and modeling by the fact that, in the former case, no new responses are acquired, and disinhibitory processes are not involved since the exhibited responses have rarely, if ever, incurred punishment. A familiar example of this type of outcome is provided in situations where a person gazes intently skyward and most passers-by respond in a similar manner.

In laboratory experiments with humans, a wide variety of socially approved behaviors, such as volunteering services or monetary contributions (Blake *et al.*, 1955; Rosenbaum, 1956; Rosenbaum and Blake, 1955; Schachter and Hall, 1952), pledging oneself to a course of action (Blake *et al.*, 1956; Helson *et al.*, 1956), and preferences for certain types of foods (Duncker, 1938) and pictorial items (Gelfand, 1962), have been readily induced by the presentation of actual or symbolic modeling stimuli. Some of the most influential theoretical formulations of imitative processes (Miller and Dollard, 1941; Skinner, 1953) have, in fact, been almost exclusively concerned with the discriminative function of social cues. In the prototypic experiment the model's responses serve as the occasion upon which another organism is likely to be reinforced for displaying the corresponding patterns of behavior. After a period of exposure to differential reinforcement, imitative tendencies become strongly established; conversely, by reversing the social contingencies so

that matching responses are never reinforced but nonmatching behavior is consistently rewarded, imitativeness is reduced to a very low or zero level (Miller and Dollard, 1941).

Ethologists provide extensive documentation of the response facilitating function of social cues in birds, fish, and mammals (Hall, 1963; Thorpe, 1956). Typically, the sight of certain responses performed by an animal elicits a similar or identical pattern of behavior in other members of the same species. This process is generally referred to as "social facilitation" or "behavioral contagion" when it is presumably determined by prior discriminative reinforcements, and "mimesis" when corresponding unconditioned response patterns are supposedly instinctively aroused.

As Hinde (1953) points out, the occurrence of matching behavior in animals is often erroneously attributed to mimetic processes. In the first place, what appears to be mimetic behavior may, in fact, involve response patterns that have been established through prior social learning. Even in cases where matching behavior is clearly instinctive, it is frequently difficult to determine whether social cues constitute the critical eliciting stimuli. Readily discriminable "sign stimuli" (Tinbergen, 1951) or "releasers" (Thorpe, 1956) in the form of color displays, preparatory movement sequences, postural cues, and specific vocalizations frequently serve as unconditional stimuli for complete patterns of instinctive behavior in other members of the species. Therefore, when appropriate releasing stimuli are displayed by a model during the performance of a given activity, the corresponding responses on the part of observing animals may be primarily controlled by releasing stimuli, rather than the model's behavioral cues. Thus, for example, the white tail feathers of a bird flying upward can function as flight-eliciting stimuli for other members of a flock (Armstrong, 1942). A suitably feathered but non-flying artificial model might likewise succeed in getting a flock of birds airborne.

Pseudo-mimesis is also evident in instances where the model's behavior directs the observer's attention to environmental stimuli which, in turn, elicit similar innate response patterns. Satiated chickens, for example, will begin to eat at the sight of other birds feeding (Katz and Révész, 1921). It is entirely possible that in such cases modeling cues primarily serve an *orienting function*, whereas the consummatory responses of the sociable chicks are reinstated and maintained by the grain to which their attention has been redirected. The fact that the stimulus complex to which observing animals are responding frequently contains, in addition to social cues, releasing stimuli and other controlling environmental events complicates the identification and analysis of genuine mimetic phenomena.

The behavior of a model may not only function as a discriminative stimulus for a similar response, but it also serves to direct the observer's

attention to the particular stimulus objects manipulated by the performer (Crawford and Spence, 1939). As a consequence, the observer may subsequently utilize the same objects to a greater extent, though not necessarily in an imitative way. In one modeling experiment, for example, the model pummelled a plastic doll with a mallet. Children who had observed this aggressive act later displayed significantly more behavior in which they pounded a peg board with the mallet than both control subjects and those who had viewed a nonaggressive model (Bandura, 1962). *Stimulus enhancement effects* are distinguished from social facilitation in that the observer's behavior in the former case may bear little or no resemblance to the model's activities.

III. Vicarious Classical Conditioning

The investigations reviewed in the preceding sections have been essentially confined to the social transmission of instrumental classes of responses as a function of exposure to real-life or symbolic models. Vicarious classical or respondent conditioning, on the other hand, has received surprisingly little experimental attention, despite ample evidence from informal observation that emotional responses are frequently acquired through observation of the pain and fear reactions exhibited by other persons exposed to aversive stimuli. Indeed, most persons exhibiting snake phobias have never had any direct aversive experiences with reptiles, and similarly, children often acquire, on the basis of exposure to modeled stimulus correlations, intense emotional attitudes toward members of unpopular minority groups or nationalities with whom they have little or no personal contact. Positive incentive learning may likewise occur on a vicarious basis by observing others experiencing positive reinforcement in contiguous association with discriminative stimuli.

A. VICARIOUS EMOTIONAL AROUSAL

One of the earliest studies of vicarious affective arousal was reported by Dysinger and Ruckmick (1933), who measured the autonomic responses of children and adults to movie scenes depicting dangerous situations and romantic-erotic displays. A more recent demonstration of vicarious emotional instigation through filmed stimulation is provided in a series of experiments by Lazarus and his associates (1962). Continuous recordings of subjects' autonomic responses were obtained while they viewed a film portraying a primitive ritual of an Australian tribe in which a pubertal native boy underwent a crude genital operation. The college students displayed heightened autonomic responsiveness while witnessing the genital subincision scenes, the reactions being particularly marked when the operation was accompanied by sobs and other pain

cues on the part of the young initiate. Both the deletion of the vocal pain cues and the provision of sound-track commentaries that minimized the aversiveness of the depicted operation significantly reduced the subjects' level of emotional arousal, whereas commentaries highlighting the suffering and hazards of such operations enhanced observers' physiological arousal (Speisman *et al.*, 1964).

In an erudite analysis of vicarious processes, Berger (1962) restricts the phenomenon of vicarious instigation to situations in which an observer responds emotionally to a performer's presumed affective experiences. Since the emotional state of another person is not directly observable, its presence, quality, and intensity are typically inferred from stimuli impinging upon the performer and behavioral cues indicative of emotional arousal. As Berger points out, a person may be vicariously instigated on the basis of erroneous inferences primarily from stimulus events, as in the case of a mother who responds fearfully at seeing her child fall even though the child is, in fact, unhurt and undisturbed. Similarly, a bystander may react apprehensively to hearing a sudden, loud scream although, unknown to him, the distressing vocalizations are simulated as part of a game.

Berger has reasoned that a loud scream which elicits a fear response from the observer may represent a case of pseudovicarious instigation, since the vocal cue may serve merely as a conditioned fear stimulus independent of the performer's unconditioned emotional response or stimulus situation. The basis for this distinction is debatable, since expressive cues are the observable indicants of a performer's assumed emotional state and, as will be shown later, it is precisely because such social cues have acquired emotion-provoking properties that an observer can be at all vicariously aroused by the experiences of another person. There are, however, instances in which covariations in the emotional responses of observers and performers do not necessarily involve vicarious-instigation processes. Once a given environmental stimulus has acquired strong eliciting potency for an observer, his emotional responses are likely to be evoked directly by the nonsocial conditioned stimulus, regardless of the behavior of others. Thus, for example, individuals will experience fear upon hearing the sound of a fire alarm in the building in which they are working, although, due to common conditioning histories, each person may be responding similarly, but independently, to the same non-social cues. Under these circumstances it is exceedingly difficult to establish precisely the stimulus sources of the observer's emotional state since the behavior of others, depending on its character, undoubtedly augments or reduces the effects of environmental eliciting stimuli. The most convincing demonstration of vicarious instigation is, therefore, provided under condi-

tions where the observer's emotional responses are elicited entirely by the performer's affective expressions, because the latter's evocative stimuli either are unobservable to, or of neutral valence for, the observing subject.

Social cues signifying affective arousal can acquire emotion-provoking properties through essentially the same process of classical conditioning that is involved in the establishment of positive or negative valences to nonsocial environmental stimuli. That is, if affective responses of others have been repeatedly followed by emotional experiences on the part of observers themselves, the affective social cues alone gradually acquire the power to instigate emotional reactions in observers. The clearest demonstrations of vicarious arousal are furnished by laboratory studies with infrahuman subjects in which the requisite social and temporal contingencies are instituted.

In testing the conditioning interpretation of the development of "sympathetic" responses, for example, Church (1959) either subjected groups of rats to paired aversive consequences, unpaired consequences, or assigned them to a control condition in which no aversive stimuli were presented. In the paired-consequences condition, animals were administered brief shocks after another rat had been shocked for thirty seconds, with the aversive stimulation to both animals being terminated simultaneously. Animals in the unpaired-consequences condition received the same number of brief shocks, but these were not temporally associated with painful stimulation to another rat. Following the emotional conditioning phase of the experiment, decrements in the animals' rate of bar-pressing for food, which served as the index of vicarious fear arousal, were measured in response to the pain reactions of another rat that was continuously shocked in an adjacent cage. Animals that had previously experienced paired consequences were markedly affected by the pain responses of another rat, the control group showed little empathetic responsiveness, and animals whose past aversive experiences were unassociated with the pain responses of another member of their species showed an effect intermediate between the two groups.

The manner in which vicariously instigated emotions may motivate avoidance responses is illustrated in experiments by R. E. Miller *et al.* (1962, 1963) employing a cooperative, avoidance-conditioning procedure. Rhesus monkeys were first trained to avoid an electric shock by pressing a bar whenever a stimulus light appeared. Following the avoidance training, the animals were seated in different rooms, with the bar removed from the chair of one monkey and the stimulus light from the other. Thus, the animal having access to the conditioned stimulus had to communicate by means of affective cues to his partner, equipped with the response bar, who could then perform the appropriate instrumental response that

would enable both animals to avoid aversive stimulation. Distress cues exhibited by the stimulus monkeys in anticipation of shock were highly effective in eliciting fear in their observing companions as reflected in rapid performance of discriminated avoidance responses. Moreover, mere exposure to a monkey reacting in an apprehensive or fearful manner could reinstate avoidance responses in the observer after they had been extinguished to a zero level (R. E. Miller *et al.* 1959).

B. VICARIOUS CLASSICAL CONDITIONING

The foregoing studies identify the contingencies under which emotional responses of a model, as conveyed through auditory cues, facial expressions, and postural manifestations, acquire the capacity to arouse empathetic emotional responses in observers. In the case of vicarious classical conditioning, the observers' vicariously elicited emotional responses become conditioned, through contiguous association, to formerly neutral stimuli. One of the earliest laboratory investigations of this process was reported by Kriazhev (1934), who conditioned one animal in each of seven pairs of dogs to stimuli presented in conjunction with food or electric shock, while the other member of the pair merely witnessed the procedure. The observing dogs rapidly developed salivary responses to the signal for food, and conditioned agitation and respiratory changes to that for shock. However, this brief report does not contain sufficient information on the details of the experimental procedure to determine whether the observers' reactions to the conditioned stimulus were tested in the absence of the models.

In laboratory investigations of vicarious classical conditioning in humans (Barnett and Benedetti, 1960; Berger, 1962) one person, the performer or model, typically undergoes an aversive conditioning procedure in which a formerly neutral stimulus is presented, and shortly thereafter the model displays pain cues and other emotional reactions supposedly in response to an unconditioned aversive stimulus. If an observer witnesses the model undergoing this conditioning procedure, the observer will also begin to exhibit emotional responses to the conditioned stimulus alone, even though he has not himself experienced the aversive stimulation directly.

Berger (1962) has recently conducted a series of studies in each of which one group of observers was informed that the performing model would receive a shock whenever a light dimmed, the dimming of the light being in each trial preceded by a buzzer. A second group of observers was instructed that the performer would make a voluntary arm movement whenever the light dimmed but that the performer was receiving no aversive stimulation. In two other conditions the model was supposedly shocked

but refrained from making arm movements, or the model was neither shocked nor exhibited arm withdrawal responses. The measure of vicarious conditioning was the frequency of observers' galvanic skin responses to the buzzer, which served as the conditioned stimulus. Observers who were informed that the model was receiving aversive stimulation and who witnessed the model make avoidance responses displayed a greater degree of vicarious conditioning than observers in the other three groups. Had the models exhibited additional nonverbal and vocal pain cues characteristically associated with actual aversive stimulation, the vicarious conditioning effects would probably have been even more marked.

Although the phenomenon of vicarious conditioning has been clearly demonstrated, wide interindividual variability has been noted in the acquisition rate and stability of vicariously acquired conditioned responses. Since this process requires the observer to experience vicariously another person's pain responses, thereby producing emotional arousal in the observer, variables that influence an observer's general level of emotional arousal are likely to enhance or retard vicarious learning.

There are numerous investigations of *direct* aversive classical conditioning as a function of subjects' arousal level in which arousal is either manipulated by varying the intensity of unconditioned and stressor stimuli, or assessed in terms of personality measures of emotional proneness. These studies have shown that conditioned responses are developed more rapidly and, once acquired, extinguish less readily under conditions of high, as compared to low, arousal (Doerfler and Kramer, 1959; Spence, 1958, 1964). From these findings it might be expected that *vicarious* conditioning would likewise be positively related to degree of psychologically induced arousal.

A considerable body of recent experimentation exploring the interserver, variables that influence an observer's general level of emotional state (Schachter, 1964; Schachter and Singer, 1962; Schachter and Wheeler, 1962) indicates that administration of epinephrine, a sympathetic stimulant, may enhance observers' susceptibility to modeling influences. In particular, when given epinephrine without accurate information of its side-effects, subjects displayed much greater matching of models' aggressive, euphoric, and jocular behavior than subjects who were exposed to these models without prior psychological arousal, or who were given a sympathetic depressant.

Findings from studies concerning the effects of autonomic arousal on fearful and avoidant behavior, although not employing modeling procedures, nevertheless have implications for the vicarious instigation and acquisition of affective responses. Singer (1963), for example, found that rats injected with epinephrine displayed considerably more fear in response

to aversive stimuli than placebo- or chlorpromazine-injected animals. However, available evidence (Latané and Schachter, 1962) indicates that acquisition of emotional responses through *direct* aversive conditioning is significantly influenced by the dose level of adrenalin employed: Small doses of adrenalin generally facilitate avoidance conditioning, whereas large doses have negligible effects on avoidance responses, suggesting a non-monotonic relationship between autonomic arousal and conditioned emotional responses.

In order to determine the effects of varying degrees of arousal, manipulated both psychologically and physiologically, on vicarious conditioning processes, an experiment was conducted (Bandura and Rosenthal, 1965) that proceeded in the following manner. College students participated in a vicarious aversive conditioning paradigm in which a model emitted pain cues in conjunction with an auditory stimulus, and the observers' acquisition and extinction of galvanic skin responses to the conditioned stimulus were studied.

The following treatment conditions were included in the experiment:

1. *No injection nonthreat condition.* These observers were subjected to no direct experience of an emotion-provoking sort, and consequently provide an index of vicarious conditioning under relatively low arousal.
2. *Placebo injection.* Subjects in this condition received a placebo hypodermic without any knowledge of its contents which, for most subjects, constituted a moderately anxiety-arousing experience.
3. *Placebo injection plus threat of aversive stimulation.* This group of observers, which also received the placebo injection, was informed that following the conditioning of the model, they too would undergo the painful shock stimulation. The threat of impending shock was designed to induce an additional increment of emotional arousal.
4. *Epinephrine-induced arousal: small dose.* Observers assigned to this group received a dose of epinephrine sufficient to produce a noticeable physiological effect.
5. *Epinephrine-induced arousal: large dose.* The dosage level employed in this condition was capable of producing sizeable sympathetic arousal.

The two sets of experimental manipulations thus provided three degrees of psychologically induced emotional arousal (i.e., nonthreat, placebo injection, placebo injection plus shock threat) and three points on a physiological arousal continuum (epinephrine dosage of .2 cc and .5 cc, with the placebo injection condition serving as a 0 dosage group).

Immediately after the arousal manipulations the subjects observed the model, a confederate of the experimenter, perform on a pursuit rotor apparatus which served as the cover task for presenting the CS-UCS pairings to the model. At periodic intervals a buzzer, which served as the CS, was sounded, and shortly thereafter the model suddenly flexed

his arm, dropped the stylus, and winced, creating the impression that painful shock had been delivered. Six CS-alone trials were interspersed among the ten vicarious acquisition trials as tests of the degree to which the CS was accruing conditioned aversive properties. During the test trials the buzzer was sounded, but the model exhibited no response whatsoever. At the completion of the acquisition-test series all subjects were given ten extinction trials in which the CS was presented alone.

Figure 6 shows the percentage of the total number of conditioning trials in which subjects from the various groups exhibited GSR responses.

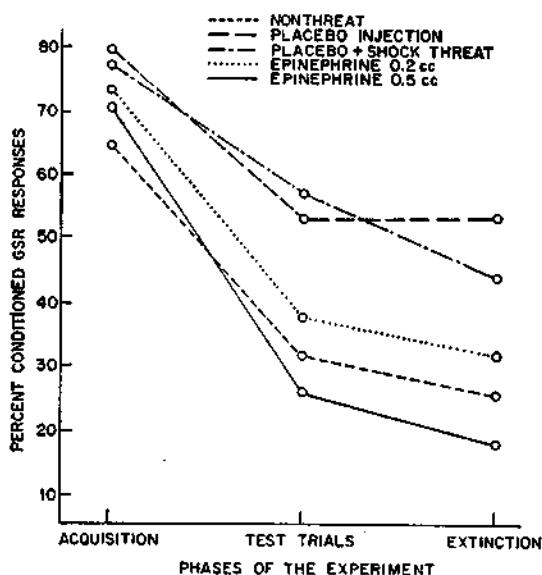


FIG. 6. Mean % conditioned GSR responses exhibited by subjects on each of three test periods for each of five treatment conditions representing differential levels of arousal. (Adapted from Bandura and Rosenthal, 1965.)

Subjects in all groups displayed a high frequency of GSR responsivity to the stimulus complex containing both the CS and the model's pain cues during the acquisition trials, and did not differ significantly in this respect. As can be seen from the test-trial scores in Fig. 6, however, the auditory stimulus itself had acquired differential aversive properties among groups of observers subjected to varying degrees of arousal. The differential vicarious conditioning revealed in the test trials is even more pronounced in the extinction phase of the experiment. Observers in both the placebo and the shock-threat groups continue to exhibit a significantly

higher level of conditioned responses than either the low-aroused nonthreat group or the high-aroused epinephrine large-dose group.

The overall findings clearly reveal that observers' emotional arousal is a significant determinant of vicarious conditioning. This is demonstrated by the fact that the frequency of conditioned responses is a positive function of the degree of psychological stress. However, a monotonic decreasing function is obtained when, in addition to situational stress, subjects experience increasing physiologically induced arousal.

If it can be assumed that the five treatment conditions represent incremental levels of affective arousal on a single dimension, then the combined results suggest an inverted-U relationship between magnitude of arousal and vicarious conditioning. There are two sets of data that lend some support to this interpretation. First, subjects in the shock-threat group achieved the highest level of vicarious conditioning, but the placebo condition emerged superior in the extinction phase of the experiment. This reversal is probably due to the fact that the threat of impending shock stimulation produced a further heightening of emotional arousal in shock-threat observers as they entered the extinction series of trials. Second, within-treatments correlational analyses between a measure of emotional proneness and the vicarious conditioning and extinction scores furnished results that are indicative of a nonmonotonic relationship (Bandura and Rosenthal, 1965).

The failure of low-aroused subjects to exhibit much vicarious conditioning is readily explainable in terms of an activation hypothesis, but the equally poor conditioning in subjects administered the large dose of epinephrine may suggest alternative interpretations. One possible explanation is that epinephrine in the high dosage range has an inhibitory effect on the GSR response itself. This interpretation, however, cannot account for the differential conditioning rates, since no significant differences were obtained among groups in both the total number of trials to adaptation, and the frequency of GSR responsivity during acquisition, when the stimulus complex contained both the CS and the model's pain cues. Moreover, the fact that test trials were interspersed with acquisition trials, and the entire conditioning series was completed in a relatively brief period of time, rules out the possibility of any significant temporally related changes in drug action.

Although the data provide evidence of a relationship between arousal level and vicarious conditioning, the manner in which arousal produces facilitative or disruptive effects remains to be demonstrated. Subjects' replies to a post-experimental questionnaire suggested that disruptive effects may, in part, be mediated by self-generated competing responses designed to reduce the aversiveness of the vicarious instigation situation.

In some cases, this took the form of an intensive focus on irrelevant external stimuli, to the exclusion of the disturbing pain cues ("When I noticed how painful the shock was to him, I concentrated my vision on a spot which did not allow me to focus directly on either his face or hands.") Most observers attempted to decrease the aversive stimulation arising from the model's pain reactions by conjuring up competing cognitive responses. ("I tried to be cool. I thought about Latin verbs and about Latin composition.") A few subjects, however, marshalled considerably more potent contravening cognitive responses ("I finally just tried to think about the girl I slept with last night. It kept my mind off those damn shocks.")

To the extent that an observer who is confronted by a vicarious instigation situation succeeds either in attenuating unpleasant arousal by producing competing cognitive responses, or in curtailing attentional responses to the eliciting stimuli, the CS is likely to become endowed with relatively weak aversive properties. The deliberate use of avoidant and stimulus neutralization stratagems was reported most frequently by the most highly aroused subjects.

It should be noted that, unlike direct classical conditioning in which the subject is unable to modify the intensity of aversive stimulation administered to him, in vicarious conditioning situations the observer can readily engage in response-interference stratagems that serve to reduce vicariously instigated affective reactions. For this reason, investigations of direct and vicarious classical conditioning may not always yield equivalent relationships between variables. Similarly, findings based on vicarious classical conditioning may not be applicable to modeling processes involving instrumental classes of responses. Thus, as demonstrated in Schachter's experiments, a person experiencing high-intensity autonomic responses may welcome the opportunity to engage in matching social behavior, whereas in a classical conditioning situation permitting no motoric responses, high-aroused subjects can resort only to stimulus neutralization tactics as a means of reducing their discomfort.

The questionnaire data revealed additional complexities in the vicarious conditioning process that require systematic investigation. It was assumed that vicarious instigation of emotional responses is mediated by a process of stimulus generalization. That is, stimuli impinging upon a given person and the attendant reactions will arouse in the observer analogous emotional responses, the magnitude of the responses being a function of the degree of similarity between the participants. One would expect persons who possess similar characteristics to share many experiences in common. Results of experiments with infrahuman subjects discussed earlier (Church, 1959) reveal that the experience of repeated paired

consequences is an important determinant of vicarious arousal. Moreover, Murphy *et al.* (1955) demonstrated that emotional responses in monkeys could be vicariously elicited not only by the sight of their experimental counterparts, but also through stimulus generalization by another monkey that was never involved in the original aversive contingencies.

The self-report data indicated that with a few notable exceptions subjects did, in fact, experience strong, empathetic reactions. Several of the observers, however, derived considerable satisfaction from witnessing pain being inflicted on the model (e.g., "My main reaction was sadistic. My main thoughts were, 'Oh, boy, is he getting it' . . . "I was rather embarrassed to see that I was grinning when my partner got shocked and dropped the stylus with a suppressed groan.") On the assumption that such reactions are established through discordant, interindividual contingencies (Berger, 1962), a study is planned in which the level of vicarious conditioning will be measured as a function of antecedent paired aversive consequences, paired opposing consequences, and unassociated negative outcomes experienced by the model and observing subjects.

C. HIGHER-ORDER VICARIOUS CONDITIONING

In the experiments described above, observers' affective responses to the pain of the models undergoing direct aversive stimulation were conditioned to neutral stimuli. Social attitudes are frequently established on the basis of modeled higher-order pairings in which the names and discriminative attributes of target persons and objects are associated by the model with verbal stimuli likely to evoke in the observer intense, emotional responses on the basis of prior, first-order conditioning. The following quotation, taken from a report of a Ku Klux Klan rally (*San Francisco Chronicle*, 1963), provides a vivid illustration of how fear and hatred of Negroes can be conditioned in this manner and transmitted through modeling to the Klansmen's observant offspring.

The speaker shouted, "In Washington and New York it weren't safe for a white woman to walk the streets by day." "Niggers," the crowd cried out.

There was an attack on the Red Cross for not labelling blood "black and white." Another speaker was introduced as an expert on the subject. He told the people that there was a "round-shaped corpuscle in nigra blood" and that it was a "white child killer when it gets in our blood."

From the platform came attacks on the "black communist conspiracy plot" . . . Shelton (Klan Grand Dragon) said "nigras" constituted 10 per cent of the Nation's population, but were responsible for 80 per cent of the crime, rape, illegitimate births, syphilis, and gonorrhea. . . . The grand commander of the Woman's Klan in Georgia was introduced. She said she was a mother and grandmother and then urged the people to "teach your children the difference between black and white. How do you know who

they'll marry? I'm fighting to keep mine pure and white." A woman sitting in front shook her head slowly. "Those damn niggers," she mumbled. "Damn niggers."

Many of the parents in the crowd had brought their young children to the meeting. On the fringe of the crowd three boys, not more than 10 years old, were playing the old American game of "king-of-the-mountain." They were on a mound of dirt pushing each other from the top. "Down, nigger, you get down there, you nigger," one of them said pushing his friend. "I ain't no nigger, you are," said another, as he scrambled to the top.

In view of the ample opportunities provided children to acquire prejudicial attitudes simply by observing the vehement, emotional responses displayed by bigoted models, it is not surprising that scapegoat theories of prejudice, based on a conflict-displacement paradigm (N. E. Miller, 1944, 1959) have yielded equivocal results (Berkowitz, 1958; Cowen *et al.*, 1959; Lindzey, 1950; Stagner and Condon, 1955; Weatherley, 1961). According to this theory, the objects and strength of displaced aggressive responses can be predicted by knowledge of three variables only—the strength of instigation to aggression by the original frustrating agents, the strength of inhibitory responses, and the degree of dissimilarity of the displaced objects to the original frustrators. This model thus makes no provision for the potentially powerful influence of social agents in transmitting and shaping highly discriminative patterns of prejudicial attitudes toward stimulus objects other than themselves (Bandura and Walters, 1963a). The predictive power of the conflict paradigm is likely to be particularly limited under conditions where the modeling cues and reinforcement contingencies displayed by the primary social agents have no consistent relationship to the similarity of the original frustrators to possible displaced objects.

IV. Vicarious Extinction

Autonomic and instrumental classes of responses can not only be acquired, but also extinguished on a vicarious basis. The latter outcome is achieved by exposing the observer to modeled stimulus events involving either the omission of reinforcement, or the presentation of opposing reinforcing stimuli to the performing subject. Some suggestive evidence for the occurrence of vicarious extinction of conditioned emotionality is provided by Masserman (1943) and Jones (1924) in exploratory studies of the relative therapeutic efficacy of modeling procedures.

Masserman produced strong feeding inhibitions in cats by pairing food approach responses to a conditioned stimulus with either air-blasts, grid-shocks, or both forms of noxious stimulation presented simultaneously. In the remedial phase of the experiment, the inhibited animals

observed a cagemate which had never been negatively conditioned exhibit prompt approach and feeding responses. The observing subjects initially cowered at the presentation of the conditioned stimulus, but with continued exposure to their fearless companion, they advanced, at first hesitantly and then more boldly, to the goal box and consumed the food. Some of the animals, however, showed little reduction in avoidance behavior despite prolonged hunger and repeated modeling trials. Moreover, avoidance responses reappeared in a few of the animals after the normal cat was removed, indicating that in the latter cases the modeling stimuli served merely as temporary external inhibitors of avoidance responses. Jones (1924) similarly obtained variable results in extinguishing children's phobic responses by having them observe their peers behave in a non-anxious manner in the presence of the avoided objects.

In the cases cited above, the models responded to the most aversive stimulus situation at the onset, a modeling procedure that is likely to generate high levels of emotional arousal in observers. Under these conditions any avoidance responses performed by the observing subject that serve to attenuate or terminate the vicariously instigated aversive stimulation will in fact be reinforced rather than extinguished. Therefore, the efficacy of vicarious extinction procedures may depend to a large extent on the care with which the modeled performances are programmed.

Avoidance responses can be rapidly extinguished if subjects are exposed to a graduated series of aversive stimuli that progressively approximate the original intensity of the conditioned fear stimulus (Kimble and Kendall, 1953). In the application of this stimulus generalization principle to vicarious extinction, the subject might initially observe a model responding in a positive manner to relatively weak emotion-provoking cues. After these stimuli have lost their aversive properties for the observer, gradually increasing intensities of anxiety-arousing stimuli can be presented to the model until the most potent cues have been successfully neutralized.

If emotion-eliciting stimuli are repeatedly associated with positively reinforcing events, the former cues are likely to lose their aversive properties more rapidly than through mere repeated, nonreinforced presentation (Melvin and Brown, 1964; Wolpe, 1958). The induction of competing positive responses in observers during exposure to modeling trials may likewise expedite the vicarious extinction process. The latter principles and other factors known to facilitate extinction were systematically applied in an investigation of group vicarious extinction of dog phobias in young children (Bandura *et al.*, 1965b).

The strength of avoidance responses toward dogs was measured by a standardized situational test in which children were instructed to engage in increasingly intimate interactions with a dog. Children who displayed

avoidance responses were grouped into stratified levels of avoidance behavior and then assigned to one of four conditions.

One group of children participated in eight brief modeling sessions in which they observed a fearless peer model exhibit progressively longer, closer, and more active interactions with his canine companion. For these subjects, the modeled approach behavior was presented within the context of a highly positive, party atmosphere. A second group of children was exposed to the same graduated modeling stimuli, but in a neutral context.

In the latter two treatment conditions, the stimulus complex involved both modeling cues and repeated observation of the feared animal. Therefore, in order to control for the effects of exposure to the dog per se, a third group of children was presented the series of parties in the presence of the dog with the model absent. A fourth group participated in the positive activities but was never exposed to either the dog or the modeled displays.

Following the completion of the treatment series, the children were readministered, by a different experimenter, the situational test consisting of the graded sequence of interaction tasks with the test animal. They were asked, for example, to approach and to pet the dog, to release her from a play pen, to remove her leash, to feed her dog biscuits, and to spend a fixed period of time alone in the room with the animal while the experimenter departed to fetch an additional supply of canine cookies. The terminal test items required the children to climb into the play pen with the dog, to pet, and to remain alone with the animal under the exceedingly confining and potentially fear-provoking conditions.

In order to determine the generality of vicarious extinction effects, half the children in each of the four groups were tested initially with the experimental animal and then with an unfamiliar dog; the remaining children were presented the two dogs in the reversed order. In addition, the assessment procedures were repeated approximately one month later so as to assess the stability of the modeling-induced changes.

The modeling procedure produced highly stable and generalized vicarious extinction of avoidance responses. This is shown in the fact that the two groups of children, who had observed the peer model interact nonanxiously with the dog, displayed significantly greater approach behavior toward both the experimental and the unfamiliar animals than children in the exposure and control conditions, which did not differ from each other. The positive context, however, did not contribute any significant variance to the obtained outcomes. As might be expected, the positive context and repeated assessments also produced some decrease in avoidance behavior.

If symbolic modeling procedures, utilizing pictorial stimuli, should also prove efficacious in extinguishing conditioned emotional responses, then carefully programmed therapeutic films could be developed for pre-

ventive programs designed to eliminate common fears and anxieties before they become well established and widely generalized.

V. Concluding Remarks

Both the early and more recent conceptualizations of vicarious or observational learning have been developed and tested largely on the basis of a limited paradigm requiring observing subjects to perform matching responses as a precondition for their acquisition. A considerably more prevalent and significant vicarious phenomenon is evident in the occurrence of delayed reproduction of modeling behavior originally learned by observers under a nonresponse acquisition procedure.

The present paper is mainly concerned with the theoretical analysis of the process of no-trial learning. Unlike most previous accounts of modeling effects, which tend to highlight the reinforcing stimulus control of matching responses, the theory propounded by the author emphasizes the function of representational processes in observational learning. According to this formulation, matching responses are acquired on the basis of stimulus contiguity and are mediated by cue-producing symbolic responses which exercise discriminative stimulus control over corresponding overt performances. Thus, in this mode of response acquisition, imaginal and verbal representations of modeling stimuli constitute the enduring learning products of observational experiences. While the perceptual and cognitive aspects of vicarious learning are given emphasis, it is recognized that motivational and reinforcement variables may influence indirectly the level of *response acquisition* by augmenting or reducing the occurrence of requisite observing responses and facilitative covert rehearsal. There is considerable research evidence, however, that the *performance* of previously learned matching responses is primarily governed by reinforcement-related variables.

The theory advanced in this paper suggests that vicarious learning may be analyzed in the same manner as other associative learning processes. In the formation of novel responses, new associative connections between existing behavioral elements are established through observation. Since the observer does not engage in overt performances during the acquisition stage, the new integrations involve representational responses elicited by the modeling stimuli. In addition, the observer learns the sequential connections between modeling responses as they are exhibited in a continuous chain.

The fact that vicarious learning experiments employ social cues rather than nonsense syllables does not result in an acquisition process that is fundamentally different from traditional associative learning. There is no reason to believe, for example, that the principles governing the

integration of elements in the mechanically displayed syllables ZXK, the modeled verbalization *supercalifragilisticexpialidocious*, or a modeled aggressive response consisting of several distinct components are essentially different simply because the former stimuli are presented to the observer in a nonsocial memory drum, whereas the latter stimuli are displayed socially. Nor are basically different learning processes involved in the acquisition of the clearly unique verbal response *supercalifragilisticexpialidocious* when presented in the aperture of a memory drum or by a verbalizing model. Consequently, there is no need to search for enigmatic, psychological mechanisms and elusive, dynamic variables in accounting for learning by observation, imitation, or identification.

The study of the social transmission of response patterns is necessitated by the fact that the behavioral repertoires which constitute an enduring part of a culture are to a large extent transmitted on the basis of repeated observation of behavior displayed by social models rather than by memory drums. While the learning process is essentially the same, the characteristics of the social transmitters and other interpersonal variables can greatly affect the rate, level, and types of responses that will be acquired observationally. Moreover, the efficacy of parameters established on the basis of learning in one-person situations may differ in dyadic and group situations (Bandura *et al.*, 1963b). A comprehensive theory of behavior must therefore be based on experimentation involving both social and learning variables.

In addition to response learning, witnessing the reinforcement contingencies of a model is often highly influential in modifying the extent to which similar existing patterns of social behavior will later be exhibited by observers. The strength of inhibitory responses may likewise be significantly altered, and emotional responses may be vicariously conditioned and extinguished as a function of observing the reinforcing consequences to a model and his attendant affective reactions. The research findings reviewed in this chapter identify some of the social-learning variables determining the diverse behavioral effects on observers of exposure to socially modeled stimulus events.

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Social-Learning Theory Of Identificatory Processes

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Among the various processes involved in socialization, identificatory learning is generally assigned a prominent role regardless of whether explanatory theories favor psychological or sociological variables. There are several reasons for this emphasis. It is evident from informal observation that the complex repertoires of behavior displayed by members of society are to a large extent acquired with little or no direct tuition through observation of response patterns exemplified by various socialization agents. This is particularly true of behavior for which there is no reliable eliciting stimulus apart from the cues furnished by the responses of others.

The provision of social models is also an indispensable means of transmitting and modifying behavior in situations where errors are likely to produce costly or fatal consequences. Indeed, if social learning proceeded exclusively on the basis of rewarding and punishing consequences, most people would never survive the socialization process. Even in cases where nonsocial stimuli can be relied upon to elicit some approximation of the desired behavior, and errors do not result in perilous outcomes, people are customarily spared exceedingly tedious and often haphazard trial-and-error experimentation by emulating the behavior of socially competent models. In fact, it would be difficult to imagine a socialization process in which the language, mores, vocational and avocational patterns, the familial customs of a culture, and its educational, social, and political practices were shaped in each new member by selective reinforcement without the response guidance of models who exhibit the accumulated cultural repertoires in their own behavior. To the extent that people successfully match the behavior of appropriate societal models, the social-learning process can be greatly accelerated and the development of response patterns by differential reinforcement can be short-circuited.

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DEFINITION AND MEASUREMENT OF IDENTIFICATION

Although wide differences of opinion exist among personality theorists in what they consider to be the most suitable reference events for identification, it is generally agreed that identification refers to a process in which a person patterns his thoughts, feelings, or actions after another person who serves as a model. The present chapter deals mainly with the conceptual scheme, strategies of research, and major findings based on a social-learning theory of identification. However, some consideration will be given to other theoretical approaches, particularly in instances where several alternative explanations of specific modeling phenomena are indicated.

Measures of Identification Based on Actual or Assumed Similarity

In empirical investigations of modeling processes, the degree of similarity between a subject's self-description on some type of personality questionnaire and his description of his parents on the same or a similar test is occasionally employed as an index of parental identification (Heilbrun, 1965; Sopchak, 1952). A more commonly used variant of this procedure operationally defines identification in terms of the degree of correspondence in self-description scores on an inventory completed independently by the subject and the person who presumably is taken as the model (Cass, 1952; Gray & Klaus, 1956; Helper, 1955; Lazowick, 1955; Payne & Mussen, 1956). In other instances identification scores are obtained by comparing ratings of the participants' personality characteristics by one or more observers who are well-acquainted with the persons under study (Hetherington, 1965).

The interpretation of these types of difference scores and the various possible combinations of actual and assumed resemblances as valid measures of identification has been seriously questioned on numerous grounds by Bronfenbrenner (1958) and Cronbach (1955). First, self-descriptions and ratings by observers are susceptible to response biases which may artificially inflate or diminish identification scores. The issue of rater contamination is particularly serious in cases where the same person evaluates both himself and the model. Second, questionnaire techniques measure similarity only in self-descriptive responses which, in many cases, may have little relationship to respondents' actual social behavior. Accuracy of self-definition is affected not only by response sets and item ambiguity, but also by adequacy of self-observation. Third, the use of global indices, in which responses to a heterogeneous set of test items are combined into a single identification score, assumes a high degree of generality between modeling outcomes presumably mediated by a unitary identification process. Contrary to the unitary theory, evidence to be cited later in this chapter clearly indicates that persons are quite discriminative in the types of behaviors they select to reproduce. Con-

sequently, intercorrelations among different classes of matching responses tend to be relatively low. Fourth, measures derived from difference scores involving self-ratings are affected by statistical artifacts such as the lack of independence of errors of measurement, regression effects, and treatment of data measured in ordinal scales as though the points had equivalent meaning and represented equal intervals to different raters.

Even if ingenious procedures could be devised to overcome the numerous psychometric problems, measures of real or assumed similarity as indices of identification would still have serious limitations. All parent-child resemblances in attitudes or behavior do not necessarily represent outcomes of a modeling process. Many behavioral similarities undoubtedly result from direct tuition, selective exposure to environmental settings and activities, and the influence of common reinforcement contingencies in specific cultural subgroups.

Sex-role behavior, for example, which is generally attributed to identificatory processes, provides an excellent example of active parental training in sex-appropriate interests and modes of behavior before young children have much opportunity to observe and to discriminate accurately the sexual appropriateness of response patterns displayed by adult males and females. Sex-role differentiation usually commences immediately after birth when the baby is named and both the infant and the nursery are given the blue or pink treatment depending upon the sex of the child. Thereafter, indoctrination into masculinity and femininity is diligently promulgated by adorning children with distinctive clothes and hair styles, selecting sex-appropriate play materials and recreational activities, promoting associations with same-sex playmates, and through nonpermissive parental reactions to deviant sex-role behavior. In view of the extensive discrimination training, peer modeling, and frequent maternal demonstrations of masculine activities at times when the father is absent, it seems highly improbable that a three-year-old child looks and behaves like a boy primarily as a result of identifying with a 35-year-old man whom he can observe for relatively brief periods mainly during leisure-time activities if the commuting schedule happens to be favorable.

In most instances behavioral similarities are attributable in large part to modeling processes. The problem of identifying the sources of emulated behavior, however, is complicated by the fact that children are repeatedly exposed to multiple models including teachers, other adults in the immediate neighborhood, peer companions, and a host of prestigious models presented mainly through television and films. It is therefore extremely doubtful that children rely exclusively on parents as models for the diverse response patterns that are characteristically displayed at different periods of development. Moreover, the findings of Lazowick (1955) and Helper (1955) that people show no greater similarity to their actual parents than to randomly matched parental figures suggest that measures of identification based on personality questionnaires primarily assess general culturally conditioned patterns of behavior basic to all members of the same sex, or to raters' sex-linked stereotypes.

Identification Measured in Terms of Adult-Role Behavior, Sex-Typing and Behavioral Manifestations of Self-Control

A second major approach to the study of modeling processes focuses attention on hypothesized products of identification rather than on actual behavioral similarities between parent and child. According to this theoretical formulation, which is most clearly explicated by Sears and his associates (Sears, Rau & Alpert, 1965), a single mediating process of identification governs the development of diverse types of responses including sex-role behavior, prosocial aggression, adult-like attitudes and conduct, resistance to deviation, and guilt reactions following transgression. Research guided by this point of view attempts to link child-rearing antecedents supposedly determining the hypothetical process of identification to their presumed behavioral manifestations. Various measures of identificatory behavior are typically employed in these studies including use of male or female dolls as agents of doll-play actions (Levin & R. R. Sears, 1956; P. S. Sears, 1953), choices between responses portrayed by doll models in doll-play situations (Hartup, 1964), projective tests of sex-role preference (Mussen & Distler, 1959), and responses to vocational interest tests (Mussen, 1961). Identification is also frequently inferred from the presence of adult-like attitudes and behavior, sex-typed characteristics, and indices of self-control based on behavioral observations, projective tests, parental interviews, and semi-structured parent-child interactions (Sears et al., 1965).

Both the conceptual structure and the dependent variables of psychodynamically-based approaches to identification are beleaguered by serious problems, not the least of which is evidence that the myriad behaviors presumably generated by the single mediating process are not positively intercorrelated to any appreciable degree (Bandura & Walters, 1963; Sears et al., 1965). A single unitary mediator cannot possibly account for the remarkable variety of heterogeneous responses and changes in their occurrence under different stimulus conditions, toward different persons, and at different times. It would seem that a considerably more complex theory of modeling is required.

As in the case of similarity measures, the major methodological difficulties with most of the popular indices of identification arise from failure to establish the source of children's responses, or to demonstrate that they are in fact products of a modeling process. There is substantial evidence from laboratory studies (Aronfreed, 1967; Bandura & Walters, 1963), for example, that reinforcement variables can be influential in establishing resistance to deviation and self-punitive responses following transgression. Moreover, the reinforcement contingencies required for the acquisition of these two modes of response differ markedly. Therefore it is not surprising that no consistent relationships between resistance to temptation and guilt have emerged from numerous studies in which both variables have been measured, and that the

child-rearing antecedents of these indices of moral development are somewhat different (Hoffman, 1963).

The evidential value of linkages between child-rearing practices and behavioral qualities attributed to identification for a theory of modeling is difficult to evaluate when the most critical set of variables—namely, the actual content of the attitudes, values, and social behavior displayed by parental models—is not directly and intensively assessed, as is often the case. Thus, a boy who deviates readily and experiences little or no guilt over violation of prohibitions would be considered deficient in identificatory behavior even if this resulted from emulating antisocial attitudes of a deviant parental model. Similarly, the presence of feminine interests, mannerisms, and personality characteristics in a boy who identified strongly with an effeminate father would receive low scores on paternal identification. It is apparent from these examples that identificatory behavior has no intrinsic defining properties and consequently, it cannot be identified or validly measured independently of the behavior of the persons who have been emulated. The specific origin of social behavior is further obscured by the fact that after particular responses have been acquired observationally, they may later be evoked by a variety of models and appropriate situational cues. When there exists considerable homogeneity in the behavior displayed by societal models, there is no reliable means of determining whether a given pattern of behavior was originally adapted from parents, peers, teachers, other adults or even from influential televised characters.

Definition and Measurement of Identificatory Processes in Social-Learning Theory

In social-learning theory an identificatory event is defined as the occurrence of similarity between the behavior of a model and another person under conditions where the model's behavior has served as the determinative cue for the matching responses.¹ Although the matching process frequently involves reproduction of specific patterns of behavior, in many instances a common attribute abstracted from diverse responses is modeled. It should be noted that both the characteristics of the behavior and its antecedents are the principal defining properties of identification. The reason for considering the stimulus source of behavior is that two or more persons may exhibit identical responses to the same environmental cues without the occurrence of any identification (e.g., when several motorists stop their automobiles the moment a red signal light flashes).

Pseudo-identification is also involved in cases where differential situational cues independently elicit similar patterns of behavior in different participants.

¹The term "behavior" is employed in the broad sense to include motoric, cognitive, and physiological classes of response.

This point is dramatically illustrated in a story, definitely apocryphal, about a big-game hunter who, after many days of fruitless search for wild animals, finally came face to face with a ferocious lion. As he prepared to shoot the onrushing beast, the gun jammed. Helpless and terrified, the hunter promptly closed his eyes and began to pray rapidly. Moments passed and, much to his surprise, nothing happened. Puzzled by this unexpected turn of events, the hunter cocked his head, and slowly opened his eyes to find the lion also bowed in prayer. The jubilant hunter loudly exclaimed, "Thank God, you are responding to my prayers!" The lion promptly replied, "Not at all, I'm saying grace."

In dealing with naturally occurring events it is exceedingly difficult to establish precisely the stimulus sources of a person's social behavior. Consequently, laboratory studies in which models exhibit novel responses that do not exist in observers' behavioral repertoires can provide the most definitive information about the conditions regulating identificatory learning. Moreover, to the extent that investigators can successfully generate and modify identificatory behavior by systematic manipulation of variables considered germane to the phenomenon by their theory, one can place considerable confidence in the validity of the guiding theoretical principles.

Regardless of how identification may be defined, the actual behavioral phenomenon encompassed by the construct (i.e., the occurrence of matching behavior as a function of exposure to modeling cues) is no more complicated nor elusive than most other psychological events. Even a cursory review of the relevant literature discloses, however, that the phenomenon has become hopelessly entangled in semantics as a result of efforts to differentiate various forms of matching behavior. For example, on the basis of numerous arbitrary criteria, one finds distinctions among "identification," "imitation," "introjection," "incorporation," "internalization," "copying," and "role-taking," to mention only a few of the more popular varieties.

Identification has been most frequently differentiated from imitation in terms of outcome variables on the assumed basis that imitation involves the reproduction of discrete responses whereas identification involves the adoption of either diverse patterns of behavior (Kohlberg, 1963; Parsons, 1955; Stoke, 1950), symbolic representations of the model (Emmerich, 1959), or similar meaning systems (Lazowick, 1955). Sometimes the distinction is made in terms of differential antecedent or maintaining variables as illustrated in Parsons' (1951) view that a "generalized cathectic attachment" is a necessary precondition for identification but is unessential or absent in the case of imitation; Kohlberg (1963), on the other hand, reserves the term identification for matching behavior that is presumed to be maintained by the intrinsic reinforcement of perceived similarity and the construct imitation for instrumental responses supported by extrinsic rewards. Others define imitation as matching behavior occurring in the presence of the model, while endowing identification with the performance of the model's behavior in the latter's absence (Kohlberg, 1963; Mowrer, 1950). Not only is there little consensus with respect

to differentiating criteria, but some theorists assume that imitation produces identification, whereas others contend, with equally strong conviction, that identification gives rise to imitation.

Unless it can be shown that vicarious learning of different classes of matching behavior is governed by separate independent variables, distinctions proposed in terms of forms of emulated responses are not only gratuitous, but breed unnecessary confusion. Limited progress would be made in elucidating behavioral change processes if, for example, fundamentally different learning mechanisms were invoked, without adequate empirical basis, to account for the acquisition of one social response and ten interrelated social responses that are designated as various aspects of a given role. Results of numerous studies to be reviewed later demonstrate that the acquisition of isolated matching responses and entire behavioral repertoires is determined by the same antecedent conditions. Further, retention and delayed reproduction of even discrete matching responses require representational mediation of modeling stimuli. There is also little reason to suppose, either on empirical or theoretical grounds, that different principles and processes are involved in the acquisition of matching responses that are subsequently performed in the presence or in the absence of the model. Indeed, if the diverse criteria enumerated above were seriously applied, either singly or in various combinations, in categorizing modeling outcomes, most instances of matching behavior that have been labelled imitation would qualify as identification, and much of the naturalistic data cited as evidence of identificatory learning would be reclassified as imitation.

Although it is possible to draw distinctions among descriptive terms based on antecedent, mediating, or behavioral variables, one might question whether it is advantageous to do so, since there is every indication that essentially the same learning process is involved regardless of the content and generality of what is learned, the models from whom the response patterns are acquired, and the stimulus conditions under which emulative behavior is subsequently performed. Therefore, in the interests of clarity and parsimony the terms "identification," "imitation," and "observational learning" will be employed interchangeably to refer to behavioral modifications resulting from exposure to modeling stimuli.

LEARNING MECHANISM UNDERLYING MODELING PROCESSES

In evaluating theories of identification or modeling phenomena, it is essential to distinguish between *acquisition* and spontaneous *performance* of matching behavior because these events are determined by different sets of variables. Traditional theories of identification devote a great deal of attention to familial conditions that may be conducive to modeling performance, but these formulations rarely specify the basic learning mechanisms by which persons acquire response patterns through exposure to the behavior of models. An adequate theoretical account of identification must designate the variables regulating

observational response acquisition, the factors influencing long-term retention of previously learned matching responses, and the conditions affecting degree of behavioral reproduction of modeling stimuli.

A number of theorists, in their efforts to explain imitation, have offered detailed analyses of modeling phenomena in terms of instinctual propensities (Morgan, 1896; Tarde, 1903; McDougall, 1908), associative and classical conditioning mechanisms (Allport, 1924; Holt, 1931; Humphrey, 1921; Mowrer, 1960; Piaget, 1951), or reinforcement theories of instrumental conditioning (Miller & Dollard, 1941; Skinner, 1953; Baer & Sherman, 1964). As discussed at length elsewhere (Bandura, 1965a), the latter theoretical formulations account satisfactorily for the control of previously learned matching responses. However, they fail to explain how new response patterns are acquired observationally, particularly under conditions where an observer does not overtly perform the model's responses during the acquisition phase, reinforcers are not administered either to the model or to the observer, and the first appearance of the acquired response may be delayed for days, weeks, or even months. Since observers can acquire only perceptual and other symbolic responses resembling the sequences of modeling stimuli while they are occurring, internal representational processes which mediate subsequent behavioral reproduction obviously play a prominent role in observational learning.

Mechanisms of Observational Learning

Recent theoretical analyses of observational learning (Bandura, 1962, 1965a; Sheffield, 1961)—which is the basic learning process underlying identification, however defined—assign a prominent role to representational mediators that are assumed to be acquired on the basis of a contiguity learning process. According to my formulation observational learning involves two representational systems—an *imaginal* and a *verbal* one. After modeling stimuli have been coded into images or words for memory representation they function as mediators for response retrieval and reproduction.

Imagery formation is assumed to occur through a process of sensory conditioning. That is, during the period of exposure, modeling stimuli elicit in observers perceptual responses that become sequentially associated and centrally integrated on the basis of temporal contiguity of stimulation. If perceptual sequences are repeatedly elicited, a constituent stimulus acquires the capacity to evoke images of the associated stimulus events even though they are no longer physically present (Conant, 1964; Ellson, 1941; Leuba, 1940). These findings indicate that, in the course of observation, transitory perceptual phenomena produce relatively enduring, retrievable images of modeled sequences of behavior. Later, reinstatement of imaginal mediators serves as a guide for reproduction of matching responses.

The second representational system, which probably accounts for the notable speed of observational learning and long-term retention of modeled contents by humans, involves verbal coding of observed events. Most of the

cognitive processes that regulate behavior are primarily verbal rather than visual. To take a simple example, the route traversed by a model can be acquired, retained, and later reproduced more accurately by verbal coding of the visual information into a sequence of right-left turns (e.g., RRLRLL) than by reliance upon visual imagery of the itinerary. After modeled sequences of responses have been transformed into readily utilizable verbal symbols, performances of matching behavior on later occasions can be effectively controlled by covert verbal self-directions.

The influential role of symbolic representation in observational learning is disclosed in a study (Bandura, Grusec & Menlove, 1966) in which children were exposed to complex sequences of modeled behavior on film during which they either watched attentively, verbalized the novel responses as they were performed by the model, or counted rapidly while watching the film to prevent implicit coding of modeling cues. A subsequent test of observational learning disclosed that children who generated verbal equivalents of modeled stimuli reproduced significantly more matching responses than those in the viewing alone condition who, in turn, showed a higher level of acquisition than children who engaged in competing symbolization.

Further supporting evidence for the influence of symbolic coding operations in the acquisition and retention of modeled responses is furnished by Gerst (1968). Subjects observed a filmed model perform motoric responses varying in the ease with which they can be verbally coded and they were instructed to transform the items into either vivid images, concrete verbal descriptions of the response elements, or convenient summary labels that incorporate the essential ingredients of the responses. Compared to the performance of controls who had no opportunity to generate symbolic mediators, all three coding operations enhanced observational learning. Concise labeling and imaginal codes were equally effective in aiding immediate reproduction of modeled responses and both systems proved superior in this respect to the concrete verbal form. However, a subsequent test for retention of modeled responses showed concise labeling to be the best coding system for memory representation. Subjects in the latter condition retained most of what they learned, whereas those who relied upon imagery and concrete verbalization displayed a substantial loss of matching responses.

Results of a program of research utilizing a nonresponse acquisition procedure (Bandura, 1965a) indicate that the organization of behavior elements into novel patterns resembling modeled stimulus compounds can occur at a central level without motoric responding. The present theory assumes, however, that *stimulus contiguity is a necessary, but not a sufficient, condition for acquisition and performance of modeled patterns of behavior*. Modeling phenomena, in fact, involve complex interactions of numerous subprocesses each with its own set of controlling variables. A comprehensive theory of identification must therefore encompass the various subsystems governing the broader phenomena. The subprocesses that markedly influence the degree and content of observational learning are discussed next.

Attentional processes. At the sensory registration level, it is exceedingly unlikely that a person could reproduce modeling stimuli if he did not attend to, recognize, and differentiate the distinctive features of the model's responses. Considerable research is needed to evaluate the effects on observational learning of visual exposure variables including the frequency, duration, rate, saliency, multiplicity, and complexity of modeling cues.

In the case of highly intricate response systems such as linguistic behavior, children encounter considerable difficulty in acquiring linguistic structures because the identifying characteristics of different grammatical constructions cannot be readily distinguished within extremely diverse and complex utterances. Given high occurrence of observing responses and the presence of adequate discriminative cues, relatively complicated response patterns can be acquired observationally (Bandura & Harris, 1966; Sheffield & Maccoby, 1961).

Simply exposing persons to distinctive sequences of modeling stimuli is no guarantee that they will attend closely to the cues, that they will necessarily select from the total stimulus complex only the most relevant stimuli, or that they will even perceive accurately the cues to which their attention has been directed. Motivational conditions, prior training in discriminative observation, and the presence of incentive-oriented sets may strongly determine those features of the social environment which will be of greatest interest and to which the person will pay closest attention. In addition, observer characteristics and other social factors that affect association preferences will determine to a large degree the types of models who are selected for observation and consequently, the modes of behavior that will be most thoroughly learned.

Retention processes. Another basic component function involved in observational learning, but one that has been virtually ignored in theories of identification, concerns the long-term retention of coded modeling events. This is a particularly interesting problem in cases where children, for example, acquire patterns of behavior observationally and retain them over extended periods even though the response tendencies have rarely, if ever, been activated into overt performance until the persons reach the age or social status that makes the activity appropriate and permissible.

Among the numerous variables governing retention processes, rehearsal operations effectively stabilize and strengthen acquired responses. The level of observational learning can be considerably enhanced through overt practice or rehearsal of modeled response sequences (Margolius & Sheffield, 1961). Of greater import is evidence that covert rehearsal, which can be readily engaged in when overt participation is either impeded or impracticable, may likewise enhance retention of acquired matching responses (Michael & N. Maccoby, 1961).

The influential function of covert role-practice of modeled behaviors has received greatest emphasis in E. E. Maccoby's (1959) account of the identification process. According to this view, controlling, nurturant, and caretaking activities require explicit reciprocal behaviors on the part of parents and

children. Consequently, in the course of frequent mutually dependent interactions, both participants learn, anticipate, and covertly rehearse each other's customary responses. In addition to the frequency and intimacy of social interactions, the degree of power exercised by the model over desired resources is considered to be an important determinant of the frequency of fantasy role-playing. In this theory, vicarious role-rehearsal primarily serves a defensive function; that is, in an effort to guide his behavior toward models who possess controlling power, a person will imagine different courses of action for receiving help or avoiding censure, and he will try to anticipate as accurately as possible the model's probable responses to these approaches. On the other hand, there would be little incentive to prepare oneself for, or to practice covertly, the behavior of models who command no rewarding or punishing power.

Anticipatory implicit rehearsal of modeled responses may be supported by role reciprocity and threat from resource controllers, but it should be noted that persons will also be inclined to practice modeled responses that are effective in producing rewarding outcomes. Moreover, according to social-learning theory, the behavior of powerful models will be attended to, rehearsed, and reproduced even though observers have had no direct interaction with them (Bandura, Ross & Ross, 1963b), because their behavior is likely to have high utilitarian value. This is particularly true in the case of models who possess expert power in particular specialties. It would be unnecessary, for example, for a novice to establish a complementary role relationship with a qualified automobile mechanic in order to master his skills through observation during apprentice training. Rehearsal processes are undoubtedly governed by different types of incentive conditions, some of which may be entirely independent of the model whose behavior is being emulated.

Symbolic coding operations, to which reference was made earlier, may be even more efficacious than rehearsal processes in facilitating long-term retention of modeled events. During exposure to stimulus sequences observers are inclined to recode, classify and reorganize elements into familiar and more easily remembered schemes. These coding devices may take various forms such as representing stimulus events in vivid imagery, translating action sequences into abbreviated verbal systems, or grouping constituent patterns into larger integrated units.

Motoric reproduction processes. The third major component of modeling phenomena involves the utilization of symbolic representations of modeled patterns in the form of imaginal and verbal contents to guide overt performances. It is assumed that reinstatement of representational schemes provides a basis for self-instruction on how component responses must be combined and sequenced to produce new patterns of behavior. The process of representational guidance is essentially the same as response learning under conditions where a person behaviorally follows an externally depicted pattern or is directed through a series of instructions to enact novel response sequences. The

only difference is that, in the latter cases, performance is directed by external cues whereas, in delayed modeling behavioral reproduction is monitored by symbolic counterparts of absent stimuli.

The rate and level of observational learning will be partly governed, at the motoric level, by the availability of necessary component responses. Responses of high-order complexity are produced by combinations of previously learned components which may, in themselves, represent relatively intricate compounds. Modeling outcomes are most readily achieved when they primarily involve the synthesis of previously acquired behavioral elements into new patterns exhibited by models. On the other hand, observers who lack some of the necessary components will, in all probability, display only partial reproduction of a model's behavior. In such cases the constituent elements are first established through modeling and then in a stepwise fashion increasingly complex compounds are acquired imitatively.

The above modeling procedure is frequently employed in the treatment of gross behavioral deficits, such as autism, childhood schizophrenia, and severe social or mental retardation. A model may repeatedly exhibit desired patterns of behavior, but these displays often have relatively little impact on the children (Baer, Peterson & Sherman, 1967; Lovaas, Berberich, Perloff & Schaeffer, 1966). This lack of responsiveness often results from such great inattention to social stimuli that the children fail to observe adequately the modeled events. Even on occasions when the children attend closely to modeling cues, given an impoverished behavioral repertoire their reproductions of the therapist's behavior are deficient because many of the required components for the modeled responses are lacking. In addition to the use of graduated modeling, powerful incentives are employed to enhance attentiveness and to activate into performance the responses that have been acquired as a function of exposure to the modeling cues.

In many instances modeled responses have been acquired and retained in representational forms but they cannot be enacted behaviorally because of physical limitations. Few basketball enthusiasts could ever successfully match the remarkable performance of a Wilt Chamberlain regardless of their vigilance and dutiful rehearsal.

Accurate behavioral enactment of modeling cues is also difficult to achieve under conditions where the model's performance is governed by subtle adjustments of internal responses that are unobservable and not easily communicable. An aspiring operatic singer may benefit considerably from observing an accomplished voice instructor; nevertheless, skilled vocal reproduction is hampered by the fact that the model's laryngeal and respiratory muscular responses are neither readily observable nor easily described verbally. The problem of behavioral reproduction is further complicated in the case of highly coordinated motor performances (e.g., golf) in which a person cannot observe many of the responses he is making and must therefore primarily rely upon proprioceptive feedback cues.

Incentive or motivational processes. A person may acquire, retain, and possess the capabilities for skillful execution of identificatory behavior, but the learning is rarely activated into overt performance due to negative sanctions or inadequate positive reinforcement. When favorable incentives are introduced, observational learning promptly emerges in action (Bandura, 1965b). As noted earlier, incentive conditions can, of course, affect learning and retention as well as performance. Since most theories of identification are built around performance-related variables, the factors presumed to control identificatory performances will be discussed at length in succeeding sections.

It is evident from the foregoing discussion that observers do not function as passive video-tape recorders which register indiscriminately and store symbolic representations of all modeling stimuli encountered in everyday life. Identificatory learning constitutes a multiprocess phenomenon that is determined by factors regulating sensory registration of modeling stimuli, their transformation to representational forms, subsequent stabilization and retrieval of modeling contents, response capabilities, and motivational processes.

VARIABLES GOVERNING PERFORMANCE OF IDENTIFICATORY RESPONSES

A thorough review of the literature on theories of identification discloses a remarkably narrow range of conditions that supposedly regulate spontaneous performance of modeling behavior. According to psychoanalytic theory, which has provided the most widely accepted explanation of modeling phenomena, there exist two sets of familial conditions, both frustrative or aversive, that induce a child to identify with his parents (Bronfenbrenner, 1960; Freud, 1923, 1925). These hypothesized processes, labeled *anaclitic* and *defensive* identification, are discussed, along with pertinent experimental findings, in the sections that follow.

Nurturance Withdrawal

Anaclitic identification (Freud, 1925) is believed to occur during the first few years of life when a nurturant adult, usually the mother, to whom the child has developed a nonsexual attachment withdraws affectual gratifications. The resulting threat of loss of love then motivates the child to "introject" the parent's behavior and attributes. This general formulation has been reinterpreted and elaborated in terms of learning theory by Mowrer (1950, 1958) and Sears (1957) to furnish more empirically verifiable implications.

According to Mowrer's reformulation (1950), when a parent mediates the child's primary gratifications her behavior gradually takes on secondary reward value as a function of repeated contiguous association with rewarding experiences. On the basis of stimulus generalization, responses that resemble those of the parent generate positively reinforcing effects in proportion to

their similarity when performed by the child. Consequently, the child can produce self-rewarding experiences when the parent is absent or withdraws her attentions simply by reproducing as closely as possible the parent's positively valenced behavior.

Sears (1957; Sears et al., 1965) likewise considers a nurturant interaction between a caretaking adult and a child as a necessary precondition for identification. Through this basic relationship the child learns to want and to value the maternal behaviors that have accompanied rewarding caretaking activities and, by the end of the first year of life, the child acquires a dependency motive. However, for reasons of social necessity and the need to develop the child's independence, the mother begins reducing or withholding affectionate interaction and nurturance. The consequent dependency frustration leads the child to adopt the method of role practice as a means of reinstating the maternal nurturant responses. The child thus secures self-rewards by imitating or role-playing maternal behaviors that possess conditioned reward value. In the earlier formulation (Sears, 1957) it was further hypothesized that, as a function of repeated association of imitation with direct or self-produced rewards, identification becomes an acquired drive for which the satisfying goal response is behaving like another person. More recently, however, Sears (Sears et al., 1965) has conceptualized identification as a generalized habit of role practice rather than as a secondary drive.

There is evidence from naturalistic studies of child-rearing antecedents of identification that, compared to boys whose fathers were relatively nonnurturant, boys of warm affectionate fathers display a higher degree of male-role preference (Mussen & Distler, 1959), stronger masculine vocational interests (Mussen, 1961), and greater father-son similarity in response to items on a personality inventory (Payne & Mussen, 1956); more often assume the father role in doll-play activities (P. S. Sears, 1953); and more frequently perceive themselves as thinking and acting like their fathers (Bandura & Walters, 1959).

In naturalistic relationships nurturance may exert its effects upon modeling through means other than the endowment of self-reinforcing properties to modeled behavior. Warm affectionate parents are more likely than cold aloof ones to engage in frequent and extensive interactions with their children thus providing them with more opportunities to observe and to learn parental patterns. Moreover, influence processes are typically bidirectional, in which case children who express parental values and emulate their behavior might be expected to increase the level of both parental affection and interpersonal contact. Several modeling studies have been conducted in which the rewarding quality of the model is manipulated experimentally, the amount of exposure to the modeling cues is controlled, and the influence of reciprocal reinforcement is eliminated (Bandura & Huston, 1961; Henker, 1964; Mischel & Grusec, 1966). In accord with correlational findings, these experiments have generally shown that an adult who is warm and nurturant elicits considerably more imitative behavior from children than a model who lacks rewarding qualities. Similar results are also obtained when parents, preselected on the basis of high

or low nurturance, serve as models for their children on imitation performance tasks (Hetherington & Frankie, 1967; Mussen & Parker, 1965).

Although the available data generally support the hypothesized relationship between nurturance and identification, finer analyses of matching performances indicate that the theory of anaclitic identification may require substantial qualification. First, modeling outcomes are considerably less generalized or pervasive than the theory assumes. Mischel and Grusec (1966), for example, found that a prior nurturant interaction with the model enhanced children's spontaneous reproduction of the model's socially neutral behaviors, but it did not increase their willingness to perform matching responses that possessed aversive qualities. Some further evidence of the differential effects of nurturance on reproduction of different classes of modeling behavior is provided in a study by Bandura and Huston (1961). Whereas the model's rewarding quality facilitated imitation of verbal and stylistic responses, children readily adopted aggressive responses regardless of the degree of the model's nurturance. The foregoing results, and data that will be cited later, demonstrate that the rewarding property of a model is often a facilitative but not a necessary condition for imitation, and that children typically display imitative response specificity rather than a generalized disposition to emulate the behavior of others.

The problem is further complicated by the fact that a high degree of nurturance may, in fact, *diminish* identification, depending upon the pattern of behavior that is being transmitted. This is clearly illustrated in an experiment (Bandura, Grusec & Menlove, 1967b) designed to identify conditions under which children willingly adopt high standards of achievement that result in negative self-evaluations and self-denial of available rewarding resources.

Most learning interpretations of the socialization process emphasize the role of extrinsic reinforcement in the modification and maintenance of social behavior. A highly important, but largely ignored, reinforcement phenomenon is evident when a person adopts a standard of what constitutes a worthy performance and rewards himself when he attains his self-imposed standard, but engages in self-critical or self-punitive behavior when his performances fall short of self-prescribed norms.

It has been shown in a series of studies that self-monitoring reinforcement systems can be readily transmitted to children through exposure to the self-reinforcement patterns displayed by adults and peers (Bandura & Kupers, 1964). However, children are inclined to reject superior models who set themselves relatively high standards (Bandura & Whalen, 1966). In order to determine whether the rejection process could be counteracted, we introduced, in a subsequent experiment, social variables that would be expected to enhance modeling. One group of children experienced a highly rewarding interaction with an adult model who subsequently exhibited high criteria for self-reward and was praised for adhering to high standards. With other groups of children the model assumed a nonnurturant attitude or received no social recognition for high standard-setting behavior. In addition, half the children in each con-

dition also observed a peer who displayed a low standard of behavior in order to determine the effects of exposure to conflicting modeling cues.

This experiment disclosed, among other things, that children who had experienced a highly nurturant and rewarding interaction with the adult model were more inclined to accept the low standards set by the peer than if the adult were less beneficent. In this case, high nurturance was conducive to ready self-gratification rather than to modeling the stringent achievement demands self-imposed by the rewarding adult.

Finally, it should be noted that the experimentation establishing a covariation between nurturance and identification is based almost entirely upon modeling studies utilizing two-person groups. There is some evidence (Bandura et al., 1963b) that developmental principles based upon a two-person paradigm may be subject to stringent limitations, since the introduction of additional social variables can produce significant changes in the functional relationships between the rewarding properties of a model and children's matching behavior.

In the experiment referred to above, which employed triads, one adult served as a controller of highly rewarding resources, and another adult and a child were placed in a competitive situation so that rewards given to one person precluded their availability for the other. Children who were treated generously by the controller subsequently exhibited more total imitation (i.e., the number of characteristics of both adult models that were reproduced) than children who lost out in the competition and were ignored. However, the effect of combining direct gratification of the child with resource ownership by the female model was primarily to increase imitation of the neglected male, rather than to enhance imitation of the model who generously provided the child with food, attractive toys, and a great deal of positive attention. In fact, boys who were the recipients of the generous treatment from the female model tended to favor slightly the ignored male as their object of imitation. Post-experimental interviews revealed that the rewarded boys felt sympathetic toward the neglected male and were mildly critical of the controller for not being more charitable with her bountiful resources. However, children exhibited a marked preference in imitating the behavior of the rewarding model under conditions where they received the same nurturant treatment but the other adult was excluded by choice rather than through competitiveness. Thus, the same absolute level of the model's rewarding quality exerted a differential effect upon children's degree and pattern of imitation, depending upon whether they were provided gratifications within a competitive or a nonrivalrous interpersonal setting. These findings indicate that modeling may be affected to a greater extent by interpersonal contrast of rewarding treatment in interaction with other social variables than by the absolute magnitude of reward.

It would appear from the over-all evidence based on research conducted within a social-learning framework that the developmental or anacritic theory of identification, which assumes that nurturance promotes modeling, may be valid only under certain limiting conditions. The findings of other studies also raise questions concerning the interpretation of the process of defensive

identification, or identification with the aggressor, which is frequently invoked to account for modeling outcomes.

Fear of the Aggressor

The theory of defensive or aggressive identification (Freud, 1923) presumably applies only to boys. This form of identification is viewed as the outcome of the resolution of the Oedipus complex, in which the boy reduces anxiety deriving from anticipated punishment by castration for his incestuous wishes toward his mother, and rivalrous feelings toward his father, by emulating the characteristics of the threatening father. Although this theory suggests an incentive, other than feared loss of love, for identification, it provides no satisfactory explanation as to why modeling the behavior of a threatening competitor should reduce anxiety. Indeed, it is highly probable that the reproduction of aversive modeled behavior would generate negative effects and, except for adoption of paternal prohibitions, behaving like a menacing antagonist would accent the rivalry and thus augment rather than attenuate anticipatory fear of punishment.

Whiting (1959, 1960) has recently proposed an extension of Freud's defensive identification hypothesis in which envy and vicarious gratification rather than anxiety reduction are presumed to be the major motivational and reinforcing mechanisms for identificatory behavior. In his status-envy theory, Whiting depicts identification as an outcome of a rivalrous interaction between the child and the parent who occupies an envied status. While Freud presents the child as competing with the father primarily for the mother's sexual and affectional attention, Whiting regards any forms of reward, maternal or social, as valued resources around which rivalry may develop. This theory further assumes that the more strongly a child envies the status of another person in respect to the consumption of desired resources of which he feels himself to be deprived, the more he will enact the role of that person in fantasy. Hence, when a child competes unsuccessfully with an adult for affection, attention, food, and care, he will envy the adult consumer and consequently identify with him.

In contrast to the status-envy interpretation of modeling, a social power theory of identification (Maccoby, 1959; Mussen & Distler, 1959; Parsons, 1955) would predict that the controller, rather than the consumer, of rewarding resources would be selected as the primary model for emulation.

In order to test predictions derived from these opposing theories of identification, an experiment was conducted (Bandura et al., 1963b) with the use of three-person groups representing prototypes of the nuclear family. In one condition of the experiment an adult assumed the role of controller of highly rewarding resources including attractive play materials, appetizing foods, and high status objects. Another adult was the recipient of these resources, while the child, a participant observer in the triad, was seated at a distant table and totally ignored. In a second experimental condition one adult controlled the

resources; the child, however, was the recipient of the positive attention and rewarding resources, while the other adult, who was assigned the subordinate role, was neglected.

An adult male and an adult 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 family; for the remaining children, the female model mediated the positive resources as in the wife-dominant home. Following the experimental social interactions, the two adult models performed several tasks in the presence of the child, during which they exhibited divergent motoric and verbal patterns of behavior, and differential preferences for colors, pictorial items, and apparel. The child then performed the same tasks in the absence of the two adults, and measures were obtained of the degree to which he patterned his behavior after that of either model.

The results of this experiment reveal that children tend to identify with the source of rewarding power rather than with the envied competitor for rewards. 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 be a major determinant of the development of both sex-appropriate behavior and deviant sex-role tendencies.

Whiting's reformulation of the defensive identification process stresses the envy aspects of the psychoanalytic interpretation. However, the original theory (Freud, 1923) and supporting anecdotal evidence presented by Anna Freud (1946) and Bettelheim (1943) emphasize the anxiety-provoking and aggressively threatening qualities of the model. It is evident from the illustrative case data provided by Anna Freud and Bettelheim that the conditions under which identification with the aggressor is presumed to occur differ from those originally proposed by Freud. Moreover, most of the examples of aggressive behavior can be adequately accounted for without invoking a mediating identificatory process.

In a number of Anna Freud's cases, for example, the person who supposedly serves as the model in fact displays no aggression and the therapist simply assumes that the aggressive child is expecting physical attack. While the child's anticipatory aggression could be interpreted as a defensive maneuver, it could hardly represent identification with the aggressor any more than swatting a mosquito represents insect identification on the part of a threatened adult. In others of Freud's illustrations a child who was accidentally hurt by a games-master in an outdoor game at school wears military apparel the following day, and a boy who had undergone dental treatment subsequently displays aggressively demanding and destructive behavior during a therapeutic session. It is, of course, entirely possible that the boys' behavior and the previous experience of being hurt are totally unrelated and, even if a contingency were involved, it is unclear from the illustration why the boys failed to reenact the behavior of the dentist or the games-master. The clearest example that Freud gives of actual imitative behavior involves the case of a boy who

mimicked his teacher's angry grimaces while the latter was punishing or reprimanding him. Freud's interpretation that the boy "through his grimaces was assimilating himself to or identifying himself with the dreaded external object" (p. 118) is complicated by the fact that the boy's imitative grimaces provoked bursts of laughter from his classmates, thus providing strong social reinforcement for the matching facial expressions. It is therefore doubtful, even in the latter case, that the imitative behavior was maintained by anxiety-reducing mechanisms.

It is likewise apparent in Bettelheim's (1943) account of prisoners' behavior in a Nazi concentration camp, which is also frequently cited as evidence for the occurrence of identification with the aggressor, that most of the behavioral outcomes described may not, in fact, have involved identificatory processes. For example, Bettelheim reports that many of the older prisoners were verbally and physically aggressive toward newcomers and potential troublemakers, sometimes behaving more aggressively than their guards when placed in charge of others; they enforced nonsensical rules that the Gestapo had at one time or another imposed on the group; some of the older captives even modified their uniforms to resemble those of the guards and resented sympathetic foreign correspondents who criticized the Germans.

It is true that the old prisoners often imposed on their fellow captives aversive controls similar to those that they themselves had endured, but it is by no means clear whether their behavior represented identification with the aggressor, in the sense that the concept is employed in psychoanalytic theory. The Gestapo consistently imposed group-oriented punishments in which the transgressions of any individual resulted in brutal torture of the entire group. When two prisoners attempted to escape, for example, all the prisoners were punished by being forced to stand at attention in a snow storm without overcoats for hours, during which many died from exposure, and several hundred later had to undergo amputations of their badly frozen extremities. Since the group consequences were generally extremely aversive and the demands of the guards highly capricious, it is not surprising that, in order to escape brutal and degrading treatment, experienced prisoners often enforced demands that were unpredictably imposed by the Gestapo officers. The prisoners' punitive rule enforcement may thus represent straightforward avoidance behavior designed to suppress transgressions that would endanger the whole group, rather than emulative behavior. Indeed, the explicit purpose of the hostage and group-punishment system was to make every prisoner feel responsible for the acts committed by other group members.

Similarly, antagonism toward foreign correspondents and former fellow-prisoners who had publicly reported cruelties perpetrated in the concentration camps, also interpreted by Bettelheim as an example of identification with the aggressor's ideology, may have been due simply to the fact that newspaper accounts written by these persons brought severe punishment on the prisoners.

Bettelheim does provide evidence that, in some cases, prisoners went to great lengths to emulate the guards. Some of the old captives, for example, collected pieces of Gestapo uniforms and sewed their own uniforms so as to

resemble those of the guards. However, such imitative behavior was punished by the guards and therefore could hardly have served as anxiety-reducing or defensive functions. Indeed, since this particular modeling behavior persisted in spite of the explicit negative sanctions, it seems to furnish disconfirmatory evidence for the defensive identification hypothesis and perhaps to suggest that the prisoners were, in accordance with social-power theory, emulating the Gestapo elite who possessed potent rewarding and coercive power. Based on experimental evidence provided by Epstein (1966), that persons who display high authoritarianism are prone to imitate punitive behavior of aggressive models, one might expect that prisoners who had developed authoritarian attitudes before their imprisonment (some were formerly prominent politicians) would be predisposed to admire and imitate these attributes in the guards. Striving to emulate the elite who possess control over desired resources is a characteristic also of upwardly mobile persons who, like the prisoners in question, tend to persist in their imitative behavior in spite of rebuffs that they incur from their peers and admired models.

The case material discussed above, and empirical investigations of aggressive identification (Sarnoff, 1951), illustrate the vague and loose criteria that are typically employed in designating aggressive response patterns as outcomes of a defensive identificatory process. Even in cases where aggression is clearly imitative, findings of controlled experiments present some basis for questioning whether the matching behavior is maintained by anxiety-reducing mechanisms.

There is considerable evidence that both children and adults readily imitate aggressive models presented on film who obviously constitute no threat whatever (Bandura, Ross & Ross, 1963a; Hartmann, 1965; Hicks, 1965; Walters & Thomas, 1963). Moreover, studies in which the model's aggressive behavior incurs either rewarding or punishing consequences (Bandura, 1965b; Bandura, Ross & Ross, 1963c) demonstrate that the success of the model's behavior is a crucial factor in determining the degree to which an aggressive pattern of behavior will be spontaneously reproduced by observers. On the basis of the response-consequences interpretation of modeling effects, it would be predicted that if the behavior of an aggressive model is highly effective in gaining control over rewarding resources, observers will identify with the aggressor, even though they may dislike the model's attributes (Bandura et al., 1963c). If, on the other hand, the aggressor's behavior fails to gain power and control over persons and their resources, or in fact produces punishing outcomes, identification with the aggressor will not occur.

In most naturalistic situations the possible influence of the threat value of modeled aggression and its effectiveness in producing rewarding outcomes are confounded. That is, an aggressor may not only be fear-provoking, but he provides repeated demonstrations that by dominance through physical and verbal force he can gain possession of material resources, he can change rules to fit his own needs and wishes, he may gain control over and extract subservience from others, and he can level barriers which impose blocks or delays in gratification. Evidence that the behavior of domineering models is extensively

emulated (Bandura et al., 1963c; Hetherington & Frankie, 1967; Hoffman, 1960) does not necessarily establish anxiety reduction as the underlying mechanism governing the identificatory performances. An alternative explanation can be offered in terms of the utilitarian value of power-assertiveness. Although it has been shown that fear of a punitive model is not a necessary condition for identification with aggressors, the question of whether fear is a facilitative, impeding, or irrelevant factor in the identification process can be best answered through laboratory studies in which threat and rewarding and punishing consequences to the model are independently manipulated.

According to the theories of identification reviewed in the preceding sections, in order to get a boy to emulate a baseball player such as Mickey Mantle, it would be necessary for the youngster to develop an intense attachment to the brawny model, who would then withhold affectional responsiveness, thereby motivating the child to incorporate the modeled stylistic behavior. Or the athletic youngster would have to develop strong incestuous desires toward Mrs. Mantle, hostile rivalrous feelings toward the baseball slugger, and, as a way of reducing anxieties generated by his libidinal feelings and the anticipated threat of castration, the boy would begin to swat home runs and otherwise behave like his threatening competitor.

It is evident from informal observation that youngsters emulate athletic models extensively without any direct personal contact or Oedipal entanglements with them. One would predict from the social-learning theory of vicarious reinforcement (Bandura, 1965a) that boys will strive to duplicate the roles and stylistic performances of baseball players who maintain an impressive batting average and are therefore the recipients of public adulation. If, on the other hand, the players' athletic achievements and social applause should wane, they would quickly be abandoned as models for emulation.

A social-learning theory of observational learning is not confined to imitation of models to whom the observer has a cathectic attachment, but is designed to encompass a diversity of modeling outcomes based upon direct and vicarious experiences with actual and symbolic models. In this formulation the incentive conditions impinging upon the model and imitative response feedback variables, as well as the model's competence, rewarding quality, and social power, are regarded as important determinants of overt expression of identificatory responses. These incentive variables, and other parameters governing the performance of modeling behavior, are considered next.

Reinforcement Control of Identificatory Behavior

The extent of utilization of identificatory response patterns is greatly influenced by the reinforcing consequences and the social sanctions associated with imitative behavior. Thus, for example, in a series of studies by Kanareff and Lanzetta (1958, 1960; Lanzetta & Kanareff, 1959), in which the functional value of imitative responses was systematically varied, the level of matching behavior was found to increase with increasing probability of positive rein-

forcement. Conversely, when matching responses are consistently nonrewarded (Baer & Sherman, 1964; Miller & Dollard, 1941) or negatively sanctioned (De Rath, 1964; Kanareff & Lanzetta, 1958), imitative behavior is extinguished or inhibited.

Positive reinforcement of specific identificatory responses may not only increase the spontaneous performance of rewarded matching behavior, but it can, under certain conditions, also establish a generalized imitative response tendency. The phenomenon of generalized imitation has been interpreted by Baer and his associates (Baer & Sherman, 1964) in terms of self-reinforcing mechanisms. It is assumed that if accurate reproduction of modeling stimuli is consistently rewarded, behavioral similarity per se acquires secondary reinforcing properties. Thereafter a person will tend to display a high incidence of precisely imitative behaviors which, due to their acquired reward value, will be strengthened and sustained in the absence of extrinsic reinforcement.

In one study (Baer & Sherman, 1964) designed to demonstrate reinforcement control of generalized imitation, three imitative responses (head nodding, mouthing, and novel verbalizations) were established in young children by social reinforcement from a puppet who had explicitly instructed the subjects to match his modeling behavior. For a subgroup of children who showed an increase in imitative responding the puppet displayed nonreinforced bar-pressing interspersed among the other three rewarded matching responses. Under these circumstances, some of the children imitated bar-pressing in varying amounts even though this particular response was never positively reinforced. In order to further demonstrate the dependence of generalized imitation on direct reinforcement of other matching responses, social approval for imitative head nodding, mouthing and novel verbalizations was discontinued with two children. This extinction procedure resulted in decreased imitative bar-pressing in one of the two children; when reinforcement of the other three modeling responses was reinstated, imitative bar-pressing also reappeared.

The frequent references to the above study as providing dramatic evidence of reinforcement control of generalized imitation overlook the fact that, even under the strong situational demands, the imitative behavior of one-third of the children was unaffected by the reinforcement operations, and of the remaining children whose data are presented, half of them showed increments in reinforced imitative behavior, but they failed to perform the nonreinforced modeled response to any significant degree. Since reinforcement exerted no clearly predictable effects on the occurrence of generalized imitation it must have been largely determined by other unmeasured and uncontrolled variables.

Using similar reinforcement procedures with social models and more powerful incentives, Baer, Peterson and Sherman (1967) were able to establish generalized imitativeness in three severely retarded children who initially displayed a very low level of matching behavior. After an extensive period of imitation-contingent reinforcement had markedly increased modeling behavior in these children, some matching responses could be effectively maintained without reinforcement by randomly interspersing them among positively rein-

forced imitations. However, both types of matching responses rapidly declined when social approval and food were given to the children on a temporal basis rather than contingent upon imitative behavior (Figure 3.1). It was further shown that both types of matching responses could be quickly restored to their previously high level by reintroduction of response-contingent reinforcement.

In testing the efficacy of modeling procedures for establishing language in mute schizophrenic children, Lovaas and his coworkers (Lovaas et al., 1966) likewise demonstrated that the children could acquire and maintain Norwegian words imitatively without any reinforcement as long as they were rewarded for English words when correctly reproduced.

A generalized disposition to model the behavior of others can be developed by having different persons reinforce diverse types of responses in a variety of situations. However, the hypothesis that behavioral similarity becomes inherently endowed with reinforcing properties through rewarding practices requires more direct verification. If this were in fact the governing mechanism, matching responses should not undergo such abrupt and marked extinction (Figure 3.1) the moment that reinforcement for the larger subclass of imitative

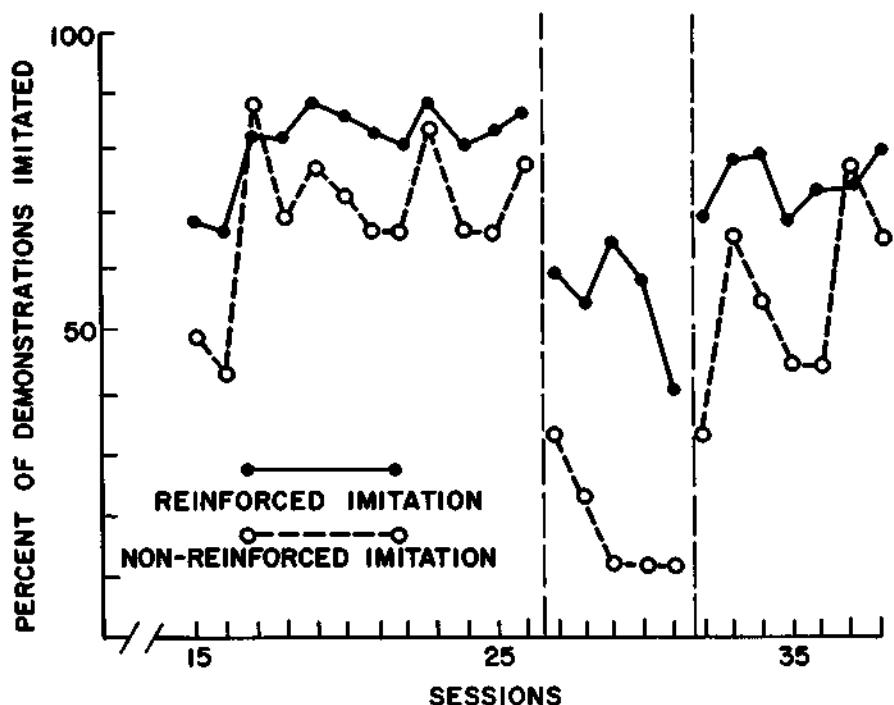


FIGURE 3.1. Per cent of reinforced and nonreinforced modeled responses reproduced by one child during periods when rewards were made contingent upon either the occurrence of matching responses or after a certain period of time had elapsed. Adapted from Baer, Peterson and Sherman, 1967.

responses is withdrawn, since one would not expect similarity cues to lose their reinforcing properties that suddenly. Rather, the intrinsic rewards arising from precise response duplication should sustain imitative behavior for some time in the absence of externally administered reinforcers.

An alternative explanation for the occurrence of generalized imitation can be offered in terms of discrimination rather than secondary reinforcement processes. When a few nonrewarded modeled responses are randomly embedded in a large number that are consistently reinforced, the two sets of modeling responses cannot be easily distinguished and are therefore likely to be performed with similar frequency. If, on the other hand, the discriminative complexity of the modeling task were reduced by having the model portray a series of reinforced responses, followed by the set of readily discriminable responses that are never rewarded, the observer would eventually recognize that the latter responses never produce positive consequences and he would, in all likelihood, discontinue reproducing them. A discrimination hypothesis thus leads to a prediction which is opposite to that derived from the principle of secondary reinforcement. According to the acquired reward interpretation, the longer imitative responses are positively reinforced, the more strongly behavioral similarity is endowed with reinforcing properties, and consequently, the greater is the resistance to extinction of nonrewarded matching responses. In contrast, discrimination theory would predict that the longer the differential reinforcement practices are continued, the more likely the observer is to distinguish between rewarded and nonreinforced imitative behaviors resulting in rapid extinction of nonreinforced imitative responsivity.

The occurrence of generalized modeling is also probably determined in part by the invariant conditions under which laboratory tests are conducted. Reinforced and nonrewarded responses are typically exhibited by the same model, in the same social setting, during the same period of time, and after subjects have been strongly urged to behave imitatively. On the other hand, under naturally occurring conditions which are highly variable and more easily distinguishable, there appears to be considerable specificity to modeling behavior. If close matching does in fact become self-reinforcing, then its occurrence should not be as restricted in generality. The issue would appear to be one of performance rather than learning, since persons do know how to match. Performance is primarily a function of anticipated outcomes which, in turn, is partly determined by the degree of similarity between new situations and situations in the past in which the particular response has been reinforced.

Although the influential role of reinforcement in maintaining the modifying identificatory behavior has been amply demonstrated, the major determinants of generalized modeling have not been adequately established.

Influence of Vicarious Reinforcement on Modeling

In social-learning theory special consideration is given to the role of vicarious reinforcement, as evidenced by changes in the behavior of observers as a

function of witnessing reinforcing stimuli administered to performers. There is considerable experimental evidence (Bandura, 1965a) that observation of rewarding or punishing consequences to a model can substantially affect the extent to which observers willingly engage in identificatory behavior. Indeed, comparative investigations of the relative efficacy of vicarious and direct reinforcement reveal that the behavioral changes displayed by observers are generally of the same magnitude as those achieved by reinforced performers (Kanfer & Marston, 1963) or, under certain conditions, may even exceed them (Berger, 1961). Moreover, vicarious reinforcement effects are governed by such variables as the percentage (Kanfer, 1965; Marston & Kanfer, 1963), intermittency (Rosenbaum & Bruning, 1966), and magnitude (Bruning, 1965) of reward in essentially the same manner as when they are applied directly to a performing subject.

The effect of observing response consequences to a model on the acquisition and spontaneous performance of matching responses is illustrated by a study (Bandura, 1965b) in which children observed a film-mediated model who exhibited a number of novel physical and verbal aggressive responses. In one condition the model was severely punished following the display of aggressive behavior; in a second treatment the model was generously praised and rewarded; the third condition depicted no response consequences to the model. A post-exposure test for spontaneous imitation revealed that the reinforcement contingencies applied to the model's aggression produced differential degrees of matching behavior. Children who had observed the model rewarded, or having suffered no adverse consequences, for his behavior displayed a significantly greater variety of imitative responses than children who saw the model punished. Moreover, boys emulated substantially more of the model's behavioral repertoire than girls; these differences were particularly marked when modeled aggression resulted in punishing consequences (Figure 3.2).

Some additional findings of this study again highlight the necessity for distinguishing between identificatory learning and spontaneous performance of matching behavior. Following the performance test, children in all three groups were offered highly attractive incentives contingent upon their reproducing the model's responses, in order to counteract the inhibiting effects of vicarious punishment and thus to actualize the modes of behavior that the children had acquired observationally. As shown in Figure 3.2, the introduction of positive incentives completely eliminated the previously observed performance differences, revealing an equivalent amount of identificatory learning among children in the model-rewarded, model-punished, and the no-consequences conditions. Similarly, the initially large sex difference in imitative aggression also was virtually eliminated.

Discrepancies between extent of response acquisition and performance level are most likely to obtain under conditions where behavior is negatively sanctioned. Thus, the children who displayed significant increments in imitation when the behavior was positively reinforced were boys who had observed the aggressive model punished, and girls for whom, in our culture, physically

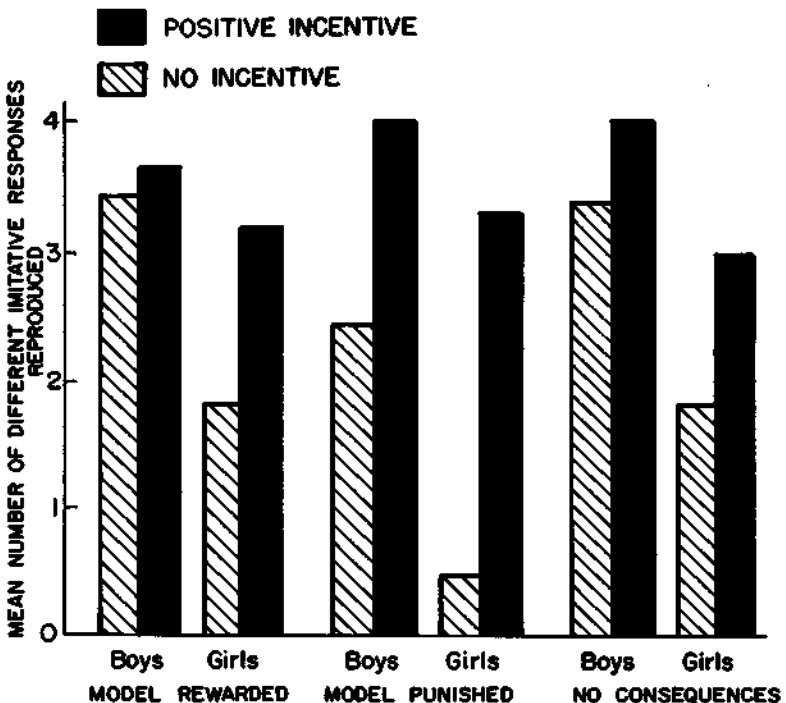


FIGURE 3.2. Mean number of different matching responses reproduced by children as a function of response consequences to the model and positive incentives. Bandura, 1965b.

aggressive behavior is typically labelled sex-inappropriate or is negatively sanctioned.

Most differences existing in the behavior of boys and girls are often explained in terms of differential masculine and feminine identification. It would appear from evidence that positive incentives essentially eliminate sex disparity in performed aggression, that most sex differences may primarily reflect differences in willingness to exhibit observationally-learned behavior because of the nature of prevailing social sanctions, rather than deficits in identificatory sex-role learning.

Under most conditions people readily adopt appropriate modeled responses. However, in some problem-solving and achievement-like situations they display strong counter-imitation tendencies for fear that matching behavior will be considered cheating, copying, or subservience and, therefore, socially disapproved (Lanzetta & Kanareff, 1959; Luchins & Luchins, 1961; Schein, 1954). The inhibiting effect of anticipated negative sanctions for imitation can be overcome in observers through positive reinforcement of the model's responses (Clark, 1965). Further evidence that imitative behavior can be enhanced or inhibited by observation of reinforcing consequences to a model's responses is provided by Walters and his associates (Walters & Parke,

1964; Walters, Parke & Cane, 1965). In the latter studies children who witnessed a peer model transgress with rewarding or no adverse consequences deviated more readily and more often than those who saw the same model punished for engaging in the socially disapproved behavior.

In cases where a model displays reprehensible behavior, it is interesting to note that the nonoccurrence of anticipated punishing consequences may influence the observer's responses to the same degree as witnessed rewarding outcomes. These findings suggest that nonreaction to formerly prohibited activities may take on, through contrast, positive qualities. Similar contrast-of-reinforcement effects have been demonstrated in studies of direct reinforcement (Buchwald, 1959a, 1959b; Crandall, 1963; Crandall, Good & Crandall, 1964) in which nonreward following punishment had functioned analogously to a positive incentive, whereas the occurrence of nonreward subsequent to a series of rewards had operated as a negative reinforcer. In fact, even a weak positive incentive, when contrasted with more rewarding prior events, may acquire punishing properties (Buchwald, 1960). The reinforcing effects of witnessed outcomes on matching behavior may therefore be determined to a large extent by the context in which the events occur and the customary sanctions associated with particular modeled response patterns.

Because previous studies have utilized deviant modes of behavior, which may be readily disinhibited through omission of negative consequences, the results provide no clear evidence for the occurrence of positive vicarious reinforcement. However, findings of a recent experiment (Bandura, Grusec & Menlove, 1967b) involving modeled behavior that is usually positively sanctioned reveal that social rewards dispensed to a model can have a strong impact on observers' identificatory behavior. Children who had observed an adult model adopt high achievement standards for self-reward, and receive social recognition for adhering to such exacting norms, subsequently imposed on themselves higher achievement demands than children who had witnessed the model portray the same stringent pattern of self-reward with no socially rewarding consequences. The enhancement of modeling through vicarious social reinforcement is particularly striking in this case, considering that the self-imposition of exceedingly high standards occurred in the absence of any social agents, and the emulative behavior resulted in increased negative self-evaluation and considerable self-denial of freely available rewards.

The discussion so far has been primarily concerned with the extent to which other persons are affected by rewards or punishments administered to the performing model by external social agents. Results of investigations concerned with the social transmission of self-reinforcing behavior (Bandura & Kupers, 1964; Bandura & Whalen, 1966) disclose that discriminative patterns of inhibition of self-rewarding responses can be acquired through observation of achievement-contingent rewards and punishments self-administered by the model. These findings suggest that observers' self-controlling responses can be modified and reinforced by models' self-evaluative and self-punitive reactions to deviation.

Although the influence of vicarious reinforcement on identificatory behavior is well-established, the behavioral changes displayed by observers may be interpreted in several ways (Bandura, 1965a). Response consequences experienced by another person undoubtedly convey information to the observer about the probable reinforcement contingencies associated with analogous performances in similar situations. Reinforcing stimuli presented to the model may therefore serve to facilitate or inhibit emulative behavior through their discriminative or informative function. Knowledge gained from witnessing the outcomes experienced by models would be particularly influential in regulating behavior under conditions where considerable ambiguity exists about what constitutes permissible or punishable actions, and where the observer believes that the model's contingencies apply to himself as well. It is highly unlikely, for example, that witnessing social approval for physical aggression exhibited by a person occupying a unique role, such as a policeman, would evoke imitative aggressiveness in observant citizens to any great extent. If the predictability of social-learning theory is to be further increased, experiments are needed that test the magnitude of vicarious reinforcement effects as a function of comparability of social sanctions customarily applied to models and observers.

A model's responses are often differentially reinforced depending upon the persons toward whom the behavior is directed or the social settings in which it is expressed. When differential consequences are correlated with different stimulus conditions, observation of the pattern of reinforcement associated with the model's responses helps the observer to identify the social or environmental stimuli controlling the model's behavior. These may be difficult to distinguish without the observed informative feedback. Hence, through repeated exposure to the outcomes of others, an observer not only acquires knowledge of predictable reinforcement contingencies, but may also discern the cues for the model's correct responses. The resultant discrimination learning can later facilitate the performance of appropriate matching responses in the presence of the cues to which the model previously had been responding with favorable consequences (Church, 1957; McDavid, 1962).

Observation of reinforcing outcomes and the model's concomitant reactions may also have important activating or motivational effects on an observer. The mere sight of highly valenced reinforcers can produce anticipatory arousal which, in turn, will affect the level of imitative performance. Similarly, variations in the magnitude of observed reinforcers, although providing equivalent information about the permissibility of matching responses, have different motivational effects on observers (Bruning, 1965). As in the case of direct reinforcement, incentive-produced motivation in observers is most likely to affect the speed, intensity, and persistence with which matching responses are executed.

The affective expressions of models undergoing rewarding or punishing experiences generally elicit corresponding emotional responses in viewers (Dysinger & Ruckmick, 1933). These vicariously aroused emotional responses can readily become conditioned, through repeated contiguous asso-

ciation either to the modeled responses themselves, or to environmental stimuli (Bandura & Rosenthal, 1966; Berger, 1962) that are regularly correlated with the model's affective reactions. Similarly, the nonoccurrence of anticipated aversive consequences to a model can extinguish in observers previously established emotional responses that are vicariously aroused by threatening modeled displays (Bandura, Grusec & Menlove, 1967a; Bandura & Menlove, 1968; Bandura, Blanchard & Ritter, 1967). It is therefore possible that the facilitative or suppressive effects of observing the affective consequences accruing to the model may be partly mediated by the vicarious arousal or extinction of emotional responses.

Finally, reinforcements administered to another person may have important social evaluative consequences. Punishment is apt to devalue the model and his behavior, whereas models who are recipients of praise and admiration tend to be attributed high prestige, status, and competence (Hastorf, 1965). Model status changes, in turn, can significantly affect observers' subsequent performance of matching responses. A particular vicarious reinforcement event, depending on its nature and context, may thus produce behavioral changes in observers through any one or more of the five processes outlined.

Further research is needed to separate the relative contribution of cognitive, emotional, and other factors governing vicarious reinforcement effects. The available evidence nevertheless presents some basis for assuming that the principle of vicarious reinforcement, together with the stabilizing effect of covert rehearsal, can explain the persistence of identificatory behavior in observers without overt responding or the support of direct reinforcement. Indeed, children frequently acquire and retain on a long-term basis adult-rewarded but child-prohibited behavior patterns that are not reproduced until the child has reached the age or social status that makes the activity appropriate or acceptable.

Influence of Model Status Cues Signifying Differential Reinforcing Outcomes

Overt performance of identificatory behavior is influenced not only by immediate response consequences to the model, but also by distinctive status-conferring symbols and model attributes; these are usually dealt with by social psychology in terms of such variables as prestige, power, competence, socio-economic status, and expertise (Asch, 1948; Campbell, 1961).

The strong control exercised by discriminative characteristics of a model on imitative behavior is well-documented in social-psychological research. For example, models who have demonstrated high competence (Gelfand, 1962; Mausner, 1954a, 1954b; Mausner & Bloch, 1957; Rosenbaum & Tucker, 1962), who are purported experts (Mausner, 1953) or celebrities (Hovland, Janis & Kelley, 1953), and who possess symbols of socioeconomic success (Lefkowitz, Blake & Mouton, 1955) are imitated to a considerably greater degree by both children and adults than models who lack these qualities. Other discriminative

properties of the model, such as age (Bandura & Kupers, 1964; Hicks, 1965; Jakubczak & Walters, 1959), sex (Bandura et al., 1963a; Rosenblith, 1959, 1961), social power (Bandura et al., 1963b; Mischel & Grusec, 1966), and ethnic status (Epstein, 1966), which are generally associated with predictable reinforcing outcomes, likewise influence the degree to which social attitudes and behavior will be reproduced by others.

In learning analyses of modeling phenomena as a function of status variables (Miller & Dollard, 1941), stimulus generalization and differential reinforcement are utilized as the main explanatory principles. According to this interpretation, social models differ in the extent to which their behavior is likely to be successful in producing favorable outcomes. Hence, persons are most frequently rewarded for matching the behavior of models who are intelligent, who possess certain social and technical competencies, and who, by virtue of their adroitness, occupy high positions in various status hierarchies. On the other hand, the behaviors of models who are ineffectual, uninformed, and who have attained low vocational, intellectual, and social status, are apt to have considerably less utilitarian value. As a result of repeated differential reinforcement for matching models who possess diverse attributes, the identifying characteristics gradually come to serve as discriminative stimuli that signify the probable consequences associated with behavior modeled by different social agents. Moreover, through the process of stimulus generalization, the effect of a model's prestige carries over from one area of behavior to another (an effect that is exploited in advertising), and imitative responses tend to generalize to unfamiliar persons to the extent that they share similar characteristics with past reward-producing models.

The foregoing theoretical assumptions have been verified by a series of studies (Miller & Dollard, 1941) in which the history of differential reinforcement for matching the behavior of models possessing diverse characteristics was experimentally manipulated. However, questions of the generality of the theory in its present form arise from the fact that only a relatively narrow range of social conditions has been investigated, the models characteristically display socially neutral behaviors, and negative sanctions are not imposed for emulation of high-status persons. As Miller and Dollard (1941) point out in another context, subordinate individuals are more inclined to imitate the social patterns and linguistic styles of models who occupy adjacent, rather than the most prestigious, positions in a status hierarchy, because of social barriers against marked upward mobility, and lack of the resources necessary for long periods to acquire proficiency in the elaborate customs and mannerisms of highly discrepant social groups. Under the latter conditions one would expect to find a non-monotonic relationship between prestige level of the model and amount of matching behavior.

Also, some recent evidence (Epstein, 1966) suggests that characteristics of the recipients of the model's actions may be highly influential in defining probable response consequences and thus attenuating the effects of prestige generalization. Epstein found that white college students displayed more imitative

punitiveness toward a Negro after they had observed an aggressive Negro model than when the punitive behavior was initially exhibited by a Caucasian. Since it seems reasonable to assume that people would have been rewarded most often for imitating ethnically similar models, the latter findings are not explainable in terms of generalization from prior differential reinforcement associated with model attributes alone. It is highly probable that an attack on a minority-group member by one of his own group implies greater culpability of the victim, and thus signifies to the observer more justification and permissibility for aggression than a similar assault by a representative of a majority outgroup whose actions would more likely be viewed as prejudicial and censurable. Without independent ratings of the target of aggression, and diversity in the ethnic status of observers and victims, it is not possible to determine the validity of this interpretation. The available data, however, indicate the need for systematic variation of the attributes of both the models and the targets of their behavior in order to determine the manner in which more complex relational cues and other aspects of the social situation govern generalization of imitation to unfamiliar models.

The preceding discussion has been primarily concerned with the influence of status variables on modeling of socially neutral or prosocial response patterns. There is some evidence (Lefkowitz et al., 1955) that prohibited or socially disapproved behavior can likewise be increased by exposure to high-status deviant models. Traffic signal violations by a high-status person attired in a freshly pressed suit, shined shoes, white shirt and tie produced a higher pedestrian violation rate than the same transgression performed by the same model when dressed in soiled patched trousers, scuffed shoes, and a blue denim shirt. The differential reduction in restraints is probably attributable to the fact that violations by persons who occupy a high position in a prestige hierarchy are likely to be punished less frequently and less severely, due to earned gratitude or their power to counter-aggress, than prohibited acts performed by low-status transgressors. The differential leniency is apt to be extended temporarily to the imitator as well, provided that he displays the matching behavior at the same time the protective model is disregarding the prohibition.

If, in fact, model status facilitates imitative transgression through assumed protection from punishment, the findings of a study by Wiggins, Dill and Schwartz (1965) suggest that the latter variables are not related in a simple linear fashion. Compared to individuals of intermediate status, high-status persons tend to receive less punishment for minor deviations, but are treated more severely when their transgressions produce serious consequences for group members. These findings are somewhat analogous to naturalistic situations in which severe and well-publicized punishments are administered for major transgressions by models who occupy prestigious positions in society in an effort to deter similar behavior in observers.

The prestige qualities of a model may not only increase the probability of matching behavior, but also produce stable value changes through the process of higher-order vicarious conditioning (Bandura, 1965a, 1968b). If a model

who elicits positive affective responses in viewers expresses strong preference for certain stimulus objects and makes pleasant evaluative statements about them, the positive reinforcing value of the objects is likely to be increased. Conversely, negative valences may become strongly conditioned to objects that are habitually associated with unpleasant evaluations portrayed by highly esteemed models.

The process of value modification through prestigeful modeling is strikingly illustrated in an ingenious experiment by Duncker (1938). In an initial test of food preferences nursery school children chose powdered chocolate with a pleasant lemon flavor over a very sweet sugar with a disagreeable medicinal taste. Later, a story was read to the children in which a stalwart astute hero abhorred a sour-tasting foodstuff similar to the children's preferred food and enthusiastically relished a sweet-tasting substance. The reactions of the admired hero reversed the children's initial food preference, as measured immediately after the story session and in six successive tests in which the children chose between powdered chocolate and sugar. Moreover, brief recall of the story reinstated the experimentally induced value change that had declined gradually over time. Although there is reason to believe, from findings cited earlier, that the prestigeful properties of the model were a significant determinant of changes in preferences, in the absence of data based on a low-status model its contribution in the present study cannot be evaluated.

More recently, Bandura, Blanchard and Ritter (1967) found that negative attitudes of long duration were drastically altered by having phobic adults observe modeled positive responses toward the repugnant attitude object without any adverse consequences accruing to the performing model. And Carlin (1965) demonstrated that young children showed a greater preference for deferred gratification after having observed an adult model display positive affective reactions while waiting for delayed rewards than when the model expressed negative emotional reactions during the imposed delay period and devalued the goal object. Results of these studies are sufficiently promising to warrant further investigation of the modification of evaluative meanings of objects and activities through their contiguous association with affective modeling cues.

Modeling as a Function of Observer-Model Similarity

The research reviewed in the preceding section examined generalization of matching responses to unfamiliar persons on the basis of their similarity to past reward-producing models. Under certain conditions, modeling can also be significantly influenced by real or assumed similarity between the observer and the model.

Stotland and his coworkers (Burnstein, Stotland & Zander, 1961; Stotland & Hillmer, 1962; Stotland & Patchen, 1961; Stotland, Zander & Natsoulas, 1961) have conducted a series of experiments on the process of identification, in each of which some subjects are initially led to believe that they are similar

in one or more attributes to a model, while other subjects are given information suggesting that they are dissimilar to the model in social background, preferences, or personality characteristics. The subjects are later informed of the model's preferential choices on a new task, and the number of matching responses induced in high and low similarity groups are compared. The results generally show that persons told they have some qualities in common with a model are more inclined to imitate additional new responses portrayed by the model than subjects who initially share no common characteristics. Moreover, within the range of conditions tested, generalized matching behavior has been found to occur without any prior acquaintance or direct social interaction with the model, and even when the relationship between the classes of modeled responses is entirely arbitrary, the possession of the initial similar attributes is a matter of chance, and the new modeled responses have no inherent rewarding properties.

According to Stotland's theoretical interpretation of identification, generalization of similarity results from a cognitive process that is characterized as follows: Individuals have a strong need to achieve cognitive consistency in their self-concepts. Therefore, when a person conceives of himself as having some characteristics in common with a model, he will introject other attributes of the model into his self-concept in order to maintain cognitive or perceptual consistency.

Although the studies by Stotland furnish some suggestive evidence for generalization of similarities, this cognitive theory of identification receives weak empirical support even in the limited conditions under which it has been tested. Several of the studies include significant attributes, but in most cases the symbolically modeled responses are of a relatively inconsequential nature (e.g., preference for musical selections, nonsense syllables or diving styles) and, following a widely accepted tradition in social psychology, the dependent measures generally involve simple self-ratings that are highly subject to response biases, rather than changes in actual social behavior. Moreover, the elusiveness of the phenomenon itself is revealed in studies (Burnstein et al., 1961; Stotland & Hillmer, 1962) that include a control condition in which no attempt is made to induce interpersonal resemblance. Whereas in many comparisons subjects in high and low similarity conditions display differential self-ratings, the two groups usually do not differ significantly from the controls. Considering that both the similarity induction and the identification model are typically presented in verbal form by the same researcher in the same situation, the relatively weak response-generalization effects may be a function of an experimentally induced set for agreement, rather than internal pressures for cognitive consistency.

It should also be noted, in this connection, that the experiments simply demonstrate generalization of imitation across different classes of modeled responses. Interpretations of these data in terms of cognitively induced motivations, perceptual processes, introjective mechanisms, and self-concept reorganization appear superfluous because, except for self-evaluative ratings which yield

equivocal results, the hypothesized mediating processes are never assessed. An alternative interpretation is that similarity facilitates modeling primarily through interpersonal attraction rather than as a consequence of striving for cognitive consistency. Byrne (1968) has shown in a series of experiments that perceived similarity between a given individual and a stranger increases attraction toward the stranger. Conversely, dissimilarity manipulations that portray the divergent model as favoring contrary interests may reduce matching behavior by arousing antipathy toward the model. Data from a condition in which the model is clearly dissimilar but possesses attributes that the subject admires and aspires to have would be particularly relevant to these alternative formulations. The cognitive consistency and the attraction hypotheses lead to opposite predictions regarding imitation of admired dissimilar models.

Even if empirical findings had strongly substantiated the cognitive-consistency interpretation of modeling, a more inclusive theory of identification would still be needed to account adequately for both the generalization of similarity across a wide range of socially significant responses and the absence of generalized matching when high initial similarity exists between observers and a model. In Stotland's theory it is assumed that new modeled responses will not be acquired through identification if they are contradictory to, or incompatible with, already existing attributes in the observer. Since this condition may obtain only rarely in socially significant areas of behavior, this theoretical formulation places severe limitations on the behavioral changes that can be achieved through the influence of models. The theory also implies that individuals would be continually reorganizing their self-concepts and changing their behavior on the basis of casual contacts with unfamiliar models who happen to share some common characteristics. Finally, there are numerous studies (Bandura & Kupers, 1964; Hicks, 1965; Jakubczak & Walters, 1959) in which children are more imitative of adults than peers—who obviously display a considerably greater number of common attributes—and adults may be more inclined to match some behaviors of ethnically dissimilar models than those of similar ethnic and socioeconomic status (Epstein, 1966). These types of findings are not explicable in terms of a cognitive theory which assumes prompt generalization of similarities.

The diverse results discussed above can be encompassed within the framework of social-learning theory in terms of stimulus generalization from prior experiences involving *analogous* reinforcement contingencies. One would expect people who possess similar characteristics to share many experiences and outcomes in common. Results of experiments with infrahuman subjects reveal that the experience of repeated common consequences is an important determinant of matching responsivity. Church (1959), for example, found that animals subjected to paired aversive consequences subsequently displayed more emotional responsivity to the pain cues emitted by another animal than a group of subjects that had received the same amount of aversive stimulation, but unassociated with the pain responses of another member of their species. Moreover, Murphy, Miller and Mirsky (1955) employing a cooperative avoidance

conditioning procedure, demonstrated that emotional responses in monkeys could be vicariously elicited not only by the sight of affective cues from their experimental counterpart, but also through stimulus generalization to another monkey who was never involved in the original aversive contingencies. Findings of these laboratory studies indicate that repeated association of similarity cues with analogous reinforcing outcomes would establish likeness as a discriminative stimulus for generalized identificatory behavior.

On the other hand, if people who share common characteristics rarely experience concordant outcomes, but emulation of dissimilar models produces favorable consequences, one would predict high imitation of new attributes portrayed by a divergent model. These are precisely the conditions under which children in Miller and Dollard's (1941) experiments learned to match the behavior of an adult rather than a peer model, and subsequently generalized this differential identificatory preference to other unfamiliar adults. This process would, of course, eventually result in high observer-model resemblance.

In either case, whether initial similarity or dissimilarity facilitates generalized matching behavior may primarily depend on the extent to which these cues have been associated in the past with paired consequences or paired opposing outcomes for models and observers. The relative influence of similarity and analogous outcomes on identification could be best evaluated by an experiment in which similar people experience opposite consequences prior to the test for imitation, whereas dissimilar people encounter identical outcomes. It would be predicted from social-learning theory that discrepant outcomes would override previously established discriminative functions of modeling stimuli. The highest level of identification would be expected to occur under conditions of high subject-model similarity and common consequences.

Role of Social-System Variables and Other Extra-Familial Influences in Identification

Traditional psychological theories of socialization would lead one to believe that social behavior can be acquired vicariously only through identification with real-life models; that interpersonal relationship factors are necessary pre-conditions for identificatory learning; that parents serve as decisive role models and, at least during the early developmental period, siblings, peers, and non-familial adults are minor sources of social behavior; that the behavioral transmission process is unidirectional (i.e., children adapt behavior exhibited by parents, but not vice versa); and that social organizational systems do not exist as sources of values and conduct. Research based on social-learning theory and analyses of behavior as a function of social-structure variables indicates that a broad range of modeling influences, both actual and symbolized, must be incorporated in a comprehensive theory of behavioral transmission.

The peer group is perhaps one of the most neglected sources of social learning in psychological accounts of the identification process. In training their children parents frequently demonstrate specific skills and desired child-

appropriate behaviors, and they may also furnish play materials suitable for enacting adult roles. However, because of the wide age disparity most of the social-response patterns spontaneously portrayed by parental and other adult figures can serve, at the most, as general guides for young children in their daily social interactions. Children must, consequently, rely to some extent on older siblings and peers as models for specific modes of behavior that parents do not ordinarily provide. Indeed, in some cultures (Bronfenbrenner, 1962) peers supersede parental figures as the principal models and agents of socialization.

The identification process becomes more complicated under conditions in which children are exposed to both parental and peer models who display conflicting standards in the same areas of behavior. Thus, in the experiment mentioned earlier (Bandura, Grusec & Menlove, 1967b), children who simultaneously observed an adult set himself high standards of achievement and a peer adopt low norms subsequently imposed less stringent standards on themselves than children who were exposed only to the behavior of the adult model. The influence of the peer's self-indulgent pattern could be effectively counteracted, however, by social reinforcement of the model's high standard-setting behavior.

The deleterious effect of conflicting identifications arising from incompatible value systems of parents and peer reference figures has received considerable attention in theories of adolescent socialization. It should therefore be emphasized in passing that selection of peer models is greatly influenced by the values prevailing in the home. Children tend to choose friends who share similar values and who are therefore more likely to reinforce familial standards of conduct than to serve as sources of conflict (Bandura, 1964; Bandura & Walters, 1959; Elkin & Westley, 1955).

As children grow older, they must draw even more heavily upon peers and other extra-familial models for several reasons. In the first place, under conditions of rapid social and technological change, many parental interests, attitudes, and role behaviors that were serviceable at an earlier period may have little functional value for members of the younger generation. New complex patterns of behavior must therefore be learned from other social agents whenever major disruptive changes introduce wide disparities among age groups. One suspects that fox-trotting parents will not necessarily prove to be the most idolized or effective models for Watusi-swinging adolescents. Indeed, in many instances, adolescents function as models for their parents, especially in a culture like ours which sets a high value on the activities and symbols of youth.

Social mobility also places severe limitations on the extent of familial transmission of behavior patterns. This is most clearly evident in studies (Ellis & Lane, 1963; Krauss, 1964) investigating the sources of high educational aspirations among lower-class children. In these families the parents themselves cannot provide satisfactory models for class-typed habits of speech, customs, social skills, and attitudes that are required for successful upward mobility. The

parents usually initiate the mobility process by encouraging and supporting high educational aspirations; admired teachers further reinforce, by approval and example, college ambitions in lower-class youths; and selective association with college-oriented middle-class peers provides the social-learning conditions for the gradual development of attitudes, belief systems, and complex behavioral repertoires necessary for achieving the desired status.

During later periods of development people must continue to draw extensively upon a variety of nonfamilial models in preparing themselves for new vocational, professional, and social roles that cannot be transmitted within the family no matter how versatile its members may be. Identification should therefore be viewed as a continuous process involving multiple modeling, rather than a phenomenon that primarily occurs in relationship to parents during early childhood, producing enduring and pervasive changes in personality characteristics.

Another neglected influential source of social learning is the abundant and diverse symbolic modeling provided in television and other audio-visual displays. Since response patterns can be acquired on a purely observational basis, it is not surprising to find in comparative studies that models provided by filmed displays can be as influential as their real-life counterparts in shaping children's behavior (Bandura et al., 1963a). In fact, many of the experiments reviewed earlier, demonstrating extensive modeling effects in both children and adults, utilized pictorially presented models.

In view of the efficacy of symbolic modeling and the large amount of time that most young people spend watching televised productions (Schramm, Lyle & Parker, 1961), mass media may play a more important part in shaping behavior and in modifying social norms than has generally been assumed. To the extent that conduct norms modeled by parental transmitters are contradicted by those exemplified by prestigious televised transmitters, the socialization influence of the family is attenuated for better or for worse, depending on the types of behavior that are repeatedly portrayed. It is highly probable that with further advances in communication technology, parents, teachers, and other socialization agents may become relatively less influential role models as increasing use is made of symbolic models. Some changes in this direction have already occurred in educational practice.

Much social learning is fostered through exposure to *behavioral modeling cues* in actual or pictorial forms. However, after adequate language development is achieved, persons rely extensively upon *verbal modeling cues* for guiding their behavior. Thus, for example, one can usually assemble relatively complicated mechanical equipment, acquire rudimentary social and vocational skills, and learn appropriate ways of behaving in almost any situation simply by matching the responses described in instructional manuals. If the relevant cues are specified clearly and in sufficient detail, verbally symbolized models may have effects that are quite similar to those induced by analogous behavioral displays. Bandura and Mischel (1965) found that children's willingness to defer gratification could be modified to an essentially comparable degree by having

them either observe an adult model exhibit delay behavior that was counter to the children's orientation, or read a verbal account of his delay pattern. The use of verbal forms of modeling makes it possible to transmit an almost infinite variety of values and response patterns that would be exceedingly difficult and time-consuming to portray behaviorally.

Normative systems that describe in detail appropriate conduct in given situations and the consequences for deviation also represent a prevalent means of influencing and regulating the social behavior of both parents and children. The interpretation of normative injunctions as a special case of symbolic modeling provides a link between conceptualizations of behavioral control favored by sociologists and those that predominate among psychologists.

FAMILIAL AND SOCIAL-SYSTEMS TRANSMISSION OF BEHAVIORAL PATTERNS

In a provocative paper Reiss (1966) contrasts theories of behavioral transmission based upon the family unit with those emphasizing institutionally organized systems, and he enumerates several reasons why the former model cannot adequately explain socialization outcomes.

As noted earlier, most personality theories maintain that values, attitudes, and patterns of behavior are primarily transmitted through the parent-child relationship. Assuming a 20-year difference between generations, a relatively long period intervenes between parental input of social values and the time when the supposedly internalized contents can be passed on to succeeding descendants. Under these conditions the rate of social change would be exceedingly slow whereas, in fact, extensive society-wide shifts in normative behavior often occur within a single generation. Reiss therefore argues that the parent-child relationship cannot be the major agency of cultural transmission. Rather, standards of conduct are disseminated by institutionally organized systems (e.g., religious, political, legal, and educational agencies) and regulated by collectively enforced sanctions. Innovation, according to Reiss's view, originates at the social organization level, whereas changes emerging within the family are of minor social consequence. Thus, for example, discriminative practices in schools, public accommodations, and voting rights are more effectively eliminated by invoking Supreme Court decisions than by waiting for bigoted parents to inculcate in their children tolerant attitudes which might result in more compassionate behavior towards Negroes when the offspring become members of school boards or motel operators twenty years later.

In general agreement with Reiss's main thesis, the theory of behavioral transmission outlined in the present chapter and elsewhere (Bandura, 1968a) assumes that social behavior is, in large part, developed through exposure to modeling cues and regulated by reinforcement contingencies, many of which are prescribed by one's organizational affiliations. Because social agencies are given a great deal of power to administer potent rewarding and punishing consequences to their members, collectively enforced sanctions can produce rapid

and widespread changes in behavior. However, a systems theory alone is insufficient to explain the varied socialization outcomes that typically exist even in relatively homogeneous sub-cultures. These differences occur because organizational prescriptions for conduct must be implemented by parents and other societal agents. Parents who, for whatever reason, do not subscribe to organizationally sanctioned codes of behavior, and who themselves display deviant characteristics, generally produce children who are also socially deviant. In addition, the child-rearing practices employed by socially conforming parents can affect indirectly the success of group control. Parental methods of training may fail to endow social and symbolic cues with the reinforcing functions required for effective socialization, and establish in children strong defiant, avoidant, or overinhibited response tendencies that serve as barriers to societal influences (Bandura & Walters, 1959; McCord, McCord & Zola, 1959). Finally, in cases where strong sanctions are not employed by governing agencies to enforce advocated changes, parents generally resist adoption of new customs, technologies, and values for some time.

In discussing the limitations of personality theories of socialization, Reiss states that, in such approaches, social changes can arise only through failures in transmission between generations. This criticism may apply to radical theories that assume that parental characteristics are introjected by children *in toto* and later passed on in unmodified forms to their progeny. In fact, social learning is a continuous process in which established patterns of behavior are often extinguished or extensively elaborated, and new modes of response are adopted. The behavioral contents transmitted by parents to children therefore include not only some aspects of their social heritage, but also response tendencies acquired from numerous sources during later periods of development. Hence, considerable modifications in characteristic patterns of behavior can emerge across generations on the basis of a familial transmission process.

The limitations regarding intergenerational changes that Reiss attributes to personality theories of socialization also imply certain assumptions about modeling phenomena (i.e., homogeneity of modeling cues, extremely narrow selection of models, unmodifiability of matching responses, etc.) that are not confirmed by recent findings from research in social-learning theory. According to the observational-learning interpretation of modeling, children have repeated opportunities to observe and to learn the behavior and values not only of parents, but also of siblings, peers, and other significant persons. Consequently, when a child is exposed to a variety of models, he may select one or more of them as the principal sources of social behavior, but he rarely reproduces all elements of a single model's repertoire or confines his imitation to that person. In the experiment (Bandura et al., 1963b) that utilized three-person groups, for example, although children adopted many characteristics of the model who possessed rewarding power, they also reproduced some of the attributes exhibited by the model who occupied a subordinate role. The children therefore displayed a relatively novel pattern of behavior representing amalgams of elements from both models. Moreover, the specific admixture of behavioral ele-

ments varied from child to child. Thus, within the same family even same-sex siblings may exhibit quite different personality characteristics resulting from having selected for imitation different elements of parental and sibling behavior. It may seem paradoxical, but under conditions of high diversity of modeling patterns, much innovation of social behavior can occur entirely through identification. On the other hand, in homogeneous cultures in which models display essentially similar patterns of behavior, and deviants are ostracized, placed in confinement, or otherwise punished, one would expect little change across successive generations. Although questions can be raised about the validity of some of the criticisms levied by Reiss against the family transmission model, nevertheless his major contention that perpetuation and change of behavioral norms are primarily controlled by social-system conditions, and not by parental agents, appears to be well-grounded.

GENERALITY OF MODELING INFLUENCES

It is widely assumed, on the basis of evidence that people often produce new responses which they have never formed or seen before, that innovative behavior cannot be accounted for on the basis of learning theory principles. This limitation may apply to theoretical formulations that depict the learning process exclusively in terms of selective reinforcement of spontaneously emitted variations in behavior. However, theories employing modeling principles have often been similarly criticized on the mistaken assumption that exposure to the behavior of others can produce, at the most, mimicry of specific modeled responses.

In most experimental investigations of identificatory processes a single model exhibits a limited set of responses, and observers are subsequently tested for the amount of precise response duplication under similar or identical stimulus conditions. These restricted experimental paradigms can yield only specific imitative outcomes that do not extend beyond the particular responses demonstrated. On the other hand, studies employing more complex procedures indicate that innovative behavior, generalized behavioral orientations, and principles for generating novel combinations of responses can be transmitted to observers through exposure to modeling cues. As has been shown earlier, under conditions in which children are provided opportunities to observe the behavior of heterogeneous models (Bandura et al., 1963b), observers typically display novel patterns of behavior representing diverse combinations of elements from the different models. Illustrations of the efficacy of modeling procedures for developing generalized conceptual and behavioral propensities are provided in studies designed to modify moral judgmental orientations (Bandura & McDonald, 1963) and delay-of-gratification patterns of behavior (Bandura & Mischel, 1965). In these experiments the models and observers respond to entirely different sets of stimuli in the social-influence setting, and tests for generalized identificatory effects are conducted by different experimenters in differ-

ent settings with the models absent, and with different stimulus items. The results disclose that observers respond to new stimulus situations in a manner consistent with the models' dispositions even though the subjects had never witnessed the model's behavior in response to the same stimuli.

In the higher-order form of modeling described above the observer acquires a common verbally labelled attribute or a rule exemplified in a variety of modeling responses that may differ in many other aspects. Subsequent responses generated by the subject that embody the observationally derived rule are likely to resemble the behavior that the model would be inclined to exhibit under similar circumstances. The abstraction of rules from modeling cues is achieved through vicarious discrimination learning (Bandura & Harris, 1966) in which the responses of models that contain the relevant attribute are reinforced, whereas those that lack the critical feature are consistently nonrewarded.

Although modeling variables play an important role in the development of most social behaviors, their position with respect to language learning is almost unique. Since children cannot acquire words and syntactical structures without exposure to verbalizing models, it is obvious that some amount of modeling is indispensable for language acquisition. However, because of the highly generative character of linguistic behavior, it is usually assumed that imitation cannot possibly play much of a part in language development and production. The main argument, which is based on the mimicry view of modeling, is as follows: Children can construct an almost infinite variety of sentences that they have never heard. Consequently, instead of imitating and memorizing specific utterances that they may have heard at one time or another, children learn sets of rules, on the basis of which they can generate an unlimited variety of grammatical sentences.

It is obvious that rules about grammatical relations between words cannot be learned unless they are exemplified in the verbal behavior of models. An important question therefore concerns the conditions that facilitate abstraction of rules from verbal modeling cues. The principle underlying a model's varied responses can be most readily discerned if its identifying characteristics are repeated in responses involving a variety of different stimuli. If, for example, one were to place a series of objects on tables, chairs, boxes, and other places, and simultaneously verbalize the common prepositional relationship between the objects, a child would eventually discern the grammatical principle. He could then easily generate a novel grammatical sentence if a toy hippopotamus were placed on a piano and the child were asked to describe the enacted stimulus event.

Unlike social responses which are often readily acquired, language learning is considerably more difficult because sentences represent complex stimulus patterns in which the identifying features of syntactic structures cannot be easily discriminated. The influential role of both modeling and discrimination processes in language development is shown by findings of an experiment (Bandura & Harris, 1966) designed to alter the syntactic style of young children who had

no formal grammatical knowledge of the linguistic features that were manipulated. The grammatical constructions chosen to be modified were the prepositional phrase, which has a high base rate of occurrence, and the passive voice, which is grammatically more complex and rarely displayed by young children.

As might be expected, social reinforcement, even when combined with a strong attentional set to identify the characteristics of "correct" sentences, was ineffective in increasing the use of passives in sentences generated by the children in response to a set of simple nouns. The majority of subjects did not produce a single passive sentence, and consequently, no responses occurred that could be reinforced. Nor were the children able to discern, within the relatively brief exposure period, the critical syntactic category simply from observing a model construct a series of passive sentences. In contrast, children generated significantly more passives when verbal modeling cues were combined with procedures designed to increase syntactic discriminability. The most powerful treatment condition was one in which the attentional set was induced, modeled passive constructions were interspersed with some sentences in the active voice so as to enhance differentiation of relevant grammatical properties, and both the model and the children were rewarded for passive constructions. In the case of a syntactic category as common as prepositional phrases, reinforcement together with an active attentional set were effective in altering children's usage of prepositions, but modeling cues were not a significant contributory factor.

Children who show gross behavioral deficits, and whose discriminative and attentive capacities are limited, may benefit little from repeated exposure to verbal modeling cues alone, even though they may be easily discriminable. In such cases, highly explicit and concrete modeling procedures must be utilized, as is well-exemplified in the therapeutic program devised by Lovaas (1966) to establish grammatical speech in schizophrenic children.

The program consists essentially of rewarding the child's discriminative responsiveness to verbally or behaviorally modeled events. Whenever the child fails to respond or responds incorrectly he is aided by verbal and physical prompts which are gradually faded out on succeeding trials. Prepositional training will serve to illustrate the three basic discriminations that are developed. Initially the adult gives a verbal instruction involving a preposition (e.g., "Put the block inside the box") and the child is promptly rewarded for performing the motor response appropriate to the verbal stimulus. If the child fails to execute the response correctly, the therapist moves the child's hand with the block to the box while repeating the corresponding verbal response. In the second discrimination, objects are arranged in a particular way and the child verbally describes the relationships between the objects, using the proper preposition. In the third step, the child gives grammatical verbal responses to sentences spoken by the adult. Children are later taught to generalize the linguistic rule by modeling a variety of objects in a variety of prepositional relationships. Essentially the same modeling procedures have been

successfully employed by Lovaas to establish other types of syntactic patterns in mute schizophrenic children.

CONCLUDING COMMENTS

The theory of identification outlined in the present chapter assigns a prominent role to observational learning, which is assumed to mediate identificatory outcomes. According to this theoretical formulation, matching behavior is acquired on the basis of contiguity of modeling stimulus sequences and symbolic verbal coding of observational inputs. These representational symbolic events, in conjunction with appropriate environmental cues, later guide overt enactment of appropriate matching responses. Performance of observationally learned identificatory responses, on the other hand, is primarily governed by reinforcing events that may be externally applied, self-administered, or vicariously experienced. Moreover, emphasis is given to the differential consequences of emulating the behavior of models possessing distinctive characteristics. These come to function as discriminative stimuli for regulating generalization of identificatory responses toward unfamiliar models, in different social situations, and across different classes of behavior displayed by the same model.

The conceptualization of modeling processes in terms of social-learning principles differs in several important respects from most personality theories of identification. Traditional approaches generally depict identification as a pervasive and more or less unitary modeling outcome that is firmly established early in a child's life, and which results from nurturant and threatening interactions with parental figures. In contrast, social-learning theory not only posits a different type of learning process, and a different set of controlling variables for identification, but also assumes a considerably more complex model of behavioral transmission. Identification, according to this view, is a continuous process in which new responses are acquired and existing repertoires of behavior are modified to some extent as a function of both direct and vicarious experiences with a wide variety of actual or symbolic models, whose attitudes, values, and social responses are exemplified behaviorally, or in verbally coded forms. Although a family can provide general prescriptions for conduct, parental models cannot possibly serve as primary sources of the elaborate skills and modes of behavior required at different stages of social development. Complex cultural patterns of behavior are, in large part, transmitted and regulated at a social-systems level.

The conceptual scheme presented here appears to be sufficiently inclusive to encompass a large set of variables that have been shown to influence identificatory phenomena. Moreover, if the worth of a psychological theory is judged by the efficacy of the behavioral modification procedures that it produces, as theory ultimately should be, then preliminary results from clinical applications of modeling techniques based on social-learning principles indicate this approach holds considerable promise.

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16

PSYCHOLOGICAL MODELING: THEORY AND PRACTICE

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Whatever their conceptualization or techniques, psychological treatment approaches have the common goal of restoring clients to realistic and effective social living. From antiquity on, the decisive impact of social example on human conduct has been acknowledged. Greco-Roman and medieval thinkers practiced what they preached. They assigned a major part to learning from appropriate live and symbolic models in raising the next generation, and developing or refining complex skills in adults (Bahn & Bahn, 1970; Clark, 1957). Applied intuitively, modeling techniques were seen as obvious tools to guide, redirect, and educate people. Until recently, however, observational methods remained dormant; they were largely ignored by practitioners and researchers alike. Among historical bases for that neglect, two stand out: one was the dictum firmly held by

peripheralistic Behaviorism that all stable learning required the person to perform overt activities directly. In that view, social exemplars were subordinate to first-hand trial and error practice, which alone could establish new behavior (Miller & Dollard, 1941; Skinner, 1953). An overt practice bias narrowed the perceived relevance of modeling to literal, motoric imitation of movements. Since most vicarious benefits are regulated by the symbolic extraction and covert processing of meaningful information, there was a paradigm clash. The restoration of interest in observational learning demanded evidence that would challenge doctrinaire, overt practice accounts of learning. More recent research using observational paradigms confirms that observation creates acquisition. As well as motor acts, the most diverse linguistic, conceptual, and generalizable competencies can be developed

or restored by vicarious means (Bandura, 1977a; Rosenthal, 1976).

Another obstacle to clinical use of therapeutic modeling stemmed from the intrapsychic premises and interview approaches of the verbal psychotherapies. Ironically, those leanings may derive from Freud's having too readily adopted then-fashionable beliefs about the organization of mental life, based on associationism. If mental contents are joined by associative bonds, it seems sensible to seek the sources of psychological dysfunctions by analyzing patients' free verbalizations as clues to inaccessible determinants. Experimental psychology, preoccupied with overt molecular acts, was little help. It offered few vivid analogies to clinicians facing clients' inept and self-defeating conduct. Many therapeutic concerns seemed too remote from the research laboratory and its typically inhuman clientele. Rarely meeting on common ground, researchers studied simple behavior while therapists modeled sympathetic listening and interpretative statements or actions—withholding practical guidance lest clients' self-corrective tendencies and spontaneous insights become tainted.

INFORMATION AND GUIDANCE PROVIDED BY SOCIAL EXEMPLARS

Since the first edition of this handbook, there has been enormous progress. Research on information processing and conceptual learning has advanced a view of people as active problem-solvers whose assumptions and cognitive plans guide overt behavior. Between the first sensory registration of input cues and their eventual use in living, current research discloses organized complexity in their symbolic representation, transformation into memory codes, and refinement as viable mnemonic maps (Estes, 1975). Applied study has shown the value of systematic guidance for aiding clients. Of present concern, a burgeoning literature confirms the value of modeling treatments for redressing deficits in social and cognitive skills, and for helping to remove defensive avoidant behavior. With their promise amply documented, modeling therapies now pose questions of how to best refine techniques, to join them with other guidance methods for stronger composite programs, and to

adapt them for prevention and other new purposes. In addition to the therapeutic applications, social learning approaches provide means for increasing our understanding of the relationship between cognition and behavior. Since social learning principles allow a host of applications, their potentialities are better grasped and developed from a conceptual framework.

Some Main Roles Served by Models

Other people are salient and powerful models, but not the only ones. Seeing an object fall over a crumbling cliff-edge can alert us to the danger. We use the events witnessed and our inferences about their meaning as useful information to guide expectations and conduct, here, to avoid the precipice. Functionally, a model is any stimulus array so organized that an observer can extract and act on the main information conveyed by environmental events without needing to first perform overtly. Guidance thus stems from cognitive activities by the observer, rather than from direct terminal responding and its feedback consequences. In this view, modeling arrays may involve human actors who can be live, filmed, audiotaped, or depicted by sketches. Displays may instead contain impersonal cues both animate and static. Even then, observers may endow neutral stimuli with social properties, depending on context. For example, viewers infer various social meanings from the motions of geometric figures, based on the spatial topography and temporal sequencing of the moving forms (Bassili, 1976).

Many helpful displays are wholly impersonal, such as roadmaps, naval charts, or training films in which mechanical components move into proper order for repair and assembly. No doubt social models are most relevant clinically and have nearly always been used in therapy studies. Nonetheless, organizing events into systematic programs as with *in vivo* task hierarchies, or observing the correct terminal patterns created earlier by an unseen model, also conveys useful guidance to observers (Alford & Rosenthal, 1973; Robert, White, & Rosenthal, 1975). Studying an antipasto platter arranged by a deft cook would be a homely example. Diverse senses—vision, audition, olfaction—can transmit modeling cues. In therapeutic applica-

tions, displays may contain various combinations of illustrative versus summary or narrative guidance. It is convenient to locate these format options along a heuristic continuum. At one imaginary pole, all content would be taught by demonstration or exemplification; the total display would contain exemplary instances with no orienting statements, summary rules, or interpretive guidance. At the other pole, all content would take the form of instructions or narrative summation devoid of demonstrations. There is little reason to endorse either extreme as a possible strategy. Instructions seem most efficient when content is relatively familiar and already known in part. But most often some synthesis of formats will yield the most clarity and impact. There is little research on the optimal balance between exemplary and narrative guidance for defined change programs or types of clients. That realm remains a topic for the future.

One can see that modeling may encompass a very wide span of modes and content formats, even though human performers who illustrate adaptive coping efforts are usual for clinical purposes. Also, effective modeling rarely comprises a skein of disjoined actions or statements. As a rule, one does not rely on exemplifications devoid of background rationales, goal implications, or supplements that enable clients to relate modeling episodes to concrete problems in their own lives. Meaningful guidance occurs in situational aids and explanations. The models behave in a comprehensible fashion to assist observers' understanding and retention. The client's values are taken into account. Otherwise, treatment aids may be dismissed because they affront, or conflict with observers' belief systems. Exemplary performances usually depict meaningful solutions to relevant problems, often portraying the naturalistic consequences to be expected if clients adopt the modeled styles of behavior. Much helpful guidance is carried under natural circumstances with contextual supports.

Modeling influences can produce four separable kinds of effects in observers. Each class of effects has important features for the planning and implementation of therapy.

1. Observational Learning Effects

First, observers can acquire new patterns of be-

havior and coping strategies that were not present in their repertoires, or were unavailable in an integrated, usable form. Such *observational learning effects* are shown most clearly when models exhibit novel response patterns that observers have not yet learned to execute. After observation, clients are able to adopt and implement these new solutions in substantially identical form.

Complex patterns of behavior are conveyed as integrated sequences; their meaningful regularities and functional essentials are preserved. This occurs when new action compounds are exemplified, and also when response elements that already exist in the repertoire are organized anew to follow guidelines or principles grasped through observation. Many discrete acts, response sequences, and cognitive elements already exist as products of maturation, instrumental conditioning, and prior observational learning. Modeling exposures serve an instructional role. They teach new components and guide the recombination of other elements. For example, although the color and form dimensions of stimuli may be familiar, arranging them to satisfy a new abstract rule sets demands that learners cannot meet unaided. After modeling exposures, adults and adolescents could apply a concept that was totally unavailable before (Rosenthal & Kellogg, 1973). They had learned new ways to classify familiar objects and gained new facility with a symbolic principle. Many modeling effects in therapy are analogous, as when submissive clients become more assertive with interaction partners.

Some writers doubt if behavior formed by unique recombinations of elements already available represents new learning, because the components exist in subjects' repertoires. From that stance, no new musical composition can occur; have not Bach, Beethoven, and Brahms already used most chords? Indeed, Beethoven would not deserve credit for new symphonies, since he merely rearranged a few existing notes. A pianist who masters a demanding concerto would have learned nothing new since the intricate finger movements were present in his or her repertoire; and an "original" novel would demand neologisms, rather than social language. In fact, after childhood very few components of thought or conduct are totally virgin. Yet the assembly of parts into new wholes may

be greatly original. Any behavior array having very low or zero probability of occurrence under appropriate stimulus conditions qualifies as a new response. Most novel molar activities are composed of common behavioral elements.

A great virtue of social learning techniques is their integrative capabilities. Integrated molar solutions are grasped largely intact. Observers can comprehend the interrelationships among components and the principles guiding modeled events. They acquire and can utilize organized, schematic representations of modeled configurations. Often, symbolic elaboration of the events portrayed prepares learners to cope with generalized problems, remote from the concrete details of the exemplars. They devise and can report symbolic rationales that map the key meaning of silent demonstrations (Rosenthal & Zimmerman, 1976). Like knowledge drawn from any other source, vicariously derived information is actively codified by observers as best they can. With well-structured exemplifications, people usually extract much knowledge useful in future conduct. They gain a coherent view of what needs to be done and how to proceed. Then, overt practice and corrective feedback can further refine new skills. Errors in executing component acts, in sequencing elements, or judging informative cues are put right. Guided, and later independent, performance helps stabilize competence and assures learners of their mastery. Their path is smoothed because vicarious guidance equips them for much or most coping before direct practice begins.

In contrast, acquisition prospects were gloomier until recently. It was widely assumed that new response patterns were acquired by gradual shaping through selective reinforcement of trial and error attempts. Discrete responses were slowly shaped and chained by stepwise progression in a laborious sequence. Often avoiding cognitive structuring, or even verbal prompts, the successive approximations paradigm was tedious, if not costly, for learner and teacher alike. Fortunately for survival and efficiency, most naturalistic learning does not take this tedious path. At home, in school, on the playing field, and on the job the novice learns from the precedents and guidance of those with expertise. Moreover, research confirms that observational learning is valuable for countless activities: they span a myriad of cognitive, affective, and be-

havioral domains (Bandura, 1977a; Rosenthal, 1976).

2. Inhibitory and Disinhibitory Effects

A second main function of modeling influences is to strengthen or to weaken inhibitions of responses that are available in observers' repertoires (Bandura, 1971). The impact of modeling on behavioral restraints largely depends on (1) the rewarding or punishing outcomes produced by models' deeds, (2) observers' inferences that similar or unlike consequences would result from emulating the conduct witnessed, and (3) observers' judgments of their ability to enact the modeled behavior.

Inhibitory effects occur when observers either reduce performing the modeled class of behavior, or generally curtail their rate of response as the result of negative consequences perceived. Clinical modeling rarely seeks to create inhibitions. Yet for some cases, such applications may be warranted. If the behavior is seriously harmful to self or society, inhibitory modeling might aid to reduce the noxious conduct while more functional alternatives are developed.

Disinhibitory effects are evident when observers increase production of formerly inhibited acts after models perform them without any adverse results. Disinhibitory effects are common in clinical modeling designed to reduce fears. Observing another approach, cope with, and master situations that scare clients can vicariously enhance expectations of personal effectiveness and thus reduce fear reactions in observers. With inhibitory avoidance reduced, clients gain optimism and are more apt to undertake direct approaches to threats that formerly were too fearsome. Then, successful overt encounters further reinforce a sense of self-efficacy, allowing the persons to favorably reassess their ability to manage the task. Judgments of one's own efficacy are major determinants of overt performance that mediate confident approach or timorous avoidance in the future (Bandura, 1977b). Research illustrating the foregoing points is reviewed later.

It is important that clients do not perceive modeling displays as coercive pressures. If they make new approaches to avoid shame or embarrassment, overt disinhibition may be bought at the

price of covert distress. In that case, they may judge themselves as too weak or faint-hearted to initiate future approaches. Thus, in structuring trial encounters, it is important to minimize feedback that confirms self-appraisals of incompetence.

3. Response Facilitation Effects

The behavior of others can also serve as discriminative cues or priming stimuli. Perceiving others perform facilitates observers' production of the same general class of responses, which already exist in their repertoires. Response facilitation effects are distinguished from observational learning and disinhibition because (1) no new responses are acquired, and (2) disinhibitory processes are not involved because the activity is socially acceptable and not encumbered by restraints. Countless examples occur in everyday interactions. If one guest recounts her vacation experiences, others join in and share theirs. One laugh in a room often provokes others. Subtle configurations of behavior can be elicited by modeling. Thus, demonstrating the reaction patterns characteristic of a hypnotized person cues performance equal to standard hypnotic induction (Comins, Fullam, & Barber, 1975). As priming cues, response facilitators are related to set effects. By sensitive use of facilitative exemplars, learners might be aided to become skillful conversationalists or interaction partners. Indeed, a therapist's style and pacing may provide social cues that alter clients' coping and self-reactions for better or worse. Teaching clients and therapists to exemplify social cues that bring out the best in other people's repertoires seems a plausible goal. Since the social activities that people engage in at any moment are partly regulated by the behavior of others, the response-eliciting and cueing function of modeling influences operates continually in all social situations.

4. Cognitive Standards for self-regulation

Most routine behavior is governed by our past experience in the form of adaptation levels and judgmental standards. We seldom react to situations as unique. We are guided by expectations from related events that are categorized and interpreted as similar. Even perceptual cues are scanned in relation to standards. Once perceived, new information is compared to former inputs that act

as meaningful decision-making guidelines (Banks, Clark, & Lucy, 1975). Such frames of reference prepare us to handle current and future demands. If conditions shift, refractory standards can disrupt harmonious adjustment. When people suffer serious illness, like stroke, they typically revise their levels of aspiration downward so that expectations remain in tune with capabilities (Levine & Zigler, 1975). Rigid self-demands would bring the patient chronic disappointment or worse. But the hard-driving achiever will at first lack guidelines for matching aspirations to lowered physical capacity. Usually, as people begin to recognize key features of a situation, they relate them to prior analogues and act accordingly. However, in many cases people lack clear standards for conduct or opinion. Tasks and issues suddenly change or are too novel to apply guidelines from our repertoires. Value judgments must be made but criteria are lacking. There is no handy way to weigh the worth of alternative deeds because the significance of action outcomes is ambiguous. At such times one typically dispels uncertainty by adopting the norms enacted or endorsed by others as evaluative criteria. The fourth main function served by models is providing standards to judge the adequacy and appropriateness of performance under ambiguous or greatly altered conditions.

Modeling influences affect self-regulation standards in many spheres. When novices have to assess their own progress, they may prove extremely self-critical from lack of reference criteria. After exposure to their instructors' more favorable judgments about the same accomplishments, learners' self-evaluations became more realistic (Watts, 1973). A model's choice of performance goals, and what amount of self-reward is fair for meeting them, can instate similar standards in observers even when the exemplary self-demands are stringent (Bandura, 1976b). Indeed, when payment is deferred, viewing the pledges made by others can lead observers to promise enormous donations; the magnitude of pledge increased proportional to modeled standards, with little sign of incredulity or "boomerang" effects (White, 1975).

Modeled standards can alter observers' expectancies and inner states with surprising vigor. Perhaps most striking has been the vicarious alteration of pain thresholds. Exposure to models who

are tolerant of shocks lead observers to accept more shocks, and of stronger intensity—without showing any greater autonomic response than groups given less pain. They also rate the shock experiences as less noxious than controls. Observing a model who is intolerant to pain has reverse effects (Craig, Best, & Ward, 1975; Craig & Neidermayer, 1974).

Such data suggest treatment applications worth exploring. Clients whose dysphoria involves unrealistic discontent with their own situations relative to others', and people who devalue their self-worth and deprive themselves of attainable joys because of excessively stringent levels of aspiration, might benefit from appropriate modeling.

Although one can distinguish the foregoing main effects of modeling influences, they often interact. Thus, new social competences may rest on a combination of newly learned social skills, reduced inhibitions about self-expression, social facilitation of preexisting patterns, and the adoption of more realistic standards for judging one's own social performance. In specific cases, classifying the relevant modeling process may be rather arbitrary, since changes are multiply determined.

Determinants of Vicarious Influence

Several interrelated subprocesses jointly control how modeled information is comprehended and utilized by observers. When these components are properly implemented, powerful therapeutic changes can be predictably achieved. Neglect of any subprocess may retard or neutralize the entire treatment plan. Hence, analysis of the subsystems aids both for designing modeling applications and for analyzing procedures that fail to produce their intended effects. Also, recent basic research on the component processes is expanding knowledge rapidly, and revising psychological conceptions of human potentialities. In part, divergence between social learning principles and the operant or non-mediational associative positions stem from these new developments.

Attentional processes.

Presenting a modeling display does not assure that learners will perceive it. They must be able to register the sensory events as coherent input. When stimuli appear chaotic, are too fast, too weak, or

carry too many cues simultaneously, observers may fail to discriminate the relevant aspects. Distractions from competing contextual events and other interference have similar effects. If observers actively attend to and register sense impressions, they still must be able to decipher them. Both semantic and judgmental acts are involved. Even in the earliest phases of processing cues presented by tachistoscope, familiar stimuli have greater meaning and dominate more equivocal ones. The semantic influence on "peripheral" scanning events is shown by differences in apparent duration and recognizability among more and less familiar stimuli viewed for fractions of a second (Avant & Lyman, 1975). This occurs although perceptual capacity is surprisingly robust as the number of factors to be detected increases (Rosenthal, White, & Alford, 1974; Shiffrin, McKay, & Shaffer, 1976). Thus, stimulus meanings affect sensory recognition, which is the gateway to short-term memory.

The contents of short-term memory decay very quickly unless stabilized by cognitive transformations. Even in this brief stage, multiple distinct coding systems, built up from past experience, seem available for various types of sensory input (Posner, 1973). More important, it is then that selective attention determines which content will earn priority and which will be promptly lost. Judgmental processes operate to filter key from negligible gist. With auditory cues, for example, the observer attempts to segregate ongoing events worthy of attention from others to be ignored; even so, the structure of the rejected cues can interfere with differential attention (Bregman & Rudnick, 1975).

For the molar input sequences typical in therapeutic modeling, judicious selective attention is critical. Three different types of attention loss are plausible. If a modeling display seems boring or has little personal relevance, observers may disattend and scanning grows perfunctory (Kanfer, Karoly, & Newman, 1974). A second hazard involves client-produced covert interference, often mediated by states of excess arousal. A display may be too upsetting for clients. It may trigger their helpless and hopeless self-definition, remind them that they will soon need to attempt the fearsome acts depicted, or encourage deeds that violate strongly en-

trenched values. At such times, observers may redirect attention to competing cognitions and functionally attenuate the modeling influences (Bandura & Rosenthal, 1966; Spiegler & Liebert, 1973). In that event, one needs to present the threat level more gradually by interpolating easier tasks or protective supplements. When values clash, one must assure that clients approve of treatment's aims. They should be active participants in selecting the direction of change. Sometimes one may work to change values, but the clients should decide the nature of the change.

An alternative kind of covert arousal problem is best seen in some acute psychotics whose attention is dominated by private events. There, excessive self-preoccupation or emotionality disrupts attentiveness to external events. Strong excitation from any source can disrupt cognitive functioning and prevent the processing of new guidance information. Acute affective disorders are an example. It is largely futile to attempt symbolic ministrations while individuals are mired in despondent agitation or are in the thrall of manic excitements. Fortunately, there have been major recent advances in biological psychiatry for reducing acute arousal (e.g., Akiskal & McKinney, 1973; Fieve, 1973). Once extreme disequilibria are corrected, psychosocial techniques can begin profitably. Clients can be taught new adaptive strategies and helped to rectify the problems they often create by rash decisions, made when their functioning deteriorated.

A third hurdle for attentional processes involves the client's skill at monitoring and interpreting modeled events to extract their meaning. Attending to relevant information and avoiding distractors is an essential step in effective observational learning. However, sheer duration of attention is less crucial than discerning focus on key meaning components. Judicious observation covaries more strongly with learning than does gross amount of attention time (Yussen, 1974). To assure that clients perceive the crux of modeling routines, and interpret the information properly, one can ask people to describe what they have learned. Omissions or misconceptions can then be corrected by repeating modeled segments, by additional displays, by explanatory summaries, or by discussing guidelines for future conduct.

Retention Processes

Once discriminated, input is soon lost if not recast in more durable form. Modeled information must be represented and encoded in a framework. Such symbolic codes must be available when needed for the response information to be used. Mnemonic systems organize knowledge to aid retrieval.

The representation of information involves complementary but recursive steps, depending on its form and meaning, which jointly dictate how cues are sorted and cognized (Schvaneveldt, Meyer, & Becker, 1976). For example, judgments of an arrow as pointing up or down are faster if "up" arrows are high in their surround and if "down" arrows are low, that is, when the semantic thrust of up direction and high position are congruent (Clark & Brownell, 1975). Both with verbal and nonverbal input, interactions between form and meaning are typical. Verbal material is often learned better if people attach pictorial (iconic) images while representing it. Many verbal learning studies find that constructing internal images aids memory, whether input is brief or lengthy (e.g., Bower, 1972; Pressley, 1976). It is still too soon to gauge the relative merits of iconic, motor, and verbal imagery as representation modes. Results will depend on task demands, on content's meaning and patterning, and on learners' skills. Verbal symbols support the lion's share of knowledge in daily life, but it is often hard to separate mediating systems. Verbal and pictorial items can interfere equally with iconic scanning, cautioning against a sharp dichotomy (Chow & Murdock, 1976). For difficult content, retention and subjective interest rise if graphic aids are used to represent verbal abstractions (Rigney & Lutz, 1976; White & Rosenthal, 1974). What seems clear is that learning results from cognitive processes and not sheer contiguity or classically conditioned bonds (Bandura & Jeffery, 1973; Langevin & Martin, 1975; Rosenthal & White, 1972). Thus, people perform intricate transformations on mental analogs of spatial inputs (Bundesen & Larsen, 1975; Cooper & Shepard, 1975). Color categories are represented by structural analogies (Rosch, 1975). Stimuli are flexibly encoded (Hawkins, Reicher, Rogers, & Peterson, 1976). A first representation may undergo multiple recodings before grouping it into higher-order un-

its, and the microsegment's form can interact with molar organization (Spoehr & Smith, 1975).

Thus, modeled inputs are represented in diverse modes and frameworks. Imaginal and verbal mediators are prominent, but the format of cues does not fix the format of storage. Modeled events elicit visual images of serial acts and context stimuli; these can be held as iconic codes that maintain core features. Likewise, observers encode displays into condensed, summary verbal symbols. The same central processes operate in learning from overt experience. In both cases, acquisition stems from symbolic transformations of external information. Except for minimizing errors and backtracking, modeling surveys most cues perceived by performers. In both enactive and vicarious experience, the ongoing input can be too long or detailed for isomorphic storage. Some elements are promptly dismissed as irrelevant. Others are interpreted and revised into meaningful forms. Even when tasks invite rote learning, people redefine them and seek understanding (Bower, 1974; Goldberg, 1974; Rosenthal, White, & Rosenthal, 1975). Also, in both overt and vicarious learning, the representations of novel data will not long endure unless the learner evolves suitable memory codes.

Reductive memory codes maintain modeled events far better than isomorphic imagery. People who devise capsule labels to summarize complex demonstrations retain far more than those who seek to remember by duplicating the cue sequences as imaginal or verbal copies (Gerst, 1971). Memory codes may differ in form from their referents. Bandura and Jeffery (1973) taught one group to code modeled acts into number keys, and another to use a letter code. Both coding groups proved comparable, but surpassed observers who tried to improvise mnemonics. After delay, the systematic coders retained far more than the impromptu groups, which recalled little. Thus, retrieval depends on the power and availability of symbolic transforms to preserve information. Narrative and iconic facsimiles can lose data if not condensed but arbitrary codes will be forgotten unless tied to meaningful guidelines. Pictures, metaphors, analogies, and other salient illustrations bridge novel and familiar information, making it easier to store and retrieve new mediators (Royer & Cable, 1976). If observers first reduce modeled sequences

to codes, and then devise intelligible acronyms to facilitate recall of the codes, they retain much more than people who use either component strategy alone (Bandura, Jeffery, & Bachicha, 1974). After delay, retrieval covaried closely with availability of the prior codes that the dual strategy preserved best. Hence, higher-order symbols, like other mediators, depend on organizing frameworks.

External organization involves the patterning and tempo of stimuli; this may differ from the subjective organization that learners covertly apply to the events. Input arrangements interact with people's expectations and organizing styles. Memory and transfer improve when overt and covert structures harmonize. Natural patterns, forming good gestalts that mesh with past rubrics, are easier to encode and store (Bell & Handel, 1976). Haphazard sequences create weaker conceptual learning and transfer than orderly displays, but maximum external structure may not optimize storage and retrieval (Rosenthal & Zimmerman, 1973; 1976). Some degree of uncertainty can prompt learners to think, and strive harder than with overly programmed tasks. Cognitive challenge can deflect distracting influences.

The component processes of memory and retrieval are not rigid. Modeling new cognitive strategies and styles can alter processing habits (Zimmerman & Rosenthal, 1974). Momentary cognitive organization hinges on many factors like subjective priorities, cue salience, social demands, and which solution strategy is chosen. The familiarity and spatial configuration of inputs may interact to shift processing tactics (Ambler & Proctor, 1976). Readers actively parse and code to fit task goals. Asked to recall sentences, people read to emphasize syntactic structures (e.g., phrase boundaries); but if asked to comprehend prose, subjects instead dwell on key semantic units (Aaronson & Scarborough, 1976). Mnemonic strategies thus govern how knowledge is approached and cognized.

No magic is needed to improve covert processing by clients or students. Apt organizing schemes and memory aids can be demonstrated, their regularities distilled by discourse, and their correct use assured by practice and corrective feedback. To learn a new language, one group was taught to connect each foreign word with a familiar English

word that shared a common sound, and then to visualize the pair interacting. This cognitive rehearsal technique produced better language acquisition than having learners covertly pair words as contiguous associates (Raugh & Atkinson, 1975). Modeling results are very similar. Observers who adopt organized retention schemes outperform peers who use associative rehearsal, or who lack mnemonic codes (Bandura & Jeffery, 1973; Bandura, Jeffery, & Bachicha, 1974).

Motoric Reproduction Processes.

The third main determinant of modeling effects is motor reproduction competence. Some tasks require combining familiar, easy movements to enact very abstract plans; chess is an example. Symbolic representations and codes guide motor execution in those undertakings. Jeffery (1976) had observers watch a model assemble more and less complex structures. Then, learners rehearsed cognitively, or motorically with the building pieces, or had composite practice. On both structures, all symbolic organization and rehearsal surpassed purely motor practice, whose results were matched by unrehearsed controls. The outcome was unchanged after a week's delay. For such cases, once an abstract model is acquired, motor enactment is routine unless learners have physical deficits.

For other tasks, goal plans are simple but motor components demand great finesse, for example, hurling the javelin or discus. In such feats, response integration depends on proprioceptive and equilibratory cues, not readily conveyed by the distal senses that inform observers. Athletes report planning and rehearsing symbolically upcoming performances (Mahoney, 1974). Such organized imagery is not perceived by spectators, although the strategy could be taught. Thus, modeling takes a smaller role in the refinement of motor skills governed by movement-contingent feedback. Apt demonstrations confine overt trials to plausible bounds; augmented feedback of learners' errors though videotaped replays aid future attempts. But overt practice and its movement effects are essential for proficiency.

Many tasks join subtle strategies with intricate motor acts, as ballet or violin recitals. Efficiency rises if concept elements are first modeled, and then motor practice given for implementation. In

Jeffery's (1976) study, symbolic-then-motor rehearsals led to somewhat faster performance than the reverse sequence. Since so many intricate deeds are guided by central representation, organized solution patterns aid clients. Then, complementary motor practice can refine component movements and molar response integration.

Motivation and Incentive Processes.

The last main subprocess underlying modeling outcomes concerns motivational or reinforcement effects. Persons may attend to modeled activities, grasp their meaning, code the gist into durable symbols, retain the guidance in accessible form, and have the response competence to execute it adeptly. Yet, they will rarely perform behavior if they face unfavorable incentive conditions or expect negative sanctions for so acting. In such cases, providing positive incentives can promptly elicit overt enactment of observational learning (Bandura, 1965). Judgments about response consequences do not just dictate what acts to perform and when. Incentive expectations also steer acquisition by prompting selective attention, deliberate coding, and active rehearsal if the modeled patterns promise high utilitarian value (Masters, Gordon, & Clark, 1976).

Reward operations do not stamp in the behavior that precedes them, or assure better performance. Incentives have informative effects and, like other sources of information, are symbolized and weighted before they can guide action (Bandura, 1977a). Thus, depressives may have acquired deficits in aiming deeds at future rewards (Miller & Seligman, 1975). Cognizing response-reward contingencies often controls patients' behavior more strongly than applying reinforcers (Resick, Forehand, & Peed, 1974). If people accept task goals, and are not deterred by negative expectations, the offer or delivery of rewards may have little or no effect (Zimmerman & Rosenthal, 1974). Under special conditions, rewards may do harm. Communal incentives can prompt threats that further handicap laggards (Axelrod, 1973). When people are rewarded for undertaking activities irrespective of quality of performance, the rewards may lower elective persistence (Lepper & Greene, 1975; Ross, 1976). If tasks are redefined as toil, performance and demeanor can suffer (Garbarino,

1975). Such anomalies may occur if attention fixates on incentive features, arousing consummatory sets that detract from instrumental activity.

In any case, rewards bear no absolute valence. Like other events they are weighed in reference to one's adaptation level. Contextual factors that provide standards for comparison, and social equity norms defining fair play, also decide the net worth of a reinforcer. Scarce or plentiful supply, and what partners earn for equivalent performance, will alter the value of raises and praise alike. Satisfaction with a given outcome is relative to others' payoffs and changes when attributed to skill versus chance (Brickman, 1975). Likewise, self-chosen reward schedules motivate stronger response than externally imposed wages in some task settings, but not others (Bandura, 1976b; Weiner & Dubanoski, 1975).

At times, no amount of structured guidance will sustain behavioral involvement unless inducements are provided (Miller, Hersen, & Eisler, 1974). But often rewards are the only source of feedback supplied. Then, performance gains mediated by informative value of reward may be attributed to incentive control. When informative and incentive functions of rewards are separated, clients may learn as well without tangible payoffs (Rosenthal & Kellogg, 1973), and cognitive supports can far exceed reinforcer effects (Zimmerman & Rosenthal, 1974). Such data, and the relativity of valence, should caution therapists against over-reliance on incentive inducements. In most cases, far more than needing token points or weekend passes to reward specific performances, people whose lives seem a hopeless morass need (1) cognitive guides that depict their obstacles and options accurately, (2) solution routes that lead in attainable steps from their current status to a more effective level of functioning, and (3) the cognitive and social skills to implement such plans. The subprocesses governing modeled phenomena provide categories to identify deficits, and to suggest apt correctives by modeling and other procedures.

Guided Practice and Corrective Feedback.

Demonstrations and instructions are fine means to impart informative rules and to illustrate their use. Therapy does not end when clients grasp

exemplary principles or solutions. They need help to apply knowledge until they gain secure mastery in diverse situations, to assure transfer skills and to confirm positive self-expectations. Just as modeling prevents gross flaws in approach, and reduces trial-and-error fumbling, so does guided practice. Before coping unaided, clients usually need guided practice with corrective feedback and encouragement. Errors are promptly corrected and not allowed to grow habitual or to alter clients' lives detrimentally. A problem with interview insights, even when cogent, is that people are not then aided to devise or execute applications. Clients may ignore them, or translate meanings into rash or clumsy acts that foster new stresses. Structured plans and rehearsal are called for. Typically, combining modeling with guided practice exceeds each method alone (Bandura, 1977b; Zimmerman & Rosenthal, 1974). Feedback can boost cognitive rehearsal, which is better than passive information-processing (Diamond, Steadman, Harada, & Rosenthal, 1975).

Further, therapists' corrective feedback and guidance aid clients' self-regulation on later independent attempts. With many hierarchical skills to integrate, neglecting early mishaps invites steep cumulative costs. So does inattention to personal factors. One does not promote more tolerant self-conceptions, nor inspire respect, by modeling stern fixation on technical milestones. Time gaps between developing and using new skills can long delay gratifications. Unless faith and trust in the therapist can bridge such strains, clients may exit before the fruits of a superbly conceived program grow visible.

REMOVING FEARS AND INHIBITIONS THROUGH MODELING

Modeling techniques can reduce fears and overt avoidance in diverse phobias and related conditions. Once clients are willing to undertake formerly inhibited acts, graded exposures can diminish remaining doubts and instill the benefits of firsthand mastery.

Conditions Maintaining Avoidance

It was once axiomatic that traumatic learning created defensive, "neurotic" conduct. Noxious

events gave associated cues the capacity to elicit autonomic arousal which, in turn, was reduced by instrumental activities that kept one from the locus of fear. By stimulus generalization, anxiety spread on multiple dimensions to related events. By response generalization, avoidant acts fanned out from conduct originally punished to related behavior. This dual-process theory, hinging on physiological arousal and peripheral regulation, has been questioned on grounds discussed elsewhere (Bandura, 1977a; Rachman, 1976). First, much fear learning occurs from observation and not direct experience (Bandura, Blanchard, & Ritter, 1969; Bandura & Menlove, 1968; Fazio, 1972; Rachman, 1974). Second, anxiety and overt avoidance are not strongly linked (Orenstein & Carr, 1975; Riccio & Silvestri, 1973); changes in one system need not alter the other (Black, 1965; Schroeder & Rich, 1976). Third, surgical removal of autonomic feedback capability in animals has little effect on the acquisition of avoidance behavior. Maintenance of avoidance behavior is even less dependent on autonomic feedback (Rescorla & Solomon, 1967). Such cognitive regulators as expectations, social reactions, and situational clues are major influences on emotion (Calvert, Boyanowsky & Leventhal, 1975; Rogers & Deckner, 1975). Since central events can activate and maintain bodily arousal, affective labeling, and defensive strategems, avoidance rests largely on semantic cues and symbolic inferences.

Thus, a family resemblance exists between the information-processing operations discussed earlier and the variables that maintain avoidance. The perceived locus of dangers will depend on what cues are selectively attended to and coded as threats, and on categorical similarities in form, function, or meaning that extend avoidance from initial instances to generalized classes. Sensitization effects—that is, weak response until several aversive exposures to a stimulus class have cumulative impact—may perhaps require grouping the inputs as allied.¹

¹Given the volume and complexity of informational traffic, some errors in grouping and retrieving information within and between classes is inevitable. Slips of the pen or tongue may hinge on extracting items, not entirely on the conceptual focus, from overlapping categories. So may wit, for example, James Joyce's quip about youthful

People dwell on danger cues in order to fend them off. But in so doing, they rehearse worries and prepare escapes that validate and vivify the threats. Sharp distinctions are made among stimuli never encountered, which are often considered as the worst because multiple negative aspects logically demand additive effects. Clients envision their failures, panics, embarrassment, and physical distress. Such cognitive practice can raise autonomic arousal, further validating the avoidance and confirming self-appraisals of weakness or incompetence to cope with the avoided. Also, repeated rehearsals of anticipatory dangers can spur positive feedback cycles that magnify arousal (Eysenck, 1976).

Relearning that cognized threats are less formidable, and habituating to them, are precluded by active efforts to prevent contact. Corrective feedback is ruled out by avoidance. Negative perceptions, and beliefs that one cannot manage certain endeavors, may go unchallenged. If parents, peers, or spouses will not accept the defensive behavior, they may reduce the pattern by coaxing, coercing, and otherwise prompting approach. But if they defer to, encourage, or themselves share the avoidance tendencies, they may support it by special concessions to clients' limitations. Such sympathetic attention to the sufferer, easing of duties, and excuses to escape demands peripheral to the defensive pattern, can further reward avoidance. At times, truly aversive or hazardous fates are thus averted. Far more often, secondary gains are trivial compared to the impoverished experience, self-critical evaluation, social stigma, and convoluted detours imposed by avoidance behavior. In any case, the therapy task is to restore competence and a sense of personal mastery in dealing with feared events.

Vicarious Procedures

Because defensive behavior is largely maintained by cognitive preparations to ward off anticipated dangers, fear reduction depends on changing the

sexuality. "When we were jung and easily freudened." Cognitive slippage sometimes ascribed to "unconscious" phenomena may stem from similar causes, especially when intense arousal burdens subtle symbolic tuning mechanisms.

covert meanings that regulate response to overt events. When safe, successful approach steps are directly enacted, threatening stimuli are progressively redefined as harmless by performers. Events once construed as aversive become neutral (e.g., heights, small animals), or are viewed as means to satisfactions (e.g., driving, swimming, social interaction). Much of the information created by direct approach is available to observers who witness models engage in feared acts, or who cognitively practice equivalent symbolic facsimiles. Through observation, clients can rehearse symbolically the feared activities that share many features of direct approach. Such efforts are steps enroute to eventual performance, and weaken the customary inhibitory pattern. Clients can also provide themselves with positive feedback, similar to what is derived from overt action. For fear extinction to occur in any therapy, cognitive regulators must be altered. External danger is trivial compared to dire symbolic representations and their defensive effects. The physical features of writhing snakes, dark rooms, and steep mountain trails remain constant before and after treatment. Fear is eliminated when the perception, meaning, and anticipatory sets triggered by environmental events no longer signify threat. The nominal source of disinhibiting feedback counts far less than its impact on client's cognitive processes. New information may stem from direct contacts, observation of models' direct contacts, or purely imaginal rehearsal of contacts. But the locus of extinction is symbolic in each case. What changes is the predictive value of environmental events—their subjective meaning and judgments about their implications for action. When vicarious exposures lower avoidance enough that clients will attempt overt coping, direct experiences create further positive feedback until confident mastery is achieved.

Overt Modeling.

Fearful observers profit from viewing others perform threatening activities. Much research shows that observing live or filmed models can extinguish timorous conduct and affect, partly or totally, depending on the intensity of clients' avoidant behavior. Instead of hoping for insights to transfer from consulting room to real life, or awaiting spontaneous encounters to elicit approach, the therapist fosters response enactment by structured demonstrations. With phobic children, live and filmed modeling in which peers interacted calmly with feared objects brought similar gains (Bandura, Grusec, & Menlove, 1967; Bandura & Menlove, 1968). Restored approach competence transferred to new test situations and was maintained in follow-up tests. Socially anxious, withdrawn toddlers viewed a film of peers who first watched and then gradually took part in enjoyable group activities. The observers later increased their level of interpersonal interaction, unlike matched controls who remained isolates (O'Connor, 1969). Next, contingent reward for social participation was contrasted with filmed modeling. Whether given rewards or not, the groups having the benefit of modeling commenced interaction faster, and maintained sociability at follow-up. The rewarded group reverted to withdrawal, interacting at the level of untreated, control isolates (O'Connor, 1972).

Adults and adolescents presenting various inhibitions have benefitted from similar overt modeling. Vicarious extinction of fears, and behavioral disinhibition, have been found with severe animal phobias (e.g., Bandura & Barab, 1973; Bandura, Blanchard, & Ritter, 1969; Blanchard, 1970), with examination anxiety (e.g., Jaffe & Carlson, 1972; Mann, 1972), with compulsive rituals (Rachman, Hodgson, & Marks, 1971), and with sexual underresponsiveness (Wincze & Caird, 1976). Other examples of overt modeling producing vicarious gains are given below, in studies comparing alternative modeling treatments. Recent trends suggest that modeling is being included in multicomponent, composite programs to successfully remove inhibitions, such as phobic reactions to air travel (Denholz & Mann, 1975) and social communication (Wright, 1976).

Covert and Symbolic Alternatives.

If reduction in fears and inhibitions depends on the cognitive formulations and preparatory responses that people generate toward external events (rather than on automatic control by peripheral cues), symbolic counterparts of overt experiences should produce many of the same effects. In principle, if equivalent meanings result from direct, observed,

and imagined approach sequences, there should be no outcome differences among the alternative modes of exposure. Particular guidance formats may diverge in the vividness, plausibility, and clarity of the information they impart. Some messages will have greater impact than others. The organization of content, its personal appeal, and client characteristics may favor one mode over another. However, when variant forms of treatment have similar symbolic effects, clients should benefit equally despite differences in the vehicles conveying the information. Thus, cognitively visualizing a modeling episode, or properly interpreting directions that specify similar covert approach steps, should have consequences akin to scrutinizing a model's behavioral portrayals.

In fact, with cognitively sophisticated college samples, covertly imagining models enact approach scenarios has had salutary results. For example, Kazdin (1973, 1974a, 1974b) instructed snake-fearful students to imagine people engaging in progressive contacts with serpents. Approach behavior increased and fearfulness declined after the cognitive modeling. Differences in the status and demeanor of the symbolic models produced outcomes that paralleled those from comparable variations used with overt modeling. Similar covert modeling benefits have been obtained with socially timid, submissive clients. Those who visualized models deal forcefully with interpersonal situations reduced inhibitions more than untreated controls. When the performers and the response consequences for social expressiveness were varied in imagination, differential treatment outcomes were found (Kazdin, 1974c, 1975, 1976). A group that imagined modeled acts earning reward elaborated the content of scenes more than did a no reward condition, but qualitative nuances of imagery failed to alter extinction (Kazdin, 1976).

In direct comparisons to date, overt and covert therapeutic modeling arrays have yielded equivalent benefits with college samples. Cautela, Flannery, and Hanely (1974) report that imaginal modeling and observing live modeling produce comparable results, although the latter treatment reduced fear and achieved terminal performances more effectively. Functional equivalence of methods was found among women afraid to resist

infringements of their rights. Although all conditions made gains, viewing overt demonstrations of protecting personal interests was no better than a group that imagined the same modeling scenes, or another group that imagined the scenes recast as individually tailored episodes (Rosenthal & Reese, 1976). Students proved readily able to represent cognitively the content of modeling scenarios in both foregoing studies.

Obviously, further confirmation that cognitive modeling compares favorably with overt demonstrations would argue for the covert technique on utilitarian grounds. Reliance on images is simpler and more efficient than are behavioral demonstrations. Also, difficult to arrange resources like access to airplanes, public speaking practice forums, or remote locales, could be reserved for direct mastery trials after vicarious extinction has made its contribution. Several boundary constraints on covert modeling need further checking. If clients' symbolic facility is poor, imagined activities may lack fidelity compared to overt demonstration. Thus, young children (Rosenthal & Zimmerman, 1972) and retardates (Forehand & Yoder, 1974; Rosenthal & Kellogg, 1973) have processed actual examples better than symbolic facsimiles. Likewise, many activities may be too intricate for people to address in fantasy (consider the skein of conditional rejoinders needed to aptly handle a stressful employment interview), or may be too threatening for very avoidant clients to represent accurately early in treatment. Such instances invite fantasy errors in adept enactment, but are also the cases where distortions seem hardest for therapists to monitor, detect, and rectify promptly. Hence, research is needed to clarify the problems and client characteristics that admit or discourage the use of covert modeling techniques. However, clinical evidence that overt and symbolic demonstrations can promote similar changes sheds light on how therapeutic outcomes are mediated.

Source of Information and Functional Redundancy

Observationally achieved gains illustrate that overt response is not required to diminish fear and avoidance. Covert modeling gains illustrate that useful guidance can be extracted from multiple informa-

tive channels. This further suggests that common central mechanisms underlie many externally distinctive brands of therapy. Therapist-defined procedures count less than client-defined meanings to determine functional similarities and differences among alternative methods. Not that procedural permutations are trivial—or that research comparing specific format variations is contraindicated! But until there is better understanding of the variables that control how clients interpret, and act on, therapeutic influences, it will not be surprising if plausible variations in method foster negligible outcome differences. For example, there is reason to doubt that the best organized task will necessarily surpass structuring that forces learners to make some active efforts to organize things for themselves (e.g., Battig, 1972). Moreover, the ordering of training sequences has complex effects on learning and transfer, depending on the specific task procedures (Rosenthal & Zimmerman, 1973, 1976). Thus, exclusive focus on presenting complaints need not be the optimal strategy for constructing modeling displays. Some groups of phobic clients only witnessed modeled episodes based on their respective problems. Other groups instead received one-third as many exposures drawn from handicaps, and on the remaining trials viewed approach scenes not of major concern to them. Yet both content variations produced equal vicarious extinction of the target complaints (Linehan, Rosenthal, Kelley, & Theobald, *in press*). Such data exemplify the conceptual gap between intuitively plausible expectations and symbolic processes that govern behavioral progress. Sometimes variations in the sequencing of component steps will lead observers to adopt divergent standards. Those, in turn, can produce complex treatment outcomes that depend on which modeling variables are selected for study or are ignored (Feist & Rosenthal, 1973).

Related to the therapy impact of specific event structures is the puzzle of untangling causation if multiple interventions share common meanings. The assets and shortcomings of a treatment element will hinge not only on its virtues, but on the context in which it is introduced and its effects measured. The guidance value of a procedure administered by itself will differ from its worth if as-

sessed relative to other options, redundant information, which accompany, precede, or follow it. For example, clinical studies find that a first intervention usually promotes more change than procedures that follow afterward (Boulougouris, Marks, & Marset, 1971; Watson & Marks, 1971). This probably occurs because all the variance shared by related procedures will be preempted by the initially applied method. It will create the changes that could largely be prompted by any of its functional counterparts, thereby imposing a ceiling effect on their common contributions: later procedures that provide redundant information will only add appreciably if they also control variance not highly correlated with the common factor. Such primacy effects are especially likely in crossover designs, and when a narrowly defined element is placed after, or added to, another technique. In that case, operations that are helpful by themselves may appear weak, even though inverting the sequence of procedures might qualify or reverse the results (Blanchard, 1970; McFall & Twentyman, 1973; Mann, 1972). To prevent misleading conclusions, perhaps the simplest expedient would be to routinely counterbalance serial position among related procedures. But this will pose problems when the organization of treatment procedures is governed by logical, stylistic, or pragmatic constraints.

The issues discussed above are often neglected or misunderstood. For example, Marks' chapter in this handbook dwells on the element of exposure to threats in modeling therapies to reduce fear. No meaningful treatment of fearful behavior, whatever its form, can be applied devoid of exposure—whether it is direct, vicarious, or symbolic—to what people fear. Since it is impossible for a treatment to be directed at a void, the notion of exposure reduces to the simple observation that reduction of fearful behavior requires some commerce with fear-relevant stimuli. One can, of course, have fearful people engage in activities in which they are provided with no opportunities to interact with feared objects, to observe others do so, or to confront what they fear in imaginal representation. Such a procedure would be regarded as a handy control condition but a nonsensical treatment.

Both acquisitional modeling and disinhibitory

modeling serve as ways of transmitting information, but they alter behavior through different types of information. Acquisitional modeling informs observers on how response elements are synthesized into new patterns. From observing others, one forms a conception of how new behavior patterns are performed and on later occasions the symbolic construction serves as a guide for action. Disinhibitory modeling operates through the information it conveys about personal efficacy and the consequences of approach responses. Contrary to Marks, the term modeling has never been used as synonymous with exposure. Disinhibitory modeling has always been explicitly defined in terms of observing actions performed toward threatening objects without any untoward consequences to the model (Bandura, 1969).

Experiments can be performed to demonstrate that modeling nonsensical and irrelevant behaviors involving no commerce with threats does not reduce fearful behavior. Marks cites several studies of this type. The findings of such studies say more about the irrelevance of the research than about the effectiveness or processes of disinhibitory modeling. The substantial evidence already reviewed demonstrates that modeling provides an effective mode for transmitting information about personal efficacy and the likely consequences of approach responses. Such information reduces fear. Control conditions expressly designed to assess the effects of exposure to threatening objects show that exposure alone has negligible effects (Bandura, Grusec, & Menlove, 1967; Kazdin, 1973, 1974a, 1975).

The judgments expressed by Marks regarding disinhibitory modeling rest heavily on arbitrary relabeling of treatments. For example, two versions of modeling in which subjects observe either themselves or others successfully executing approach responses are transformed into "modeling" versus "nonmodeling" categories. Since the two versions yield comparable results, the arbitrary dichotomy is interpreted to show that modeling has no effects. The data, however, merely affirm that similar modeling treatments (visualizing approach responses without adverse consequences) produce similar outcomes. In other examples, modeling is arbitrarily wedged to irrelevant activities but divorced from relevant performances. In treating clients who are

obsessed over dirt contamination, seeing a therapist relax is designated as modeling, whereas observing a therapist engage in soiling activities is labeled as "the therapist expose(s) herself to contaminating situations." Since observing irrelevances (e.g., relaxation or hearing former clients describe variable improvements) does not change obsessions or agoraphobias, modeling is again judged unhelpful. Other judgments of comparative efficacy are derived from studies of redundant treatments that confound order of administration or include modeling as unrecognized elements in the alternative formats. Arbitrary analytic practices create confusions, spurious disputes, and trivialize substantive issues of importance.

The issue of interest is not whether a viable treatment does or does not include exposure, but rather the form the transactions with the threats take, the information derived from those transactions, and the mechanisms by which the transactions produce changes in behavior. The descriptive concept of "interactional exposure" has no explanatory value and little predictive utility. No one would argue with the notion that duration of commerce with feared stimuli is a variable that can affect behavioral change. However, when one examines this conception for more specific predictions, it yields little.

According to Marks, approach to feared objects is the critical ingredient in interactional exposure. Actually, it is not the interactional exposure but the effects of interaction that form the critical factor in reducing fears and defensive behavior. Interactional exposures that produce injurious consequences create and reinforce fears and inhibitions; interactions that result in personal mastery and beneficial outcomes eliminate fears and inhibitions.

Gross variations in amount of exposure to threats without adverse consequences will ordinarily produce some differences at the group level. That is, participants who deal with threats for five hours will, as a group, usually achieve greater change than those who are treated for one hour. But "exposure" is of no value either in explaining or in predicting the wide variations in behavioral changes exhibited by clients who have received the same amount of exposure. Regardless of whether the treatment involves desensitization, flooding, ra-

tional emotiveness, cognitive restructuring, or any other method one might wish to insert, the standard finding is marked variation in behavior under the same duration of treatment. Nor is exposure of much help in predicting changes in behavior achieved through different forms of treatment. Enactive mastery produces substantially better results, in much shorter periods of exposure, than does symbolic mastery (Bandura, 1977b; Bandura, Blanchard, & Ritter, 1969). Although enactive and imaginal formats both involve "interactional exposure," it is the modality through which self-efficacy and outcome information is conveyed, not exposure, that is the useful predictor. Exposure is best considered as a quantitative variable (e.g., the amount of time spent confronting threatening stimuli if therapies diverge in this respect) and not as an explanatory construct, or as a categorical basis to distinguish among treatment strategies.

Research conducted within the social learning framework, to be reviewed later, lends substantial validity to the theory that psychological influences alter defensive behavior by enhancing the level and strength of perceived self-efficacy (Bandura, 1977b). By encompassing all modalities through which efficacy information is conveyed (i.e., enactive, vicarious, exhortative, and emotive), this conceptualization provides a common theoretical framework for explaining and predicting behavioral changes accompanying diverse modes of treatment. Thus, efficacy expectations predict with high accuracy variations in improvement between and within treatments, and even the rate of improvement during the course of treatment.

Marks suggests that self-efficacy may reflect a "fearful attitude." As we have previously noted, the findings of different lines of research lend little support to the view that fear regulates defensive behavior. Fear and avoidance are not closely related. Both are effects of some other cause. In the social learning theory of anxiety, it is mainly perceived lack of efficacy for managing potentially aversive situations that makes them fearsome. People are afraid of things they cannot cope with, but they do not find them fearsome if they believe they can manage them. A weak sense of efficacy can thus produce both fear and defensive behavior. Empirical tests support the view that perceived self-

efficacy mediates fear (Bandura & Adams, 1977). High self-efficacy is associated with weak anticipatory fear and low fear arousal during performance of threatening activities.

Attributes of Models.

People are more likely to process and implement information transmitted by social sources who compel attention (Grusec & Skubiski, 1970; Yussen, 1974), who deserve trust (Beutler, Johnson, Neville, Elkins, & Jobe, 1975; McGarry & West, 1975; Raw, 1976), who appear realistic reference figures to compare with oneself (Brown, Brown, & Danielson, 1975; Festinger, 1954; Kanfer, Karoly, & Newman, 1974), who depict consensus in a sample of individuals (Bandura & Menlove, 1968; Kazdin, 1975, 1976), and whose conduct offers plausible standards to guide observers' aspirations (Bandura, 1976b; Kazdin, 1974b; Rosenthal & White, 1972; Thelen & Kirkland, 1976). In essence, models' impact will be positive functions of their relevance and credibility for observers.

However, the specific operations that determine models' impact will vary with context, and depend on clients' inferences and standards of comparison. Coping models, who begin by sharing some of clients' fears or failings but progressively gain poise and confidence, typically surpass mastery models, who start with faultless expertise (Meichenbaum, 1971; Kazdin, 1973, 1974b). A coping model first mirrors clients' own woes (more relevance), but also, people who overcome handicaps and shift toward success earn positive social judgments (Levine, Ranelli, & Valle, 1974). Exceptions occur if coping models display excessive distress, social distance from observers, or both.

To the extent that coping models facilitate boldness in others, the effects are probably achieved by increasing expectations of personal efficacy rather than by the modeled fearfulness. It is possible to capitalize on the benefits of model similarity without temporarily exacerbating fear arousal by exposure to frightened models. The similarity can be presented historically by depicting the skilled model as a person who had previously suffered similar fears that were successfully eliminated through treatment. In this type of approach, which is a common rehabilitation practice among self-

help groups, model mastery of problems is portrayed historically rather than enacted currently.

Within limits, model-client similarity (e.g., in age, sex, or needs) improves vicarious outcomes (Kazdin, 1974a; Kornhaber & Schroeder, 1975; Thelen, Dollinger, & Roberts, 1975). Such results suggest that peers who have solved, or share, common problems are effective tutors. Some efforts to test peer systems have worked well (e.g., Fremouw & Harmatz, 1975; Nelson, Worrell, & Polsgrove, 1973) and invite further extensions (Rosenthal, 1976), yet, diversity in social exemplars is helpful. Progress is greater if clients observe multiple models performing the feared activities (Bandura & Menlove, 1968; Marburg, Houston, & Holmes, 1976) and also when models occupy a range of positions relative to the client's status (Kazdin, 1975, 1976).

In contrast, models' personality styles have had negligible effects (Bandura, Blanchard, & Ritter, 1969; Mann & Rosenthal, 1969), unless harsh or otherwise inappropriate (Vernon, 1974). A warm, nurturant model elicited more incidental emulation by chronic psychotics, but no better task progress than a neutral model (Chartier & Ainley, 1974). In treatment with neurotics, warm, and neutral model roles proved equal, but both surpassed a cold model group that gained no more than untreated controls (Goldstein, Martens, Hubben, Van Belle, Schaaf, Wiersma, & Goedhart, 1973). Because models are usually perceived as assistants to the therapist, who is (or should be) warm and supportive, clients will extend trust to models if not clearly unmerited. Thus, models' personal traits seem less critical than how well their aptitudes and behavior provide cogent guidelines.

When models grossly depart from plausible conduct (Vernon, 1974), clients are more likely to define therapeutic influences in ways not intended by therapists. Because therapists' social influence will depend on their credibility, and can count more in treatment than permutations of method (Russell, Armstrong, & Patel, 1976), the clients' viewpoint must be taken into account. Ambiguity or doubt can raise people's vulnerability to threats even if degree of perceived similarity to the model has no effect (Brown, 1974). The situational set or definition that clients adopt can greatly alter what

the influences signify, and lead to different results, despite constancy in modeled performance. Thus, observers who empathized with their model reacted quite unlike others who took a detached, onlooker role (Aderman, Brehm, & Katz, 1974; Regan & Totten, 1975). As with the loose coupling between fearful affect and avoidant acts, the linkage between modeled events and observer response depends on the stance, interpretation, and expectancies that patients adopt.

Common Features in Variant Symbolic Procedures.

Similar information and meaningful inferences can be drawn from many permutations of input. Hence, it is not surprising if symbolic modeling produces much the same results as related guidance techniques bearing other labels like systematic desensitization, role-playing, and flooding. Nominal format differences may prompt contrasting brandnames that emphasize superficial distinctions but obscure basic commonalities. Ordinarily, all such methods share a number of important treatment features that overlap substantially in form, organization, substance, and functional consequences. These common aspects include: (1) *situational settings and goals.* Clients enter treatment with the aim of changing certain patterns of behavior. (2) *Encounters with beneficial feedback.* Clients observe, imagine, or simulate restored contact with threats, and gain appropriate performance skills, by symbolic rehearsal with corrective guidance under protected conditions. (3) *Organized presentation formats.* The treatment procedures are directed at actively developing or restoring competence, using orderly sequences of steps clients can grasp. Whether for symbolic, simulate, or actual practice, the essential components of the desired behavior are mapped and transmitted coherently, usually in graded stepwise progression. Therapists often supply guiding rationales to explain why treatment elements will assist the client. (4) *Inferential parallels for self-directed efforts.* Whatever the specific treatment procedures, similar core implications are conveyed: to increase contacts with the formerly avoided, to speak up for oneself, to converse with companions in ways that are mutually interesting, to negotiate compromises with partners about

budgeting, sexual conduct, childcare, and so on. All these features, and (5) social influence exerted by the therapist, occur in most behavioral psychotherapies. As with other types of information, a range of social sources and influence formats can lead to comparable molar effects (Simpson, Rosenthal, Daniel, & White, *in press*).

Sometimes, the special hallmark of one therapy is equally applicable to variant brands. For example, implosion rests on a strategy of presenting high intensity fantasy items at the outset. Within limits, this may be an efficient technique (e.g., Boudewyns, 1975; Emberle, Rehm, & McBurney, 1975), because stringent instances create judgmental displacement of the remaining items (i.e., "contrast effects"). After visualizing a jeering, hostile audience, clients will by contrast weight public speeches under usual classroom conditions as relatively innocuous, even if the more dramatic trappings of implosion fail to enhance progress (White, Rosenthal, & Gerber, 1975). However, the perceived contrast produced by intense items as standards are not specific to the implosion method. The same strategy can be adapted to desensitization hierarchies (as flooding), to modeled episodes, or to role-playing routines.

The difference between self and another as actor can be important, especially on overt trials where one's own poise is far more relevant than a stranger's. With symbolic trials, frightened clients may at times find it more plausible if a model meets the peak challenges than if they try to visualize themselves coping with terrifying events. However, videotaped models were no better than desensitization scenes for removing spider fears (Denney & Sullivan, 1976). Observing a performer overcome social inhibitions, imagining a model perform instead, and imagining oneself as the actor can produce the same changes (Rosenthal & Reese, 1976). Further, in actual clinical practice, many therapists elaborate desensitization items to generalize their content, increase their vividness, and expand clients' perception of sustained, correct participation. Under such conditions, desensitization and symbolic modeling may not only yield indistinguishable benefits, but may involve substantially identical cognitive events. Research comparing direct with vicarious desensitization of test

anxious students has found equivalent results whether observers watched videotapes or treatment given to live peers, and whether clients were treated individually or in groups (Denney, 1974; Mann & Rosenthal, 1969).

Although various studies (e.g., Borkovec, Kaloupek, & Slama, 1975) have confirmed the value of relaxation training, its inclusion or exclusion has not greatly altered comparative outcomes. Relaxation does not enhance the effects achieved by live modeling (Bandura, Grusec, & Menlove, 1967) or symbolic modeling (Bandura, Blanchard, & Ritter, 1968). Vicarious desensitization gains were unchanged if the relaxation component was omitted, and whether or not observers actively copied the model's responses (Mann, 1972). In a test with small animal fears, symbolic modeling progress rose by slender margins if supplemented by relaxation (Denney & Sullivan, 1976).

Likewise, when modeled and role-played simulations were combined, improvement has been somewhat better than, or just equal to, desensitization, depending on which response measures are examined (e.g., Curran & Gilbert, 1975; Marzillier, Lambert, & Kellett, 1976). Similar marginal differences were found in comparisons between symbolic modeling and flooding (Rachman, Marks, & Hodgson, 1973). But adding versus omitting a modeling tape (Emmelkamp & Emmelkamp-Benner, 1975), or terminal response demonstrations (McFall & Twentyman, 1973), had no effect when largely redundant with other guidance procedures that were also given. Sometimes, related but competing procedures overlap in major themes, yet vary in so many details, that crediting an advantage to one or another approach becomes arbitrary (e.g., Lira, Nay, McCollough, & Etkin, 1975; McFall & Twentyman, 1973). However, when alternative methods provide distinct sources of influence, combining procedures will typically surpass each separate component. Videotaped playback of self-modeled behavior added to narrative commentaries was far more useful than the purely verbal feedback alone (Edelson & Seidman, 1975). Opposed response-prevention methods both improved when either was joined with modeling (Boersma, Den Hengst, Dekker, & Emmelkamp, 1976). If we had some means to compute

the coefficients of overlap among alternative methods, they might facilitate selecting elements for composite programs rationally. A simple, pragmatic hypothesis is proposed: unless procedures are structurally incompatible (e.g., imaginal flooding and desensitization), the less covariation between two effective treatments, the better their combination, and vice versa.

In related spheres, contingent and noncontingent covert (imagined) reward and fantasy exposure without reward were equally helpful but all exceeded an attention-placebo control group (Hurley, 1976). This again illustrates the weakness of incentive prompts if clients grasp treatment meanings and concur with their implications. Pitted against each other, contingent praise assisted much less than precise feedback for overcoming phobic avoidance (Leitenberg, Agras, Allen, Butz, & Edwards, 1975). Under naturalistic conditions, people's ability to benefit from new experience depends on being able to discriminate their performance by assessing its strengths and failings, and to apply that information to guide future efforts constructively. Thus, monetary loss or gain contingent on stuttering acts had trivial impact compared with training to use self-observation and recording as feedback devices (Lanyon & Barcas, 1975).

Equivocal at first blush, all the foregoing data taken together provide further evidence for the importance of human information-processing. Comparing covert, filmed, and live symbolic modeling, or any of those with desensitization, flooding, or simulated role-plays, one finds roughly equal outcomes. Those, in turn, reflect the functional overlap of information provided by the methods as well as commonalities in the mediating events that underlie client changes. What does appear to make a major difference is whether treatment is confined to facsimile conditions or, instead, is moved out into the natural contexts and provides clients with practiced skills to deal effectively with the problems they face in daily living.

Participant Modeling

"Nothing succeeds like success." Folk wisdom (The proof of the pudding . . .) has long asserted the hazards of extrapolating from the potential to the achieved. Clients who observe others or im-

agine themselves renewing contact with avoided situations must still put simulated progress to actual test. People often doubt that they can "really" tolerate enclosed spaces or mount steep heights unless actual trials confirm restored ability. Desensitization clients sometimes worry that fantasized advances will be refuted when they ultimately face what they fear (Karoly, 1974). Only direct confrontation, if performed adequately, can fully remove such concerns. Even taking a few overt contacts in stride may leave lingering doubts. Clients need evidence of some sustained mastery with a range of real instances before they can firmly accept that success in first encounters was not a fluke. Treatment is incomplete until clients are confident they will be able to perform adeptly on future occasions, when alone and unaided (Röper & Rachman, 1976).

Contrary to the widely accepted view that all forms of treatment are equally effective (Luborsky, Singer, & Luborsky, 1975), some treatment approaches are decidedly more powerful than others. Most of the behavioral treatments developed in recent years have been implemented either through performance or by symbolic procedures. Regardless of the methods involved, results of comparative studies attest to the superiority of performance-based treatments (Bandura, 1977b). Performance desensitization produces substantially greater behavioral change than does symbolic desensitization (LoPiccolo, 1970; Sherman, 1972; Strahley, 1966). Real encounters with threats are superior to imagined exposure (Emmelkamp & Wessels, 1975; Stern & Marks, 1973; Rabavilas, Boulougouris & Stefanis, 1976; Watson, Mullet, & Pillay, 1973). Participant modeling, which uses successful performance as the primary vehicle of change, is much more effective than modeling alone (Bandura, Blanchard, & Ritter, 1969; Blanchard, 1970; Lewis, 1974; Ritter, 1969; Röper, Rachman, & Marks, 1975), symbolic desensitization (Bandura, Blanchard, & Ritter, 1969; Litvak, 1969), and cognitive modeling (Thase & Moss, 1976). Further, clients who only make partial improvement after facsimile contacts promptly attain complete recoveries when subsequently administered modeling with guided participation (Bandura, Blanchard, & Ritter, 1969; Thase & Moss, 1976).

Participant modeling programs eliminate separation in time or context between demonstrations and guided practice elements. Clients and therapists work at a graded hierarchy of tasks that eventually leads to mastery of feared activities. At each step the therapist exemplifies the relevant activity while the client observes, then accompanies the client during performance until the client gains enough skill and self-assurance to attempt the task alone. Once clients can handle formerly threatening situations on their own with relative comfort, more difficult tasks are introduced. The same strategy is applied until the hardest steps are eventually completed. At that stage, further independent practice is supplied until clients have mastered several different instances by themselves, and expect they can tackle successfully any plausible future encounters (Bandura, Jeffery, & Gajdos, 1975). Treatment continues as long as needed for clients to confirm overt competence and a strong sense of personal efficacy.

A number of technical features allow therapy to commence in the natural setting. First, the presence of the therapist is a source of comfort and support (Epley, 1974). Even in a simplified situation, clients accompanied by the therapist are able to approach feared stimuli more closely than those who performed while the therapist, only a few feet distant, watched (Feist & Rosenthal, 1973). Second, pains are taken to reduce the client's inhibitions and distress during overt attempts by means of diversified response induction aids (Bandura, Jeffery, & Wright, 1974). Even profoundly inhibited acts can usually be elicited if their form, context, or duration is modified to match clients' tolerance. Initially, claustrophobics might endure confinement for just seconds, with intervals gradually lengthening until minutes and later hours can be tolerated. Verbal or physical reassurance from the therapist can reduce avoidance and arousal during early trials, before clients are willing to attempt the subtask on their own (Ritter, 1968, 1969).

The severity and type of problem will determine the specific performance aids that may be required. A program to remove driving inhibitions might start with brief trips on secluded streets in minimal traffic, advance to longer drives on more active routes with scattered traffic, and culminate in lengthy ex-

cursions on crowded freeways under difficult weather conditions. The same dimensional principles are applied to graduating and structuring the components of active practice tasks. Some data suggest that stepwise increase in task difficulty has advantages over immediately facing the client with intensely demanding performances (Boersma, Den Hengst, & Emmelkamp, 1976; Emmelkamp, 1974), but this will depend on the severity of clients' handicaps and the range of situations spanned in the hierarchy (Kirsch, Wolpin, & Knutson, 1975; Rankin, 1976). Clients who abandon appealing careers, or deny themselves many social and recreational rewards because of incapacitating fears and inhibitions, will not likely achieve high competence without first mastering intermediate challenges, especially when skill deficits as well as inhibitions must be overcome.

In any case, treatment planning is constrained by the specific activities the client will or will not undertake (Rosenthal, 1976). Clients' attempting or refusing to perform a given task sets the limits on the momentary content of treatment. Therefore, various behavior supports are provided to facilitate coping efforts. protective devices can be introduced and progressively faded out. Contact with feared animals can be prompted if their movements are first restrained, and if clients wear protective gear. Peering down from windy rooftops or sheer cliffs is eased if safety lines secure the client to firm anchorings. Other performance aids designed to overcome fearful avoidance during overt practice are illustrated elsewhere (Bandura, Jeffery, & Wright, 1974; Rosenthal, 1976).

When participant modeling is used to redress skill deficits, added kinds of behavior supports may be valuable. Thorough assessments that delineate concrete facets of interpersonal conflict will prepare the clinicians to deliver cogent guidance and feedback (e.g., Thomas, Walters, & O'Flaherty, 1974). Then, various cueing devices can be used to prompt appropriate behavior during complex social interactions (Carter & Thomas, 1973; Weathers & Liberman, 1973). Demonstrating self-regulatory strategies and providing cognitive mnemonics can guide conduct and help keep clients' attention from straying into futile or self-defeating channels. Unless information processing

activities are properly guided, an intervention may have variable or harmful effects (Kauffman, La Fleur, Hallahan, & Chanes, 1975). Many natural categories for representing events do not reflect a reasoned weighting of instances, but instead rely on subjective prototypes that can distort or ignore intended meanings (Rachman & Seligman, 1976, Rosch, 1975).

The advantages of performance aids for inducing requisite behavior should not be confused with their limitations for maintaining behavior. Put most simply, the more aids used to assure performance, the more that treatment departs from the real life conditions clients must eventually manage unaided. Once clients can endure participation, the supports are faded out until competence is sustained without any aids. Unless people end by attributing their gains to enhanced personal resources, they have reason to doubt the significance of progress and its predictive value for future challenges. One cannot assume that the more protective devices the better. When participant modeling outcomes were compared for clients given few, more, or many inductive aids, the minimally aided gained much less than both other groups, but maximally aided did not surpass moderately aided treatment. Yet the most extreme, refractory cases later profited from added therapy with unlimited response induction aids (Bandura, Jeffery, & Wright, 1974). In practice, therapists will use however many aids are needed to assure early successful performance, but will then withdraw supports as clients become skilled at the activities. At that point, independent practice in various situations is added to instill mastery. Providing opportunities for self-directed accomplishments after the desired behavior has been established further increases the level and generality of change and enhances perceived self-efficacy (Bandura, Jeffery, & Gajdos, 1975).

A Common Cognitive Mechanism of Operation.

Bandura (1977b) has proposed a theory to account for changes produced by alternative treatments that differ in external form. According to this theory, psychological procedures, whatever their format, serve as ways of creating and strengthening

expectations of personal effectiveness. Expectations of efficacy affect people's choice of activities and behavioral settings, how hard they strive, and how long their attempts will persist despite barriers, adverse feedback, or other response costs.

Expectations of personal efficacy stem from four main sources of information. Performance accomplishments provide the most influential efficacy information because such information is based on personal mastery experiences. The other sources include the vicarious experiences of observing others cope and succeed; verbal persuasion, exhortation, and allied types of social influence; and states of physiological arousal from which people judge their level of anxiety and vulnerability to stress. A number of factors influence the cognitive processing of efficacy information arising from enactive, vicarious, exhortative, and emotive sources. Thus, for example, cognitive appraisals of the difficulty level of the tasks will affect the impact of performance accomplishments on perceived self-efficacy. To succeed at easy tasks provides no new information for altering one's sense of self-efficacy, whereas mastery of challenging tasks conveys salient evidence of enhanced competence. Momentary setbacks or advances count less than the conclusions clients draw from sequences of events. People who stumble and fail, but detect relative progress, may enhance self-judged efficacy more than those who succeed but interpret their efforts as deteriorating or stuck on a plateau compared to prior attempts. Perceived self-efficacy refers to people's conviction that they can engage in and successfully execute given deeds, not to short-run payoffs the behavior may earn. Obviously, although confident about their ability to perform, people withhold actions that are judged too costly or against their best interests.

Empirical tests of this theory (Bandura & Adams, 1977; 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 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 vicarious experi-

ences alone, or elimination of emotional arousal through systematic desensitization. Behavioral changes correspond closely to level of self-efficacy regardless of the mode of treatment. The higher the mastery expectations, the greater the likelihood that clients will cope successfully with threatening situations. The relationship is most precisely revealed by microanalysis of the congruence between self-efficacy and performance at the level of individual tasks. This measure is obtained by recording whether or not clients consider themselves capable of performing the various tasks and computing the percent of accurate correspondence between efficacy judgment and actual performance. Self-efficacy was an accurate predictor of performance in 89 percent of the behavioral tasks for participant modeling, in 86 percent of the tasks for mastery expectations instated by modeling alone, and in 89 percent of the tasks for increases in self-efficacy produced by desensitization treatment. When clients are tested at periodic intervals during the course of treatment, self-efficacy predicts with a high degree of accuracy how much the individuals will change in their behavior after receiving limited amounts of treatment.

In general, the efficacy analysis is able to account for performance variations both between and within therapeutic modes, and to predict behavioral approach on specific tasks during the course of treatment and after it is completed. The foregoing theory integrates the results of heterogeneous treatment approaches. It proposes a common cognitive mechanism that regulates overt behavior, and provides an explanatory framework for the impact of behavioral psychotherapies in general. Most of the treatment issues, already reviewed and to be discussed, gain coherence when viewed in these terms.

DEVELOPING SOCIAL SKILLS THROUGH MODELING

Personal problems often intermesh skill deficits with behavioral inhibitions. For inhibited ability, guided performance seems the intervention of choice. But to acquire new competence, observational methods offer special advantages (Bandura, 1976a). Development of skills would be exceed-

ingly laborious, not to mention perilous, if learning were based solely on trial-and-error experiences without the guidance of models who exemplify the effective patterns. Shifting the balance between deficit and avoidance should alter the respective merits of exemplary and enactive options. In most complex problems, composite programs that include multiple forms of guidance serve clients best.

Profound Deficits

Major deficits arise if people have never acquired generalizable competencies, or if their living conditions have so encumbered once-learned behavior that it remains functionally void. When clients lack the rudiments of coping ability, demonstration is a key tool to instate skill. Modeling can convey needed information faster and better than other methods that rely on rewarding self-generated fragments of requisite patterns.

If a client cannot perform any segment of the appropriate activity, the first goal is eliciting some molecule of action to build on. Gross deficits are found in autistic children, who may only enact bizarre and self-injurious conduct, or in regressed, chronic psychotics who remain largely mute, in stupor, and unresponsive. For such cases, modeling first drew notice when operant researchers could not evoke rewardable acts unless initiative prompts combining modeling, guided performance, and reinforcement of progress were supplied. The basic strategy is much the same in treating adults (e.g., Sherman, 1965) and autistic children (Lovaas & Newsom, 1976; Risley & Wolf, 1967). The therapist first gains control over the child's attending behavior. Complex behavior is gradually elaborated by modeling the activities in small steps of increasing difficulty. If the child fails to respond, verbal and manual aids are used to facilitate the behavior. Response induction aids are gradually withdrawn and reinforcement for prompted behavior is later withheld to counteract passive responding. As is typical, acquisition begins slowly but accelerates with continued participant modeling. After desired behavior is established, children are taught to generalize their new capabilities by rewarding appropriate responsiveness in a variety of settings toward a variety of people.

Sometimes vastly prolonged treatment is needed before the first few instances of a response

class are modeled. Once those responses gain meaning, progress is much faster and far exceeds waiting until impaired clients spontaneously emit rewardable acts. It is of interest that the more abstract the skill, the more exemplification has aided learning (Lovaas, Freitas, Nelson, & Whalen, 1967). Children whose parents continue the therapeutic practices maintain or expand skills at long-term follow-ups. If put in milieux that neglect sustained guidance, conduct reverts but relearning is fairly rapid (Lovaas, Kogel, Simmons, & Stevens, 1973).

Essentially the same principles and techniques apply to institutionalized retardates. Prompted demonstrations provide effective guidance to correct gross skill deficits. Robust gains are confirmed across variations in age, type of behavior, and putative nosology (Azrin, Gottlieb, Hughart, Wesolowski, & Rahn, 1975; Baer, Peterson, & Sherman, 1967; Bernal, Jacobson, & Lopez, 1975). Consistent with the findings of disinhibition through multiple modeling, seriously retarded clients generalized far better if taught by multiple than by single models (Marburg, Houston, & Holmes, 1976). When deficits are less severe, competence develops further and faster.

Verbal Expressiveness

Faithful carrier-waves do not censor the message they bear: Ample research finds modeling helpful to promote more vivid affect and more intimate discourse during interviews. Prior reviews (e.g., Marlatt, 1972; Rosenthal, 1976) summarize much of this evidence; current studies continue the tradition. Often, subjects first observe exemplary self-revelations via alternative modeling formats whose impact is then tested in an interview. Thus, an "expert" model evoked more self-disclosure than a peer (Doster & McAllister, 1973), but positive versus negative content led to equal candor (Doster & Brooks, 1974). Compared to controls, audiotaped strangers raised frank self-references, but less than filmed models (Stone & Stebbins, 1975) or the interviewer's live examples (Davis & Skinner, 1974). Yet as taped models, another person described as a "colleague" surpassed the interviewer and verbally describing self-disclosure proved weak unless exemplary tapes were added (McAllister & Kiesler, 1975). Demonstration was more

helpful when joined to longer sets of specific instructions than when briefer, global directions were supplied (Stone & Gotlib, 1975). Varying time and narrative versus exemplary guidance, longer demonstrations aided most, but short directions exceeded scanty illustrations (McGuire, Thelen, & Amolsch, 1975). Demonstration, instructions, and rehearsal were compared to enhance empathic talk; strongest by itself, demonstration was bolstered if either other method was added (Stone & Vance, 1976). In practice, mode of conveying information should count less than ability to discern relevant cues, and to organize them into cogent classes (Hersen & Eisler, 1976; Hersen, Eisler, & Miller, 1974).

Although caution is needed in judging when and how to stimulate intimate disclosures (Shimkunas, 1972), exemplary frankness can promote clinical gains. Exemplary disclosures raised intimate talk but also suspicion in nonpsychotics, and elevated delusions and autism in psychotics. Self-modeled practice before conversation reduced inept statements more than monitoring by self or other during conversation (Cavior & Marabotto, 1976). Resistant, involuntary counselees were more communicative after peer demonstrations (Smith & Lewis, 1974), as were asocial clients given modeling aids (Gutrupe, Goldstein, & Hunter, 1973). Contrasts between coping and mastery models expressing positive versus neutral affect did not alter skill judged in simulated job interviews; but psychotics' self-rated arousal was less with coping than mastery models (Bruch, 1975). A starkly constricted man grew and remained more animated after his therapist exemplified spontaneity for just one session (Wexler & Butler, 1976). Modeling, role-playing, and rehearsal were given to reorient stilted clients; their social behavior, as rated by friends, improved significantly (Cabush & Edwards, 1976). In all, modeling options seem promising tools to rectify constricted, rigid styles of personal conduct.

Assertiveness.

People who cannot behave assertively and express their legitimate rights will suffer considerable aversive control by others. Their satisfactions in living and self-regard may be chronically meager. Fortunately, modeling can rectify submissive patterns in

samples ranging from timid students (McFall & Lillesand, 1971; Rathus, 1973) to hospitalized psychotics (Goldstein et al., 1973; Hersen & Bellack, 1976a). Earlier work is capsule elsewhere (Hersen & Eisler, 1976; Rosenthal, 1976). Typically, demonstrations, instructions, prompting, and role-playing are joined to simulated or actual practice. Exemplary plus narrative guidance surpasses either method alone (Hersen, Eisler, & Miller, 1974; Hersen, Eisler, Miller, Johnson, & Pinkston, 1973). Such composite guidance has created stable long-term gains (Galassi, Kostka, & Galassi, 1975). To date, structured rehearsal of assertiveness in natural situations is skimpy. That lack may explain many failures on new, transfer demands (McFall & Lillesand, 1971; McFall & Twentyman, 1973; Rosenthal & Reese, 1976; Young, Rimm, & Kennedy, 1973).

To assess severity, handling social situations requiring assertiveness may tax clients more than responding to simulated situations presented on audiotape (Galassi & Galassi, 1976). But content medium counts less in promoting change. Audio and videotapes proved equal (McFall & Twentyman, 1973); covert modeling works well, especially if multiple models are visualized (Kazdin, 1975, 1976); and imagining self or other perform was as good as a live peer (Rosenthal & Reese, 1976). Incentive inducements hinge on their cognitive effects (cf., Moore, Mischel, & Zeiss, 1976). Praising clients' practice did not boost gains (Young, Rimm, & Kennedy, 1973). Yet if assertive fantasy models earn reward, progress improves (Kazdin, 1974c, 1976) because clients elaborate on favorable performances more (Kazdin, 1975).

Assertive guidance as a behavioral aid, or supplement, can facilitate changes in other problems like inept social behavior (Hallam, 1974) and sexual difficulties (Stevenson & Wolpe, 1960; Yulis, 1976). The treatment strategy can bring enduring advances, and is helpful when applied to related complaints. Its ultimate potential needs testing in formats that assure sustained practice of assertiveness in the natural environment (Bandura, 1973).

Social Competencies

Perhaps the most prevalent and critical adjustment problems stem from deficits or deviance in relating to others. Whether deprived of opportunity, or

handicapped by dysfunctional development, clients' prospects for adept relearning are hopeful. Although still an infant realm, treatments based on social learning principles have made strides in promoting cognitive and social skills.

Withdrawal.

A combination of modeling, repeated role-playing, and feedback was compared with desensitization to assist socially inadequate outpatients. Both methods increased social contacts relative to non-treated controls, but composite guidance produced a wider range of new interpersonal behavior than did desensitization (Marzillier, Lambert, & Kellett, 1976). Videotaped or narrated behavioral guides, plus rehearsal, were given to elicit appropriate social conduct from psychotics who averaged over 20 years in hospitals. Each modeling format surpassed an attention-placebo group, with no differences based on treatment medium (Jaffe & Carlson, 1976). Social gains achieved through demonstrations, instructions, and feedback transfer to new situations and are maintained over time (Bellack, Hersen, & Turner, 1977).

In a milestone study, Goldsmith and McFall (1975) devised and validated a treatment program in a hospital setting. First, they carefully assessed interpersonal deficits on comparable wards to locate exemplary coping behavior, and to specify principles for later guidance. Then a new sample was assigned to skill development, pseudotherapy, or assessment-only conditions (balanced for schizophrenic and neurotic or character disorders). Treatment spanned the following explicit sequence: (1) narrative description; (2) coaching on principles of effective conduct; (3) observing competent styles of behavior demonstrated; (4) review of the prior content; (5) check on clients' understanding, and willingness to role-play; (6) simulated rehearsal; followed by (7) audio-taped playback, first judged by client and then by the therapist. The guided group exceeded the controls on simulated role-playing, in self-reported change, and in a structured situational test. The treated group also achieved slightly lower readmission rates. These gains held across diagnoses, although just three hours' guidance was supplied! Such data confirm the utility of their strategy. It is hard to gauge how psychotics treated for three hours compared in

severity with some chronic schizophrenics who, for example, required 20 to 30 sessions (Edelstein & Eisler, 1976; Hersen & Bellack, 1976b). To what extent did briefer treatment rest on more efficient therapy, on less deviant participants, or both? Growth of systematic programs will magnify the need for shared and valid criteria of social skills, to allow comparisons among studies.

Marital and Dating Problems.

Efforts have begun to devise methods for assessing dating skills. Peer-ratings, self-reports, and speech during verbally simulated interactions separated high from low male daters, but tests in natural situations did not (Arkowitz, Lichtenstein, McGovern, & Hines, 1975). Distinct patterns were later found in women, who mainly lacked familiarity with social guidelines, while poor self-appraisals most hampered men (Glasgow & Arkowitz, 1975). Diverse composites of role-playing, demonstration, coaching, and group feedback have aided shy males; grasping generalizable dating strategies seems more crucial than rehearsing discrete acts (Curran, Gilbert, & Little, 1976; Macdonald, Lindquist, Kramer, McGrath, & Rhyne, 1975; McGovern, Arkowitz, & Gilmore, 1975; Twentyman & McFall, 1975). Thus, desensitization was as good as repeating modeled responses (Curran, 1975). When instructions and group discussion clarified events, skill development surpassed desensitization (Curran & Gilbert, 1975). Likewise, fear of dating was reduced best if simulated practice was joined to role-playing and feedback by partners, but adding desensitization brought no extra gain (Bander, Steinke, Allen, & Mosher, 1975).

Analogous guidance can resolve spouse discord. Demonstrations taught dyadic feedback rules to couples with faulty interaction styles, who then showed clear progress (McLean, Ogston, & Grauer, 1973). Modeling and discussion followed by structured home practice with feedback improved spouse communication (Ely, Guerney, & Stover, 1973). Exemplary modeling to clarify reciprocal reward patterns aided a reinforcement-oriented marital skills approach (Azrin, Naster, & Jones, 1973). An ambitious stepwise program spanned four stages: (1) identifying dyadic conflicts and strengths; (2) role-playing with feedback to improve joint efforts; (3) contracting to negotiate

compromises, assisted by therapist demonstrations and bargaining rules; and (4) implementing prior learning and agreements. The couples made rapid gains on several measures, and continued feedback might have aided still further (Tsoi-Hoshmand, 1976). Symbolic modeling has also helped in programs to enhance sexual competence (Obler, 1973; Serber, 1974). As skill dimensions in conjugal dysharmony are better specified, a host of vicarious applications should have treatment value (Jacobson & Martin, 1976).

The foregoing research suggests that many social competencies are best taught by programs organized along the following lines: (1) the learning task is structured in an orderly, stepwise sequence to effectively communicate the needed skill guidance. (2) Generalizable rules of effective conduct are explained and demonstrated, and clients' understanding is checked to permit clarification if necessary. (3) Guided simulated practice is provided with feedback that rewards clients' successes and corrects their errors. (4) Once the desired behavior has been established, less structured opportunities for self-directed accomplishments are given so that people can authenticate a sense of personal efficacy. (5) During this transition to independent mastery, consultation and feedback by the therapist can further enhance provisional gains. (6) As a final step, clients test their newly acquired skills in the natural environment, at first under conditions likely to produce favorable results, and then in more demanding situations. (7) Transfer performance assignments are progressively adjusted to clients' capabilities at the given time, to enhance and reward their developing competence.

Cognitive and Self-Control Competencies

The evidence so far reviewed suggests this trend: As requisite skills grow more abstract or demand conditional judgments, guidance in strategic principles gains value, but repetition of discrete acts loses efficiency. Much human endeavor depends on the plans that govern the organization of already available component behavior. Problem-solving rules, self-regulatory standards, and habit change regimens that clients execute on their own are examples. A comprehensive discussion of this realm is given in Mahoney and Arnkoff's chapter of this

handbook. Our analysis, instead, concentrates on the vicarious elements in symbolic control.

Problem-solving.

Substantial research, elsewhere reviewed (Rosenthal, 1976; *in press*; Zimmerman & Rosenthal, 1974), confirms that modeling techniques are prime channels to convey abstract rules. Demonstrations can, for instance, transmit difficult principles (White & Rosenthal, 1974), subtle decision criteria (Macri, 1976), and elaborate concepts far better than instructions (Tumblin, Gholson, Rosenthal, & Kelley, 1977) or overt practice options, with excellent transfer despite major changes in physical cues (Rosenthal & Zimmerman, 1976). If learners' prior repertoires are limited, or the content highly novel, exemplary methods excel. Regardless of their level of ability, children acquire a new concept far better taught by example than by narration (Rosenthal, *in press*; Rosenthal & Kellogg, 1973). Conceptual progress is often best if information is exemplified and a summation of its guiding principles also given. Vicarious techniques are hence among the methods of choice to teach abstract competence. In applied settings, modeling becomes a versatile tool to convey new strategies and guidelines for living.

Although viewing treatment as problem-solving is hardly new (D'Zurilla & Goldfried, 1971), programmatic research is limited. Isolated papers, however, span a wide range of preliminary applications. Those run from role reversals between therapist and clients to prompt their devising new solutions for old problems (Alperson, 1976), to using peer norms as performance standards that helped depressives on anagrams tasks (Klein, Fencil-Morse, & Seligman, 1976). Test-anxious learners usually validate the Yerkes-Dodson law by scoring less well on abstract tests than calmer peers. Yet anxious students solved puzzles as well as normals if a model both demonstrated solutions and commented on guidelines to be followed (Sarason, 1973); they surpassed normals on a memory task if shown a coping model who acknowledged test fears but shared tactics to abate emotionality (Sarason, 1975). Modeling boosted clients' questions to aid personal problem solving, and videotaped feedback of own efforts most in-

creased judicious queries (Arnkoff & Stewart, 1975). A modeling tape, used to orient clients about vocational guidance, led to more solicitation of career data than did control methods (Fisher, Reardon, & Burck, 1976). Exemplifying a painful act reduced pain for people taught a cognitive coping plan, but raised distress for unguided observers (Chaves & Barber, 1974). The lion's share of benefit in a program to lower alcoholism resulted from combining videotaped playback of own drunkenness with guidance to discern and control blood alcohol level; behavioral counseling (demonstrations, role-playing, and social feedback), alcohol education, and competing response practice to setting cues further enhanced outcomes (Volger, Compton, & Weissbach, 1975). Academic guidance (by study manuals, cognitive and participant modeling, and programmed instruction) plus desensitization for test worries best aided students with scholastic problems (Mitchell, Hall, & Piatkowska, 1975). Guided group discussions that illustrated rationales to explain fear helped phobics more than desensitization (Wein, Nelson, & Odom, 1975). The foregoing medley of problem-solving themes invites further recitals.

Self-regulation.

The ultimate therapy goal is to replace handicaps with effective conduct, independently guided and maintained. Research on means to give clients control over changes, by altering covert regulators, is moving forward. Since laboratory studies clarified the processes by which people acquire standards of self-reward through modeling (Bandura, 1971, 1976b) the realm has burgeoned. Standards displayed by others may alter observers' phenomenology and deeds in subtle ways (Coyne, 1976; McGarry & West, 1975; Piliavin, Piliavin, & Rodin, 1975; White, 1975). Modeled standards also modify the satisfactions and future goal aspirations people extract from performance attainments (Fry, 1976; Masters & Christy, 1974; Masters, Gordon, & Clark, 1976) as well as the impact of therapy procedures (Rosenthal, Hung, & Kelley, 1977; White, Rosenthal, & Gerber, 1975).

The growth of treatments combining cognitive modeling with self-instructions has been an especially interesting development. First proposed by

Meichenbaum (1973), and kin to other cognitive behavior therapies (Beck, 1976; Goldfried, Deceneteo, & Weinberg, 1974), this approach combines recursive cycles of demonstration, cognitive modeling of action strategies, guided practice, and self-rehearsal planning to resolve problems in stepwise fashion. During treatment, the locus of guidance by external displays is faded into covert ultimate self-regulation. Thus, hospitalized schizophrenics moved from serial progress in conceptual tasks and reasoning, to mastering social communication skills (Meichenbaum & Cameron, 1974; Meyers, Mercatoris, & Sirota, 1976). Similar programs have helped shy people become more openly expressive (Cabush & Edwards, 1976), have aided hyperaggressive youngsters to develop self-control, (Goodwin & Mahoney, 1975) and to improve their cognitive functioning by adopting reflective styles of behavior (Bender, 1976; Debus, 1976). The content of self-directions and the event-structure of therapy dictate precise outcomes. Omitting a guiding rationale can impair results (Bender, 1976). As noted earlier, the more abstract the self-regulatory skill, the less that teaching by acutal toil on component acts seems to offer; in contrast, guides to strategic, executive principles grow more valuable. This is probably because repeating fairly simple elements is a poor means to recode and integrate information, but reviewing summary rules or cognitive strategies is efficient. Time and future data will tell best. From such investigations into modeling of cognitive processes, and self-directed, symbolic regulation, we will learn better how to organize, sequence, and combine elements of information that vary in difficulty and abstractness.

POTENTIAL DIRECTIONS

The bulk of the literature, already discussed, suggests that vicarious guidance has come of age to alleviate dysfunctional fears and inhibitions and to teach new competence. A shift from retrospect to prospect is eased by recalling that a growing family of information-producing and social influence tools can generate similar molar outcomes and cognitive mediators. Separate routes may differ in speed of clinical gain, or have special merits for defined tasks

and samples, but still reach the same goal. Also, methods may interact well or poorly if conjoined, but rarely will one procedure yield outcomes as good as with an array of tools. Not sheer utility but cost criteria—reckoned in time, staff, “side-effects,” attrition, and success rates—will decide whether and which modeling procedures are called for, and how diverse techniques should be hybridized. We can only hope that the best is yet to come.

Education and Preventative Possibilities

Educating parents or teachers to manage conduct problems in their children offers several advantages beyond savings in staff time. Since the model mediating change is a natural member of the milieu, access is automatic, gains from improved practices can extend to other children not initially referred, and the adult's prior role in creating deviance can be altered without stigma as part of lessons. Modeling aids are prominent in many such guidance programs. Benefits have come to families with aggressive and autistic children (Grogower & Sloop, 1976; Lovaas & Newsom, 1976; Patterson & Reid, 1973). Children improve more, because parents learn better, from a performance composite (including demonstration and role-playing) than from “reflective” counseling (Tavormina, 1975). Positive changes at home, designed to help a particular child, can generalize to other kin. Siblings not specifically treated as clients reduced their rates of deviant conduct, and maintained progress after new modeling patterns were instated (Arnold, Levine, & Patterson, 1975). Reciprocally, sibs (Laviguer, 1976) and parents who excel as learners (Butler, 1976) become ideal models to teach the less adept. Mothers' videotaped demonstrations surpassed several other parent education methods, such as lectures (Nay, 1975). There is evidence that social deficiencies characterize children who later become schizophrenic (Watt & Lubensky, 1976), and that derogatory self-reactions underlie much chronic maladjustment (e.g., Meichenbaum & Cameron, 1974). Given such data, various kinds of hazardous naturalistic modeling deserve concern, including: (1) withdrawn, or grossly aberrant parental interaction styles; (2) chronic patterns of demeaning negative feedback from adults to child;

and (3) excessive, deviant, or niggardly self-reinforcement by parents that may transmit harmful frames of reference across generations. There are substantial benefits to warding off developmental casualties as early as possible. Outreach projects are one solution. College students, serving as visiting models, were able to improve the parenting skills of mothers from disadvantaged backgrounds (Goodman, 1975).

With teachers, exemplary group guidance via modeling and role-playing led to better grasp of behavior principles than a manual; more important, student conduct was more improved in classrooms taught by the guided modeling group than by teachers given other methods (McKeown, Adams, & Forehand, 1975). Similar outcomes emerged in comparisons of counselor education programs (Eskedal, 1975). Such results argue that courses on advanced topics (White & Rosenthal, 1974), or social skills (Springer, Springer, & Aaronson, 1975), should adopt exemplary formats rather than lectures. Modeling applications to schoolroom pedagogy remain largely unexplored. Videotaped demonstration has primed observers to seek career information (Fisher, Reardon, & Burck, 1976). Disadvantaged adults in a basic education course watched coping models advance in study skills and attitudes favorable toward schooling: these observers showed better test grades, attendance, and eventual continuance of studies than did control classmates (Kunce, Bruch, & Thelen, 1974).

Preventative health offers great possibilities. Videotaped modeling of people undergoing dental procedures plus relaxation enabled more dental phobics to successfully complete dental treatment than did desensitization (Shaw & Thoresen, 1974). Shown to youngsters facing surgery, films of coping peer models reduced fear arousal both before and after surgical operations, and prevented the unease in home adjustment problems found for unprepared controls (Melamed & Siegel, 1975). Many of the above examples lend themselves to mass media formats, but the potential of televised education and prophylaxis remains scarcely tapped. In a rare exploration, weekly programs on local public television sought to teach self-control techniques, with some evidence that unselected viewers profited (Mikulas, 1976).

In an innovative program of research, Maccoby and Farquhar (1975) have successfully used mass media procedures on a community-wide basis to inform the public on how personal habits (e.g., dietary habits, smoking, overeating, exercise) affect the risk of premature heart disease and to change longstanding risk-related behaviors. Multi-media campaigns are used to create interest in the health program: instructional manuals and personal influence relying on modeling, guided practice, and reinforcing feedback are used to change habits injurious to health. Medical examinations of people selected from the community reveal that media influences produce significant reduction in risk-related behavior. Personal guidance in conjunction with mass media achieves more extensive and rapid changes than the media alone. Results of this exemplary project illustrate how personal habits conducive to health can be promoted on a community-wide basis with minimum involvement of health professionals.

Applications to Communal and Residential Settings

For some people, extent of deficit or the nature of their deviance thwarts early return to fully independent living as a proximate treatment goal. Lack of adequate resources, irreversible handicaps based on physical debility, social abandonment by family and friends, or legal sanctions facing the person require that treatment must maximize clients' potentialities within circumscribed or institutional boundaries. Often, those narrower aims can later be refocused toward wider horizons. But sometimes client and therapist must seek to optimize coping under sheltered conditions. In such cases, social learning principles offer a gamut of strategems that have yet to be harnessed at large.

Programs designed to help social offenders develop broadly useful skills that enable them to participate successfully in the larger society face related problems. They must overcome distrustful reactions if new aspirations and styles of living are to be developed in the confined milieu. They must also bridge between a restricted treatment setting and the freer environment in which beneficial changes will need to be maintained. Often, staff may be viewed with distrust. In contrast, peers who have advanced in a program, and have achieved

positive changes, are much harder to dismiss as exemplars. Their testimony and precedents will carry more weight. Few models seem as plausible or relevant as people who have shared but overcome clients' own problems. This is critical if a client rejects staff members as reference figures because they appear too remote in age, education, status, ethnicity, and so on, for suitable comparisons with self, or are perceived as outsiders, lacking vivid conversance with the client's burdens and viewpoint. Although positive interaction styles can raise staff credibility and influence (Jesness, 1975), delinquents may gain more from constructive peer modeling. Even brief videotapes have some favorable impact (Thelen, Fry, Dollinger, & Paul, 1976). If youngsters observe advanced peers in the same milieu demonstrate prosocial changes, more pervasive gains may follow (Eitzen, 1975). Graduates from a reeducation program have helped newer arrivals by exemplifying functional skills (Silver, 1976).

Transitions from confined settings to more natural milieux can be harder to accomplish than provisional change in protected contexts. Maintenance and transfer of gains cannot be left to the vagaries of fate without inviting recidivism (Fairweather, Sanders, Maynard, & Cressler, 1969; Hill, Hops, & Johnson, 1975; Lovaas, Koegel, Simmons, & Stevens, 1973). Peer role models can develop self-presentation and practical judgment skills. For example, practice in group discussion, decision-making, and planning was introduced. Once begun, mutual modeling, feedback, and choice of solutions aided hospitalized clients; they improved their social interactions and spent more time working in the community or at home than did people given a conventional token economy program (Greenberg, Scott, Pisa, & Friesen, 1975). Even teaching humble skills like how to shop, to cook, or to sustain audible conversations, can boost family acceptance of a deviant member compared with unguided visits at home or in the hospital (O'Brien & Azrin, 1973). Sometimes, modeling can defuse communal crises to prevent the spread of fears and of symptoms by group exemplification and consensual validation (Shelton, 1973). More often, modeling principles can help dischargees or other clients with common plights to regain meaningful community roles.

Transition programs are starting to be tested. In one, guided planning assisted unemployed clients find jobs, using a clublike setting. There, clients shared information, skills, and social support while seeking employment. Their families and friends were enlisted to supply leads for jobs. Mutual modeling and feedback prompted job-seeking efforts, guided members to improve their dress and grooming, and helped them organize career resumes. Demonstrations and role-playing prepared clients before employment interviews. Compared to matched controls, the club members found jobs much more often, started work sooner, and earned significantly higher salaries (Azrin, Flores, & Kaplan, 1975).

Programs of these sorts are called for to harvest the progress that can start during institutional treatment. In a longitudinal scheme, new recruits would receive guidance from proficient models, including advanced or graduate peers, as well as vocational and social skill consultants. Clients would witness a stepwise structure that exemplifies and rewards progressive levels of competence. As people achieve beneficial changes, they would be called on as tutors for neophytes, and the best models could eventually win staff positions. Upon discharge, the client would move to a transition phase where realistic needs and problems were met through group support, feedback, and cooperation, and by modeled guidance as needed, until clients earned stable and useful roles in the community. This strategy fosters multiple benefits; it helps assure relevant models; incoming clients can see the milieu strive to promote and reward progress toward independent success, not passive compliance for institutional convenience; group efforts and resources are used to ease transition stresses on each member; and jobs are created for dischargees in which their background invites hiring, not stigma. It should be possible to devise and implement sequential rehabilitation programs that capitalize on the foregoing social system guidelines. Such projects promise to more fully realize the educative and therapeutic potentialities of modeling influences.

Conclusion

The above potentialities encourage wider sociocultural horizons for social learning approaches, and

imply optimism about people's capacity for change. In a real sense, the current and future directions of psychological modeling mirror those in our discipline generally. From peripheralistic focus on observable acts, one sees reorientation toward symbolic processes and social guidelines that regulate overt acts. From chain-link views of causation exemplified by the S-R metaphor, we are moving toward more explanatory prototypes whereby personal meanings and thought integrate diverse information to arrive at observable patterns of behavior. Our view of reality is changing from exclusively experimenter-defined to largely person-constructed. We are devising new research paradigms to open up the "black box" and are finding predictive and explanatory contents within. New frontiers for vicarious processes and applications depend on progress toward improved understanding of human organization and intricacy. Let us hope these developments bring better models of mankind to serve observers—both in the role of clients and as interpreters of human nature.

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Self-Efficacy Mechanism in Human Agency

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Self-Efficacy Mechanism in Human Agency

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ABSTRACT: This article addresses the centrality of the self-efficacy mechanism in human agency. Self-percepts of efficacy influence thought patterns, actions, and emotional arousal. In causal tests the higher the level of induced self-efficacy, the higher the performance accomplishments and the lower the emotional arousal. Different lines of research are reviewed, showing that the self-efficacy mechanism may have wide explanatory power. Perceived self-efficacy helps to account for such diverse phenomena as changes in coping behavior produced by different modes of influence, level of physiological stress reactions, self-regulation of refractory behavior, resignation and despondency to failure experiences, self-debilitating effects of proxy control and illusory ineffectiveness, achievement strivings, growth of intrinsic interest, and career pursuits. The influential role of perceived collective efficacy in social change is analyzed, as are the social conditions conducive to development of collective efficacy.

Psychological theorizing and research tend to center on issues concerning either acquisition of knowledge or execution of response patterns. As a result the processes governing the interrelationship between knowledge and action have been largely neglected (Newell, 1978). Some of the recent efforts to bridge this gap have been directed at the biomechanics problem—how efferent commands of action plans guide the production of appropriate response patterns (Stelmach, 1976, 1978). Others have approached the matter in terms of algorithmic knowledge, which furnishes guides for executing action sequences (Greeno, 1973; Newell, 1973).

Knowledge, transformational operations, and component skills are necessary but insufficient for accomplished performances. Indeed, people often do not behave optimally, even though they know full well what to do. This is because self-referent thought also mediates the relationship between knowledge and action. The issues addressed in this line of inquiry are concerned with how people judge their capabilities and how, through their self-percepts of efficacy, they affect their motivation and behavior.

Recent years have witnessed a growing convergence of theory and research on the influential role of self-referent thought in psychological functioning (DeCharms, 1968; Garber & Seligman, 1980; Lefcourt, 1976; Perlmutter & Monty, 1979; Rotter, Chance, & Phares, 1972; White, 1959). Although the research is conducted from a number of different perspectives under a variety of names, the basic phenomenon being addressed centers on people's sense of personal efficacy to produce and to regulate events in their lives.

Efficacy in dealing with one's environment is not a fixed act or simply a matter of knowing what to do. Rather, it involves a generative capability in which component cognitive, social, and behavioral skills must be organized into integrated courses of action to serve innumerable purposes. A capability is only as good as its execution. Operative competence requires orchestration and continuous improvisation of multiple subskills to manage ever-changing circumstances. Initiation and regulation of transactions with the environment are therefore partly governed by judgments of operative capabilities. Perceived self-efficacy is concerned with judgments of how well one can execute courses of action required to deal with prospective situations.

Function and Diverse Effects of Self-Percepts of Efficacy

Self-percepts of efficacy are not simply inert estimates of future action. Self-appraisals of opera-

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tive capabilities function as one set of proximal determinants of how people behave, their thought patterns, and the emotional reactions they experience in taxing situations. In their daily lives people continuously make decisions about what courses of action to pursue and how long to continue those they have undertaken. Because acting on misjudgments of personal efficacy can produce adverse consequences, accurate appraisal of one's own capabilities has considerable functional value. Self-efficacy judgments, whether accurate or faulty, influence choice of activities and environmental settings. People avoid activities that they believe exceed their coping capabilities, but they undertake and perform assuredly those that they judge themselves capable of managing (Bandura, 1977a).¹

Judgments of self-efficacy also determine how much effort people will expend and how long they will persist in the face of obstacles or aversive experiences. When beset with difficulties people who entertain serious 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 (Bandura & Schunk, 1981; Brown & Inouye, 1978; Schunk, 1981; Weinberg, Gould, & Jackson, 1979). High perseverance usually produces high performance attainments.

High self-percepts of efficacy may affect preparatory and performance effort differently, in that some self-doubt bestirs learning but hinders adept execution of acquired capabilities. In applying existing skills strong self-efficaciousness intensifies and sustains the effort needed for optimal performance, which is difficult to realize if one is beleaguered by self-doubts. In approaching learning tasks, however, those who perceive themselves to be supremely self-efficacious in the undertaking feel little need to invest much preparatory effort in it. Salomon (*in press*) provides some evidence bearing on this issue. He found that high perceived self-efficacy as a learner is associated with heavy investment of cognitive effort and superior learning from instructional media that children consider difficult, but with less investment of effort and poor learning from media that they believe to be easy. Thus some uncertainty has preparatory benefits. An aid to good performance is a strong sense of self-efficacy to withstand failures coupled with some uncertainty (construed in terms of the challenge of the task, rather than fundamental doubts about one's capabilities) to spur preparatory acquisition of knowledge and skills.

People's judgments of their capabilities addi-

tionally influence their thought patterns and emotional reactions during anticipatory and actual transactions with the environment. Those who judge themselves ineffectual in coping with environmental demands dwell on their personal deficiencies and imagine potential difficulties as more formidable than they really are (Beck, 1976; Lazarus & Launier, 1978; Meichenbaum, 1977; Sarason, 1975). Such self-referent misgivings create stress and impair performance by diverting attention from how best to proceed with the undertaking to concerns over failings and mishaps. In contrast, persons who have a strong sense of efficacy deploy their attention and effort to the demands of the situation and are spurred to greater effort by obstacles.

Microanalytic Research Strategy

Psychological theories postulate intervening mechanisms through which external factors affect behavior. Attempts to verify a theory commonly seek evidence of covariation between behavior and the external factors believed to instate the intervening events, without including independent probes of the postulated mediator. Demonstrations of environmental-action covariation increase confidence in a theory, but they do not establish firmly its validity because the covariation can be mediated through other mechanisms capable of producing similar effects. A postulated mediator is not directly observable, nevertheless it should have observable indicants other than the actions it presumably governs. Hence the most stringent test of a theory is provided by anchoring the hypothesized mediator in an independently measurable indicant and confirming that external factors are indeed linked to an indicant of the internal mediator and that it, in turn, is linked to overt behavior.

In testing propositions about the origins and functions of perceived self-efficacy, a microanalytic methodology is employed (Bandura, 1977a). Individuals are presented with graduated self-efficacy scales representing tasks varying in difficulty, complexity, stressfulness, or some other dimension, depending on the particular domain of

¹ In the case of habitual routines, people develop their self-knowledge through repeated experiences, to the point where they no longer need to judge their efficacy on each occasion that they perform the same activity. They behave in accordance with what they know they can or cannot do, without giving the matter much further thought. Significant changes in task demands or situational circumstances, however, prompt self-efficacy reappraisals as guides for action under altered conditions.

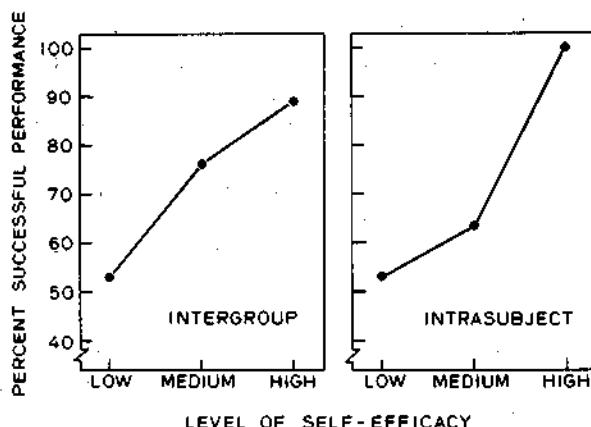


Figure 1. Mean performance attainments as a function of differential levels of perceived self-efficacy. (The left panel shows the performances of groups of subjects whose self-percepts of efficacy were raised to either low, medium, or high levels; the right panel shows the performances of the same subjects at different levels of self-efficacy [Bandura, Reese, & Adams, in press].)

functioning being explored. They designate the tasks that they judge they can do and their degree of certainty. An adequate efficacy analysis requires detailed assessment of the level, strength, and generality of perceived self-efficacy commensurate with the precision with which performance is measured. This methodology permits microanalysis of the degree of congruence between self-percepts of efficacy and action at the level of individual tasks.²

Of central interest to self-efficacy theory is the dynamic interplay among self-referent thought, action, and affect. In this approach, self-referent thought is indexed in terms of particularized self-percepts of efficacy that can vary across activities and situational circumstances rather than as a global disposition assayed by an omnibus test. Measures of self-percepts are tailored to the domain of psychological functioning being explored. A special merit of the microanalytic approach is that particularized indices of self-efficacy provide refined predictions of human action and affective reactivity.

Causal Analysis of Self-Percepts of Efficacy

Some of the research conducted within the efficacy framework has sought to clarify the causal link between self-percepts of efficacy and action (Bandura, Reese, & Adams, in press). For this purpose differential levels of perceived efficacy were induced in phobic subjects, whereupon their coping

behavior was measured. In one experiment the level of perceived self-efficacy was raised through enactive mastery of progressively more threatening activities. This was achieved through a sequential procedure in which mastery of each task was followed by a self-efficacy probe until subjects achieved their preassigned low, moderate, or high level of self-efficacy. The next phase of the study included successive modifications of self-efficacy level within the same subjects.

Inspection of Figure 1 shows that performance varies as a function of perceived efficacy. Increasing levels of perceived self-efficacy both across groups and within the same subjects gave rise to progressively higher performance accomplishments.

Judgment of self-efficacy from enactive information is an inferential process in which the relative contribution of personal and situational factors must be weighted and integrated. Fine-grain analysis of enactive mastery and the growth of self-efficacy during the course of treatment reveals that self-percepts of efficacy may exceed, match, or remain below enactive attainments, depending on how they are appraised.³ That self-efficacy is not

² The question arises regarding whether making self-efficacy judgments in itself can affect performance by creating public commitment and pressures for consistency (Rachman, 1978). 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 different situations in advance of behavior tests, rather than immediately prior to each performance task. Research on the reactive effects of efficacy assessment shows that performance and fear arousal are the same regardless of whether people do or do not make prior self-efficacy judgments (Bandura, Adams, Hardy, & Howells, 1980; Brown & Inouye, 1978). Nor are people's performances affected by whether they make their self-efficacy judgments publicly or privately (Gauthier & Ladouceur, 1981; Weinberg, Yukelson, & Jackson, 1980). Contrary to the consistency demand notion, degree of congruence between self-efficacy judgment and action is unaffected or reduced when self-efficacy judgments are reported publicly, with knowledge that they will be inspected, rather than if they are made privately under conditions in which no one will ever see them (Telch, Bandura, Vinciguerra, Agras, & Stout, 1981). When public inspection of their judgments is made salient, people are inclined to become conservative in their self-appraisals, which creates efficacy-action discordances. Veridical self-appraisal is thus best achieved under test conditions that reduce social evaluative factors.

³ During the efficacy-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 risk raising self-efficacy beyond the preassigned level. These treatment process data reveal the impact of each incremental mastery experience on subsequent self-percepts of efficacy. After subjects reached their preassigned level of perceived self-

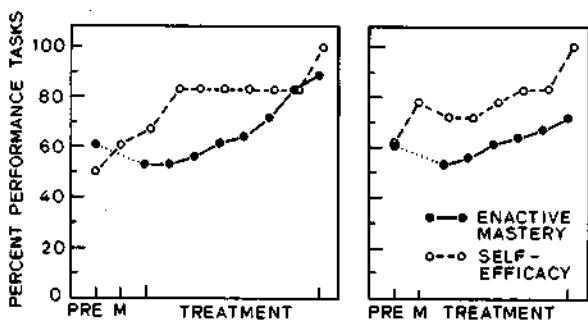


Figure 2. Data from two moderately phobic subjects, illustrating how similar mastery experiences have variable effects on perceived self-efficacy over the course of treatment. (PRE represents the subjects' pretest status; M, the changes produced in perceived self-efficacy by the preparatory modeling alone; and TREATMENT, the changes in subjects' self-percepts of efficacy measured after each task mastery [Bandura et al., in press].)

merely an isomorphic reflection of past performance can be illustrated by a few representative cases. For the female subject presented in the left panel of Figure 2, modeling and initial enactive successes heightened self-efficacy substantially. But her self-percepts of efficacy did not subsequently change, even though progressively more tasks were mastered. An additional success produced maximal self-efficacy. The male subject portrayed in the right panel judges himself to be more and more efficacious with each enactive success. However, self-percepts of efficacy consistently exceed prior enactive attainments.

In Figure 3 the patterns of changes are plotted for two markedly phobic subjects. The subject in the upper panel gains considerable self-efficacy from merely observing the feared activities modeled, but subsequent 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 the preceding task mastery. For the subject in the lower panel, self-efficacy outstrips performance in the initial phase of treatment, reaches a plateau in the intermediate phase, then drops below performance, and remains beneath it until self-efficacy eventually surpasses performance.

Because people are influenced more by how they read their performance successes than by the successes per se, perceived self-efficacy was a better

efficacy, the performance test gauged fully what they were able to do; at which point actions corresponded closely to self-percepts.

predictor of subsequent behavior than was performance attainment in treatment. The finding that self-percepts of efficacy often surpass final performance as predictors of future performance receives support from other studies concerned with markedly different activities (Bandura & Adams, 1977; DiClemente, 1981; Kendrick, Craig, Lawson, & Davidson, Note 1; McIntyre, Mermelstein, & Lichtenstein, Note 2).

In preliminary explorations of the cognitive processing of enactive experiences, people register notable increases in self-efficacy when their experiences disconfirm misbeliefs about what they fear and when they gain new skills to manage threatening activities. They hold weak self-percepts of efficacy in a provisional status, testing their newly acquired knowledge and skills before raising judgments of what they are able to do. If in the course of completing a task, they discover something that appears intimidating about the under-

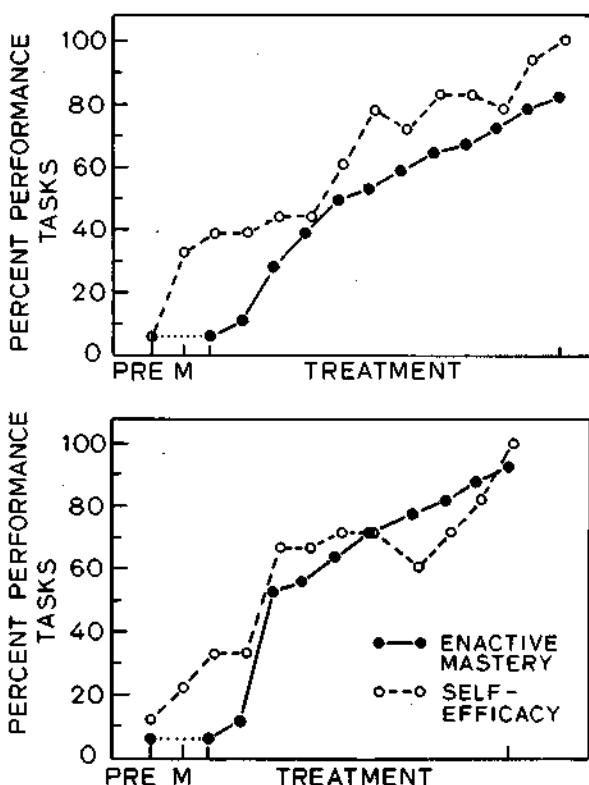


Figure 3. Data from two severe phobics, illustrating how similar mastery experiences have variable effects on perceived self-efficacy over the course of treatment. (PRE represents the subjects' pretest status; M, the changes produced in perceived self-efficacy by the preparatory modeling alone; and TREATMENT, the changes in subjects' self-percepts of efficacy measured after each task mastery [Bandura et al., in press].)

taking or suggests limitations to their mode of coping, they register a decline in self-efficaciousness despite their successful performance. In such instances apparent successes leave them shaken rather than emboldened. As they gain increasing ability to predict and to manage potential threats, they develop a robust self-assurance that serves them well in mastering subsequent challenges.

VICARIOUS INDUCTION OF DIFFERENTIAL LEVELS OF PERCEIVED SELF-EFFICACY

A further experiment was designed to provide an even more stringent test of the causal contribution of perceived self-efficacy to action by creating differential levels of self-efficacy vicariously. In this mode of efficacy induction, persons observe coping strategies being modeled, but they themselves do not execute any actions. Consequently, motoric mediators and their effects do not come into play. In vicarious influence observers have to rely solely on what they see in forming generalized perceptions of their coping capabilities.

The same causal paradigm was used in which level of performance was examined as a consequence of induced differential levels of self-efficacy. The model displays emphasized two aspects—predictability and controllability—that are conducive to the enhancement of self-percepts of efficacy. In demonstrating predictability the model repeatedly exemplified how feared objects 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 threats in whatever situation might arise.

Self-efficacy probes were made at selected points in the modeling of coping strategies until subjects' perceived self-efficacy was raised to preassigned low or medium levels. The third level—maximal self-efficacy—was not included because some phobics would undoubtedly have required at least some performance mastery experiences to attain complete self-efficaciousness. As shown in Figure 4, the higher level of perceived self-efficacy produced the higher performance attainments.

The combined findings lend validity to the thesis that self-percepts of efficacy operate as cognitive mediators of action. The efficacy-action relationship is replicated across different modes of efficacy induction, across different types of phobic dys-

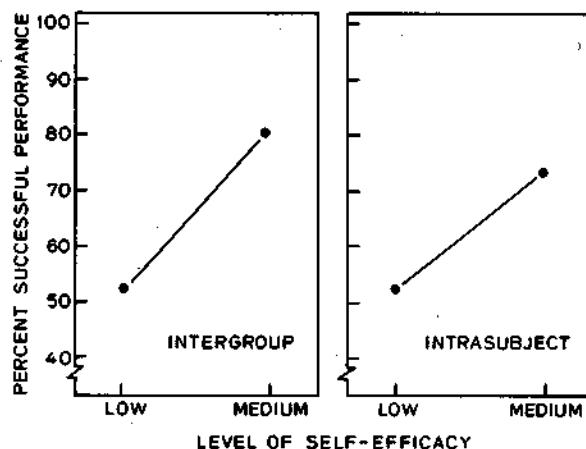


Figure 4. Mean performance attainments by different groups of subjects at different levels of perceived self-efficacy (intergroup) and by the same subjects at higher levels of perceived self-efficacy (intrasubject) [Bandura et al., in press].

functions, and in both intergroup and intrasubject experimental designs. Microanalyses of efficacy-action congruences reveal a close fit of performance to self-percepts of efficacy on individual tasks. People successfully execute tasks that fall within their enhanced range of perceived self-efficacy, but shun or fail those that exceed their perceived coping capabilities.

Predictive Generality Across Modes of Influence

In the social learning view, judgments of self-efficacy, whether accurate or faulty, are based on four principal sources of information. These include performance attainments; vicarious experiences of observing the performances of others; verbal persuasion and allied types of social influences that one possesses certain capabilities; and physiological states from which people partly judge their capability, strength, and vulnerability.

Enactive attainments provide the most influential source of efficacy information because it can be based on authentic mastery experiences. Successes heighten perceived self-efficacy; repeated failures lower it, especially if failures occur early in the course of events and do not reflect lack of effort or adverse external circumstances.

People do not rely on enactive experience as the sole source of information about their capabilities. Efficacy appraisals are partly influenced by *vicarious experiences*. Seeing similar others perform successfully can raise efficacy expectations in observers who then judge that they too possess the

capabilities to master comparable activities. By the same token, observing others who are perceived to be of similar competence fail despite high effort lowers observers' judgments of their own capabilities (Brown & Inouye, 1978). Vicariously derived information alters perceived self-efficacy through ways other than social comparison. As previously noted, modeling displays convey information about the nature and predictability of environmental events. Competent models also teach observers effective strategies for dealing with challenging or threatening situations.

Verbal persuasion is widely used to get people to believe they possess capabilities that will enable them to achieve what they seek. Although social persuasion alone may be limited in its power to create enduring increases in self-efficacy, it can contribute to successful performance if the heightened appraisal is within realistic bounds. Persuasive efficacy influences, therefore, have their greatest impact on people who have some reason to believe that they can produce effects through their actions (Chambliss & Murray, 1979a, 1979b). To the extent that persuasive boosts in self-efficacy lead them to try hard enough to succeed, such influences promote development of skills and a sense of personal efficacy.

People rely partly on information from their *physiological state* in judging their capabilities. They read their visceral arousal in stressful and taxing situations as an ominous sign of vulnerability to dysfunction. Because high arousal usually debilitates performance, people are more inclined to expect success when they are not beset by aversive arousal than if they are tense and viscerally agitated. In activities involving strength and stamina, people read their fatigue, aches, and pains as indicants of physical inefficacy.

Information that is relevant for judging personal capabilities—whether conveyed enactively, vicariously, persuasively, or physiologically—is not inherently enlightening. Rather, it becomes instructive only through cognitive appraisal. The cognitive processing of efficacy information concerns the types of cues people have learned to use as indicators of personal efficacy and the inference rules they employ for integrating efficacy information from different sources (Bandura, 1981).

The aim of a comprehensive theory is to provide a unifying conceptual framework that can encompass diverse modes of influence known to alter behavior. In any given activity skills and self-beliefs that ensure optimal use of capabilities are required for successful functioning. If self-efficacy

is lacking, people tend to behave ineffectually, even though they know what to do. Social learning theory postulates a common mechanism of behavioral change—different modes of influence alter coping behavior partly by creating and strengthening self-percepts of efficacy.

The explanatory and predictive power of this theory was tested in a series of experiments in which severe snake phobics received treatments relying on enactive, vicarious, emotive, and cognitive modes of influence (Bandura & Adams, 1977; Bandura, Adams, & Beyer, 1977; Bandura, Adams, Hardy, & Howells, 1980). This type of disorder permits the most precise tests of mechanisms of change because participants rarely, if ever, have contact with reptiles while the treatment is in progress. Consequently, the changes accompanying treatment are not confounded by uncontrolled experiences arising from contact with the threats between sessions. In each study in this series, the level, strength, and generality of coping self-efficacy for a variety of threatening tasks was measured prior to and after treatment.

In the treatment employing enactive mastery as the principal vehicle of change, phobics are assisted by performance induction aids in dealing with what they fear. As treatment progresses the provisional aids are withdrawn, and self-directed mastery experiences are then arranged to authenticate and generalize personal efficacy. In the vicarious mode of treatment, phobics merely observe the model perform progressively more threatening activities without any adverse effects. In the third treatment tested, which draws heavily on a cognitive modality (Kazdin, 1978), phobics generate cognitive scenarios in which multiple models of differing characteristics cope with and master threatening activities. As a further test of the generality of efficacy theory, an emotive-oriented procedure was also examined. In this desensitization treatment people visualize threatening scenes while deeply relaxed until they no longer experience any anxiety arousal. Imaginal conquest of fear and acquisition of a self-relaxation coping skill can boost perceived self-efficacy.

Results of these studies confirm that different modes of influence all raise and strengthen self-percepts of efficacy. Moreover, behavior corresponds closely to level of self-efficacy change, regardless of the method by which self-efficacy is enhanced (Figure 5). The higher the level of perceived self-efficacy, the greater the performance accomplishments. Strength of efficacy also predicts behavior change. The stronger the perceived ef-

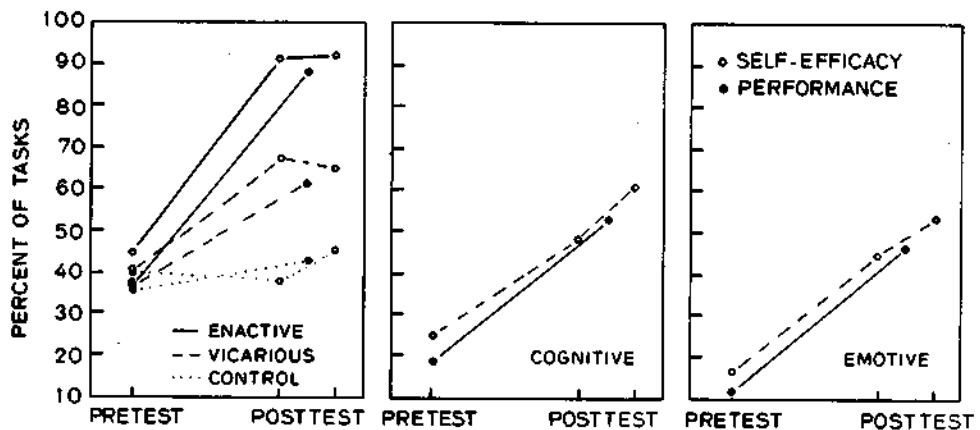


Figure 5. Level of perceived self-efficacy and coping behavior displayed by subjects toward threats after receiving treatments relying on either enactive, vicarious, emotive, or cognitive modes of influence. (In the posttest phase, level of self-efficacy was measured prior to and after the test of coping behavior. The scores represent the mean performance attainments with similar and generalization threats [Bandura & Adams, 1977; Bandura, Adams, & Beyer, 1977; Bandura, Adams, Hardy, & Howells, 1980].)

ficacy, the more likely are people to persist in their efforts until they succeed. Consistent with self-efficacy theory, enactive mastery produces the highest, strongest, and most generalized increases in coping efficacy. The latter finding is corroborated by other comparative studies demonstrating that enactive mastery surpasses persuasive (Biran & Wilson, 1981), emotive (Katz, Stout, Taylor, Horne, & Agras, Note 3), and vicarious (Feltz, Landers, & Raeder, 1979) influences in creating strong self-percepts of efficacy.

Self-efficacy theory explains rate of change during the course of treatment as well (Bandura & Adams, 1977). Self-percepts of efficacy formed through partial mastery experiences at different points in treatment predict, at a high level of accuracy, subsequent performance of threatening tasks that subjects had never done before.

The degree of relationship between self-percepts of efficacy and action can be quantified in several ways. Correlations can be computed between aggregate scores of perceived self-efficacy and performance attainments. At a more particularized level of analysis, degree of congruence between self-percepts and action can be gauged by recording whether persons judge themselves capable of performing each of the various tasks using a cutoff strength value and computing the percentage of accurate correspondence between self-efficacy judgment and actual performance on individual tasks. Dichotomizing self-efficacy judgments on the basis of a minimal strength value inevitably loses some predictive information. The most precise microanalysis of congruence is provided by

computing the probability of successful performance as a function of strength of perceived self-efficacy. All three indexes reveal a close relationship between self-percepts of efficacy and action regardless of whether efficacy is instated by enactive mastery, vicarious experience, cognitive coping, or elimination of anxiety arousal (Bandura, 1977a; Bandura et al., 1980).

Influences that operate through nonperformance modes are of particular interest because they provide no behavioral information for judging changes in one's self-efficacy. Persons have to infer their capabilities from vicarious and symbolic sources of efficacy information. Even in the case of enactively instated self-efficacy, performance is not the genesis of the causal chain. Performance includes among its determinants self-percepts of efficacy. We know from the research of Salomon (in press), for example, that self-perceived learning efficacy affects how much effort is invested in given activities and what levels of performance are attained. Thus, judgments of one's capabilities partly determine choice of activities and rate of skill acquisition, and performance mastery, in turn, can boost perceived self-efficacy in a mutually enhancing process. It is not as though self-percepts of efficacy affect future performances but play no role whatsoever in earlier performance attainments. Questions about causal ordering of factors arise in enactively based influences when interactive processes are treated as linear sequential ones and causally prior self-efficacy determinants of past performance accomplishments go unmeasured.

Predictive Generality Across Domains of Functioning

The preceding experiments examined the explanatory and predictive generality of self-efficacy theory across different modes of influence applied to the same type of dysfunction. Tests of the generality of this theory have been extended to diverse areas of functioning. One study designed for this purpose included severe agoraphobics, whose lives were markedly constricted by profound coping ineffectiveness that makes common activities seem filled with danger (Bandura et al., 1980).

The treatment included group sessions in which the participants were taught how to identify situational and ideational elicitors of anxiety, how to manage anxiety arousal through thought and self-relaxation, and how to use proximal goal setting in gaining coping skill. But the critical ingredient of treatment involved field mastery experiences. Therapists, who accompanied the agoraphobics into community settings, drew on whatever performance induction aids were required to enable their clients to cope successfully with what they dreaded. As treatment progressed therapists reduced their guided participation and assigned the clients progressively more challenging tasks to perform on their own.

Assessment of self-efficacy and performance accomplishments in previously dreaded situations—traveling by automobile, using elevators and escalators, climbing stairs to high levels, dining in restaurants, shopping in supermarkets, and venturing forth alone into public places—reveals substantial increases in perceived coping efficacy (Figure 6). In microanalyses conducted both prior to and at the completion of treatment, behavioral change corresponded closely to level of self-efficacy change.

A variety of studies applying different modes of influence to diverse domains of functioning speak further to the issue of perceived self-efficacy as a common mechanism mediating psychological changes. Perceived self-efficacy predicts degree of change in diverse types of social behavior (Kazdin, 1979; Barrios, Note 4); varieties of phobic dysfunctions (Biran & Wilson, 1981; Bourque & Ladoceur, 1980); stress reactions and physiological arousal (Bandura et al., in press); physical stamina (Weinberg et al., 1979; Weinberg, Yukelson, & Jackson, 1980); self-regulation of addictive behavior (Condiotte & Lichtenstein, 1981; DiClemente, 1981); achievement strivings (Bandura & Schunk, 1981; Collins, 1982; Schunk, 1981); and career

choice and development (Betz & Hackett, 1981; Hackett & Betz, 1981; Hackett, Note 5). In these diverse lines of research, predictive success is achieved across time, settings, performance variants, expressive modalities, and vastly different domains of psychological functioning. Moreover, measures of self-percepts of efficacy using the microanalytic approach predict variations in level of changes produced by different modes of influence, variations among persons receiving the same mode of influence, and even variations within individuals in regard to the particular tasks they are likely to master or fail (Bandura, 1977a; Bandura et al., 1980). Some of these areas of research are discussed more fully because they clarify different aspects of the mediating self-efficacy mechanism.

Although self-efficacy judgments are functionally related to action, a number of factors can affect the strength of the relationship. Discrepancies may arise because of faulty self-knowledge, misjudgment of task requirements, unforeseen situational constraints on action, disincentives to act on one's self-percepts of efficacy, ill-defined global measures of perceived self-efficacy or inadequate assessments of performance, and new experiences that prompt reappraisals of self-efficacy in the time elapsing between probes of self-efficacy and action. These and other sources of discordance are discussed fully elsewhere (Bandura, in press) and will not be reviewed here.

Perceived Self-Regulatory Efficacy

Exercise of influence over one's own behavior is not achieved by a feat of willpower. Self-regulatory capabilities require tools of personal agency and the self-assurance to use them effectively (Bandura, in press). People who are skeptical of their ability to exercise adequate control over their actions tend to undermine their efforts in situations that tax capabilities. Relapses in self-regulation of refractory consummatory behavior provide a familiar example.

Marlatt and Gordon (1980) have postulated a common relapse process in heroin addiction, alcoholism, and smoking in which perceived self-regulatory efficacy operates as a contributing factor. People who have the skills and assurance in their coping efficacy mobilize the effort needed to succeed in high-risk situations. Mastery of problem situations further strengthens self-regulatory efficacy. In contrast, when coping skills are underdeveloped and poorly used because of disbelief in one's efficacy, a relapse will occur. Faultless self-

control is not easy to come by for pliant activities, let alone for addictive substances. Nevertheless, those who perceive themselves to be ineffectual are more prone to attribute a slip to pervasive self-regulatory inefficacy. Further coping efforts are then abandoned, resulting in a total breakdown in self-control.

Studies of behavior that is amenable to change but difficult to sustain over an extended period confirm that perceived inefficacy increases vulnerability to relapse. In this research, investigators measured the self-judged efficacy of cigarette

smokers to resist smoking under various social and stressful inducements after they had quit smoking through various means (DiClemente, 1981; McIntyre et al., Note 2). Although all participants achieved the same terminal behavior, they did not exhibit the same level of self-regulatory efficacy. Compared to abstainers, relapsers expressed lower self-efficacy at the end of treatment about their ability to resist smoking under subsequent instigating conditions. The higher the perceived self-regulatory efficacy, the more successfully smoking was checked during the follow-up period. In con-

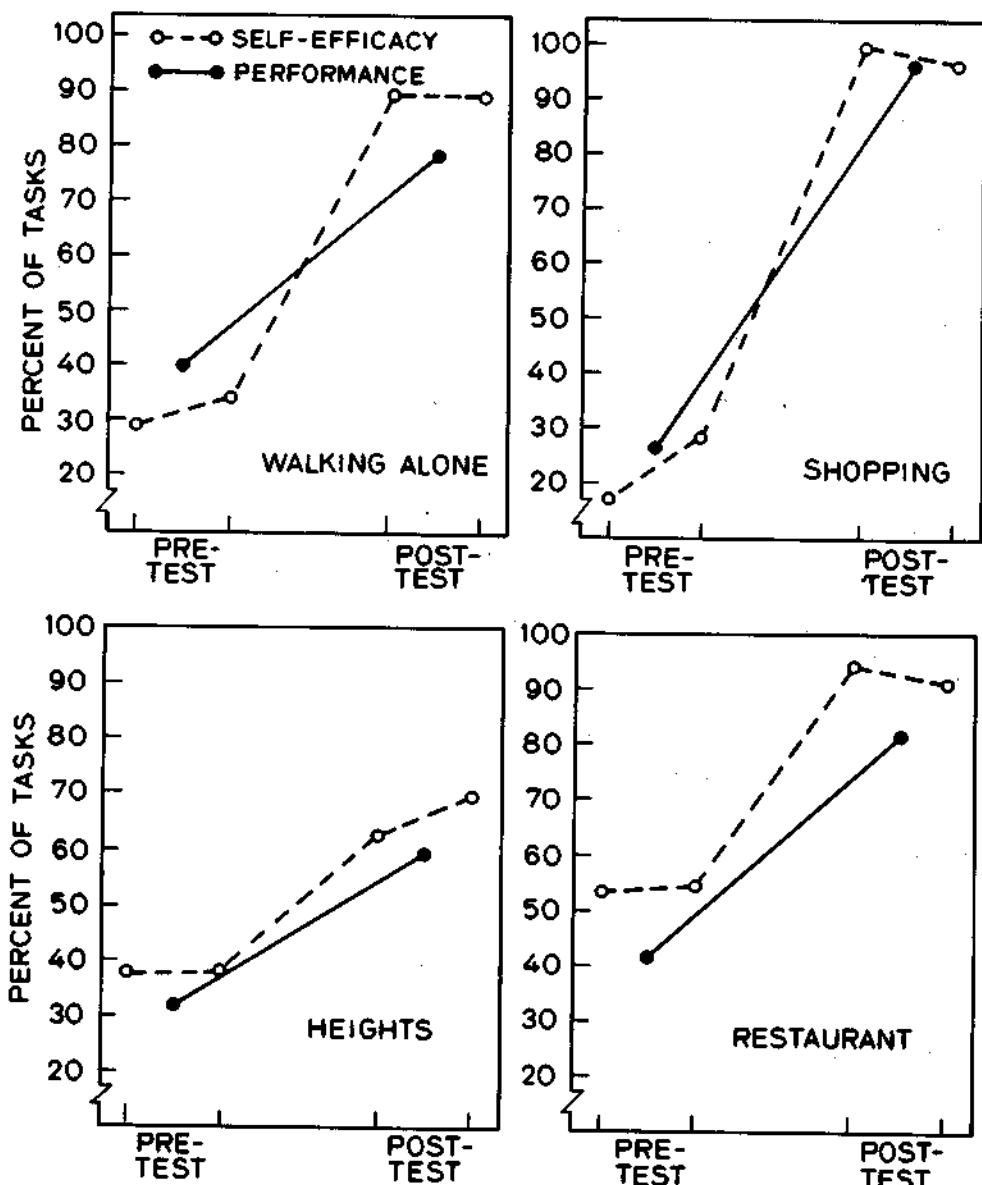


Figure 6. Level of perceived self-efficacy and coping behavior displayed by subjects in different areas of functioning before and after receiving treatment (Bandura, Adams, Hardy, & Howells, 1980).

trast, neither demographic factors nor smoking history and degree of physical dependence on nicotine differentiated relapsers from abstainers.

In a microanalysis of the relation between self-percepts of efficacy and smoking, Condiotte and Lichtenstein (1981) assessed, at the completion of treatment, subjects' perceived capability to resist the urge to smoke in a variety of situations. Perceived self-regulatory efficacy predicted months later which participants would relapse, how soon they would relapse, and even the specific situations in which they experienced their first slip. Moreover, perceived self-efficacy at the end of treatment predicted how participants were likely to respond to a subsequent relapse, should it occur. The highly self-efficacious subjects reinstated control following a slip, whereas the less self-efficacious ones displayed a marked decrease in perceived self-efficacy and relapsed completely. Evidence that changes in self-percepts of efficacy predict coping and self-regulatory behavior suggests that self-efficacy probes during the course of treatment can provide helpful guides for implementing a program of personal change.

Interactive Perceived Efficacy and Postcoronary Rehabilitation

Social environments may place constraints on what people do or may aid them to behave optimally. Whether their endeavors are socially impeded or supported will depend, in part, on how efficacious they are perceived to be. The impetus for interpersonal judgments of efficacy is strongest in close relationships involving interdependent consequences. This is because actions of a partner based on faulty self-percepts of efficacy can produce detrimental consequences for all concerned. Since risky actions are also the means of securing valued benefits, veridical mutual judgments of efficacy provide a reliable basis to promote advantageous endeavors and to dissuade foolhardy ones. Full understanding of how perceptions of efficacy affect courses of action under close social interdependencies requires analysis of interactive efficacy determinants.

Recovery from a heart attack presents an important problem in which to study both the impact of interactive efficacy and the contribution of self-percepts of efficacy to health-promoting habits. In recovering from a heart attack, the restoration of perceived physical efficacy is an essential ingredient in the process. The heart heals rapidly, but

psychological recovery is slow for patients who believe they lack the physical efficacy to resume their customary activities. They avoid physical exertion and recreational activities that they previously enjoyed, they are slow to resume vocational and social life in the belief that they will overburden their debilitated cardiac capacity, and they fear that sexual activities will do them in. The rehabilitative task is to restore a sense of physical efficacy so that postcoronary patients can lead full, productive lives.

Physicians typically use one or more of the four principal sources of efficacy information to raise and strengthen perceptions of cardiac robustness in postcoronary patients. Enactive efficacy information is compellingly conveyed through strenuous treadmill exercises. Vicarious efficacy information is provided by enlisting the aid of former patients who exemplify active lives. Persuasive efficacy information is furnished by informing patients about what they are capable of doing. A heart attack is apt to give rise to overattentiveness to cardiac activity and misattribution of fatigue to an impaired heart. The meaning of physiological efficacy information is explained to ensure that patients do not misread their physiology, for example, by interpreting cardiac acceleration as portending a reinfarction.

As a first step toward clarifying some aspects of the efficacy restoration process, a research project being conducted in collaboration with Ewart, Taylor, DeBusk, and Reese is examining the impact of enactive and persuasive efficacy information on resuming physical activities. Several weeks after patients have experienced a myocardial infarction, their self-percepts of physical efficacy are measured for physical exertion, cardiac capability, emotional stress, and sexual activities.

Psychological recovery from a heart attack is a social, rather than an individual, matter. Because one spouse's notions about the other's physical capabilities can aid or retard the recovery process, the spouse's judgments of the patient's physical efficacy are measured under three levels of involvement in the treadmill activity. All of the patients being studied are men, so the wives' judgments of husbands' efficacy are tested: when she is uninformed in the treadmill exercises; when she is present to observe the husband's stamina as he performs on the treadmill under increasing workloads; or when she performs the strenuous treadmill exercises, to experience personally the physical demands of the task, whereupon she observes her husband do the same. In the informative consul-

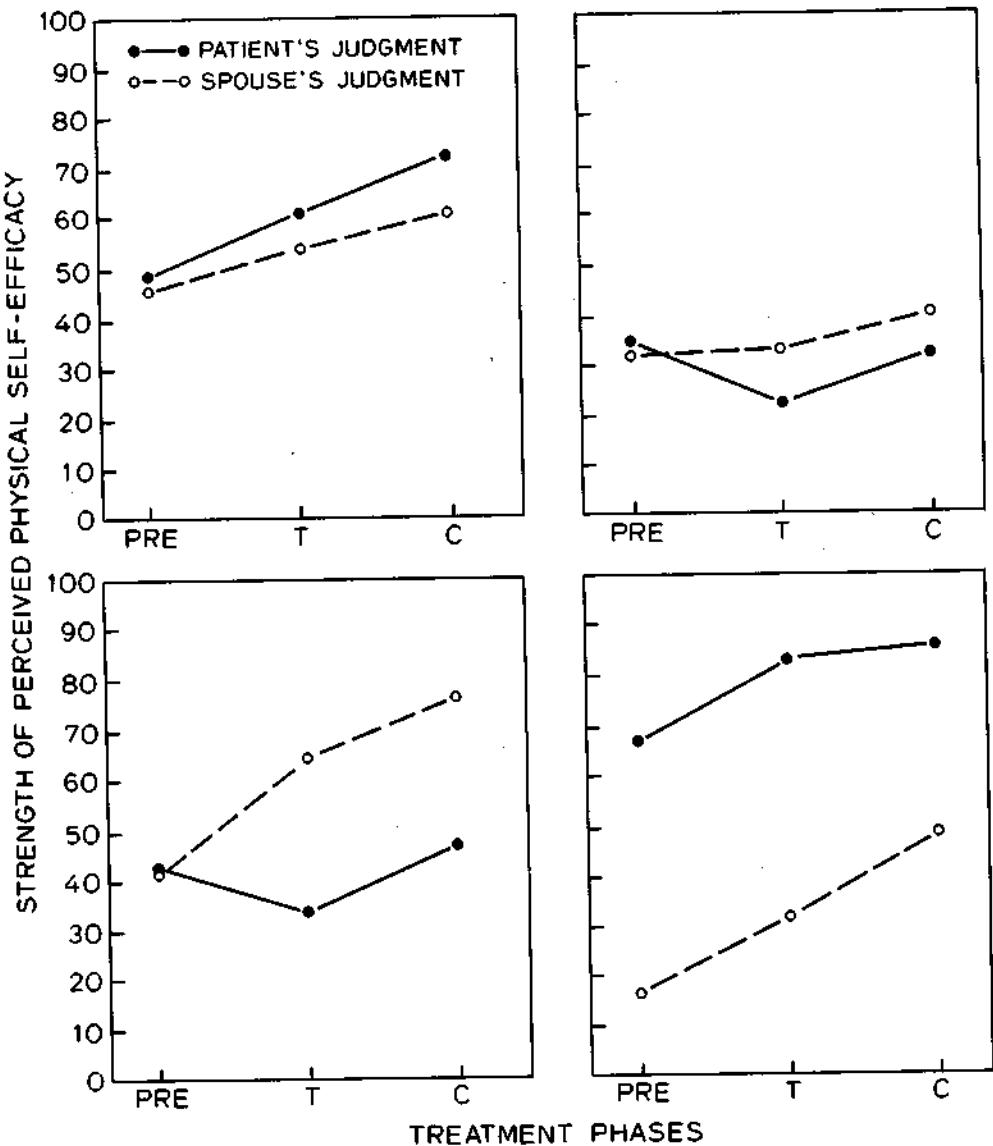


Figure 7. Illustrative variations in patterns of perceived physical efficacy for different couples at pretest (PRE), after treadmill exercises (T), and after the combined influence of treadmill exercises and medical consultation (C).

tation with the medical staff, which follows the treadmill activity, couples receive information about the patient's cardiac functioning and its relation to physical, vocational, and sexual activity.

Self-efficacy probes are taken at each step in the process. In addition, before and after the efficacy enhancing program and six months later, patients' cardiac output and physical activity level are monitored continuously for several days to determine how much they are exerting themselves. Preliminary findings reveal that treadmill exercises and medical consultation have differential impact on self-percepts of physical efficacy in different domains of functioning. Microanalytic measures of

perceived self-efficacy thus provide refined feedback of what various treatments are doing.

Wives who are actively involved in the test of their husbands' physical stamina judge their physical efficacy more highly than if they do not observe their treadmill performances. Patterns of perceived efficacy vary, sometimes widely, for different couples. Figure 7 illustrates the major variations. The recovery process is expected to be fastest under congruent high efficacy; slowest under congruent low efficacy; and at an intermediate level when the patient and the spouse differ in judgments of the patient's capability to resume daily activities.

Cultivating Intrinsic Interest Through Development of Self-Efficacy

Most of the things people enjoy doing for their own sake originally had little or no interest for them. But under appropriate learning experiences, almost any activity, however silly it may appear to many observers, can become imbued with consuming significance. The process by which people develop interest in activities in which they initially lack skill, interest, and self-efficacy is an issue of some importance. Positive incentives are widely used to promote such changes. Some writers (Deci, 1975; Lepper & Greene, 1978) have questioned the wisdom of such an approach, on the grounds that rewarding people for engaging in an activity is more likely to reduce than to increase subsequent interest in it. Extrinsic incentives presumably decrease interest by weakening competency drives or by shifting causal attributions for performance from internal motivators to external rewards.

The effects of extrinsic incentives have received extensive study. Results show that rewards can increase interest in activities, reduce interest, or have no effect (Bates, 1979; Kruglanski, 1975; Lepper, 1980; Ross, 1976). In evaluating the role of incentives in human functioning, it is important to distinguish between whether incentives are used to manage performance or to cultivate personal efficacy.

TASK-CONTINGENT INCENTIVES

Extrinsic rewards are most likely to reduce interest when they are given merely for performing over and over again an activity that is already of high interest (Condry, 1977; Lepper & Greene, 1978). In such situations rewards are gained regardless of the level or quality of performance. However, even under the limiting conditions wherein rewards are believed to produce reductive effects, incentives sometimes enhance interest (Arnold, 1976; Davidson & Bucher, 1978), boost low interest but diminish or do not affect high interest (Calder & Staw, 1975; Loveland & Olley, 1979; McLoyd, 1979), or reduce low interest but do not affect high interest (Greene, Sternberg, & Lepper, 1976). Apparently a wide array of other factors—level of preexisting interest and ability, magnitude and salience of rewards, type of activity, degree of reward contingency, accompanying social messages—can radically alter or override the effects of rewards given simply for undertaking a task.

COMPETENCE-CONTINGENT INCENTIVES

The controversy over the effects of performance-irrelevant reward on high interest has led to neglect of the important issue of whether incentives for performance attainments cultivate interest and self-percepts of efficacy. Rewards for task mastery, which reflect on personal efficacy, should be distinguished from performance-contingent rewards gained by performing routine activities. A garment worker paid on a piece-rate basis for sewing shirts day in and day out is unlikely to develop a growing fondness for sewing, even though rewards are highly contingent on performance.

Conceptual analyses of intrinsic interest within the framework of social learning theory (Bandura, in press) and the theory of intrinsic motivation (Deci, 1975; Lepper & Greene, 1978) assign perceived competence a mediating role. The alternative theoretical approaches, however, postulate somewhat different underlying mechanisms. In cognitive evaluation theory (Deci, 1975), interest is an expression of an inborn drive for competence and self-determination; in attribution theory (Bem, 1972; Lepper & Greene, 1978), interest is a product of retrospective judgments of the causes of one's performances; in social learning theory (Bandura, 1981, in press), interest grows from satisfactions derived from fulfilling internal standards and from perceived self-efficacy gained from performance accomplishments and other sources of efficacy information.

There are several ways in which incentives for task mastery can contribute to the growth of interest and self-efficacy. Positive incentives foster performance accomplishments. Gaining knowledge and skills that enable one to fulfill personal standards of merit tend to heighten interest and a firm sense of personal efficacy. Success in attaining desired outcomes through challenging performances can further verify existing competencies. This is because people usually do not perform maximally, though they possess the constituent skills. It is under incentives that test upper limits that people find out what they are able to do. By mobilizing high effort, incentives can help to substantiate talents, even though no new skills are acquired in the process.

Rewards also assume efficacy informative value when competencies are difficult to gauge from performance alone, which is often the case. To complicate further the competence validation process, most activities involve diverse facets so that perceived adequacy may vary widely, depending

on how the differing aspects are subjectively weighted. Because of these ambiguities level of reward imparts social information on the quality of performance. In this process competent performances are perceived as the reason for the rewards, rather than the rewards being viewed as the cause of competent performance (Karniol & Ross, 1977).

Several lines of research confirm that positive incentives promote interest when they enhance or authenticate personal efficacy. Both children and adults maintain or increase their interest in activities when rewarded for performance attainments, whereas their interest declines when they are rewarded for undertaking activities irrespective of how well they perform (Boggiano & Ruble, 1979; Ross, 1976). The larger the extrinsic reward for performances signifying competence, the greater the increase in interest in the activity (Enzle & Ross, 1978). Even incentives for undertaking a task, rather than for performance mastery, can raise interest if engagement in the activity provides information about personal competence (Arnold, 1976). When material reward for each task completion is accompanied by self-verbalization of competence, children sustain high interest in the activity (Sagotsky & Lewis, Note 6).

PROXIMAL SELF-MOTIVATION

Contingent incentives are not necessarily the best vehicle for enlisting the type of sustained involvement in activities that builds interest and self-efficacy where they are lacking. In social learning theory an important cognitively based source of motivation operates through the intervening processes of goal setting and self-evaluative reactions (Bandura, 1977b, in press). This form of self-motivation, which involves internal comparison processes, requires personal standards against which to evaluate performance. By making self-satisfaction conditional on a certain level of performance mastery, persons create self-incentives for their efforts.

Self-motivation is best summoned and sustained by adopting attainable subgoals that lead to large future ones. Whereas proximal subgoals provide immediate incentives and guides for action, distal goals are too far removed in time to effectively mobilize effort or to direct what one does in the here and now. Proximal goals can also serve as an important vehicle in the development of self-percepts of efficacy. Without standards against which to measure their performance, people have little basis for judging how they are doing or for gauging

their capabilities. Subgoal attainments provide clear markers of progress along the way to verify a growing sense of self-efficacy.

There are at least two ways in which proximal goals might contribute to enhancement of interest in activities. When people aim for, and master, desired levels of performance, they experience a sense of satisfaction (Locke, Cartledge, & Knerr, 1970). The satisfactions derived from subgoal attainments can build intrinsic interest. When performances are gauged against distal goals, similar accomplishments may prove disappointing because of wide disparities between current performance and lofty future standards. As a result interest fails to develop, even though skills are being acquired in the process. As already noted, a sense of personal efficacy in mastering tasks is more apt to spark interest in them than is self-perceived inefficacy in performing competently.

That proximal self-motivation can build intrinsic interest in disvalued activities receives support from a study in which children who exhibited gross deficits and disinterest in mathematical tasks pursued a program of self-directed learning under conditions involving either proximal subgoals, distal goals, or no reference to goals (Bandura & Schunk, 1981). Under proximal subgoals children progressed rapidly in self-directed learning, achieved substantial mastery of mathematical operations, and developed a strong sense of self-efficacy in solving arithmetic problems (Figure 8). Distal goals had no demonstrable effects. In addition to its other benefits, goal proximity fosters veridical self-knowledge of capabilities, as reflected in high congruence between judgments of mathematical self-efficacy and subsequent mathematical performance.

As shown in Figure 9, it was mainly children in the proximally self-motivated condition, all of whom felt highly efficacious, who displayed the notable level of intrinsic interest. Children in the other conditions generally expressed self-doubts concerning their capabilities and showed little spontaneous interest in solving arithmetic problems. Regardless of treatment conditions, self-percepts of moderate to high strength were positively related to interest.

The relationship of the growth functions of self-efficacy and interest warrants systematic investigation. There may exist some temporal lag between newly acquired self-efficacy and corresponding growth of interest in activities that are disvalued or even disliked. In the temporal lag pattern, self-efficacy fosters mastery experiences

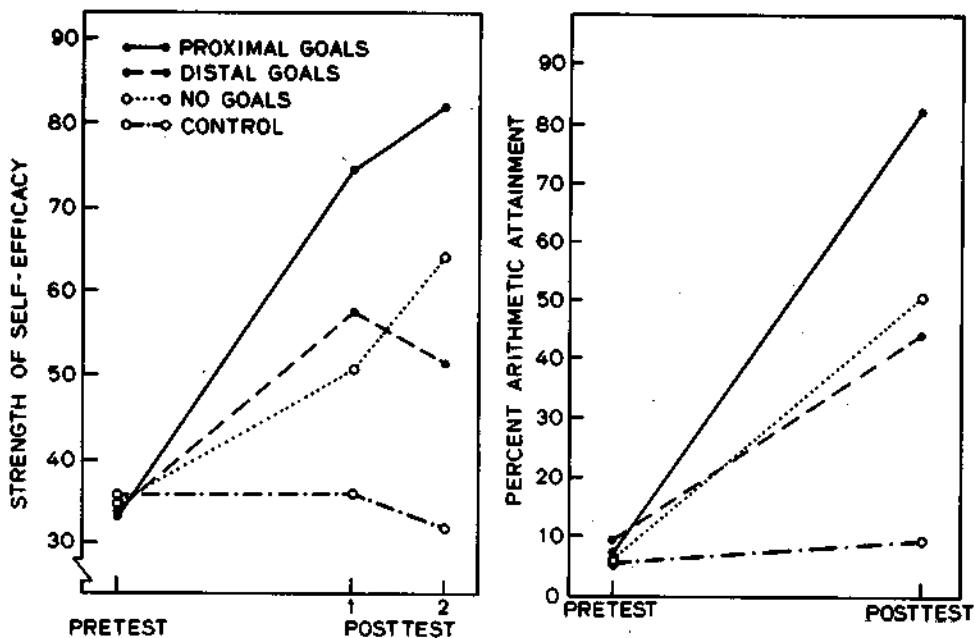


Figure 8. The left panel shows the strength of children's self-percepts of arithmetic efficacy at the beginning of the study (pretest) and before (1) and after (2) taking the arithmetic posttest; the right panel displays the children's level of achievement on the arithmetic test before and after the self-directed learning (Bandura & Schunk, 1981).

that, over a period of time, provide self-satisfactions conducive to growth of interest. If, in fact, effects follow such a temporal course, then increased interest would emerge as a later, rather than as an instant, consequence of enhanced self-efficacy. The threshold notion suggests an alternative pattern. It may require at least moderately high self-efficacy to generate and sustain interest in an activity, but interest is not much affected by small variations above or below the threshold level. Indeed, supreme self-assurance may render activities unchallenging and thus uninteresting. Both strength and optimal level of perceived self-efficacy correlate with intrinsic interest, but the threshold notion yields the more consistent positive relationships (Bandura & Schunk, 1981; Schunk, Note 7). Temporal lag and threshold effects are by no means incompatible. In fact both probably operate in the developmental process.

SELF-EFFICACY DETERMINANTS OF CAREER INTERESTS AND PURSUITS

Choices during formative periods shape life paths through selective development of competencies, interests, and affiliative preferences. Hackett and Betz (1981) have been developing a causal model of career choice in which perceived self-efficacy functions as a major mediator. One of the impor-

tant issues addressed in this line of research is how the career interests and pursuits of women are constricted by self-beliefs that traditionally male oc-

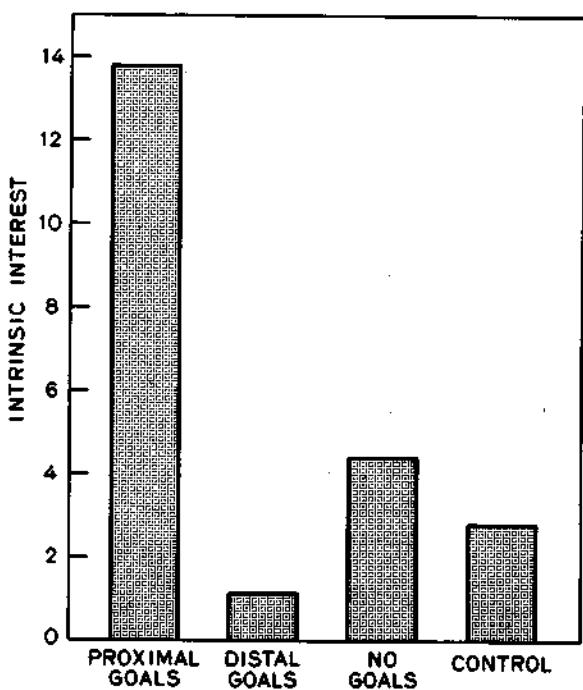


Figure 9. Average number of arithmetic problems children in the different conditions chose to solve when given free choice of activities (Bandura & Schunk, 1981).

cupations are inappropriate for them because they lack the capabilities to master requisite skills.

Efficacy analyses of career decision making (Betz, 1981) reveal that males perceive themselves to be equally efficacious for traditionally male and female vocations. In contrast, females judge themselves highly efficacious for the type of occupations traditionally held by women, but ineffectual in mastering the educational requirements and job functions of vocations dominated by men. These differential perceptions of personal efficacy are especially striking because the groups do not differ in their actual verbal and quantitative ability on standardized tests. It is not the subskills that selected college students possess, but how they perceive and use them that makes the difference. Regardless of sex, level of perceived self-efficacy correlates positively with range of career options seriously considered and the degree of interest shown in them.

Hackett (Note 5) has devoted special attention to perceived mathematical self-efficacy because modern technologies have made quantitative skills increasingly important to a wide range of career options and professional advancement. Using a path analysis, Hackett found that sex, sex role socialization, and high school preparation affect perceived self-efficacy in quantitative capabilities. Perceived self-inefficaciousness in dealing with numbers in turn affects mathematical anxiety and math relatedness of college major.

The causally prior contribution of perceived efficacy to socialization practices and educational preparation remains an important problem of future research to determine through longitudinal analysis. It follows from the present model of career development that parental career-related efficacy will influence the range of vocational options they consider viable for their offspring. Students' differential self-percepts of efficacy for mastering occupational entry requirements are likely to influence what types of courses they choose to pursue during their secondary educational preparation. Societal practices require of women a robust sense of self-efficacy not only to enter careers dominated by men, but to fulfill the heavy demands arising from dual workloads of career and household.

Self-Efficacy Conception of Fear Arousal

Perceptions of self-efficacy affect emotional reactions as well as behavior. This is especially true

of anxiety and stress reactions to unfamiliar or potentially aversive events. Self-efficacy theory suggests an alternative way of looking at human anxiety. Psychodynamic theories generally attribute anxiety to intrapsychic conflicts over the expression of tabooed impulses. The external object of anxiety is considered to be of limited significance because the threat posed by the impulse can be projected onto any number of things. In this approach anxiety is rooted in the prohibited impulse.

Conditioning theory assumes that formerly neutral events acquire fear-provoking properties by association with painful experiences. This theory externalizes the cause in the stimulus—It is the stimulus that is said to become aversive. If a person develops a phobia of mountain driving as a result of running into a stately roadside redwood, it is not the road that is changed by the aversive experience. Rather, it is perceived competence in driving and anticipatory thought patterns that undergo change.

From the social learning perspective, it is mainly perceived inefficacy in coping with potentially aversive events that makes them fearsome. To the extent that one can prevent, terminate, or lessen the severity of aversive events, there is little reason to fear them. Hence experiences that increase coping efficacy can diminish fear arousal and increase commerce with what was previously dreaded and avoided.

A sense of controllability can be achieved either behaviorally or cognitively (Averill, 1973; Lazarus, 1980; Miller, 1979). In behavioral control individuals take actions that forestall or modify aversive events. In cognitive control people believe they can manage environmental threats, should they arise. These two forms of controllability are distinguished because the relationship between actual and self-perceived coping efficacy is far from perfect. Indeed, there are many competent people who are plagued by a sense of inefficacy, and many less competent ones who remain unperturbed by impending threats because they are self-assured of their coping capabilities.

BEHAVIORAL CONTROL

The effects of behavioral control on fear reduction and stress responses have been amply documented with both children and adults. Ability to exercise behavioral control over potentially aversive events eliminates or decreases autonomic reactions to them (Gunnar-vonGnechten, 1978; Miller, 1979).

Control over events makes them predictable, thus reducing uncertainty, which in itself can be ameliorative. It might, therefore, be argued that it is predictability, rather than behavioral mastery, that is stress reducing. However, behavioral control decreases arousal over and above any benefits derived from the ability to predict the occurrence of stressors. If anything, having foreknowledge of when aversive events will occur without being able to do anything about them increases anticipatory stress reactions (Gunnar, 1980; Miller, 1981). But since predictability signals safety as well as danger (Seligman & Binik, 1977), it can have opposite effects at different points in time—raising anticipatory arousal just prior to stressful events while reducing arousal during safe interim periods.

Being able to manage what one fears can diminish arousal because the capability is used to reduce or to prevent pain. But there is more to the process of stress reduction by behavioral control than simply curtailing painful stimuli. In some forms of behavioral mastery, previously frightening events occur undiminished, but they become nonthreatening when activated personally (Gunnar-vonGnechten, 1978). Here it is the personal agency of causality, not curtailment of the events themselves, that reduces fear. And in situations in which the opportunity to wield control exists but is unexercised, it is the self-knowledge of coping efficacy, rather than its application, that reduces anxiety arousal (Glass, Reim, & Singer, 1971).

COGNITIVE CONTROL

A painful event has two arousal components to it—discomfort produced by the aversive stimulation and the thought produced arousal. It is the thought component—the arousal generated by repetitive perturbing ideation—that accounts for much of human distress. As noted earlier, people who judge themselves ineffectual dwell on their coping deficiencies and view trying situations as fraught with peril. They not only magnify the severity of possible threats but worry about perils that rarely, if ever, happen. As a result they experience a high level of cognitively generated distress. Elevated arousal, in turn, heightens preoccupation with personal ineffectiveness and potential calamities.

Anticipatory thought that does not exceed realistic bounds has functional value in that it motivates development of competencies and plans for dealing with foreseeable threats. But to those who doubt their coping self-efficacy, the anxious anticipation can become a preoccupation that often far

exceeds the objective hazards. In an intensive analysis of acute anxiety reactions, Beck, Laude, and Bohnert (1974) found that almost without exception, frightful cognitions occur just prior to the onset of anxiety attacks. The ideation often centers around profound coping inefficacy, which results in dreadful physical and social catastrophes.

Because stress-inducing thought plays a paramount role in human arousal, self-percepts of coping efficacy can reduce the level of arousal before, during, and after a trying experience. In laboratory studies of perceived control, people who believe that they can exercise some influence over aversive events display less autonomic arousal and impairment in performance than those who believe they lack any personal control, even though both groups are subjected to the same aversive stimulation (Averill, 1973; Miller, 1979, 1980). Mere belief in coping efficacy similarly increases ability to withstand pain (Neufeld & Thomas, 1977).

SELF-EFFICACY AS A MEDIATING MECHANISM

That perceived self-efficacy operates as a cognitive mechanism by which controllability reduces fear arousal receives support in the previously cited research designed to enhance coping efficacy in severe phobias (Bandura & Adams, 1977; Bandura et al., 1977; Bandura et al., 1980). In these studies, after completing the various forms of treatment, phobics designated the strength of their perceived efficacy in performing different tasks varying in threat value. During later behavioral tests they reported the intensity of fear arousal that they experienced in anticipation of performing each task and, again, while they were performing the activity.

In Figure 10 the intensity of fear arousal is plotted as a function of self-efficacy strength enhanced through four different modes of influence. People experience high anticipatory and performance distress on tasks in which they perceive themselves to be ineffectual, but as the strength of their self-judged efficacy increases, their fear arousal declines. At high strengths of self-efficacy, threatening tasks are performed with virtually no apprehensiveness.

Studies in which perceived self-efficacy is induced to differential levels (Bandura et al., in press) shed further empirical light on the notion that fear arousal arises from perceived coping inefficacy. Here the data of interest are the amount of distress phobics at different levels of perceived self-efficacy experience while performing the same

common task (Figure 11). The relationship between perceived ineffectiveness and subjective distress is replicated, regardless of whether self-percepts of efficacy are instated enactively or vicariously or whether the analysis involves anticipatory or performance fear based on intergroup or intrasubject changes. The less efficacious subjects judge themselves to be, the more fear they experience.

The generality of the relationship between perceived ineffectiveness and stress reactions is further corroborated in a study using physiological indices of arousal (Bandura et al., in press). Elevation in blood pressure and cardiac acceleration were measured in severe spider phobics during anticipation

and performance of intimidating tasks corresponding to strong, medium, and weak strength of perceived self-efficaciousness. In the next phase of the study, self-percepts of efficacy were raised to maximal strength, whereupon autonomic reactions to the same tasks were again measured. Figure 12 shows the mean change from the baseline level in heart rate and blood pressure as a function of differential strength of self-percepts of efficacy.

Subjects were viscerally unperturbed by tasks that they regarded with utmost self-efficaciousness. On tasks about which they were moderately insecure concerning their coping efficacy, however, their heart rate accelerated and their blood

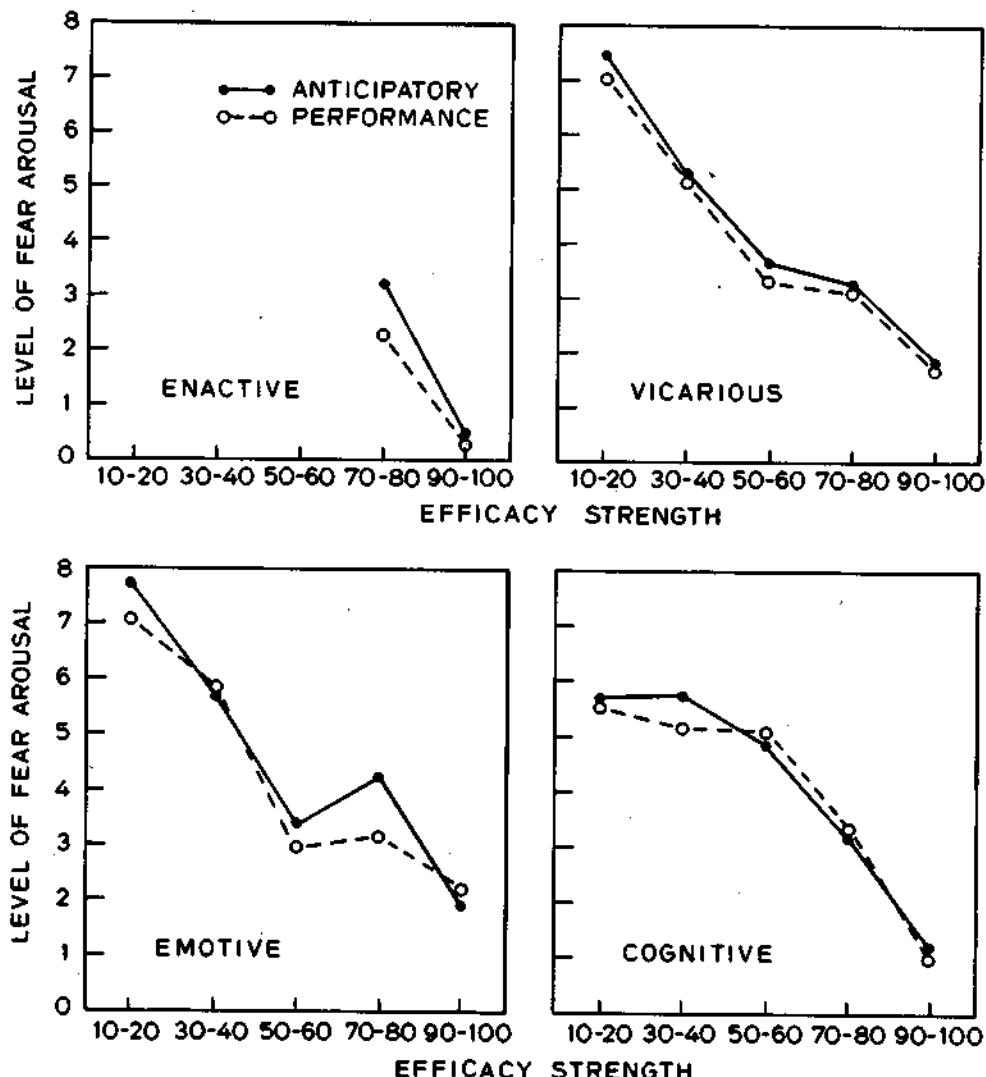


Figure 10. Relationship between strength of self-percepts of efficacy and level of anticipatory and performance fear arousal, after enhancement of self-efficacy through enactive, vicarious, emotive, or cognitive influence. (Participant modeling created such strong self-efficacy that there were only a few instances in which subjects receiving this form of treatment displayed self-percepts of efficacy below a strength value of 80 [Bandura, Adams, Hardy, & Howells, 1980].)

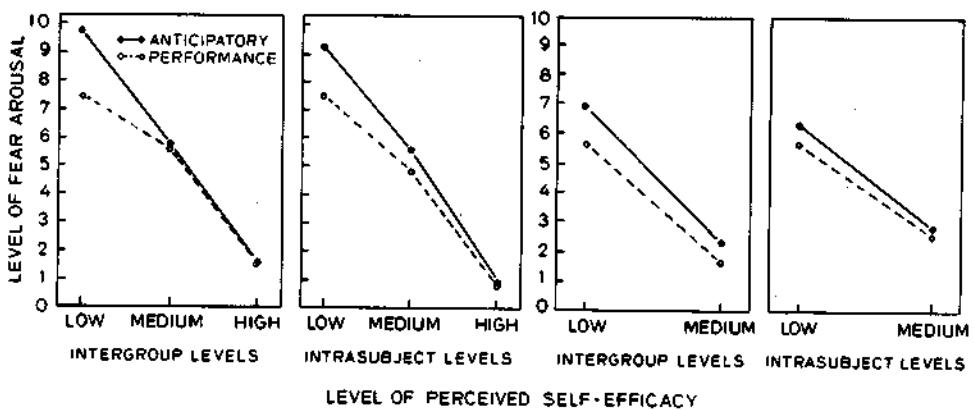


Figure 11. Mean intensity of anticipatory and performance fear arousal experienced by different groups of subjects at different levels of perceived self-efficacy (intergroup) and by the same subjects at successively higher levels of perceived self-efficacy (intrasubject). (Self-percepts of efficacy were raised through enactive mastery in the two left panels and through modeling in the two right panels [Bandura et al., in press].)

pressure rose during anticipation and performance of the activities. After self-percepts of efficacy were fully strengthened, these same task demands were managed unperturbedly.

When presented with tasks in the weak self-efficacy range, most subjects promptly dismissed them as too far beyond their coping capabilities to even attempt. Indeed, only a few subjects were able to do any of them. Although too few instances were available for a meaningful analysis of performance arousal, data from the anticipatory phase shed some light on how visceral reactions change when people preclude transactions with threats that they judge will overwhelm their coping ca-

pabilities. Cardiac reactivity subsided, but blood pressure continued to climb. After self-percepts of efficacy were strengthened to the maximal level, everyone performed these previously intimidating tasks without any visceral agitation.

Heart rate is likely to be affected more quickly than blood pressure by personal restructuring of stressful demands, which may explain the differential pattern of physiological reactivity at extreme self-inefficaciousness. 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

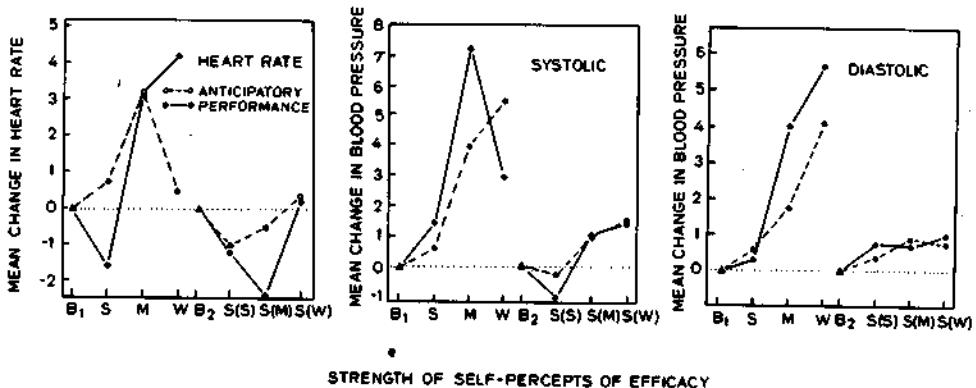


Figure 12. Mean change from the baseline level in heart rate and blood pressure during anticipatory and performance periods, as a function of differential strength of self-percepts of efficacy. (B refers to baseline, and S, M, and W signify strong, medium, and weak strengths of perceived self-efficacy, respectively. For each physiological measure the figure on the left in the panel shows the autonomic reactions related to self-percepts that differ in strength [performance arousal at weak self-efficacy is based on only a few subjects who exhibited partial performances]; the figure on the right in the same panel shows the autonomic reactions to the same set of tasks after self-percepts of efficacy were strengthened to maximal level [Bandura et al., in press].)

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.

Perceived self-efficacy and emotional arousal undoubtedly involve interactive (though asymmetrical) effects, with coping efficacy exercising the much greater sway. That is, perceived inefficaciousness in coping with potential threats leads people to approach such situations anxiously, and experiencing disruptive arousal may further lower 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 relationship to it (Bandura, 1978a; Bolles, 1972; Herrnstein, 1969; Leitenberg, Agras, Butz, & Wincze, 1971). People are thus much more likely to act on their self-percepts of efficacy than on visceral cues. This should come as no surprise, since information derived from past accomplishments and comparative appraisals is considerably more indicative of capableness than are the indefinite stirrings of the viscera. For example, accomplished actors interpret their brief nervousness before a play as a normative situational reaction, rather than as an indicant of personal incapability, and are in no way dissuaded by their viscera from going on stage and performing well what they assuredly know they can do once they get started.

Perceived Self-Inefficacy, Futility, and Despondency

Inability to influence events and social conditions that significantly affect one's life can give rise to feelings of futility and despondency as well as to anxiety. Self-efficacy theory distinguishes between two judgmental sources of futility. People can give up trying because they seriously doubt that they can do what is required. Or they may be assured of their capabilities but give up trying because they expect their efforts to produce no results due to the unresponsiveness, negative bias, or punitiveness of the environment. These two separate sources of futility have quite different causes and remedial implications. To change efficacy-based futility requires development of constituent competencies and strong percepts of self-efficacy. In contrast, to change outcome-based futility necessitates changing the social environment so that people can gain

OUTCOME JUDGMENT		
SELF-EFFICACY JUDGMENT +	SOCIAL ACTIVISM PROTEST GRIEVANCE MILIEU CHANGE	ASSURED, OPPORTUNE ACTION
	RESIGNATION	SELF-DEVALUATION
	APATHY	DESPONDENCY

Figure 13. Interactive effects of self-percepts of efficacy and response outcome expectations on behavior and affective reactions.

the benefits of the competencies they already possess.

In any given instance behavior would be best predicted by considering both self-efficacy and outcome beliefs.⁴ As can be seen in Figure 13, different patterns of outcome and efficacy beliefs are likely to produce different psychological effects. A high sense of personal efficacy and a responsive environment that rewards performance attainments fosters assured, active responsiveness. Consider next the pattern combining high self-efficacy

⁴ The types of outcomes people expect depend largely on their judgments of how well they will be able to perform in given situations. For example, drivers who judge themselves ineffectual in navigating winding mountain roads will conjure up outcomes of wreckage and bodily injury, whereas those who are fully confident of their driving capabilities will anticipate sweeping vistas rather than tangled wreckage. Similarly the social reactions people anticipate for asserting themselves depend on their judgments of how adroitly they can do it. In social, intellectual, and athletic pursuits, those who judge themselves highly efficacious will anticipate successful outcomes and self-doubters will expect mediocre performances of themselves and, thus, less favorable outcomes. For activities in which outcomes are either inherent to the actions or are tightly linked by social codes, expected outcomes cannot be disembodied from the very performance judgments on which they are conditional. Outcome expectations are dissociable from self-efficacy judgments when extrinsic outcomes are loosely linked to level or quality of performance. Such structural arrangements permit social biases to come into play, so the same performance attainments may produce variable, and often inequitable, outcomes. Expected outcomes are also partially separable from self-efficacy judgments when extrinsic outcomes are fixed to a minimal level of performance, as when a designated level of work productivity produces a fixed pay but higher performance brings no additional monetary benefits.

with low environmental responsiveness. Efficacious persons who cannot achieve positive outcomes by their actions will not necessarily cease behaving. Those of low efficacy will give up readily, should their efforts fail to produce results. But self-efficacious individuals will intensify their efforts and, if necessary, try to change the environment.

The pattern in which competency goes unrewarded or is punished underscores the need to differentiate two levels of control—control over outcomes and control over the social systems that prescribe what the outcomes will be. In addressing this issue Gurin (in press) and Lacey (1979) give considerable attention to the exercise of influence over social systems, which typically receives scant notice in psychological analyses of controllability. Conditions combining high self-efficacy with environmental unresponsiveness tend to generate resentment, protest, and collective efforts to change existing practices (Bandura, 1973; Short & Wolfgang, 1972). Should change be difficult to achieve, given suitable alternatives people will desert environments that are unresponsive to their efforts and pursue their activities elsewhere.

Considering the joint influence of self-efficacy and outcome beliefs provides a basis for differentiating conditions conducive to apathy from those likely to induce despondency. When people have a low sense of personal efficacy and no amount of effort by themselves or comparative others produces results, they become apathetic and resigned to a dreary life. The pattern in which people perceive themselves as ineffectual but see similar others enjoying the benefits of successful effort is apt to give rise to self-disparagement and depression. Evident successes of others make it hard to avoid self-criticism.

In the original theory of learned helplessness (Seligman, 1975), people become inactive and depressed if their actions cannot affect what happens to them. Because they come to expect future responding to be futile, they no longer try, even in situations in which they can achieve results through their behavior. The reformulated theory (Abramson, Seligman, & Teasdale, 1978) shifts the causal locus of detrimental effects from belief that one's performances will go unrewarded (response-outcome independence) to belief that one cannot produce the performances. It singles out three dimensions in causal judgments of failure: Internality—Are failures ascribed to personal or to external factors? Stability—Are the ascribed causes enduring or transient? Generality—Are the causes

believed to operate in many situations or only a few? Attributing one's failures to personal deficiencies of generalized and enduring nature, which is postulated to be most debilitating and depressing, constitutes a profound sense of personal inefficacy. Biases toward ascribing poor performances to basic personal deficiencies increase proneness to depression (Seligman, Abramson, Semmel, & von Baeyer, 1979).

The adequacy of performance attainments depends on the personal standards against which they are gauged. A comprehensive theory of depression must therefore be concerned not only with the perceived causality of failure but also with internal standards by which attainments will be self-judged as successes or as failures to begin with. Depressive reactions often arise from stringent standards of self-evaluation, which make objective successes personal failures. Individuals who are prone to depression impose on themselves high performance demands and devalue their accomplishments because they fall short of their exacting standards (Kanfer & Hagerman, 1980; Rehm, 1977; Simon, Note 8).

A theory must specify when perceived inefficacy will give rise to anxiety or despondency. The nature of the outcomes over which personal control is sought is one differentiating factor. People experience anxiety when they perceive themselves ill equipped to manage potentially injurious events. Attenuation or control of *aversive outcomes* is central to anxiety. People are saddened and depressed by their perceived inefficacy in gaining highly valued outcomes. Irreparable loss or failure to gain desired *rewarding outcomes* figures prominently in despondency. In the extreme cases individuals become so chronically preoccupied with self-depreciation and their sense of worthlessness that the pursuit of personal satisfactions becomes futile (Beck, 1973). There are certain situations, of course, in which perceived inefficacy in gaining highly valued outcomes can be anxiety provoking as well. When the valued outcomes one seeks also serve to forestall future aversive events, as when failure to secure a job jeopardizes one's livelihood, perceived inefficacy is both distressing and depressing. Because of the interdependence of events, both apprehension and despair often accompany perceived personal inefficacy.

Undermining Self-Efficacy by Relinquishing Personal Control

When personal control is easy to exercise and enables one to deal effectively with everyday events,

it is highly desired. Indeed, in laboratory studies in which aversive stimuli can be controlled by simple responses requiring neither skills nor expenditure of effort and entailing no risks, controllability is decidedly preferred (Miller, 1979). But there is an onerous side to personal control that is rarely, if ever, incorporated in most of the paradigms designed to study personal control. Self-development of efficaciousness requires mastery of knowledge and skills that can be attained only through long hours of arduous work. This often necessitates sacrificing many immediate rewards. Moreover, maintaining proficiency in given endeavors, which constantly change with social and technological advances, demands continued heavy investment of time, effort, and resources.

In addition to the work of self-development, in many situations the exercise of personal control carries heavy responsibilities and risks. For example, presidents of corporations are granted considerable controlling power, but they must bear personal responsibility for the negative consequences of their decisions and actions, some of which have widespread repercussions. These burdensome aspects dull the appetite for personal control. Attractive incentives, privileges, and heady social rewards are therefore needed to get people to seek control involving complicated skills, laborious responsibilities, and heavy risks.

PROXY CONTROL

People are not averse to relinquishing control over events that affect their lives in order to free themselves of the performance demands and hazards that the exercise of control entails. Rather than seeking personal control, they seek their security in proxy control—wherein they can exert some influence over those who wield influence and power. Part of the price of proxy control is restriction of one's own efficacy and a vulnerable security that rests on the competencies and favors of others.

Perceived inefficacy fosters dependence on proxy control, which further reduces opportunities to build the requisite skills for efficacious action. The influential role of comparative self-ability evaluation in proxy control is revealed in studies by Miller and her associates (Miller, 1980). People who are led to believe that they possess superior coping ability handle potential threats themselves, whereas those who believe themselves to be less skilled readily yield control to others to cope with the aversive environment. The dependent ones enjoy the protective benefits without the performance demands and attendant stresses, and the

controllers do the work and suffer the distress over risks of failure.

UNDERMINERS OF PERSONAL EFFICACY

The preceding discussion focused on personal inefficacy arising from the costs and demands of efficacious behavior. Many factors operate in everyday life to undermine efficacious use of the knowledge and skills that people possess. In an informative program of research on illusory incompetence, Langer (1979) has given us a better understanding of the diverse conditions that impair the exercise of capabilities: Situational factors that often accompany poor performance can in themselves instill a sense of incompetence that is unwarranted. The mere presence of a highly confident individual undermines effective use of routine skills. Attending to what is strange in new tasks, rather than what is familiar and clearly within one's range of capability, may similarly hinder performance. And when people are cast in subordinate roles or are assigned inferior labels, implying limited competence, they perform activities at which they are skilled less well than when they do not bear the negative labels or the subordinate role designations.

The intervening mechanism through which demoralizing conditions undermine effective use of well-established skills remains to be clarified. Studies in which self-percepts are measured under induced illusory self-efficacy suggest that perceived inefficacy, with its concomitant effects on choice behavior, effort expenditure, persistence, and self-debilitating thought, may be the operative mechanism. This evidence comes from experiments demonstrating that changes in physical stamina in competitive situations are partly mediated through self-percepts of efficacy (Weinberg et al., 1979; Weinberg et al., 1980). The lower the illusorily instated self-percepts of physical efficacy, the weaker the competitive endurance in new physical activities. Even the mere sight of a formidable looking opponent instills lower self-percepts of efficacy than does one who looks less impressive. As might be expected preexisting self-percepts of efficacy have greatest impact on initial competitive performance, whereas socially induced self-percepts affect the subsequent course of competitive endurance (Weinberg, Gould, Yukelson, & Jackson, in press). The power of self-efficacy belief over brawn is underscored further by evidence that self-percepts of physical efficacy illusorily boosted in females and illusorily diminished in males obl-

erates large preexisting sex differences in physical strength (Weinberg et al., 1979).

Collective Efficacy

The discussion thus far has focused mainly on the personal effects of perceived self-efficacy. People do not live their lives as social isolates. Many of the challenges and difficulties they face reflect group problems requiring sustained collective effort to produce any significant change. The strength of groups, organizations, and even nations lies partly in people's sense of collective efficacy that they can solve their problems and improve their lives through concerted effort. Perceived collective efficacy will influence what people choose to do as a group, how much effort they put into it, and their staying power when group efforts fail to produce results. It should be noted that knowledge of personal efficacy is not unrelated to perceived group efficacy. As will be shown shortly, collective efficacy is rooted in self-efficacy. Invertebrate self-doubters are not easily forged into a collectively efficacious force.

COLLECTIVE EFFICACY AND SOCIAL CHANGE

The task of social change has never been an easy one. Those who seek to alter social systems and their practices encounter opposition from power holders and influential vested interests. Should challengers resort to forceful social protest, punitive sanctions can be brought to bear against them. The numerous obstacles and coercive threats deter attempts to alter social conditions that adversely affect human lives.

It is often said that hopelessness breeds militant social action. However, the evidence would seem to dispute this view. Consistent with self-efficacy theory, studies of social and political activism indicate that detrimental conditions prompt forceful action, not in those who have lost hope, but in the more able members whose efforts at social and economic betterment have met with at least some success (Bandura, 1973). Consequently, they have reason to believe that some changes can be brought about through forceful group action.

Among the members of dissident groups, those who protest social inequities, compared to non-participants, are generally better educated, have greater self-pride, have a stronger belief in their ability to influence events in their lives, and favor coercive measures, if necessary, to improve their living conditions (Caplan, 1970; Crawford & Na-

ditch, 1970). In many nations university students, rather than the severely underprivileged segments of the society, are the spearhead of political activism (Lipset, 1966). They are the ones who often initiate the protest movements that eventually force social reforms and topple governments. Results of comparative studies indicate that people who are most disposed to social action generally come from familial backgrounds in which the exercise of social influence has been modeled and rewarded (Keniston, 1968; Rosenhan, 1970). Modeling influences, however, which serve as a major vehicle of social diffusion, can substantially alter the personal and social correlates of activism over time. Those who initiate collective action usually differ in characteristics from later adopters.

Research including efficacy probes speaks more directly to the issue of whether perceived efficacy serves as one mechanism through which social discontent gives rise to social activism. Much of this research relies on global indices of efficacy, often blending mixed contents (Balch, 1974). Even so, the relationships obtained are fairly consistent. The higher the perceived efficacy, the greater the propensity to social activism (Forward & Williams, 1970; Marsh, 1977; Muller, 1972, 1979). However, sharper empirical tests of theory will require particularized multifaceted measures of efficacy, tapping perceived capabilities for fashioning and executing different types of strategies designed to influence the course of social events. Since social outcomes are typically achieved in concert with others, perceptions of group as well as personal efficacy warrant examination.

UNDERMINERS OF COLLECTIVE EFFICACY

Rapidly changing conditions, which impair the quality of social life and degrade the physical environment, call for wide-reaching solutions to human problems and greater commitment to shared purposes. Such changes can be achieved only through the mutual effort of people who have the skills, the sense of collective efficacy, and the incentives to shape the direction of their future environment. As the need for efficacious group action grows, so does the sense of collective powerlessness.

One can point to a number of factors that serve to undermine the development of collective efficacy. Modern life is extensively regulated by complex physical technologies that most people neither comprehend nor believe they can do much to influence. Pervasive dependence on technologies that govern major aspects of life imposes dependence on specialized technicians. The social ma-

chinery of a society is no less challenging. Layers of bureaucratic structures thwart effective social action. Even the more efficacious individuals, who are not easily deterred, find their efforts blunted by mazy organizational mechanisms that diffuse and obscure responsibility. Rather than developing the means for shaping their future, most people grudgingly relinquish control to technical specialists and to public officials.

Effective action for social change requires merging diverse self-interests in support of common goals. Disagreements among different constituencies that have a personal stake in the matters of concern create additional obstacles to successful group action. Recent years have witnessed growing social fragmentation into narrow-interest constituencies. Pluralism is taking the form of militant factionalism. As a consequence it is easier to enlist diverse factions to block courses of action than to merge them into a unified force for social change.

In addition to the difficulties in enlisting shared purposes and collective effort in their service, the institutions that are the objects of change mount their own forceful countermeasures. Because of the many conflicting forces that come into play, attempts to produce socially significant changes do not bring quick successes. Long delays between action and noticeable results discourage many of the advocates along the way, even though changes of long-term significance may eventually occur. It is difficult to develop and sustain a sense of collective efficacy when the effects of group effort are not readily noticeable.

To complicate matters further, life in today's societies is increasingly affected by transnational interdependences (Keohane & Nye, 1977). What happens in one part of the world can affect the welfare of vast populations elsewhere. There are no handy direct mechanisms by which people can exercise reciprocal influence on transnational systems that affect their daily lives. Profound global changes—burgeoning populations, shrinking resources, deteriorating environments—are creating new realities requiring transnational remedies.

The subject of collective efficacy calls for broad and comprehensive research effort. Advancement in this field of study requires development of suitable tools for gauging groups' perceptions of their efficacy to achieve varying levels of results. Greatest progress will be made in elucidating the development, decline, and restoration of collective efficacy and how it affects group functioning, if measures of perceived group efficacy are tied closely to explicit indices of group performance.

National surveys have been conducted periodi-

cally of people's general sense of political efficacy, their confidence in their social institutions, and how they view the competence of those they choose to lead them. Though such omnibus measures leave much to be desired, they do provide evidence of growing erosion of perceived efficacy of the citizenry and its social institutions to solve human problems (Guest, 1974; Lipset & Schneider, 1982).

FACTIONAL EFFICACY AND COLLECTIVE ENDEAVOR

In analyzing impediments to human endeavors, it is all too easy to lose sight of the fact that human influence, whether individual or collective, operates in reciprocal, rather than in unidirectional, ways (Bandura, 1978b; Cairns, 1979; Endler & Magnusson, 1976; Pervin & Lewis, 1978). Although the degree of reciprocity may vary from one domain of activity to another, social transactions are rarely unilateral. The amount of imbalance of social power partly depends on the extent to which people exercise the influence that is theirs to command. The less they bring their influence to bear on others, the more control they relinquish to them.

It is the internal barriers created by perceptions of collective inefficacy that are especially pernicious because they are more demoralizing and behaviorally self-debilitating than are external impediments. People who have a sense of collective efficacy will mobilize their efforts and resources to cope with external obstacles to the changes they seek. But those convinced of their inefficacy will cease trying even though changes are attainable through concerted effort.

The social system is not a monolith. Rather, it comprises numerous constituencies, each vying for power and lobbying for its own interests. In this continual interplay one and the same faction is transmuted from a challenger of the system to an influential confederate in the system opposing rival factions, depending on the issues at stake. Thus, for example, the tobacco constituency fights the system in federal efforts to curtail smoking, but it becomes the system fighting the efforts of others to curtail federal subsidies to tobacco growers. Whether people want government in or out of their lives depends on the particular interests being serviced.

The rise of narrow-interest groups flexing their factional efficacy does not jibe with the diagnoses of growing public apathy and feelings of helplessness. Clearly there exists a paradox to be explained. Viewed from the efficacy perspective, in the absence of shared imperatives, growing fac-

tional efficacy undermines the exercise of collective efficacy through mutual immobilization. Efficacious factional initiatives, often fragmented and rivalrous, create an overload of programs and regulations, force divisive issues on officeholders, weaken their capabilities to deal with them satisfactorily, and obfuscate a sense of purpose (Atkin, 1980; Barton, 1980; Fiorina, 1980). Thus people are exercising greater factional influence but achieving less collectively and becoming more discontented. Since changing officeholders does not eliminate the social problems people face, they become disillusioned about the prospect of effecting significant change in their social and economic way of life through the institutional means available to them.

Achievement of collective efficacy requires cogent means of relating factional interests to shared purposes. The unifying purposes must be explicit and attainable through concerted effort. Because success calls for sustained endeavor over a long time, proximal subgoals are needed to provide incentives and evidence of progress along the way. As a society we enjoy the benefits left by those before us, who collectively resisted inhumanities and worked for social reforms that permit a better life. Our own collective efficacy will shape, in turn, how future generations will live their lives. The times call for a commitment of collective effort, rather than litanies of powerlessness that instill in people beliefs of inefficacy to influence conditions that shape the course of their lives.

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Social Cognitive Theory of Organizational Management

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This article analyzes organizational functioning from the perspective of social cognitive theory, which explains psychosocial functioning in terms of triadic reciprocal causation. In this causal structure, behavior, cognitive, and other personal factors and environmental events operate as interacting determinants that influence each other bidirectionally. The application of the theory is illustrated in a series of experiments of complex managerial decision making, using a simulated organization. The interactional causal structure is tested in conjunction with experimentally varied organizational properties and belief systems that can enhance or undermine the operation of the self-regulatory determinants. Induced beliefs about the controllability of organizations and the conception of managerial ability strongly affect both managers' self-regulatory processes and their organizational attainments. Organizational complexity and assigned performance standards also serve as contributing influences. Path analyses reveal that perceived managerial self-efficacy influences managers' organizational attainments both directly and through its effects on their goal setting and analytic thinking. Personal goals, in turn, enhance organizational attainments directly and via the mediation of analytic strategies. As managers begin to form a self-schema of their efficacy through further experience, the performance system is regulated more strongly and intricately through their self-conceptions of managerial efficacy. Although the relative strength of the constituent influences changes with increasing experience, these influences operate together as a triadic reciprocal control system.

Many theories have been proposed over the years to explain human psychosocial functioning. They differ in the conceptions of human nature they adopt and in what they regard as the basic determinants and mechanisms of human motivation and action. Human behavior often

has been explained in terms of one-sided determinism. In such models of unidirectional causation, behavior is depicted as being shaped and controlled either by environmental influences or by internal dispositions. Social cognitive theory explains psychosocial functioning in terms of tri-

adic reciprocal causation (Bandura, 1986). In this model of reciprocal determinism, behavior, cognitive, and other personal factors and environmental events operate as interacting determinants that influence each other bidirectionally (see Figure 1). Reciprocity does not mean that the different sources of influences are of equal strength. Nor do the reciprocal influences occur simultaneously. It takes time for a causal factor to exert its influence and to activate reciprocal influences. Because of the bidirectionality of influence, people are both products and producers of their environment.

This article focuses on how personal factors contribute to this dynamic transaction in the management of organizations. In the analysis of the personal determinants in this interactional causal structure, social cognitive theory accords a central role to cognitive, vicarious, self-regulatory, and self-reflective processes. Three aspects of social cognitive theory are especially relevant to the organizational field (Bandura, 1988d): the development of people's cognitive, social, and behavioral competencies through mastery modeling, the cultivation of people's beliefs in their capabilities so that they will use their talents effectively, and the enhancement of people's motivation through goal systems.

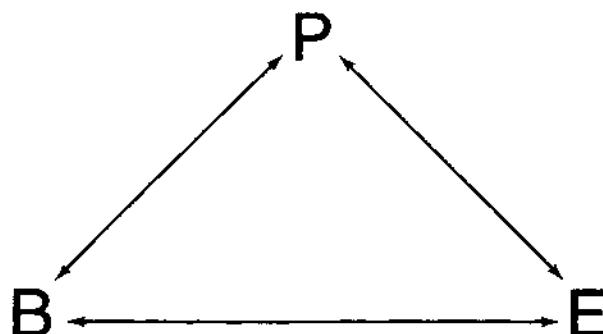


Figure 1. Schematization of the relations among behavior (B), cognitive and other personal factors (P), and the external environment (E).

Development of Competencies Through Mastery Modeling

Psychological theories traditionally have emphasized learning through the effects of one's actions. If knowledge and skills could be acquired only through direct experience, the process of human development would be greatly retarded, not to mention exceedingly tedious, costly, and hazardous. Fortunately, people can expand their knowledge and skills on the basis of information conveyed by modeling influences. Indeed, virtually all learning phenomena resulting from direct experience can occur vicariously by observing people's behavior and the consequences of it (Bandura, 1986; Rosenthal & Zimmerman, 1978).

Mechanisms Governing Modeling

Observational learning is governed by four component processes. Attentional processes determine what people selectively observe in the profusion of modeling influences and what information they extract from ongoing modeled activities. People cannot be much influenced by observed accomplishments if they do not remember them. A second major subfunction governing observational learning concerns cognitive representational processes. Retention involves an active process of transforming and restructuring information about events in the form of rules and conceptions. Retention is greatly aided when people symbolically transform the modeled information into memory codes and mentally rehearse the coded information.

In the third subfunction in modeling—behavioral production processes—symbolic conceptions are translated into appropriate courses of action. This is achieved through a conception-matching process, in which people's centrally guided patterns of behavior are enacted and the adequacy of their actions is compared against their conceptual model (Carroll & Bandura, 1987). Individuals then modify their

behavior on the basis of the comparative information in order to achieve close correspondence between their conceptions and their action. The richer the repertoire of subskills that people possess, the easier it is to integrate these skills in the production of new behavior patterns.

The fourth subfunction in modeling concerns motivational processes. Social cognitive theory distinguishes between acquisition and performance because people do not do everything they learn. Performance of observationally learned behavior is influenced by three major types of incentive motivators—direct, vicarious, and self-produced. People are most likely to adopt modeled strategies if the strategies produce valued outcomes, rather than unrewarding or punishing effects. The observed cost and benefits that are accrued to others influence observers' adoption of modeled patterns in much the same way as do directly experienced consequences. People are motivated by the successes of others who are similar to themselves, but they are discouraged from pursuing behaviors that they have seen often result in adverse consequences. Personal standards of conduct provide a further source of motivation. The self-evaluations people generate about their own behavior regulate which observationally learned activities they are most likely to pursue. They express what they find self-satisfying and reject what they disapprove of.

Modeling is not merely a process of behavioral mimicry. People may adopt functional patterns of behavior, which constitute proven skills and established customs, in essentially the same form as they are exemplified. However, for many activities, subskills must be improvised to suit changing circumstances. Modeling influences also convey rules for generative and innovative behavior. In this form of abstract modeling, observers extract the rules governing the specific judgments or actions exhibited by others. Once they learn the rules, they can use them to judge events and to generate courses of

action that go beyond what they have seen or heard. Much human learning is aimed at developing cognitive skills on how to acquire and use knowledge for different purposes. Observational learning of thinking skills is greatly facilitated if models verbalize their thought processes in conjunction with their action strategies (Bandura, 1986; Meichenbaum, 1984).

Guided Mastery Modeling

Mastery modeling has been widely used with good results to develop intellectual, social, and behavioral competencies (Bandura, 1986, 1988d). The method that produces the best results includes three major elements. First, the appropriate skills are modeled to convey the basic competencies. Effective modeling teaches people general rules and strategies for dealing with different situations, rather than specific responses. People need to learn how the rules can be widely applied and adjusted to fit changing conditions. Modeling influences must be designed to build self-assurance in one's capabilities as well as to convey skills. The impact that modeling has on beliefs about one's capabilities is greatly increased by one's perceived similarity to the models.

The second aspect involves guided skill mastery. After individuals understand the new skills, they need guidance and opportunities to perfect them. Initially, they test their newly acquired skills in simulated situations in which 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 must manage in their work environment and they receive instructive feedback. The feedback that is most informative and helps to achieve the greatest improvements is based on corrective modeling.

Modeling and guided performance under simulated conditions are well suited for creating competencies, but it is unlikely that the new skills will be used for long, unless they prove useful when they are put into practice in work

situations. The third aspect of mastery modeling is a transfer program aimed at providing self-directed success. People must experience sufficient success when using what they have learned in order to believe both in themselves and 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 that are likely to produce good results. As individuals gain skill and confidence in handling easier situations, they gradually take on more difficult problems. If they do not gain sufficient success to convince themselves of their new effectiveness, they will apply the new skills weakly and inconsistently, and they will rapidly abandon their newly acquired skills when they either fail to get quick results or experience difficulties.

Mastery modeling programs have been successfully applied to help supervisors develop competencies. Mastery modeling produces lasting improvements in supervisors' skills (Latham & Saari, 1979). Simply explaining to supervisors the rules and giving them strategies on how to handle problems on the job without using modeling and guided practice does not improve their supervisory competencies. To enhance competencies, people need instructive modeling, guided practice with corrective feedback, and help in transferring new skills to everyday situations. Porras and his colleagues have shown that mastery modeling affects the morale and productivity of organizations as well as supervisors' skills (Porras et al., 1982). Supervisors who had the benefit of the modeling program improved and maintained their supervisory problem-solving skills, as rated by their employees. The plant in which the modeling program was applied had a lower absentee rate, lower turnover of employees, and a higher level of productivity in follow-up assessments.

Self-Efficacy Regulatory Mechanism

In social cognitive theory (Bandura, 1986, 1988a), self-regulation of motivation and perfor-

mance attainments is governed by several self-regulatory mechanisms that operate together. One of the mechanisms that occupies a central role in this regulatory process works through people's beliefs in their personal efficacy. Perceived self-efficacy concerns people's beliefs in their capabilities to mobilize the motivation, cognitive resources, and courses of action needed to exercise control over events in their lives. There is a difference between possessing skills and being able to use them well and consistently under difficult circumstances. To be successful, one not only must possess the required skills, but also a resilient 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.

Sources of Self-Efficacy Beliefs

People's beliefs about their efficacy can be instilled and strengthened in four principal ways. The most effective way individuals develop a strong sense of efficacy is through *mastery experiences*. Performance successes strengthen self-beliefs of capability. Failures create self-doubts. However, if people experience only easy successes, they come to expect quick results and are easily discouraged by failure. To gain a resilient sense of efficacy, people must have 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 affected by them.

The second way to strengthen self-beliefs is through *modeling*. Proficient models build self-beliefs of capability by conveying to observers effective strategies for managing different situations. Modeling also affects self-efficacy beliefs

through a social comparison process. People partly judge their capabilities in comparison with others. Seeing similar others succeed by sustained effort raises observers' beliefs about their own capabilities, whereas observing similar others fail despite high effort lowers observers' judgments of their own capabilities and undermines their efforts.

Social persuasion is a third way of increasing people's beliefs that they possess the capabilities to achieve what they seek. If people receive realistic encouragements, they will be more likely to exert greater effort and to become successful than if they are troubled by self-doubts. However, if their beliefs of personal efficacy are raised to unrealistic levels, they run the risk of failures that undermine their 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 in which they are likely to fail. To ensure progress in personal development, success should be measured in terms of self-improvement, rather than through triumphs over others.

People also rely partly on judgments of their *physiological* states when they assess 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 for people to enhance their physical status, to reduce their stress levels, or to alter their dysfunctional construals of somatic information.

Diverse Effects of Self-Efficacy Beliefs

People's beliefs in their efficacy can affect their psychological well-being and performance through several intervening processes (Bandura, in press-a). People can exert some influence over their lives through the environments they select and the environments they

create. One's judgments of personal efficacy affect one's choice of activities and environments. People tend to avoid activities and situations they believe will exceed their coping capabilities, but they readily undertake challenging activities and pick social environments they judge themselves capable of managing. The social influences in the selected environments can set the direction of personal development through the competencies, values, and interests these influences promote. This process is well illustrated in research on the impact that perceived self-efficacy has on choice of career paths. The stronger the people's self-beliefs of efficacy, the more career options they consider to be possible and the better they prepare themselves educationally for different occupational pursuits (Betz & Hackett, 1986; Lent & Hackett, 1987; Miura, 1987). People often restrict their career options because they believe they lack the necessary capabilities, although they have the actual ability. This self-limitation arises more from self-doubts, rather than from inability. Women are especially prone to limit their interests and range of career options through the self-beliefs that they lack the necessary capabilities for occupations that are traditionally dominated by men, even when they do not differ from men in actual ability.

People's self-beliefs of efficacy also determine their level of motivation, which is reflected in how much effort they will exert and how long they will persevere. The stronger the belief in their capabilities, the greater and more persistent are their efforts (Bandura, 1988a). When faced with difficulties, people who have self-doubts about their capabilities slacken their efforts or abort their attempts prematurely and quickly settle for mediocre solutions. 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. Studies of manufacturing industries

indicate that the impact that training programs have on the acceptance of production goals and level of productivity is partly mediated by changes in employees' self-beliefs of efficacy (Earley, 1986).

People's self-beliefs of efficacy affect how much stress and depression they experience in threatening or taxing situations, as well as their level of motivation. 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 difficulties experience high levels of stress. They tend to dwell on their deficiencies and view many aspects of their environment as threatening (Ozer & Bandura, 1989). Disbelief in one's capabilities to attain valued goals that affect one's sense of self-worth or to secure things that bring satisfaction to one's life also creates depression (Bandura, 1988a; Holahan & Holahan, 1987a, b; Kanfer & Zeiss, 1983). Through ineffectacious thought, such people distress and depress themselves and constrain and impair their level of functioning (Bandura, 1988b, 1988c; Lazarus & Folkman, 1984; Meichenbaum, 1977; Sarason, 1975).

Self-beliefs of efficacy also affect thought patterns that may be self-aiding or self-hindering. These cognitive effects take various forms. Much human behavior is regulated by forethought in the form of cognized goals. Personal goal setting is influenced by one's self-appraisal of capabilities. The stronger the perceived self-efficacy, the higher the goals people set for themselves and the firmer are their commitments to these goals (Bandura & Cervone, 1986; Locke, Frederick, Lee, & Bobko, 1984; Taylor, Locke, Lee, & Gist, 1984). Many activities involve analytic judgments that enable people to predict and control events in probabilistic environments. Strong belief in one's problem-solving capabilities fosters efficient analytic thinking. And finally, people's perceptions of their efficacy influence the types of anticipatory scenarios they construct and reiterate. Highly self-efficacious

individuals visualize success scenarios that provide positive guides for performance, whereas those who judge themselves as ineffectual are more inclined to visualize failure scenarios, which undermine performance. One's perceived self-efficacy and cognitive simulation affect each other bidirectionally. People's high sense of efficacy fosters cognitive constructions of effective actions, and people's cognitive reiteration of efficacious courses of action strengthens their self-beliefs of efficacy (Bandura & Adams, 1977; Kazdin, 1979).

The sociocognitive benefits of a sense of personal efficacy do not arise simply from the incantation of capability. Saying something is so should not be confused with believing it. Self-efficacy beliefs are the product of a process of self-persuasion that relies on diverse sources of efficacy information that must be selected, weighted, and integrated (Bandura, 1986). If people's self-efficacy beliefs are firmly established, they remain resilient to adversity. In contrast, individuals with weakly held self-beliefs are highly vulnerable to change, and negative experiences readily reinstate their disbelief in their capabilities.

Self-Regulation of Motivation and Action Through Goal Systems

Social cognitive theory also emphasizes human capacities for self-direction and self-motivation (Bandura, 1988a). The self-regulation of motivation and action operates partly through people's internal standards and their evaluations of their own behavior. People seek self-satisfactions from fulfilling valued goals, and they are motivated by discontent with substandard performances. Thus, discrepancies between behavior and personal standards generate self-reactive influences, which serve as motivators and guides for action designed to achieve desired results. Through self-evaluative reactions, people keep their conduct in line with their personal standards.

Hierarchical Dual Control Mechanism

Many theories of motivation and self-regulation are founded on a negative feedback control model (Carver & Scheier, 1981; Kanfer, 1977; Lord & Hanges, 1987). 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 the performance matches the standard, the person does nothing. A regulatory process in which matching a standard occasions inactivity does not characterize human self-motivation. Such a feedback control system would produce circular action that leads nowhere. In fact, people transcend feedback loops by setting new challenges for themselves.

Human self-motivation relies on discrepancy production as well as on discrepancy reduction. It requires both active control and reactive control (Bandura, 1988a; in press-b). People initially motivate themselves through active control by first setting valued standards that create a state of disequilibrium and then by mobilizing their effort on the basis of what it would take to accomplish what they seek. Feedback control comes into play in one's subsequent adjustments of effort to achieve desired results. After people attain the standards they have been pursuing, they generally set higher standards for themselves. Their adoption of further challenges creates new motivating discrepancies to be mastered. Thus, self-motivation involves a dual control mechanism that operates through discrepancy production, which is followed by discrepancy reduction.

Diverse Effects of Goals

Many of the activities that people perform are aimed at obtaining future outcomes. Therefore, they must create guides and motivators in the present for activities that lead to outcomes in the future. This is achieved by adopting goals and evaluating one's progress in relation to those

goals. Goals can improve individuals' psychological well-being and accomplishments in several ways. First, goals have strong motivational effects. Goals provide a sense of purpose and direction, and they 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. Investigations of varied domains of functioning under both laboratory and naturalistic conditions provide substantial converging evidence that explicit, challenging goals enhance and sustain people's motivation (Latham & Lee, 1986; Locke, Shaw, Saari, & Latham, 1981; Mento, Steel, & Karren, 1987).

Goals not only guide and motivate performance, they also help to build people's beliefs in their capabilities. Without standards against which to measure their performances, people have little basis either for judging how they are doing or for evaluating their capabilities. Subgoals serve this purpose well (Bandura & Schunk, 1981). Success in attaining challenging subgoals increases people's self-beliefs in their capabilities. Accomplishing challenging goals also creates self-satisfaction and increases one's interest in what one is doing. The closer the attainments match valued goals, the greater are the positive self-reactions (Bandura & Cervone, 1986; Locke, Cartledge, & Knerr, 1970). Goals have these beneficial effects when they serve as challenges, rather than as onerous dictates.

The beneficial effects of goals are partly determined by how far into the future they are set. Short-term, or proximal, goals raise one's effort and direct what one does during 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 one's current behavior. Motivation is best regulated by long-range goals that set the course for one's endeavors combined with a series of attainable subgoals that guides and sustains the efforts along the way (Bandura & Schunk, 1981; Bandura & Simon, 1977; Morgan, 1985). Making

complex tasks manageable by breaking them down into a series of subgoals also helps to reduce one's self-demoralization through high aspiration. A person's accomplishment may indicate significant progress when evaluated against a proximal 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.

Recent research into the effects that goals have on complex decision making has shown that challenging goals lead people to use more effort in the development of strategies (Earley, Wojnaroski, & Prest, 1987). However, challenging goals also may lead to suboptimal cognitive processing (Huber, 1985) and the selection of less effective strategies (Earley, Connolly, & Ekegren, *in press*). Managerial goals that are difficult to attain increase the likelihood of failure and one's vulnerability to self-debilitating modes of thought.

Self-Influences Governing Cognitive Motivation

Motivation based on personal standards or goals involves a cognitive comparison process. By making self-satisfaction conditional on matching adopted goals, people give direction to their actions and create self-incentives to help them persist in their efforts until their performances match their goals. The motivational effects do not stem from the goals themselves, but rather from people responding evaluatively to their own behavior. Their goals specify the conditional requirements for positive self-evaluation.

Activation of self-evaluation processes through internal comparison requires both comparative factors—a personal standard and knowledge of the level of one's own performance. Neither performance knowledge without goals, nor goals without performance knowledge has any lasting motivational impact (Bandura & Cervone, 1983; Becker, 1978; Strang,

Lawrence, & Fowler, 1978). However, the combined influence of goals and performance feedback heightens motivation.

Cognitive motivation based on goal intentions is mediated by three types of self-influences: affective self-evaluation, perceived self-efficacy for goal attainment, and adjustment of personal standards. As already noted, goals motivate by enlisting self-evaluative involvement in the activity, and perceived self-efficacy determines whether discrepancies between standards and attainments are motivating or discouraging. 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). Individuals may maintain their original goal, they may lower their sights, or they may adopt an even more challenging goal. Thus, the third constituent, self-influence in the ongoing regulation of motivation, concerns the readjustment of one's goals in light of one's attainments. Taken together, these self-reactive influences account for a major share of the variation in motivation under different goal structures (Bandura & Cervone, 1983, 1986).

Analysis of Interactional Causal Structures in Managerial Decision Making

The remainder of this article presents a detailed analysis of the interactional causal structures that are operating within the context of managerial decision making in a dynamic simulated environment. In this series of experiments, each of the major interactants in the triadic causal structure—cognitive, behavioral, and environmental—functions as an important constituent of the organizational process. The cognitive determinant is indexed by self-beliefs of managerial efficacy, personal goal setting, and quality of analytic thinking. The managerial choices that are actually executed constitute the behavioral determinant. The portrayed and objective properties of the organizational envi-

ronment, the level of challenge it prescribes, and its responsiveness to managerial interventions represent the environmental determinant. By including multiple trials, the experiments advance understanding of how the interactional causal structure operates and changes over time.

Self-referent phenomena are 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 self-regulatory mechanisms governing managerial decision making, therefore, figure prominently in the causal analysis.

Multifaceted Nature of Managerial Decision Making

Descriptive studies of managerial activities portray managers as continuously involved in making decisions and structuring the efforts of others toward desired outcomes (Kotter, 1982; Mintzberg, 1973; Stewart, 1967). The managerial decision environments consist of dynamic flows of varied information and resources from diverse sources. Feedback concerning the adequacy of decisions is often delayed, multidimensional, and tainted by biases. Decision tasks usually include multiple stages, in which people's decisions at each stage are influenced by their prior decisions and informative experiences. Within this decisional context, managers must continually link short-term goals to more distal organizational objectives along ill-structured means-ends pathways.

Despite the evidence that much of what managers do involves decision making in complex and uncertain environments, little attention has been devoted to systematic analysis of managerial decision processes (Schweiger, Anderson, & Locke, 1985). Decision-making research conducted within the framework of cognitive psychology has contributed to the understanding of how perceptual and cognitive processes affect decision making. However, the range of variables encompassed by these decision models

and the types of decisions studied limit the generalizability of the findings to managerial decision making.

Some of the cognitive research is based on paramorphic models, such as the lens model of social judgment (Brunswik, 1952). This approach describes the relationship between inputs and outputs of decisions, but it ignores the dynamic processes by which individuals acquire information and make and implement decisions (Hogarth, 1981; Schweiger et al., 1985). One's search processes and feedback from executed decisions affect one's level of motivation and learning in natural decision environments (Klayman, 1984; Wood & Bailey, 1985). Managers must be concerned with the implementation and feedback aspects of decisions because these become important inputs to subsequent decisions in the continuous flow of organizational activity for which they bear responsibility. Unlike subjects in decision experiments, managers must live with the consequences of their errors in judgment and faulty decisions.

To complicate matters further, managers do not simply react to decision environments that are carefully demarcated for them. Rather, they create their own decision support systems and selectively process the information generated by these constructed environments (George, 1980). Managerial decision making requires that the manager work through others within organizational contexts that are characterized by hierarchy and division of labor and specialization. Many of the important decisions that managers must make involve allocating work roles and managing and monitoring the collective efforts of the people they oversee (Mintzberg, 1973).

Cognitive approaches to decision making are further limited because they usually ignore the impact that affective, motivational, and other self-referent influences have on one's information acquisition, evaluation, and choice. In naturally occurring decision environments, interactions between situational demands and self-referent factors can exert a powerful influence on the decision-making process. For example,

in studies of organizational decision making, perceived threats and setbacks have been shown to reduce managers' willingness to seek new information or to incorporate it into their choices (Tjosvold, 1984), to strengthen their commitment to past courses of action (Brockner & Rubin, 1985), and to narrow their focus, or to foster a retrospective focus, in their search behavior (Conlon & Parks, 1987; Janis & Mann, 1977). However, managers do not always become closed-minded in situations of threat. They may explore opposing opinions, search for disconfirming information, and strive to reconcile conflicting values in efforts to arrive at decisions that bring success (Maoz, 1981).

When research has addressed motivational mechanisms, it has often been conducted with relatively simple tasks in which individual effort can directly affect the level of performance. Such tasks limit the applicability of the findings to managerial decision making, in which performance accomplishments must be achieved through group effort. Goal setting is the most widely researched and validated theory of work motivation (Locke & Latham, 1984; Mento, Steel, & Karren, 1987). However, until recently, most of the studies on the effects of goal setting have included simple tasks (Wood, Mento, & Locke, 1987). To achieve organizational performance goals, managers must create appropriate production functions, allocate people to those functions, and continually adapt their organizational practices to changes in available resources and situational circumstances (Kotter, 1982; Mintzberg, 1973). Effective management of these ongoing activities calls for high levels of motivation and effective strategies for organizing the collective effort productively.

The multifaceted nature of managerial activities and their intricate linkage to organizational performance introduces complexities in the relation between personal goals and group attainment. In most previous research, self-set goals are applied to personal performances, over which individuals can exercise direct control by

regulating their attention and level of effort. In organizational environments, managerial goals must be socially mediated through the coordinated efforts of others. Managerial effort alone does not ensure attainment of a group goal. Moreover, efforts to enhance the level of organizational functioning often require constituent changes in particular aspects of the social structure and the way in which social resources are allocated. Systematic pursuit of such operational subgoals contributes to eventual success, but it does not necessarily produce sizable gains in organizational performance during the short run. Therefore, generalizations regarding the performance-enhancing effects of goal challenges at the organizational level must be tempered by considerations of these complexities.

In organizational environments that require complex decision making, managers must master serviceable managerial rules that enable them to predict and exercise influence over the collective effort. In order for them to discern predictive rules, they must effectively process multidimensional information that contains ambiguities and uncertainties. Predictive factors usually are related probabilistically, rather than invariably, to future events, which leaves some degree of uncertainty. In ferreting out predictive rules, people must draw on their state of knowledge to generate hypotheses about predictive factors, to weight and integrate these factors into composite rules, to test their judgments against outcome information, and to remember which notions were tested and how well they worked. Less skilled decision makers formulate vague composite rules, they tend to alter several factors concurrently, making it difficult to assess the source of multiply produced effects, and they make less effective use of informative outcome feedback (Bourne, 1965; Bruner, Goodnow, & Austin, 1956).

For the formal characteristics of the simulated organization used in this research program, managers must learn the form of the functions relating several motivational factors to aggregate

outcomes. Some of the factors involve nonlinear and compound rules, which are more difficult to learn than are linear ones (Brehmer, Hagafors, & Johansson, 1980). Moreover, they must 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 must generate hypotheses about functional relations for different motivational factors and they must integrate these hypotheses into a coherent managerial effort.

It requires a strong sense of efficacy to deploy one's cognitive resources optimally and to remain task oriented in the face of organizational difficulties and failures. Those who judge themselves ineffectacious in coping with environmental demands tend to become more self-diagnostic than task-diagnostic (Bandura & Dweck, 1988). Such self-referent intrusive thinking creates stress and undermines effective use of capabilities by diverting one's attention from how best to proceed and centers it on personal deficiencies and possible adverse outcomes. People who believe strongly in their problem-solving capabilities remain highly efficient in their analytic thinking in complex decision-making situations. Quality of analytic thinking, in turn, affects their accomplishments.

In the postulated self-regulatory causal structure that governs organizational management, perceived self-efficacy enhances organizational performance both directly and indirectly by the effect it has on people's goal setting and use of analytic strategies. The stronger the perceived self-efficacy, the more challenging are the organizational goals subjects set for themselves and the more systematically they use analytic strategies to discover the managerial rules. Their high self-set goals and systematic analytic thinking, in turn, enhance the level of organizational performance. Tests of the regulatory causal structure were performed in conjunction with experimentally varied organizational properties and belief systems that can enhance or undermine the operation of the self-system.

Organizational Simulation

The mechanisms and outcomes of managerial decision making do not lend themselves readily to experimental analysis in actual organizational settings. The ongoing interaction among behavioral, cognitive, and environmental factors cannot be controlled in a way that can 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 in order to isolate the effects of the constituent factors. The design of the simulation used in the experiments discussed here permits the isolation of time-ordered effects of the different classes of variables in social cognitive theory. By incorporating multiple trials in the simulated environment, it is possible to examine temporal interdependencies and cumulative effects in decision-making processes. Thus, the simulation provides an excellent vehicle for systematically examining the model of triadic reciprocal causation.

The characteristics of the simulated organization are presented elsewhere in some detail and will be only summarized here (Wood, Bandura, & Bailey, *in press*). Business school graduates served as managers of the simulated organization. In executing the managerial task, they were asked to allocate employees from a roster to the different production subfunctions, in order to complete the work assignments within an optimal period. By correctly matching employees to job requirements, the managers could attain a higher level of organizational performance than if employees were poorly matched to jobs. To assist them in this decision task, they received descriptions of the effort and skill required for each of the production subfunctions and the characteristics of each employee. This informa-

tion described employees' skills, experience, and motivational level; employees' preference for routine or challenging work assignments; and employees' standards of work quality.

In addition to allocating employees to jobs, the managers were asked to decide how to use goals, instructive feedback, and social incentives to guide and motivate their supervisees. For each of these motivational factors, the managers were given 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 based on the adequacy of managers' allocation of employees to jobs and their use of the three motivational factors. The group performance for each production order or trial was reported to the managers as a percentage of a preset standard number of hours to complete each manufacturing order. Managers were asked to make decisions and to react to the consequences of those choices. A more detailed description of the mathematics and logic of the model has been presented in an earlier publication (Wood & Bailey, 1985).

The managers performed the managerial task over an extended series of trials and received feedback about how well their group performed. In order to discover the managerial rules, they had to test options, to cognitively process the outcome feedback information of their decisions, and to continue to apply analytic strategies in ways that would reveal the governing rules. To enhance the performance of their organization, managers had to set the optimal level of challenge for each employee, tailor the supervisory feedback to the adequacy of the individual performance, and use social incentives beneficially. In an organizational setting, the impact that social incentives have on performance is affected by social-comparison processes as well as by the nature of the incentives. Managers, therefore, had to learn a compound decision rule that combined incentive and equity factors.

Knowing rules does not ensure optimal implementation of them. Managers also had to gain proficiency in tailoring the applications of the rules to individual employees, and they had to apply these rules together to achieve desired results. At several points in the simulation, both the managers' perceived managerial self-efficacy and the goals they sought to achieve were assessed. The adequacy of their analytic strategies for discovering managerial rules and the level of organizational performance they achieved were also measured.

Factors Affecting Management of Organizational Performance

A series of experiments was conducted that varied the properties of the organizational environment and the cognitive orientations that were expected to affect the management of organizational performance (Bandura & Wood, in press; Wood & Bandura, in press; Wood et al., in press). Some of these studies involved induction of self-aiding or self-hindering belief systems.

Conceptions of Managerial Capability

People's conceptions of their abilities can act upon the self-regulatory influences that govern ongoing motivation and personal accomplishments in complex decision-making environments. People tend to construe cognitive ability either as an acquirable skill or as a fixed inherent capacity (Bandura & Dweck, 1988; Dweck & Elliott, 1983). Those who view cognitive ability as an acquirable skill regard it as continually enhanceable through knowledge and the perfection of one's competencies. They adopt an inquiring learning goal. They seek challenges that provide opportunities to expand their knowledge and competencies. For them, errors are regarded as a natural, instructive part of an acquisition process. They judge their capabilities more in terms of personal improvement than by comparison against the achievement of others.

People who construe cognitive ability as a more or less fixed capacity regard their performance level as diagnostic of basic intellectual aptitude. For them, errors and deficient performances, therefore, carry personal and social evaluative threats. People who adopt this conception of ability tend to pursue safe performance goals that demonstrate their competence. They prefer tasks that minimize errors and permit ready display of intellectual proficiency, even if this is at the expense of expanding their knowledge and learning new skills. To them, high effort, which is often required to develop competencies in complex activities, also poses evaluative threats because it is indicative of low ability. An entity conception of ability is less conducive to effective management of failure than is the view of ability as an acquirable skill (Elliott & Dweck, 1988).

The psychological effects that these conceptions of ability had on the managerial functioning of talented business school graduates as they managed the simulated organization (Wood & Bandura, *in press*) were examined. Before they directed the simulated organization, one group of managers was told that complex decision making reflects an acquirable skill and

that the simulation provides a vehicle for cultivating decision-making capabilities. A second group was told that complex decision making reflects inherent cognitive capacities and that the simulation provides a vehicle for gauging the underlying cognitive aptitude.

The impact that these alternative conceptions of ability had on the self-regulatory mechanisms that governed the utilization skills and performance accomplishments is seen in Figure 2. Managers who were led to construe their decision-making ability as reflective of their inherent cognitive aptitude were beset by increasing doubts about their managerial efficacy as they encountered problems. They became more and more erratic in their decisional activities, they lowered their organizational aspirations, and they achieved progressively less with the organization they were managing. In marked contrast, managers with an induced conception of ability as an acquirable skill fostered a highly resilient sense of personal efficacy. Even though they were assigned taxing goals that were difficult to fulfill, these managers remained steadfast in their perceived managerial self-efficacy, they continued to set themselves challenging organizational goals, and they used analytic strat-

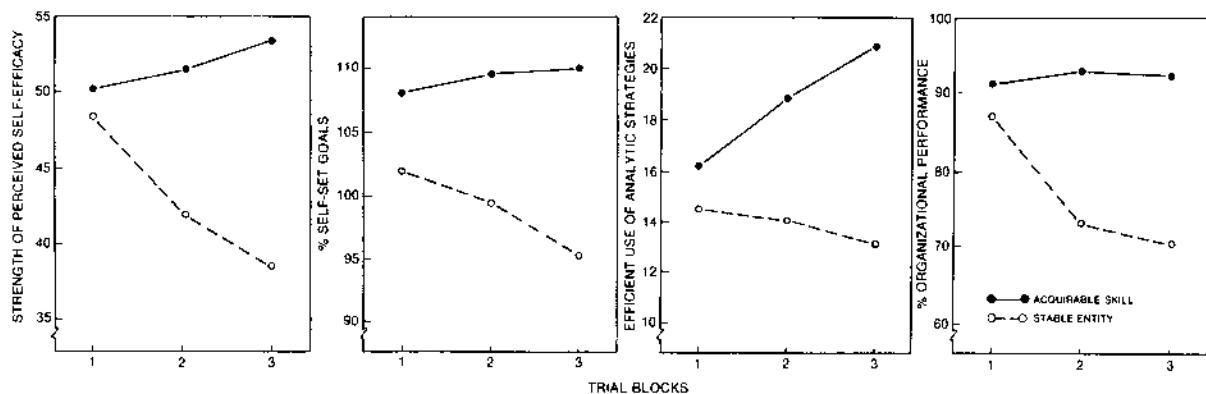


Figure 2. Changes in perceived managerial self-efficacy, the performance goals set for the organization relative to the preset standard, effective analytic strategies, and achieved level of organizational performance across blocks of trials under acquirable skill and entity conceptions of capability. Each trial block comprises six different production orders (Wood & Bandura, *in press*).

egies in ways that aided discovery of optimal managerial decision rules. Such a self-efficacious orientation, which is well suited for handling adversity, paid off in uniformly high organizational attainments.

Induced differential conceptions of ability bias how similar substandard performances at the outset are cognitively processed. A person's construal of substandard attainments as indicants of deficiencies in inherent aptitude gradually creates an ineffectual self-schema in the particular domain of functioning, whereas a person's construal of substandard attainments as instructive guides for enhancing personal competencies fosters an efficacious self-schema. Such evolving self-beliefs further bias the person's cognitive processing of outcome information and promote actions that create confirmatory behavioral evidence for them. This produces an exacerbation cycle of motivational and performance effects, in accordance with the model of reciprocal causation.

Organizational Controllability and Performance Standards

Belief systems regarding how controllable an organization is also can exert a substantial impact on the quality of organizational management. There are two aspects to the exercise of control that are especially relevant to management of organizational performance (Bandura, 1986; Gurin & Brim, 1984). The first aspect concerns the level of personal efficacy needed to effect changes through enlistment of effort and creative use of capabilities and resources. This constitutes the personal side of the transactional control process. The second aspect concerns how changeable or how controllable the environment is. This facet represents the level of system constraints and opportunities that are available for one to exercise personal efficacy.

Neither self-efficacy nor social environments are fixed entities. One's operative self-efficacy is a generative capability in which multiple subskills must be continuously improvised to manage ever-changing circumstances. Therefore,

individuals who have the same skills may perform variably, depending on how well they use the skills they possess (Bandura, 1986, 1988c). For the most part, the social environment constitutes a potentiality that is actualized by appropriate action. Thus, what parts of the potential environment are actualized and what forms they will take depend on how people behave. Human behavior is, of course, governed largely by people's perceptions of their efficacy and the social environments, rather than simply by their objective properties. Thus, individuals who believe themselves to be ineffectual are likely to effect limited change, even in environments that provide many potential opportunities. Conversely, those who have a firm belief in their efficacy, through ingenuity and perseverance, figure out ways of exercising some measure of control in environments that contain limited opportunities and many constraints.

In the transactions of everyday life, individuals' beliefs regarding self-efficacy and how controllable the environment is are not divorced from experiential realities; rather, these beliefs are products of reciprocal causation (Bandura, 1986). Thus, when people believe the environment is controllable on matters of import to them, they are motivated to exercise fully their personal efficacy, which enhances the likelihood of success. Experiences of success, in turn, provide behavioral validation of personal efficacy and environmental controllability. If people approach situations as largely uncontrollable, they are likely to exercise their efficacy weakly and abortively, which breeds failure. Over time, failures take an increasing toll on both one's perceived self-efficacy and one's beliefs about how much environmental control is possible.

To gauge the impact that perceived controllability has on the self-regulatory factors governing organizational management, differential beliefs about the controllability of organizations (Bandura & Wood, *in press*) were experimentally induced in the research program. For half the managers, organizations were portrayed as

difficult to predict and control. The work habits of employees were characterized as being not easily changeable, and not all employees are fully responsive even to helpful guidance. Small changes do not necessarily improve the overall outcomes. For the others, organizations were portrayed as predictable and controllable. The work habits of employees were characterized as more easily changeable than would be generally assumed, and most employees were characterized as responsive to helpful guidance. Small changes can set in motion processes that improve the overall outcomes. Within each of the controllability conditions, half the managers were assigned easy-to-reach organizational standards for the simulated organization. The other half were given difficult organizational standards to meet.

The contrasting effects of the induced belief systems are summarized in Figure 3. People who managed the simulated organization under a cognitive set that organizations are not easily changeable quickly lost faith in their managerial capabilities, even when performance standards were within easy reach, and they lowered their sights for the organization. If managers make an effort to manage an organization that is regarded as relatively uninfluencable, they feel a sense of personal inefficacy to effect change which, in turn, makes it difficult for them to realize group accomplishments. Although a sense of uncontrollability is personally and socially handicapping, viewing an organizational environment as capable of being influenced fosters productive action. Managers who operated under a cognitive set that organizations are controllable displayed a resilient sense of managerial efficacy, set themselves increasingly challenging goals, and used good analytic thinking for discovering effective managerial rules. They exhibited high resiliency of self-efficacy, even when difficult organizational standards eluded them. Indeed, they maintained a stronger sense of efficacy than did their counterparts, who managed the organization under readily attainable standards but who had

the view that there were severe limits on how much one can change organizational functioning. The divergent changes in these self-regulatory factors were accompanied by large differences in organizational attainments.

Resiliency of self-efficacy has considerable functional value because major accomplishments are rarely achieved through quick successes. Such accomplishments are realized by self-efficacious people who persevere in the face of failures and setbacks, who learn from their mistakes, and who construe obstacles as challenges, rather than as reflections of their deficiencies. To abort one's efforts prematurely or to undermine them by self-in efficacious thinking precludes significant personal accomplishments.

Organizational Complexity

Learning the rules in dynamic environments through the results of action alone is difficult at the individual level of behavior, let alone the collective level (Brehmer, 1980; Klayman, 1984). Managerial decision tasks vary in the complexity of judgments required and the nature of decision rules that must be mastered. The complexity of decisions can vary along several dimensions (Wood, 1986). One aspect of complexity concerns the number of relevant factors available for consideration, their informativeness, and the number of judgments that must be made. Complexity also increases if managers must coordinate and make trade-offs between different decisions. A third aspect of complexity relates to the stability of different predictive factors in the probabilistic environment. Managers can learn the factors that have highly predictable effects and can incorporate them more readily into their composite decision rules rather than factors that change in their predictive value according to changes in circumstances.

Much of the research on the effects of various motivational mechanisms has been conducted on relatively simple tasks. By contrast, in complex activities, individuals' increased effort is not

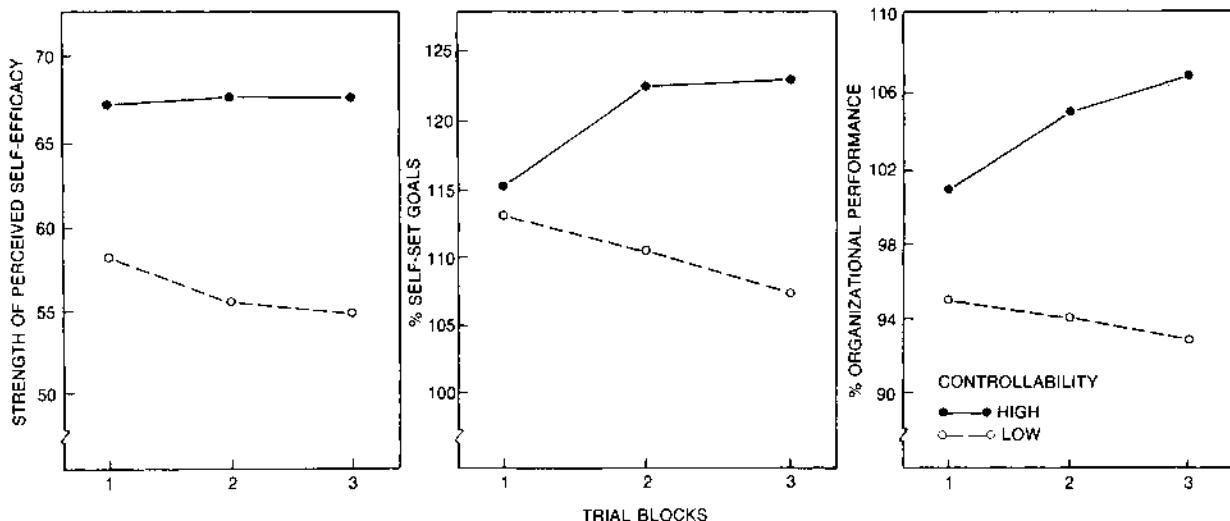


Figure 3. Changes in strength of perceived managerial self-efficacy, the performance goals set for the organization, and level of organizational performance for managers who operated under a cognitive set that organizations are controllable or difficult to control. Each trial block comprises six different production orders (Bandura & Wood, in press).

translated into performance gains unless they develop effective strategies for deploying that effort productively (Wood & Locke, in press; Wood, Mento, & Locke, 1987). As the information-processing demands of activities increase, managers need greater cognitive resources to function competently. When task demands approximate the limits of managers' cognitive capabilities, external motivators, such as incentives or assigned goals, can undermine their performance by diverting their attention from how best to perform the task to concerns about the consequences of their failure (Humphreys & Revelle, 1984; Wood, 1985).

The influence that complexity of organizational demands had on managerial performance was evaluated in a study in which both organizational complexity and managerial goal assignments were varied (Wood, Bandura, & Bailey, in press). Complexity was varied by changing the number of employees the managers supervised and the degree of match between employees' skills and job functions. In the simple organization, the managers took charge

of a small number of employees, and each employee was best suited for only one job function. In the complex organization, the managers supervised more than twice as many employees, and optimal matching of employees to jobs required several trade-offs among employees who were equally suited for the same job. This placed greater demands on managers to handle both component and coordinative sources of complexity (Wood, 1986). The managers were assigned either the general goal to do their best or the explicit goal to substantially improve their group's performance.

As shown in Figure 4, challenging goals enhanced organizational performance under low complexity, but they had no effect when the managerial demands were more complex. This is not because the managers rejected the challenging goals or lacked sufficient commitment to try to achieve them. The finding is, perhaps, better explained in terms of the temporal and social complexity of the links among managerial effort, group attainments, and the multifaceted nature of goal setting in complex social environments.

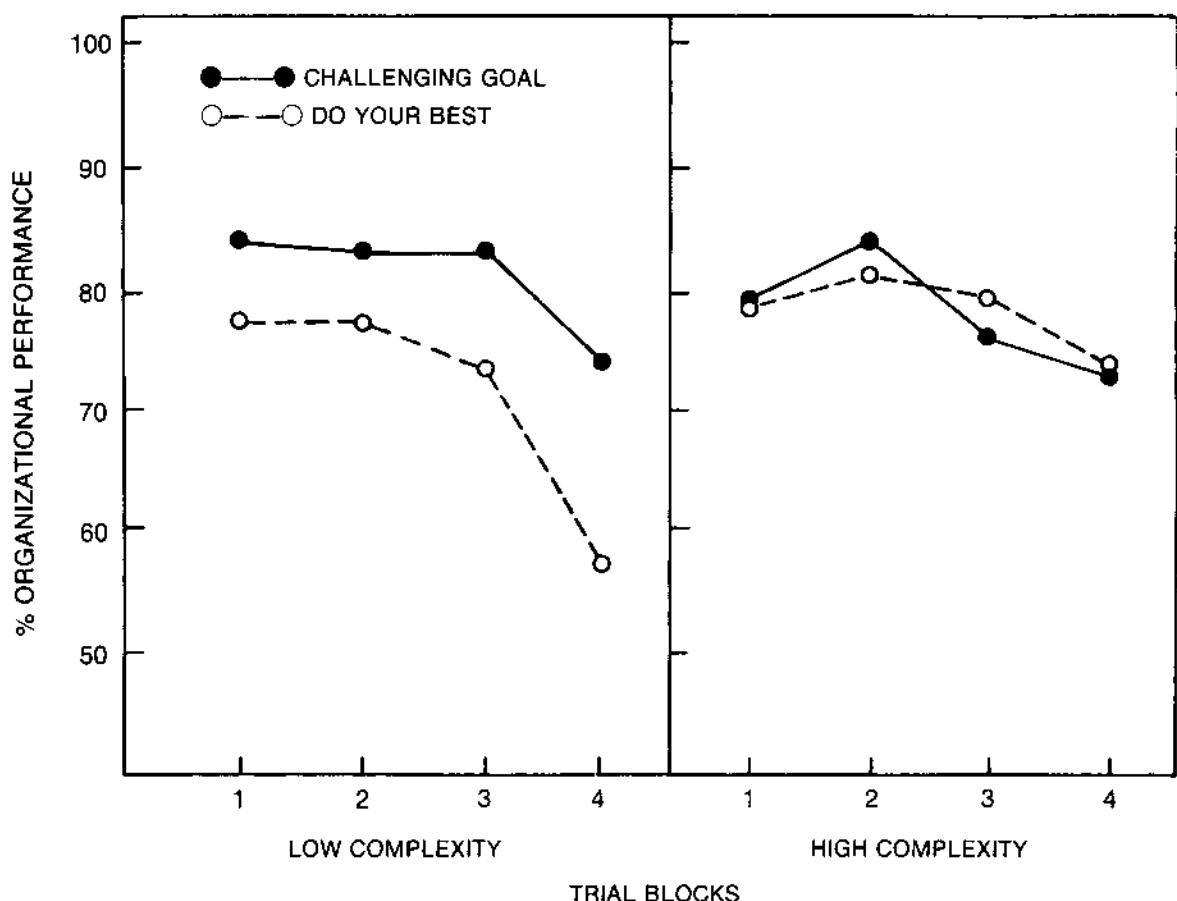


Figure 4. Organizational performance across trial blocks as a function of goal assignment and managerial complexity (Wood, Bandura, & Bailey, *in press*).

Goal attainment had to be socially mediated through the efforts of the group of employees in the simulated organization. Managerial effort alone will not augment group performance if managers have not discovered how best to match motivational factors to employee attributes in order to achieve good collective outcomes. Personal goals influenced performance in the earlier trials, but they did not in the later trials when the roster of employees had been changed. To the extent that significant changes in the dynamic components of an environment reduce the transferability of managers' prior ex-

periences, these changes temporarily disrupt the motivational effects that goal setting has on performance.

In complex tasks, proximal subgoals enhance individuals' performance attainments, whereas distal goals may have little effect (Bandura & Schunk, 1981). The managers' reports revealed additional complexities about their efforts to achieve socially mediated outcomes. Many of them directed their efforts at operational subgoals, such as improving the performance of one employee or achieving a better allocation of social rewards. Careful attention to such sub-

goals eventually will improve the level of organizational attainments, but notable gains may not be achieved immediately.

Neither complexity nor goal assignment affected the self-regulatory factors. In path analyses, the self-regulatory influences had comparable effects on managerial performance across the differing levels of goal assignment and organizational complexity.

Analysis of Causal Structures

The causal ordering of the self-regulatory influences on organizational attainments in this set of experiments was tested by path analysis computed on the combined data from the set of simulation studies. The direction of causality in the path model is based on theoretical propositions from social cognitive theory and the temporal sequencing of variables in the simulation. In this conceptual model (Bandura, 1986), prior performance attainments influence managers' perceived self-efficacy and personal goals, which, in turn, influence analytic strategies and subsequent performance. Prior performance was included as the first factor in the analysis as a proxy for possible determinants other than the self-regulatory influences examined in these studies. Perceived self-efficacy was entered second because beliefs about their capabilities influence both the goals people set for themselves and the proficiency of their analytic strategies. Perceived self-efficacy also contributes independently to performance. Managers' personal goals were expected to affect subsequent performance directly through the mobilization of effort and indirectly by their influence on analytic strategies. The quality of their analytic strategies would have a direct influence on performance attainments through allocation of resources and adjustment of motivational factors. The full set of structural equations representing the hypothesized causal relations were analyzed separately for the different phases of the organizational simulation.

The standardized path coefficients that were

significant beyond the .05 level are shown in Figure 5. In both phases of the simulation, the relation of prior organizational performance to subsequent performance is partly mediated by managers' perceived self-efficacy, personal goals, and analytic strategies. A significant direct relation also was found between prior and subsequent organizational performance.

In the initial phase, perceived self-efficacy enhanced the level of organizational performance through its effects on managers' goal setting and analytic strategies. The structure of significant causal relations is replicated in the subsequent phase, except that the contribution of prior performance is weaker, and perceived managerial self-efficacy plays a larger causal role in organizational performance, affecting it both directly as well as through managers' goal setting and analytic strategies. Personal goals influenced managers' performance indirectly through the positive effects they had on analytic strategies. Effective use of analytic strategies enhanced organizational performance, after controlling for all prior determinants. Thus, comparison of the causal structures at the different phases of organizational management reveals that when initially faced with managing a complex, unfamiliar environment, managers relied heavily on performance information in judging their efficacy and in setting their personal goals. But, as they began to form a self-schema of their efficacy through further experience, the performance system was regulated more strongly and intricately by their self-conceptions of efficacy. The specified model accounted for the major share of the variance in organizational performance attainments in both the initial phase, $R^2 = .75$, $p < .001$, and the subsequent phase, $R^2 = .84$, $p < .001$ of the organizational management.

The overall findings of this research program demonstrate the utility of social cognitive theory for the study of motivation and performance in the domain of managerial decision making. The results show that the interaction of cognitive and motivational processes is important to an under-

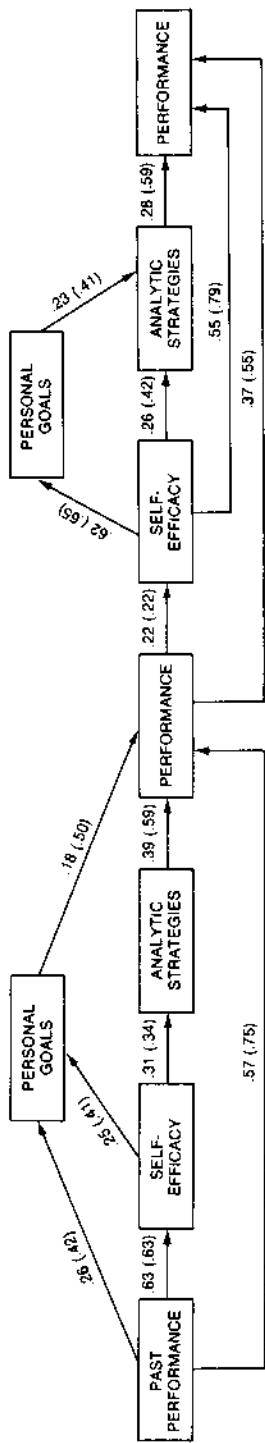


Figure 5. Path analysis of causal structures. The initial numbers on the paths of influence are the significant standardized path coefficients ($p < .05$); the numbers in parentheses are the first-order correlations. The network of relations on the left half of the figure are for the initial managerial efforts, and those on the right half are for later managerial efforts.

standing of how managers approach the daily stream of decisions that must be made in complex and uncertain decision environments.

Social cognitive theory offers several advantages over existing models of managerial decision making. First, it is not constrained by the assumption of sequential phases of search, evaluation, choice, and implementation activities (Mintzberg, Raisinghani, & Theoret, 1976; Simon, 1960). Attempts to validate the specified phases within different decision models have failed to support a methodical sequencing of activities (Witte, 1972). Many of the decision activities are performed simultaneously, and because of the dynamic, evolving nature of much managerial work, managers frequently cycle back and forth between different decisional activities (Mintzberg et al., 1976). These dynamic conditions create reciprocal influences among personal factors, decisional actions, and environmental effects.

Another contribution of this model is the incorporation of self-regulatory factors in the analysis of managerial decision processes. As the above-mentioned studies have shown, self-referent influences are important determinants of managers' analytic thinking and performance accomplishments in complex decision environments. These factors influence how well managers cope with organizational demands and how well they learn from failures, setbacks, and successes. Even managers who enjoy remarkable success operate in environments that constantly threaten their sense of self-efficacy (George, 1980). How they cope with obstacles and adversities and how they remain resilient in the face of recurrent stressors may be more important than their rate of success when explaining the evolution of managerial careers (Rochlin, 1965; Zaleznik, 1967).

The strong effects that induced belief systems have on managerial capability and organizational controllability are relevant to issues of organizational culture. This line of theorizing and research concerns ideational themes or belief

systems in organizations that influence people's interpretations of events and organizational action (Martin & Siehl, 1983; Schein, 1985). Beliefs about the nature of managerial capability and organizational controllability might represent specific manifestations of an organization's ideational culture, in a manner similar to Schall's (1983) analysis of culture as informal communication norms. Martin and her colleagues (Martin, Feldman, Hatch, & Sitkin, 1983) have shown that perceived personal control is a major theme in organizational stories that are expressions of organizational cultures. How these belief systems are transmitted through modeling, incentive practices, selection systems, and staff development activities would be a fruitful area for research, given the effects these belief systems have on the self-regulatory mechanisms that govern managerial performance. Social cognitive theory specifies psychological mechanisms by which organizational cultures can affect individual behavior.

Concluding Remarks

The value of psychological theory is judged not only by its explanatory and predictive power, but also by its operational power to improve human functioning. Social cognitive theory provides a conceptual framework for clarifying the psychological mechanisms through which social-structural factors are linked to organizational performance. Within the model of triadic reciprocal causation, both personal and organizational factors operate through a bidirectionality of influence. Many conceptual systems are dressed up in appealing terminology, but they remain prescriptively ambiguous on how to effect psychosocial changes. Social cognitive theory provides explicit guidelines about how to equip people with the competencies, the self-regulatory capabilities, and the resilient sense of efficacy that will enable them to enhance both their well-being and their accomplishments.

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*Reflections on Nonability
Determinants of Competence*

ALBERT BANDURA

Recent years have witnessed major changes in the conception of human ability and competence. Competence is not a fixed property that one does or does not have in one's behavioral repertoire. Rather, it involves a generative capability in which cognitive, social, and behavioral skills must be organized and effectively orchestrated to serve innumerable purposes. There is a marked difference between possessing knowledge and skills and being able to use them well under diverse circumstances, many of which contain ambiguous, unpredictable, and stressful elements.

A capability is only as good as its execution. People often fail to perform optimally even though they know full well what to do and possess the requisite skills. This is because self-referent thought mediates the translation of knowledge and abilities into skilled performance. Among the different facets of self-referent thought, none is more central or pervasive than beliefs regarding personal capabilities. Because of their substantial impact on motivation, affective arousal, and thought processes, self-beliefs of capability partly govern the level of performance attainments. Thus, with the same set of skills people may perform poorly, adequately, or extraordinarily depending on their self-beliefs of efficacy.

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MEDIATING MECHANISMS

The research reviewed in this volume has added greatly to our understanding of the centrality of perceived competence in sociocognitive functioning. Some progress has also been made in delineating the processes by which beliefs of personal capabilities affect psychological well-being and performance attainments. Several features of the experimental methodology employed in research conducted within the framework of self-efficacy theory are well suited for clarifying mediating mechanisms. Self-beliefs of efficacy are measured in terms of designated domains of functioning. Because of their greater relevance, domain-linked appraisals of self-efficacy generally have higher explanatory and predictive power than do nondescript omnibus measures (Bandura 1988c). Analyses of the causal contribution of self-efficacy beliefs to behavior test the postulated dual linkage in the causal process—external influences are related to the efficacy mediator which is, in turn, related to action. The efficacy-action link is corroborated by microlevel relations between particular self-percepts of efficacy and corresponding action, or by macrolevel relations between aggregated self-percepts of efficacy and aggregated behavior. Perceived self-efficacy is systemically varied rather than merely correlated, which removes ambiguity about the direction of causality. The impact of self-efficacy beliefs is assessed in relation to diverse outcomes including cognitive, affective, and behavioral functioning.

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 task demands. Perceived competence is similarly concerned with judgments of personal capabilities. Self-beliefs of efficacy affect action through several intervening processes, which are reviewed next. Some of these processes, such as affective arousal and cognitive activities, are of considerable interest in their own right, rather than merely as intervening influencers of action.

Motivational Processes

People's self-beliefs of efficacy determine 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 have self-doubts about their capabilities slacken their efforts or abort their attempts prematurely and 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—impediments, failures, setbacks, frustrations, inequities. People must have a robust sense of personal efficacy to sustain the perseverant effort needed to succeed. Self-doubts can set in fast after some failures or reverses. The important matter is not the self-doubt, which is a natural immediate reaction, but the speed of recovery of perceived self-efficacy. 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, it is resiliency of self-belief that counts.

In his delightful book *Rejection*, 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 piece published. James Joyce's *The Dubliners* was rejected by twenty-two publishers. Gertrude Stein continued to submit poems to editors for about twenty years before one was finally accepted. Now that's invincible self-efficacy. Over a dozen publishers rejected a manuscript by e.e. cummings. When he finally got it published 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 life. The musical works of most renowned composers were initially greeted with derision. Stravinsky was run out of town 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 work of the brilliant architect Frank Lloyd Wright was widely rejected during much of his career.

To turn to more familiar 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 evaluation, "We don't like their sound. Groups of guitars are on their way out." Whoever issued that pronouncement must cringe at the 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 discordant with what is in vogue. Scientists often reject theories and technologies that are ahead of their time. Because of the cold reception given to most innovations, the time between conception and technical realization typically spans several decades.

The findings of laboratory investigations are in accord with these 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 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 quality 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. They judge themselves as highly vulnerable and view many aspects of their environment as fraught with danger (Ozer & Bandura in press). They tend to dwell on their coping deficiencies. Through such ineffectuous thought they distress themselves

and constrain and impair their level of functioning (Bandura 1988b, 1988e; 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 (Bandura, Reese, & Adams 1982), and plasma catecholamine secretion (Bandura et al. 1985). The combined results from the different manifestations of anxiety are consistent in showing that anxiety and stress reactions are low when people cope with tasks in their perceived self-efficacy range. Self-doubts 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 physiological arousal. Perceived self-infficacy in exercising control over stressors also activates endogenous opioid systems (Bandura et al. 1988), which enables people to handle stressful situations with some relief from physical aversiveness.

Anxiety arousal in situations involving some risks is affected not only by perceived coping efficacy but also by perceived self-efficacy in controlling dysfunctional apprehensive 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.*"

The influential role played by thought control efficacy in anxiety arousal is corroborated in research examining the different properties of perturbing cognitions and their correlates. The results show that it is not the extent of frightful cognitions per se that accounts for anxiety arousal but rather the strength of perceived self-efficacy to control their escalation or perseveration (Kent 1987; Kent & Gibbons 1987). Thus, the incidence of frightful 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 extent of frightful cognitions is controlled. Analysis of the aversiveness of obsessional ruminations provides further support for efficacious thought control as a key factor in the regulation of cognitively generated arousal (Salkovskis & Harrison 1984). It is not the sheer frequency of intrusive cognitions but rather the perceived inefficacy to turn them off that is the major source of distress.

Perceived self-inefficacy to fulfill desired goals that affect evaluation of self-worth and to secure things that bring satisfaction to one's life also create 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 further diminishes perceptions of personal efficacy (Kavanagh & Bower 1985; West, Berry, & Powlishta 1988).

Cognitive Processes

Self-beliefs of efficacy affect thought patterns that may be self-aiding or self-hindering. These cognitive effects take various forms. Much human behavior, being 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 goals people set for themselves and the firmer their commitment to them (Bandura & Wood 1989; Locke et al. 1984; Taylor et al. 1984). Challenging goals raise the level of motivation and performance attainments (Locke et al. 1981; Mento, Steel, & Karren 1987).

Many activities involve judgmental processes that enable people to predict and control events in probabilistic environments. Discernment of the 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. Moreover, events are typically multidetermined. The fact that the same predictor may contribute to different effects and the same effect may have multiple predictors introduces ambiguity as to what is likely to lead to what.

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

(Bandura & Wood 1989; Wood & Bandura 1989). Those who are plagued by self-doubts are erratic in their analytic thinking. Quality of analytic thinking, in turn, affects performance accomplishments.

Self-efficacy beliefs usually affect cognitive functioning through the joint influence of motivational and information-processing operations. This is illustrated in research designed to explain variation in memory performance. The stronger people's beliefs in their memory capacities, the more time they devote to cognitive processing of memory tasks which, in turn, enhances their memory performances (Berry 1987).

A major function of thought is to enable people to predict the occurrence of events and to create the means of exercising control over those that affect their daily life. As alluded to earlier, people's perceptions of their efficacy influence the types of anticipatory scenarios they construct and reiterate. The highly self-efficacious visualize success scenarios that provide positive guides for performance, whereas those who judge themselves as ineffectual are more inclined to visualize failure scenarios which undermine performance by dwelling on how things will go wrong. Numerous studies have shown that cognitive reiteration of scenarios in which individuals visualize themselves executing activities skillfully enhances subsequent performance (Bandura 1986; Corbin 1972; Feltz & Landers 1983; Kazdin 1978). Perceived self-efficacy and cognitive enactment 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-percepts of efficacy (Bandura & Adams 1977; Kazdin 1978).

In their analysis of the role of self-systems in competence, Markus, Cross, and Wurf posit cognized possible selves as the guidance system for competence. Possible selves that are well-articulated help to organize behavior and energize it in pursuit of selected goals. Self-systems serve this function well when they contain the relevant plans and procedural strategies for realizing desired futures. Ill-defined possible selves remain but idle fantasies. The nonprescriptiveness of indefinite selves is captured well in Lily Tomlin's portrayal of a character named Chrissy, who never quite manages to get her act together. Self-reflection on her unrealized ambitions leads her to an incontestable insight: "All my life I've always wanted to be somebody. But I see now I should have been more specific."

Markus and her colleagues regard anticipatory cognitive simulation as the key mechanism by which self-systems get translated into behavioral competence. The evidence cited earlier corroborates that cognitive re-

hearsal of efficacious actions enhances performance. The authors consider processes by which cognitive simulation might produce its effects. On the assumption that perception, imagery, and action have parallel structural properties, cognitive simulation presumably coordinates perceptual and action schematas.

Perceptual processes play a major role in the acquisition of conceptions of skilled actions (Carroll & Bandura 1988). But the production of appropriate behavior is concerned more with conception-action coordination because, in most instances, actions are structured by conceptions rather than by perceptions of events. If structural similarities led to automatic translation of cognitive schemata into action schemata, the development of behavioral proficiency would be an easy matter. In actuality, it is usually a long arduous process, especially where complex skills are involved. An interpretation in terms of cross-modal coordination of perceptual and action schematas leaves unexplained the transformational production mechanism by which cognition is converted into proficient action.

One solution that has been proposed for the transformation problem relies on a dual knowledge system—declarative knowledge and procedural knowledge (Anderson 1980). Procedural knowledge provides production systems which embody decision rules for solving tasks. Constructing the acquisition of competence in terms of factual and procedural knowledge is well suited for cognitive problem solving where solutions are cognitively generated and either no actions are involved or they are trivially simple. One must distinguish between knowledge and behavioral skills, however. Activities requiring the construction and adept execution of complex actions call for additional mechanisms to get from knowledge structures to proficient action. Procedural knowledge and cognitive skills are necessary but insufficient for competent performance. A novice given complete information on how to ski and a set of procedural rules, and then launched from a mountain top would most likely end up in the intensive care unit of the local infirmary. Procedural knowledge alone will not convert an awkward retiring person into a demonstrative adept one.

In social cognitive theory (Bandura 1986), the mechanism for transforming thought into action operates through a conception-matching process. Conceptual representations of efficacious actions are formed on the basis of knowledge gained through observational learning, inferences from the outcomes of enactive experiences, and innovative cognitive syntheses of preexisting knowledge. These conceptions then serve as guides for response production and as internal standards for response correction. Conceptions are rarely transformed into appropriate perfor-

CONCLUSION

mance without error on the first attempt. Skilled performances are usually achieved by repeated corrective adjustments in conception matching during behavior production (Carroll & Bandura 1985, 1987). Monitored physical enactment provides the vehicle for converting conception to skilled action. The feedback accompanying the enactment provides the information for detecting and correcting mismatches between conception and action. The behavior is thus modified based on the comparative information to achieve a close match between conception and action. The amount of overt enactment needed to correct mismatches depends on the complexity of the activity, the informativeness and timing of the feedback information, and the extent to which the requisite subskills have already been developed.

Selection Processes

Thus far the discussion has centered on efficacy-related processes that enable people to create beneficial environments and to exercise control over them. Judgments of personal efficacy also affect choice of activities and selection of environments. People tend to avoid activities and situations they believe exceed their coping capabilities, but they readily undertake challenging activities and pick social environments they judge themselves capable of handling. The social influences operating in the selected environments can set the direction of personal development by the competencies, values, and interests they cultivate (Bandura 1986; Snyder 1987).

The power of self-efficacy beliefs to affect the course of life paths through choice-related processes is most 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-inadequacy than from actual inability. By constricting choice behavior that can cultivate interests and competencies, self-disbeliefs create their own validation.

MULTIFACETED NATURE OF COMPETENCE AND ITS SOCIAL LABELING

Like other human activities, the judgment of competence is influenced by properties of the behavior and social-labeling processes. Some of the

judgmental factors are grounded in the behavior, but many are extraneous to it and may be quite subjective. Sternberg shows that, although there is some consensus in the types of behaviors that one considers indicative of intellectual competence, children, laypersons, and academics differ in the relative weight they give to such things as social adeptness, verbal facility, inquisitiveness, problem-solving skill, and abstract reasoning in their prototypic view of intellectual competence. Langer and Park identify contextual factors that influence the ascription of competence or incompetence to given performances.

A judgment of competence is, by definition, a social construction. No performances ever appear with indwelling labels of competence affixed to them. Although much emphasis is placed on how factors extraneous to behavior can influence how it is labeled, one should not lose sight of the fact that certain properties of behavior can essentially dictate the social construal. In activities in which consequences are inherently linked to quality of performance, nature renders a forceful verdict, regardless of what others may think. Thus, for example, an earnest sailor who, through extraordinary ineptness, manages to frequently sink expensive sailboats in fine working order under optimal sailing conditions does not leave much leeway for socially redeeming labeling. He might be labeled as precompetent according to the taxonomy of competence proposed by Langer and Park. But since there is room for improvement in virtually every endeavor, the rechristening of objectively defective performances as precompetence would essentially eliminate the construct of incompetence from the psychological lexicon.

The social labeling of competence is more than a semantic issue. It serves social functions, beneficially in some applications and detrimentally in others. Societies use competence labeling so as not to place the welfare of people in the hands of those who perform in objectively defective ways. Air travelers demand a reliable system for gauging competence and are not about to climb aboard airliners piloted by precompetent pilots backed up by precompetent navigators. Unfortunately, competence labeling is also often misused for purposes of social control. In such instances, disputes arise over the indexes of competence that are used to justify such practices.

Sternberg's review clarifies some aspects of how variations in socialization practices cultivate different intellectual skills. They may involve practical problem-solving ability, skill in analytic reasoning, or interpersonal competence. People may prefer to use their intellectual capabilities cre-

atively, administratively, or evaluatively. If skills happen to match situational priorities and demands, the persons are viewed as intellectually competent, whereas mismatches foster ascriptions of incompetence. Discontinuities over time in which forms or styles of intelligence are valued can socially transform competence into incompetence or vice versa. One saving grace is that there exist many routes to success so that those who are fortunate in matching their intellectual styles and skills to what is socially valued enjoy a measure of self-efficacy and self-esteem.

THE ORIGINS AND DEVELOPMENTAL SOURCES OF PERCEIVED COMPETENCE

Infants' experiences with their environment provide the initial basis for developing a sense of causal agency. However, newborns' immobility and limited means of action upon the physical and social environment restrict their domain of influence. The initial experiences that contribute to development of a sense of personal agency are tied to infants' ability to control the sensory stimulation from manipulable objects and the attentive behavior of those around them. Infants behave in certain ways, and certain things happen. Shaking a rattle produces predictable sounds, energetic kicks shake their cribs, and screams bring adults.

Realization of causal agency requires both self-observation and recognition that one's actions are part of oneself (Bandura 1986). By repeatedly observing that environmental events occur with action, but not in its absence, infants learn about contingent relations between actions and effects. Repeated experiences of efficacy in influencing events fosters development of a sense of causal agency and efficacious actions (Finkelstein & Ramey 1977; Ramey & Finkelstein 1978). Development of a sense of personal agency requires more than simply producing effects by actions. Those actions must be perceived as part of oneself. The self becomes differentiated from others through differential experience. Thus, if self-action causes pain sensations, whereas seeing similar actions by others does not, one's own activity becomes distinct from that of all others. Infants acquire a sense of personal agency when they begin to perceive environmental events as being personally controlled—a growing realization that they can make events occur.

During the initial months of life, the exercise of influence over the physical environment may contribute more to the development of a child's sense of causal agency than does influence over the social environ-

ment (Gunnar 1980). This is because manipulating physical objects produces quick, predictable, and easily observable effects, thus facilitating perception of personal agency in infants whose attentional and representational capabilities are limited. In contrast, causal agency is more difficult to discern in noisier social contingencies, where actions have variable social effects and some of them occur independently of what the infants are doing. With the development of representational capabilities, however, infants can begin to learn from probabilistic and more distal outcomes flowing from actions. Before long, the exercise of control over the social environment begins to play an important role in the early development of a sense of personal agency.

Efficacy experiences in the exercise of personal control are central to the early development of social and cognitive competence. Parents who are responsive to their infants' communicative behavior, who provide an enriched physical environment, and who permit freedom of movement for exploration have infants who are relatively accelerated in their social and cognitive development (Ainsworth & Bell 1974; Yarrow, Rubenstein, & Pedersen 1975). During the course of development infants and parents operate as reciprocal interactants. Parental responsiveness increases competence, and infant capabilities elicit greater parental responsiveness (Bradley, Caldwell, & Elardo 1979). In their chapter in this volume, Schaffer and Blatt underscore the importance of mutuality and the exercise of influence in social and affective transactions in the development of a robust sense of efficacy.

Children have to develop, appraise, and test their capabilities in broadening areas of functioning with increasing age. The initial efficacy experiences are centered in the family, but as the growing child's social world rapidly expands, experiences with peers contribute importantly to children's development and self-knowledge of their capabilities. It is in the context of peer interactions that social comparison processes come strongly into play. Each period of development brings with it new challenges for coping efficacy. As adolescents approach the demands of adulthood, they must master new competencies and the ways of the adult society. The ease with which the transition from childhood to adulthood is made depends, in no small measure, on the assurance in one's capabilities built up through prior mastery experiences. In young adulthood people have to learn to cope with many new demands arising from lasting relationships, parenthood, and careers. As in earlier mastery tasks, a firm sense of self-efficacy is an important personal resource in the attainment of further competencies and success.

People's beliefs in their efficacy can be enhanced in four principal ways (Bandura 1986). The most effective way of developing a strong sense of efficacy is through *mastery experiences*. Performance successes build a sense of personal efficacy; failures create self-doubts. 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, therefore, serve a useful purpose in teaching that success usually requires sustained effort. After people have become convinced they have what it takes to succeed, they persevere in the face of adversity and quickly rebound from setbacks.

The second way of strengthening self-beliefs of efficacy is by *modeling*. The models in people's lives serve as sources of interest, inspiration, and skills. Ready access to able models fosters competencies that strengthen beliefs in one's capabilities. People partly judge their capabilities in comparison with the achievements of others. Seeing people similar to oneself succeed by sustained effort raises observers' beliefs about their own efficacy. By the same token, negative modeling can be an undermining influence. The failures of similar others can instill self-doubts about one's own efficacy to master similar activities.

Social persuasion is a third way of strengthening people's beliefs that they possess the capabilities to achieve what they seek. Social support and realistic encouragements that lead people to exert greater effort increase their chances of success. Skilled efficacy builders do more than simply convey positive appraisals. In addition to cultivating people's beliefs in their capabilities, they structure situations for them in ways that bring success and avoid placing them prematurely in situations where they are likely to experience repeated failure. To ensure progress in personal development, success is measured in terms of self-improvement rather than by triumphs over others.

People also rely partly on *judgments of their bodily states* in assessing their efficacy. They read their stress and tension as signs of personal vulnerability to deficient performance. In activities involving strength and stamina, they use somatic information as indicators of physical capacity or limitations. The fourth way of modifying self-beliefs of efficacy is to enhance physical status, reduce stress levels, or alter how people interpret their bodily states.

Krueger approaches the origins of a sense of personal effectiveness from a psychoanalytic perspective. In this view, perceived effectiveness originates in mastery of traumatic events, especially in symbolic play. The

exercise of control over potential threats can contribute to a sense of personal efficacy (Bandura 1988b; Williams 1987). As previously noted, however, the development of perceived efficacy relies on diverse sources of social influence, most of which function as positive enhancers of personal efficacy rather than operate through intrapsychic conflicts over tabooed impulses.

Krueger devotes considerable attention to phobic avoidance of success. He regards fear of success as arising from fear of maternal abandonment for independent behavior and oedipal competitiveness with narcissistic parents. Because successful performance would result in tabooed victory, success is sabotaged or deprecated. Self-sabotaging of success is also said to be motivated by fear of exposure of inadequacy. Considering that repeated failures conspicuously exhibit one's inadequacy, Krueger does not explain how behaving inadequately avoids exposure of inadequacy.

Krueger relies on material produced in psychotherapeutic sessions as the main source of support for the suppositions regarding the causes of human failings. There are several limitations to this approach that arise from both the causal structure of the theory and the validity of the method of verification. Although psychoanalytic theory postulates a sweeping psychic determinism, the causal dependencies between psychodynamics and human behavior are too loosely formulated to be easily testable. The inner dynamics not only can produce any variety of effects but can show up in opposite forms of behavior as well. For example, Krueger interprets children's school failures as efforts to create individuating boundaries between themselves and overcontrolling parents. Scholastic failures can have many causes. Children may view themselves as individuated but simply rebel against high parental pressures for scholastic achievement (Brehm 1966). Educational efforts are often debilitated by anxious self-preoccupation about the adverse consequences of scholastic failure (Sarason 1975; Wine 1980). Studies that measure alternative causative factors are needed to decide between rival interpretations of scholastic failure in terms of interpersonal boundary seeking, psychological reactance, self-debilitating preoccupation, or some other psychological process. There are, of course, countless pushy parents who have high-achieving children. Scholastic failure does not characterize the children of some of the most overcontrolling and overprotective parents (Levy 1943). Clearly, the issue of scholastic performance is more complex than simply children individuating themselves by fouling up in school.

The interview method of verification also leaves much to be desired. In a scholarly analysis of the foundations of psychoanalytic theory, Grünbaum (1984) seriously questions the evidential value of clinical data produced in psychotherapeutic sessions on the ground that such data are too tainted by the therapist's suggestive influence. As Marmor (1962), among others, has noted, each psychodynamic approach has its own favorite set of inner causes. The presupposed determinants can be readily confirmed in self-validating interviews because the therapist makes suggestive interpretations and selectively rewards clients' accounts that are consistent with the therapist's views (Murray 1956; Truax 1966). Thus, advocates of differing theoretical orientations repeatedly discover their chosen motivators at work but rarely find evidence for the motivators emphasized by proponents of competing viewpoints. The types of causal dependencies that Krueger has proposed for aborted or failed human efforts clearly require more stringent empirical scrutiny.

PERCEIVED COMPETENCE AND SELF-WORTH

Harter's chapter on the origins and functions of self-worth addresses important questions but raises a number of conceptual and methodological issues. In the literature, the terms *perceived competence* and *self-esteem* or *self-worth* are often used interchangeably as though they represent the same phenomenon. In fact, they encompass different things. Perceived competence is concerned with judgments of personal capabilities, whereas self-esteem or self-worth is concerned with the degree to which one likes or dislikes oneself. Judgments of self-worth and of self-capability have no fixed relation. Individuals may regard themselves as highly efficacious in an activity from which they derive no pride (e.g., a skilled forecloser of mortgages of families that have fallen on hard times) or may judge themselves inefficacious at an activity without suffering a loss of self-worth (e.g., inept skater). However, in many of the activities people pursue, they cultivate capabilities in what gives them a sense of self-worth. If empirical analyses are confined to activities in which people invest their sense of self-worth, this will inflate correlations because domains of functioning where people judge themselves inefficacious but could not care less are simply ignored.

In Harter's conceptual scheme, judgments of self-worth and of personal competence seem to represent levels of generality within the same phenomenon. Self-worth is said to be global and perceived competence is

domain-specific. Global self-worth is treated as an emergent property that is more than the sum of the domain-specific parts. Its assessment is disembodied from particular domains of functioning that may contribute in varying degrees to one's sense of self-pride or self-dislike. That is, persons are asked how much they like or dislike themselves without any regard as to what they like or dislike about themselves. Measurement of self-worth noncontextually and perceived competence specifically presumably integrates unidimensional and multidimensional perspectives on the self-concept.

As noted earlier, judgments of self-worth and personal competence represent different phenomena rather than part-whole relations within the same phenomenon. Moreover, self-worth is no less multidimensional than is perceived competence. The following section is devoted to a more detailed consideration of the issue of multidimensionality.

OMNIBUS VERSUS DOMAIN-LINKED ASSESSMENTS

Psychological theories have traditionally approached the assessment of personal attributes and states in terms of omnibus tests. Such measures include a fixed set of items, many of which may have little relevance to the domain of functioning being analyzed. Moreover, in an effort to serve varied predictive purposes across diverse domains of functioning and ages the items have to be cast in a general form. The more general the items, the greater is the burden on respondents to define what is being asked of them. It is unrealistic to expect omnibus tests to predict with much accuracy how people will function in different domains under diverse circumstances. Indeed, in comparative studies, domain-linked measures of personal capability typically predict changes in functioning better than do general measures (Bandura 1988c).

Use of domain-linked scales does not mean that there is no generality to perceived capability. If different classes of activities require similar functions and subskills, one would expect some generality in judgments of competence. Even if different activity domains are not subserved by common subskills, some generality of perceived competence can occur if development of competencies is socially structured so that the cultivation of skills in dissimilar domains covaries. Commonality of subskills and covariation of development will yield generality. Multidomain measures reveal the patterning and degree of generality of people's sense of personal competence. Some may judge themselves highly efficacious across a

wide range of domains of functioning, others may judge themselves as inefficacious in most domains, and many may judge themselves relatively efficacious in domains in which they have cultivated their competences, moderately efficacious in domains in which they are somewhat less conversant, and inefficacious in domains comprising activities for which they lack talent. One can derive degree of generality from multidomain scales, but one cannot extract the patterning of perceived personal efficacy from conglomerate omnibus tests.

In adopting the multidimensional approach in the assessment of perceived competence, Harter does justice to the variegated nature of self-beliefs. I am puzzled, however, by why physical appearance is included as a facet of perceived competence. Physical appearance is a feature, not a capability. Another issue concerns the level of multidimensionality. As people continue to develop their competencies through selective pursuits, their perceptions of their capabilities become more differentiated. One can increase the explanatory and predictive power of measures of perceived competence by appropriate differentiations within major activity domains. Consider perceived scholastic competence as an example. High school students will vary, often widely, in the degree to which they consider themselves competent in mathematics, physical sciences, linguistic capabilities, social sciences, and the humanities. When asked in Harter's test of perceived competence to judge their scholastic competency by rating whether they are "good at schoolwork," they have to engage in subjective weighting and aggregation across subject matters to come up with a single judgment. Because the patterning of perceived scholastic efficacy across different "schoolwork" is likely to vary from student to student, similar overall judgments may mean different things. General items linked to an assemblage of activities within a broad class are an improvement over omnibus measures disembodied from definite activities and contextual factors, but indefinite multidimensionality still sacrifices explanatory and predictive power. Microanalytic approaches linking particularized indexes of perceived competence to distinct domains of sociocognitive functioning are better suited to clarify how self-beliefs affect human thought, affect, and action. Large-scale efforts to identify causal structures usually include a sizable set of possible determinants. When subjects' time and patience are limited, investigators seek brief omnibus measures for each of many different things. Networks of relationships obtained with suboptimal measures may underestimate or misrepresent the causal contribution of given factors.

SOURCES AND MULTIDIMENSIONALITY OF SELF-ESTEEM

One can distinguish different sources of self-esteem or self-worthiness (Bandura 1986). It can stem from evaluations based on competence or on possession of attributes that have been culturally invested with positive or negative value. In self-esteem arising from competence, people derive self-pride from fulfilling their standards of merit. When they meet or surpass valued standards they experience self-satisfaction, but when they fail to measure up to their standards of merit they are displeased with themselves.

Other people frequently voice evaluations reflecting their likes and dislikes of particular attributes rather than in response to evident competencies. Such social judgments can influence how the recipients evaluate their self-worthiness. Moreover, people are often criticized or deprecated when they fail to live up to the ideals or aspirational standards of others. The role played by personal competence and social evaluation in the development of self-esteem receives support from the studies of Coopersmith (1967). He found that children who exhibited high self-esteem had parents who were accepting, who set explicit attainable standards, and who provided considerable support and latitude to acquire competencies that could serve them well in their pursuits.

Cultural stereotyping is another way in which social judgments affect perceptions of self-worth. People are cast into valued or devalued groups on the basis of their ethnic background, race, sex, or physical characteristics. Those who possess socially disparaged attributes, and who accept the stereotyped evaluations of others, will hold themselves in low regard despite their talents. Persons combining limited competencies, exacting standards, and disparaged attributes are the ones most likely to harbor a pervasive sense of worthlessness.

The different sources of self-devaluation call for different corrective measures. Self-devaluation rooted in incompetence requires cultivation of talents. Those who suffer from self-disparagement because they judge themselves harshly against excessively high standards become more self-accepting after they are helped to adopt more realistic standards of achievement (Rehm 1982). Self-devaluation resulting from belittling social evaluations requires new social experiences that affirm one's self-worth. Self-devaluation stemming from discriminatory disparagement of attributes requires modeling and rewarding a sense of pride regarding those attributes. Efforts by minorities to instill pride in racial charac-

CONCLUSION

teristics (e.g., "Black is beautiful") illustrate this approach. When self-devaluation arises from multiple sources, multiple corrective measures are needed as, for example, fostering pride in one's characteristics and also cultivating competencies that instill a high and resilient sense of personal efficacy.

Self-worth is multidimensional as is perceived competence. For example, some students derive self-satisfaction from their academic accomplishments but devalue themselves in social or athletic domains. Those who invest themselves heavily in athletic pursuits may be self-approving in athletics but self-discontented in academic activities. Hard-driving executives may value themselves in their vocational pursuits but devalue themselves as parents. Domain-linked measures of self-esteem reveal the patterning of human self-esteem and areas of vulnerability to self-disparagement.

A global measure of self-worth, as used in the research reported by Harter, may obscure the origins of self-worth or yield anomalous findings. For example, physical appearance emerges as a surprisingly large contributor to global self-worth, regardless of whether the samples include children ($r = -.66$), college students ($r = -.80$), or adults ($r = -.61$). Having just returned from a spirited meeting with graduate students who were hardly fastidiously groomed, I find it difficult to believe that their sense of self-worth springs more from how they judge their looks than from how they judge their intellectual competencies. If, indeed, self-worth were so heavily rooted in physical appearances, then beauticians, haberdashers, and plastic surgeons hold the major key to self-esteem. The role left for psychologists in this route to self-worth would be as alterers of standards of beauty.

IMPACT OF CONCEPTIONS OF ABILITY AND PERCEIVED CONTROLLABILITY ON UTILIZATION OF COGNITIVE SKILLS

Sternberg and his colleagues find that people use their conceptions of ability in judging their own intellectual competency and the competency of others. Conceptions of ability affect not only social judgment but also how effectively people use the cognitive skills they possess. Recent research has identified two major conceptions of ability to which people subscribe (M. Bandura & Dweck 1988; Dweck & Elliott 1983). In one perspective, they construe ability as an *incremental skill* that can be continually enhanced by acquiring knowledge and perfecting one's compe-

tencies. People with this conception adopt a learning goal. They seek challenging tasks that provide opportunities to expand their knowledge and competencies. Errors are regarded as a natural, instructive part of an acquisition process. They judge capabilities more in terms of personal improvement than in comparisons with the achievement of others.

In the contrasting perspective, ability is construed as a more or less *fixed entity*. Because performance level is regarded as diagnostic of intellectual capacity, errors and deficient performances carry personal and social evaluative threats. Therefore, people adopting the entity view tend to pursue performance goals of demonstrating their competence. They prefer tasks that minimize errors and permit ready display of intellectual proficiency at the expense of expanding their knowledge and learning new skills. High effort, which is often required to develop competencies in complex activities, also poses evaluative threats because high effort is taken as indicative of low ability. An entity conception of ability is less conducive to effective management of failure than is the view of ability as an incremental skill (Elliott & Dweck 1988).

According to social cognitive theory (Bandura 1986, 1988a), self-regulation of motivation and performance attainments is governed by several self-regulatory mechanisms operating in concert. They include affective self-evaluation, perceived self-efficacy for goal attainment, and personal goal setting. The conception of ability with which people approach complex activities can have a substantial impact on these self-regulatory influences. Substandard performances are likely to carry markedly different diagnostic implications depending on whether ability is construed as an acquirable skill or as a relatively stable entity. When performances are viewed as skill acquisition in which one learns from mistakes, perceived self-efficacy is unlikely to be adversely affected by substandard performances. This is because errors become a normative part of any acquisition process rather than indicators of basic personal deficiencies. In contrast, when performances are construed as diagnostic of underlying cognitive capability, frequent experience of substandard performances can take a heavy toll on perceived self-efficacy.

That conceptions of ability strongly affect the self-regulatory mechanisms governing complex decision making is revealed in a study by Wood and Bandura (1989). Much of the research on human decision making examines single trial judgments in static environments (Beach, Barnes, & Christensen-Szalanski 1986; Hogarth 1981). Judgments under such conditions may not provide a sufficient basis for developing either descriptive

or normative models of decision making in dynamic naturalistic environments which entail learning and motivational mechanisms. In such environments, decision makers must weigh and integrate a wide array of information from diverse sources. Decisions must be made during a continual flow of activity under time constraints. Moreover, many of the decisional rules for exercising control over dynamic environments must be learned through exploratory experiences in the course of managing the ongoing organizational activities under conditions of uncertainty and social pressure.

It requires a strong sense of efficacy to deploy one's cognitive resources optimally and to remain task-oriented in the face of repeated difficulties and failures as one attempts to ferret out relevant information, construct options, and test and revise one's knowledge based on results of decisional actions. People with a low sense of efficacy easily fall apart under these types of conditions. Those who judge themselves ineffectual in coping with environmental demands tend to become more self-diagnostic than task-diagnostic (M. Bandura & Dweck 1988). Such self-referent intrusive thinking creates stress and undermines effective use of capabilities by diverting attention away from how best to proceed to concerns over personal deficiencies and possible adverse outcomes.

We examined the psychological effects of different conceptions of ability on the cognitive functioning of highly talented business school graduates as they managed a simulated organization. In executing their decision-making activities they had to match individuals to organizational subfunctions and to use goals, instructive feedback, and social incentives in optimal ways to achieve organizational levels of performance that were difficult to fulfill. They performed the managerial task over a series of trials under instated conceptions of ability as either an acquirable skill that is improvable with practice or a basic intellectual entity reflecting underlying cognitive capacities. They received feedback on how well their group performed relative to the challenging standard of organizational attainment. At several points in the managerial simulation, the managers' perceived managerial self-efficacy and the goals they sought to achieve were assessed. The adequacy of their analytic strategies for discovering managerial rules and the level of organizational performance they achieved were also measured.

The impact of the different conceptions of ability on self-regulatory mechanisms governing the utilization skills and performance accomplishments may be seen in figure 14.1. Managers who were led to construe

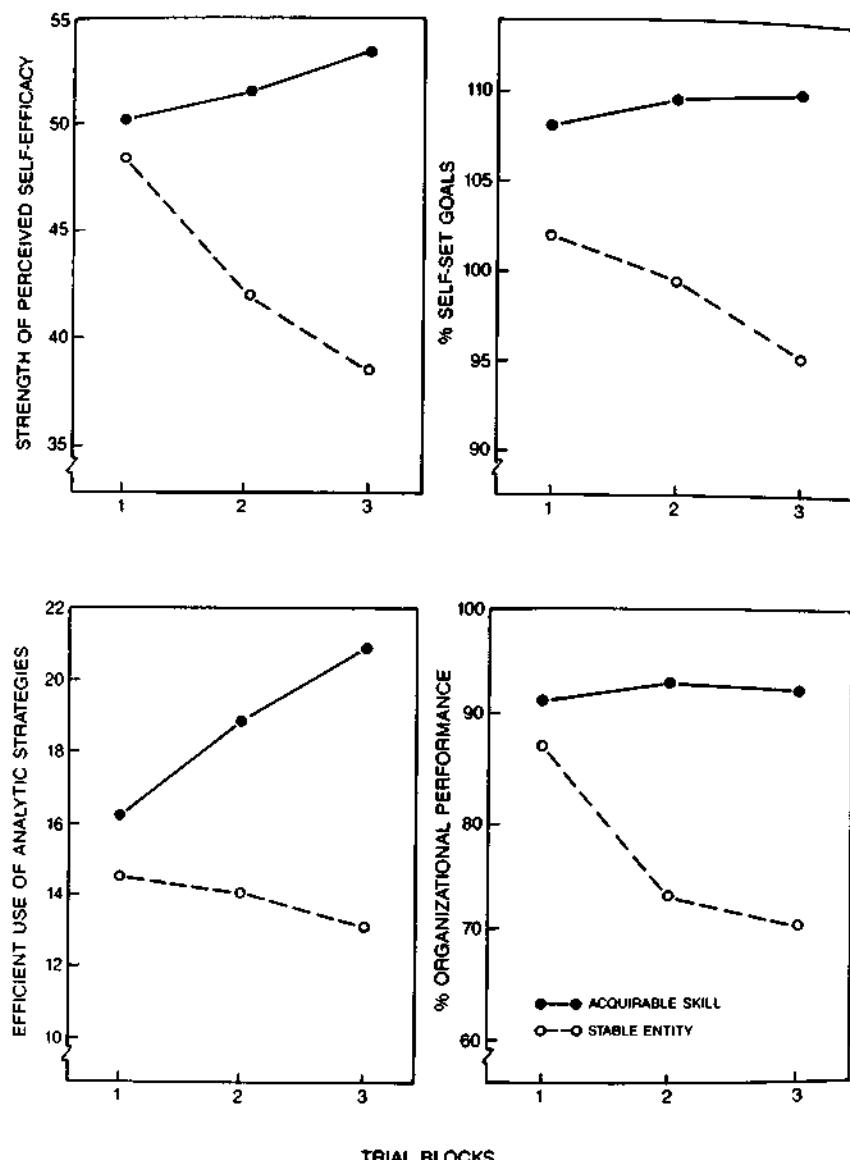


Figure 14.1. Changes in perceived managerial self-efficacy, the performance goals set for the organization relative to the preset standard, effective analytic strategies, and achieved level of organizational performance across blocks of trials under acquirable skill and entity conceptions of capability. Each trial block comprises six different production orders (Wood & Bandura 1989).

decision-making ability as reflecting basic cognitive capacities were beset by increasing doubts about their managerial efficacy as they encountered problems. They became more and more erratic in their decisional activities, they lowered their organizational aspirations, and they achieved progressively less with the organization they were managing. In marked contrast, induced construal of ability as an acquirable skill fostered a highly resilient sense of personal efficacy. Even though assigned taxing goals that eluded them, they remained steadfast in their perceived managerial self-efficacy, they continued to set themselves challenging organizational goals, and they used analytic strategies in efficient ways that aided discovery of optimal managerial decision rules. Such a self-efficacious orientation, which is well suited for handling adversity, pays off in uniformly high organizational attainments. In path analyses, perceived self-efficacy exerts a direct effect on organizational performance and an indirect effect through its influence on analytic strategies. Personal goals also affect organizational performance through the mediation of analytic strategies.

Induced differential conceptions of ability bias how similar substandard performances at the outset are cognitively processed. Construal of substandard attainments as indicants of personal deficiencies gradually creates an ineffectual self-schema in the particular domain of functioning, whereas construal of substandard attainments as instructive guides for enhancing personal competencies fosters an efficacious self-schema. Such evolving self-beliefs further bias cognitive processing of outcome information and promote actions that create confirmatory behavioral evidence for them. This produces an exacerbation cycle of motivational and performance effects.

There are two aspects to the exercise of control that are especially relevant to belief systems that can alter how effectively personal skills are put to use (Bandura 1986; Gurin & 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 changeability or controllability of the environment. This facet represents the level of system constraints and opportunity structures to exercise personal efficacy. Human behavior is, of course, governed by perceptions of personal efficacy and social environments rather than simply by their objective properties. Thus, individuals who believe themselves to be ineffectual are likely to effect little change even in environments that provide many opportuni-

ties. Conversely, those who have a strong sense of efficacy, through ingenuity and perseverance, figure out ways of exercising some measure of control in environments containing limited opportunities and many constraints.

In the transactions of everyday life, beliefs regarding self-efficacy and environmental controllability are not divorced from experiential realities. Rather, they are products of reciprocal causation (Bandura 1986). Thus, when people believe the environment is controllable on matters of import to them, they are strongly motivated to exercise fully their personal efficacy, which enhances the likelihood of success. Experiences of success, in turn, provide behavioral validation of personal efficacy and environmental controllability. If people approach situations as largely uncontrollable, they are likely to exercise their efficacy weakly and abortively, which breeds failure experiences. Over time, failures take an increasing toll on perceived self-efficacy and beliefs about how much environmental control is possible.

Organizational simulation research underscores the influential impact of perceived controllability on the self-regulatory factors governing decision making that can enhance or impede group attainments (Bandura & Wood 1989). People who managed a simulated organization under a cognitive set that organizations are not easily changeable quickly lost faith in their managerial capabilities even when performance standards were within easy reach and they lowered their sights for the organization (figure 14.2). Those who operated under a cognitive set that organizations are controllable displayed a resilient sense of managerial efficacy, set themselves increasingly challenging goals, and used good analytic thinking for discovering effective managerial rules. They exhibited high resiliency of self-efficacy even in the face of numerous recurrent difficulties. The divergent changes in these self-regulatory factors were accompanied by large differences in organizational attainments.

Path analyses reveal that, when initially faced with managing a complex unfamiliar environment, managers relied heavily on performance information in judging their efficacy and setting their personal goals. But, as they began to form a self-schema concerning their efficacy through further experience, the performance system was powered more extensively and intricately by self-conceptions of efficacy (figure 14.3). Perceived self-efficacy influenced performance both directly and through its strong effects on personal goal setting. Personal goals, in turn, enhanced organizational attainments directly and via the mediation of analytic strategies.

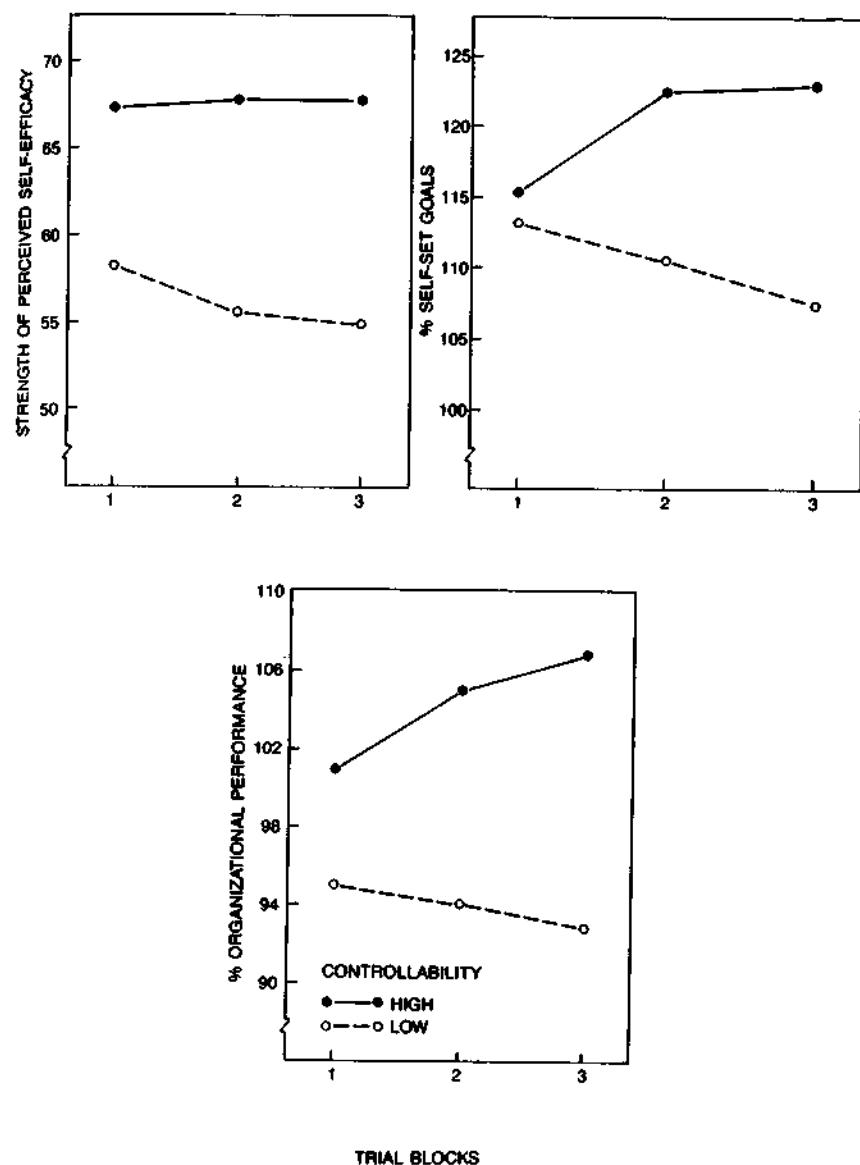


Figure 14.2. Changes in strength of perceived managerial self-efficacy, the performance goals set for the organization, and level of organizational performance for managers who operated under a cognitive set that organizations are controllable or difficult to control. Each trial block comprises six different production orders (Bandura & Wood 1989).

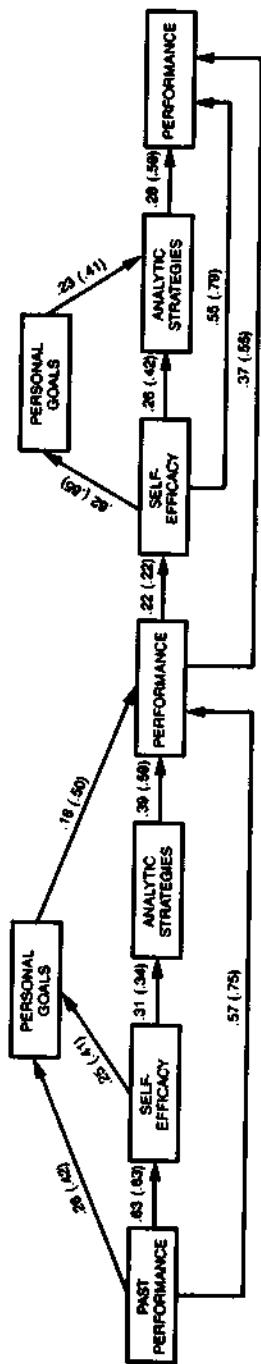


Figure 14.3. Path analysis of causal structures. The initial numbers on the paths of influence are the significant standardized path coefficients ($p < .05$); the numbers in parentheses are the zero-order correlations. The network of relations on the left half of the figure are for the initial managerial efforts, and those on the right half are for later managerial efforts (Wood & Bandura 1989).

The findings of these studies show that a strong belief in one's personal efficacy and in the modifiability of the environment pays off in psychological well-being and personal accomplishments. The speed with which efficacy-undermining cognitive sets impair the cognitive functioning of bright graduates with managerial experience attests to the power of belief systems over capability.

DIFFERENTIAL FUNCTION OF PREPARATORY AND PERFORMANCE JUDGMENTS OF COMPETENCE

Norem and Cantor present the seemingly paradoxical notion that negative thinking spawns good performances. They find that some people use pessimistic expectations as a strategy to motivate themselves and to cushion the blows of failure. The anticipatory pessimism is conceptualized as a domain-linked strategy rather than a global personality trait. These findings appear to fly in the face of a large body of evidence that negative thinking typically impairs performance attainments. One would not prescribe that people approach tasks with strong disbelief in their capabilities and anticipate the futility of their efforts as the way to promote success. A solution to the apparent paradox may lie in a temporal qualifier regarding the functional properties of self-doubt.

Self-efficacy theory distinguishes between the effects of strength of self-beliefs of efficacy during acquisition phases of an endeavor and during exercise of established skills (Bandura 1986). In approaching learning tasks, people who perceive themselves to be highly self-efficacious in the undertaking have little incentive to invest much preparatory effort in it. For example, students who greatly underestimate the difficulty of academic course demands and remain blissfully free of self-doubt are more likely to party than to hit the books to master the subject matter. As Confucian wisdom warns regarding preparatory self-appraisal, "Too much confidence has deceived many a one." Salomon (1984) provides some evidence bearing on this issue. He found that children's high perceived self-efficacy as a learner is associated with a high investment of cognitive effort and better learning from instructional media children consider difficult, but with less investment of effort and poorer learning from media they believe to be easy. Thus, some uncertainty can benefit preparation.

In applying skills already acquired, a strong belief in one's efficacy is essential to mobilize and sustain the effort needed to succeed on difficult tasks, which is hard to achieve if one is doubt-ridden. One cannot execute

well what one knows while wrestling with self-doubt. In short, self-doubt creates the impetus for acquiring knowledge and skills, but it hinders adept use of preexisting skills.

The social manipulation of preparatory and performance efficacy is a standard procedure in athletic activities. To motivate players to improve suspect skills and competitive strategies in preparation for upcoming contests, coaches inflate the capabilities of their opponents and downgrade those of their own team. Bravado self-appraisals are frowned upon. But at the time of the contest, coaches attempt to instill a strong sense of efficacy to get the players to perform at their best. Teams strive hard to overpower their opponents at the beginning of a contest to convince them that their worst doubts are warranted. Coaches try to sustain self-efficacious thinking in the face of difficulties that can shake a team's belief that the extra effort is worthwhile.

Instances in which optimistic anticipations were rudely dashed remain highly salient in people's thinking. It is not uncommon for them to invoke anticipatory pessimism as a superstitious means of exercising cognitive control over untoward outcomes. We know from Langer's (1975) research that rituals that are completely irrelevant to what will happen are viewed as providing some measure of control over outcomes entirely determined by chance. The longitudinal study by Norem and Cantor excluded negative thinking that impairs performance by confining the study to academically gifted students. Most likely, their anticipatory pessimism reflects superstitious thinking rather than genuine self-disbelief that they lack the capability to succeed. If carried too far, however, preparatory negative thinking can turn into a stressor and debilitator rather than a motivator. Norem and Cantor report that academic pessimistic thinking eventually takes a heavy toll on psychosocial functioning. Those who strive to forestall incessant anticipated misfortunes demand much of themselves, drive themselves hard, distress themselves, constrict their social life, gain little satisfaction from their activities, and begin to undermine their accomplishments. Optimists fare much better in psychosocial well-being and academic accomplishments.

VERIDICALITY OF SELF-APPRAISAL: SELF-AIDING OR SELF-LIMITING?

It is widely believed that misjudgment produces dysfunction. Certainly, gross miscalculation can get one into trouble. But optimistic self-apprais-

als 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-appraisal they tend to overestimate their capabilities, which is a benefit rather than a cognitive failing to be eradicated. If self-efficacy beliefs always reflected only what people can 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 distort in the positive direction. Anxious and depressed people have been compared in their skills and their self-beliefs with those who are unburdened by such problems. The findings show that the groups differ little in their actual skills, whereas they differ substantially in their beliefs about their efficacy. People who are socially anxious are often just as socially skilled as the more sociable ones. But socially active people judge themselves as much more adept (Glasgow & Arkowitz 1975).

Depressed persons usually display realistic self-appraisals of their social competencies. The nondepressed view themselves as much more adroit than they really are. As depressed people improve in treatment, they show the self-enhancing biases that characterize the nondepressed (Lewinsohn et al. 1980). In laboratory situations where people's actions do not affect outcomes, the depressed are quite realistic in judging they lack control. The nondepressed believe they are exercising a good deal of control in such situations (Alloy & Abramson 1979). After nondepressed people are made temporarily depressed they become realistic in judging their personal control. When depressed people are made to feel happy they overestimate the extent to which they exercise control (Alloy, Abramson, & Viscusi 1981). Thus, the depressed appear as realists, the non-depressed as confident illusionists.

Social reformers strongly believe that they can mobilize the collective effort needed to achieve social change (Bandura 1986; Muller 1979). Although their beliefs and the collective sense of efficacy they instill in others are rarely fully realized, they sustain reform efforts that achieve lesser, but important, gains. Were social reformers to be entirely realistic about the prospects of transforming social systems, they would either forgo the endeavor or fall easy victim to discouragement. Realists may adapt well to existing realities, but those with a tenacious self-efficacy are likely to change adverse realities.

The emerging evidence indicates that 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. If not unrealistically exaggerated, such self-beliefs foster personal and social accomplishments.

In their informative review, Phillips and Zimmerman identify some of the determinants and developmental changes in the self-appraisal patterns of able students who either underestimate or overestimate their capabilities or display veridical judgment. The research of Collins (1982) shows that perceptions of personal efficacy often diverge from actual ability at all levels of ability. Moreover, perceived self-efficacy affects how well children use their capabilities. Collins selected children who judged themselves to be of high or low mathematical capability at each of three levels of mathematical ability. They were then given difficult problems to solve. Mathematical ability contributed to mathematical performance. But within each level of mathematical ability, children who regarded themselves as efficacious discarded faulty strategies more quickly, solved more problems (figure 14.4), chose to rework more of those they had failed, and did so more accurately. Level of interest in mathematics was significantly related to perceived self-efficacy but not to actual ability. Thus, children may perform poorly because they lack the ability or, if they possess the ability, because they lack the perceived efficacy to make good use of their talents.

Phillips and Zimmerman report striking developmental sex differences in disparity between ability and perceived competence. Whereas boys tend to inflate their sense of competence, girls generally disparage their capabilities. These differential patterns of self-appraisal have their origins in parental gender-linked beliefs regarding their children's capabilities. Parents judge school to be more difficult for daughters than for sons even though they do not differ in actual achievement. Girls perceive their mothers as having lower academic expectations and less stringent achievement standards for them than for boys. Adoption of feminine gender-role identity is also associated with underestimation of capabilities.

Students' beliefs in their efficacy can profoundly affect the direction of their development by influencing the career paths they follow. The choices they make in earlier years cultivate different competencies and interests and determine the occupational options that can be realistically considered. It is now well documented that students' beliefs in their efficacy govern their career decision making and career development (Betz & Hackett 1986; Lent & Hackett 1987). The stronger their self-

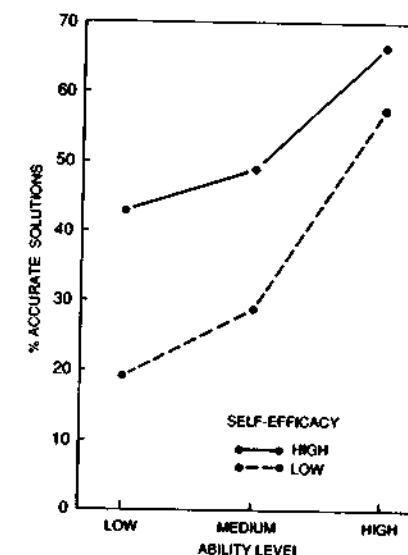


Figure 14.4. Mean levels of mathematical solutions achieved by children as a function of mathematical ability and perceived mathematical self-efficacy. Plotted from data of Collins 1982.

belief in their efficacy, the more career options they consider possible and the better they prepare themselves educationally for different pursuits. Cultural practices that convey lower achievement expectations for women, stereotypic modeling of gender roles, constraining sex typing, and dissuading opportunity structures eventually leave their mark on women's beliefs about their occupational efficacy. Female students are prone to limit their interests and range of career options by beliefs that they lack the capabilities for occupations traditionally dominated by men, even though they do not differ from male students in actual ability. The self-limitation arises from perceived inefficacy rather than from actual inability. But things may be improving. Studies of students currently coming through the school ranks reveal a smaller disparity between male and female students in their beliefs about their efficacy to pursue successfully varied careers (Post-Kammer & Smith 1985).

Computer literacy is becoming an increasingly important factor in career development and advancement. Socialization influences that breed

perceived inefficacy in the use of computer tools are creating new career barriers for women. These are not easily overcome. Even at an early age, girls distrust their efficacy to program and operate computers despite instruction and the school's encouragement to acquire such skills (Miura 1987a). The lower the perceived efficacy in computer activities, the lesser the interest in acquiring computer competencies. Sex differences in perceived self-efficacy to master computer course work extend to the college level. Regardless of sex, college students lacking a sense of computer efficacy are computer avoiders. They show less interest or inclination to pursue computer course work and they see computer literacy as less relevant to their future careers (Miura 1987b).

In commenting on overoptimistic self-appraisal, Phillips and Zimmerman suggest that its positive effects on achievement may reflect fear-motivated defensiveness. Children presumably drive themselves to high achievement to avoid confirming their worst fears that they are untalented impostors. Should optimism regarding one's capabilities really be cast in a mask of deceit? Even the most talented people are, from time to time, beset by self-doubts because no one ever experiences unceasing ever-rising accomplishments. Pursuit of standards that are difficult to fulfill provide challenges that sustain engrossment in activities but also bring periodic discouragements. Accomplishments that look good to others may prove self-disappointing when they fail to measure up to exacting personal standards. To add further strains on positive self-appraisals, there is no shortage of superstars to occasion humbling social comparisons. In short, self-doubts are natural reactions to inevitable failures and setbacks, but people with a resilient sense of efficacy are quick to recover belief in their capabilities.

There is reason to believe that the motivational benefits of overoptimistic self-appraisal might be more fruitfully analyzed in terms of affirmative processes than defensive ones rooted in pretending to be what one is not. This is the difference between motivation arising from an unshakable belief in oneself and from fear of being exposed as an intellectual phony. In the latter conception, human strivings become largely a matter of defensive impression management. The substantial body of evidence reviewed earlier supports the view that an optimistic sense of efficacy promotes psychological well-being and human accomplishments through advantageous processes, such as self-challenge, commitment, motivational involvement, and nonintrusive task orientation rather than through fearful self-protectiveness. Indeed, a resilient belief in one's capabilities is required to succeed in pursuits that present many obstacles.

THE PLASTICITY OF INCOMPETENCE

The work of Langer and her associates provides striking testimony for the surprising ease with which contextual and social factors can convert competence into incompetence (Langer 1979). Settings in which individuals happen to perform poorly can, in themselves, come to activate a sense of incompetence that impairs future performances in those particular contexts. The contextual activation of incompetence is well illustrated in athletic performances in which winners regularly turn into losers to weaker opponents in settings in which they have come to expect difficulties. The mere presence of a person exuding high confidence undermines observers' use of routine skills. Attending to what is strange in new tasks, rather than to what is familiar and clearly within one's range of capability, may similarly hinder effective utilization of skills. Rigid mindsets impede generative use of knowledge and established skills under changing circumstances. When people are cast in subordinate roles or are assigned inferior labels, implying limited competence, they perform activities at which they are highly skilled less well than when they do not bear the negative labels or the subordinate role designations. Offering unnecessary help can also detract from a sense of competence and thereby vitiate the execution of skills.

Mindlessness is hypothesized by Langer to underly illusory incompetence. Environmental cues suggestive of personal deficiencies are said to trigger deficient performances when routine circumstances are no longer given thoughtful consideration. Undoubtedly, some instances of deficient skill utilization reflect routinized situational control of action. Situational influences, however, may activate other processes that can also detract from effective utilization of skills. Verification of an explanatory mechanism is greatly aided if the mediating process is measured rather than simply presumed to be operating. The presumptive mediation of mindlessness could be tested by assessing whether amount of cognitive activity accounts for variations across subjects in how much their performances are undermined by situational influences suggesting personal deficiency. Degree of mindful involvement in the activities at hand could also be varied systematically and its impact on effective utilization of preexisting skills measured.

We know from other lines of research that the types of situations that produce illusory incompetence diminish perceived self-efficacy with its concomitant effects on choice behavior motivation, and self-debilitating thought. For example, the mere sight of a formidable-looking opponent

instills lower self-percepts of efficacy than does one who looks less impressive (Weinberg, Yukelson, & Jackson 1980). Illusorily instated self-percepts of efficacy heighten competitive performance and resilience, whereas illusorily weakened self-percepts of efficacy debilitate competitive performance and increase vulnerability to the adverse effects of failure (Weinberg, Gould, & Jackson 1979). The more self-percepts of efficacy are diminished, the greater is the performance debilitation.

Trivial factors, such as arbitrary anchor values or sequence anchoring, that are devoid of information to affect competence nevertheless influence self-efficacy beliefs (Cervone & Peake 1986; Peake & Cervone, 1989). The illusorily instated self-beliefs of efficacy exert strong effect on level of performance motivation. Dwelling on formidable aspects of a task weakens people's belief in their efficacy but focusing on doable aspects of the same tasks raises self-judgment of capabilities (Cervone 1989). The higher the altered self-efficacy beliefs, the longer people persevere in the face of repeated failure. In these experiments, perceived self-efficacy predicts variance in motivation within treatment conditions as well as across treatments. Mediational analyses reveal that these types of external influences have no impact on motivation when variations in self-efficacy beliefs are controlled. Thus, the motivational effect of the external influences is completely mediated through changes in self-efficacy beliefs.

COGNITIVE GUIDANCE AND AUTOMATIZATION

It should be noted in passing that mindfulness is not an unmitigated virtue. It can impair the execution of skills as well as facilitate their use. Cognitive guidance plays an especially influential role in early and intermediate phases of skill development. After proficiency is attained, the skills are executed in recurring situations without requiring prior thought guides unless something goes awry. Attending to the mechanics of what one is doing after proficiency is achieved is likely to disrupt skilled performance. Partial disengagement of thought from proficient action has considerable functional value. If one had to think about the details of every skilled activity before carrying it out in recurrent situations, it would consume most of one's attentional and cognitive resources and create a monotonously dull inner life.

Human behavior is regulated by multilevel systems of control. Once proficient modes of behavior become routinized, they no longer require higher cognitive control. Their execution can be largely regulated by

lower-level sensory-motor systems. However, when routinized behavior fails to produce expected results, the cognitive control system again comes into play. Both the behavior and the changing environmental circumstances are monitored to identify the source of the problem. New modes are considered and tested. Control reverts to the lower control system after an adequate mode is found and becomes the habitual way of doing things. However, automatization of skills usually entails a shift in the locus of attention from action patterns to their correlated effects rather than a total loss of consciousness of one's performance (Bandura 1986).

There are obviously substantial benefits to being able to think about other things while executing proficient skills. Routinization frees attention and thought from habitual routines for the cultivation of new competencies requiring judgment, generation of alternatives, and close monitoring of the effects of one's performances. For example, it would be a waste of cognitive resources if one had to continue to think about how to drive an automobile after one had perfected the skill. Routinization is advantageous when the ways that have been perfected are the optimal ones and remain so under a variety of circumstances. However, routinization can detract from effective functioning when people react with fixed ways in situations requiring discriminative adaptability. Langer identifies conditions under which thoughtless stereotyped reactions to superficial cues exact a toll on competent utilization of one's skills.

MAINTENANCE OF PERCEIVED COMPETENCE BY SHIFTING EVALUATIVE STANDARDS

For most activities there are no absolute indicants of level of competence. For example, the time in which a given distance is run (e.g., eight minutes) or the score obtained on a scholastic examination (e.g., 127) does not by itself indicate whether these constitute good or poor performances. When competence is not designated by an inherent outcome of performance, personal competence must be gauged in relation to some evaluative standard. The referential comparisons may take the form of normative comparison, social comparison with specific individuals, or self-comparison over time. For some regular activities, standard norms based on representative groups are used to determine one's relative standing. More often people compare themselves to particular associates in given endeavors. One's previous attainments are also used as a reference against which

personal performances are judged. In the latter referential process, self-comparison supplies the measure of adequacy. Self-satisfaction is determined relationally as is judgment of competence. Reactions of self-satisfaction or self-dissatisfaction result from comparisons among three major sources of information: performance level, personal standards of merit, and the performance attainments of others (Bandura 1986).

Competence is not a static attribute. Frey and Ruble provide developmental prescripts for how to maintain a sense of competence and self-satisfaction in the face of changing capabilities. This is achieved by flexible shifting of evaluative standards depending on phase of skill development and on age-related changes in capabilities. Temporal or self-comparison is most conducive to positive self-appraisal when skills are being improved. Evidence of progressive improvement sustains a high sense of competence and provides a continuing source of self-satisfaction. However, when skill levels have stabilized or capabilities begin to wane with increasing age, self-satisfaction and perceived competence are better served by use of social comparative standards. Surpassing comparative agemates can contribute to positive self-appraisal though personal capabilities are no longer improving or may even be declining. Frey and Ruble provide evidence that evaluative strategies are, indeed, adapted to the direction of performance change in a study of older runners. They shift their evaluative standard from self-comparison to social comparison as the course of their performance changes from improvement to decline.

A word of caution is in order about overgeneralizing these findings to pursuits that are socially structured in a different manner. Runners are free to choose where and when they will compete. In addition to the exercise of control over performance situations, the contests are carefully age-graded which constrains performance comparison mainly to age-mates. By contrast, in the important pursuits of everyday life, older persons have to compete with younger cohorts whether they like it or not. Young football recruits quickly supplant teammates whose skills have begun to wane. Corporate executives find younger rising superstars vying for their positions. Competitively structured systems in which one person's success is another person's loss force social comparison unless one cedes such pursuits.

Many age differences in cognitive capabilities are partly the product of cultural changes. It is not so much that older persons have declined in capability but that the younger cohorts have had the benefit of richer sources of information and experience with advanced technologies, en-

abling them to function at a higher level (Baltes & Labouvie 1973; Schaie 1974). Longitudinal studies reveal no universal or general decline in intellectual capabilities until the very advanced years, but in cross-sectional comparisons of different age groups the young surpass the old. Thus, older persons who weigh self-comparisons in functioning over the course of time more heavily than social comparison with younger cohorts are less likely to view themselves as declining in capabilities than if younger cohorts are used extensively in socially comparative self-appraisals.

Frey and Ruble further note that older adults who keep up their skills can maintain a high sense of competence and self-satisfaction by exploiting age norms. In such normative comparisons they come out looking superior to their agemates. This self-evaluative strategy is beneficial for those who exceed the normative age standard or for members of the mythical community of Lake Wobegon where everyone is above average. But those who have let their skills go to pot would do better to avert their gaze from normative standards unless they want to arouse self-discontent as a motivator for a program of self-reinvigoration.

Whereas Frey and Ruble prescribe normative comparison as a way of maintaining a high sense of competence and self-satisfaction, Nicholls disavows such a practice as a detrimental influence. In his view, people would do better to cease evaluating their competence and instead focus on the satisfaction and meaning they derive from their pursuits. Simpler egocentric conceptions of ability in terms of personal likelihood of success can serve this purpose better than more advanced normative conceptions of ability measured against success rates of others. Nicholls's jaundiced view of social comparison appears to stem from an exclusive focus on normative comparison. Such comparisons can certainly make the less talented miserable and wreck their sense of personal competence. As previously noted, however, social comparison can take a variety of forms and it can have beneficial as well as negative effects. Judgment of ability has considerable adaptive value. People who undertake activities without appraising their capabilities can get themselves into considerable difficulties. Some of the missteps can result in a lot of wasted effort or produce costly or irreparable harm. We shall shortly examine research showing that continuing personal attainments do not necessarily ensure self-satisfaction. This is because the strides at which activities are mastered can drastically alter self-evaluative reactions.

Most comparative self-appraisals involve particular individuals rather than group norms. This provides flexibility in the choice of comparative

others and some leeway to use comparative appraisals for positive purposes. The research reported in this volume is concerned almost entirely with self-evaluation of ability through comparison with the performances of others. People also judge their capabilities on the basis of similarity in personal characteristics that are assumed to be predictive of performance capabilities (Suls & Miller 1977). The successes of models who possess similar characteristics inspire others by strengthening belief in their capabilities to succeed, lead them to try things they would otherwise shun, and bolster their staying power in the face of obstacles (Bandura 1986). But comparative self-appraisals based on faulty preconceptions concerning the relation of characteristics such as age, sex, race, and ethnic background to capability in particular domains may also lead those who are uncertain about their abilities to judge valuable pursuits to be beyond their reach when they see others with similar attributes fail.

Frey and Ruble describe a further positive function of social comparative information in which young children use the normative accomplishments of older peers as a way of neutralizing the negative impact of failure on their self-perceptions of competence. The experience of rapid skill improvement and observation of modeled proficiency by older peers leads children to view their own skill at any given time as a transitory level in a process of growth rather than as an indicant of basic capability. Anticipatory upward comparison helps to support an optimistic self-appraisal despite current performance deficiencies.

A developmental perspective on the self-appraisal of personal efficacy can have beneficial effects provided that judgments are made solely in terms of self-comparison and upward normative comparison. Unfortunately, social realities impose a third comparative factor that counteracts an exclusively developmental conception of competence. Even preschoolers are not unmindful of the speed with which their agemates acquire skills, and they are acutely aware of ability rankings (Morris & Nemcek 1982). Children judge their learning efficacy as well as their existing level of competence. Their perceptions of their learning capabilities affect how much cognitive effort they invest in instructional activities and how much they learn (Salomon 1984). Monolithic school structures in which students study the same material and teachers make frequent comparative evaluations highlight social comparative standards. Students rank themselves according to capability with high group consensus (Rosenholtz & Rosenholtz 1981). Social comparison with ones' agemates thus reinstates the diagnosticity of rate of progress and level of achievement in the

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judgment of personal capabilities. The less talented or ill prepared suffer the greatest losses in perceived efficacy. Moreover, their self-beliefs of efficacy are more vulnerable to the negative impact of teachers with a low sense of instructional efficacy than are those of students who believe strongly in their capabilities (Midgley, Feldlaufer, & Eccles in press).

In social cognitive theory (Bandura 1986), self-appraisal is a process in which different sources of comparative information—normative comparative, specific social comparative, and personal comparative—are weighted and integrated in formation of self-efficacy judgments and experience of self-satisfaction. Developmental changes are reflected in the relative weight given to different forms of comparative information rather than in shifts in exclusive reliance from a social-comparative standard to a self-comparative one. The relative weighting of different comparative information may vary across domains of functioning and situational circumstances.

The multidimensional influence on self-appraisal is revealed in research in which normative standards and rate of personal progress are systematically varied (Simon 1979). Students performed a cognitive task and received prearranged feedback of a decelerating pattern of improvement (improve fast initially but then taper off) or an accelerating improvement (improve slowly at first but then make large gains). They also had access to normative standards that portrayed students as performing at either the upper range or the midrange of possible attainments. The students' level of self-satisfaction was strongly influenced by both social and self-comparison. The higher the normative standards, the less self-satisfied they were with their own performance attainments. Different rates of improvement produced strikingly different patterns of self-evaluation (figure 14.5). Rapid strides occasioned rising self-satisfaction, whereas declining improvements were devalued after large initial gains had been achieved.

In the final phase, all students attained the same high performance that exceeded the normative standard. Those who surpassed the norm through accelerating improvement were highly self-approving, but those who attained the same noteworthy accomplishment through a declining rate of improvement experienced virtually no self-satisfaction. Early large success is evidently conducive to later self-dissatisfaction even though one continues to make progress. As can be seen in the right panel of figure 14.5, people who are prone to depression display even greater evaluative reactivity to their progress. They are more self-satisfied with accelerating

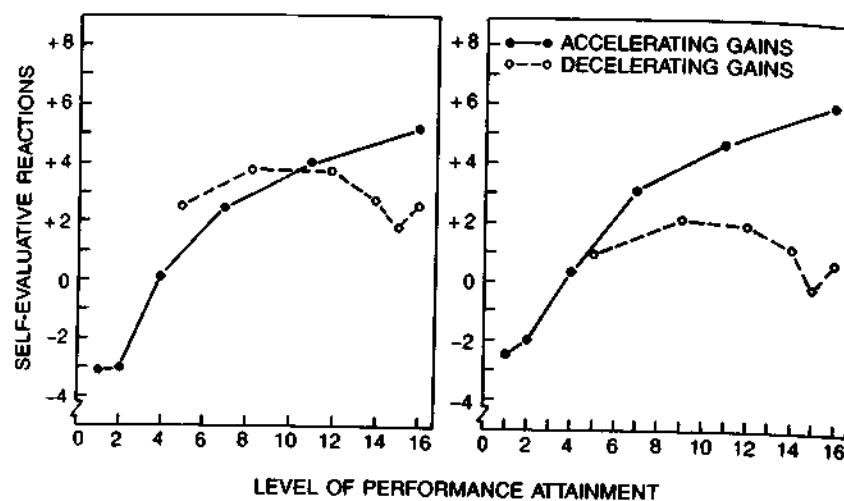


Figure 14.5. Strength of self-evaluative reactions exhibited by subjects who received feedback of a decelerating pattern of improvement (improve fast initially but then taper off) or an accelerating pattern (improve slowly at first but then make large gains). Positive numbers represent strength of self-approval; negative numbers indicate self-criticism. The graphs in the left panel are the self-evaluative reactions of normal individuals and those in the right panel are for depressed individuals. All individuals received the same performance score on the last trial (Simon, 1979).

strides, but they find even less satisfaction in modest improvements after achieving large performance attainments.

With success comes the tribulation of fulfilling not only rising personal standards but social expectations. A noted composer put it well when he remarked, "The toughest thing about success is that you've got to keep on being a success." Those who experience spectacular early successes often find themselves wrestling with self-doubts and despondency if their later work falls short of their earlier triumphs. The Nobel laureate Linus Pauling prescribed a total remedy for the woes of belittling self-comparison. When asked what one does after winning a Nobel Prize, he replied, "Change fields, of course!" The self-evaluation problem with spectacular accomplishments is by no means confined to creative endeavors. After a phenomenal long jump that shattered the existing world record by two feet, Bob Beamon avoided self-disappointment by never jumping again.

MISMATCH MECHANISMS IN HUMAN AFFECT AND MOTIVATION

Many theories of motivation and 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 a reference standard motivates action to reduce the incongruity. Discrepancy reduction clearly plays a central role in any system of self-regulation. However, in the negative feedback control system, if performance matches the standard the person does nothing. A regulatory process in which matching a standard begets inertness does not characterize human motivation.

Human self-motivation relies on both *discrepancy production* and *discrepancy reduction* (Bandura 1988a). It requires *proactive* control as well as *reactive feedback* control. People initially motivate themselves through feedforward 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 reach them. After people attain the standard they have been pursuing, they 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 dual cyclic process of disequilibrating discrepancy production followed by equilibrating discrepancy reduction.

The same hierarchical dual control mechanisms operate in the construction of behavioral patterns and regulation of established ones (Bandura 1986). Foresighted conceptions and forethought guide the construction and 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.

Moretti and Higgins present a self-discrepancy theory of self-evaluation and self-regulation in which the comparative factors include sets of attributes. They focus primarily on the affective consequences of self-discrepancies. Perceived attributes are compared against either ideal standards or standards of duty and obligation. Failure to fulfill ideal standards produces dejection when the ideals are one's own, and embarrassment when they represent the hopes that significant others hold for

one. Failure to meet standards of obligation arouses feelings of guilt when the standards are self-imposed but fear when they are prescribed by others. Moretti and Higgins report several lines of evidence that provide consistent support for the hypothesized consequences of the different forms of self-discrepancy.

Several aspects of this model of self-regulation require clarification and further empirical examination. In the verification tests, subjects rate their own attributes, the standards they apply to themselves, the standards imposed on them by others, and their feeling states. Except for a few instances in which nonverbal reactions are assessed, subjects' verbal reports are the sole source of the measures for all the variables. This can inflate obtained relationships and leave ambiguities as to whether they reflect genuine causal dependencies or people's intuitive theories about how different kinds of shortcomings should make one feel.

The self-discrepancy model seems to be concerned primarily with the self-regulation of affective states. However, self-discrepancies should have motivational and behavioral effects as well, which are readily testable. For example, how are differential magnitudes of actual-ideal discrepancy reflected in level of motivation? Under conditions of low social surveillance, self-imposed ought standards should have greater restraining power over transgressive behavior than ought standards prescribed by others. What sets of conditions produce self-regulatory failures that eventuate in actual-ought discrepancies breeding guilt? Such a state of affairs appears to reflect what has been characterized as a scotch conscience—it is too weak to restrain transgressive conduct but strong enough to ensure that you do not enjoy it.

Theories of self-regulation usually include a set of subsidiary processes through which perceived discrepancies produce their effects (Bandura 1986; Carver & Scheier 1981; Kanfer 1977; Rehm 1982). Some of these subprocesses are concerned with the self-monitoring of conduct and the circumstances under which it occurs. Other subprocesses involve judgments of the conduct in terms of different patterns of referential standards, the valuation of the activity, the perceived determinants of the conduct, and self-appraisal of capabilities to fulfill given standards. A third set of subprocesses governs the nature of the evaluative self-reactions after the conduct has been judged.

Rehm's (1982) application of the discrepancy model to depressive affect illustrates the multifaceted nature of the self-regulation of affective states. With regard to self-monitoring, depressed people tend to under-

estimate their successes but remain acutely aware of their failures. In contrast, the nondepressed remember their successes but minimize their failures. Minimizing one's successes while accenting one's failures is a good way of driving oneself to depression. Those who are plagued by depression also display a depressogenic style of processing performance-related information. In judging the determinants of their performances, the nondepressed favor a self-enhancing bias, crediting successes to themselves and ascribing failures to situational factors. The depressed do not necessarily discount their contribution to successes, but they are quick to attribute failures to themselves. The depressed are also prone to use social-comparative information in self-belittling ways. They tend to adopt standards that exceed their perceived capabilities, whereas the nondepressed favor standards that are judged to be attainable. In the self-reactive phase of self-regulation, depressed individuals tend to be less self-rewarding for successes and more self-denying and self-punishing for failures than the nondepressed for identical performances. Self-devaluation and despondency augment each other bidirectionally.

In the Moretti and Higgins self-discrepancy model, disparity between two sets of attributes (i.e., actual-ideal or actual-ought) seems to generate dejections, embarrassments, guilts, and fears without any other intervening processes. These various affective reactions are tied to four discrete sets of discrepancies (i.e., ideal-own, ideal-other, ought-own, and ought-other). In everyday life, personal and social standards operate on behavior interactively rather than isolatedly. Different patterns of disparity between these two sets of standards will activate different emotional reactions. Consider the relation between actual-ought attributes. Transgressive conduct will produce different reactions when personal and social standards are congruent than when they are discordant. People who highly value behavior that social authorities disapprove, such as principled dissenters and nonconformists, are most likely to feel pride rather than agitation in ignoring socially prescribed demands. People commonly experience conflicts in which they are socially rewarded for behavior that violates their personal standards. If the benefits for socially accommodating behavior are highly inviting, social standards often triumph over personal ones without arousal of guilt. This is because development of a self-regulatory system does not create an invariant control mechanism within a person. Self-reactive influences do not operate unless they are activated and there are many psychological mechanisms by which moral standards can be disengaged from transgressive conduct.

(Bandura 1988d). Selective activation and disengagement of internal standards permits different types of conduct and occasions different affective reactions with the same personal standards.

Self-discrepancy theory focuses primarily on negative affective reactions. Disparities between what one is and what one would like to be or ought to be arouse depression, apprehension or guilt. As noted earlier, where human aspirations are concerned, personal discrepancies serve important positive functions. People actively create discrepancies for themselves that provide continuing challenges for their pursuits. When they fulfill hoped-for standards, those who have a high sense of self-efficacy create new motivators for themselves by setting higher goal challenges (Bandura & Cervone 1983, 1986).

Discrepancies between behavior and ideal standards do not necessarily create despondency. Such discrepancies can be motivating rather than depressing depending on beliefs in one's efficacy to match them (Bandura & Abrams 1986). Negative disparities give rise to high motivation and low despondent mood when people believe they have the efficacy to fulfill a difficult goal and continue to strive for it (figure 14.6). Negative disparities generate despondent mood for people who judge themselves as ineffectual to attain a difficult goal but continue to demand it of themselves. Those who judge they lack the efficacy for goal attainment and abandon the difficult goals as unrealistic for themselves display apathetic reactions.

SOCIALIZATION OF STANDARDS

Moretti and Higgins chart the developmental cause of self-system vulnerabilities in terms of two sets of changes. The first concerns qualitative shifts in children's cognitive capacity to represent self-other relations in increasingly complex and global ways. The second involves parental socialization practices that convey information about contingencies between children's behavior and parents' responses. The socialization factors that are singled out for attention include the frequency, clarity, and consistency with which parents convey their hopes and obligatory expectations in response to their children's discrepant conduct.

Their analysis encompasses some relevant aspects of socialization, but it would need to be broadened in several directions to account fully for the developmental determinants of aspirational and obligatory standards. The conceptual extensions pertain to the varied modes by which stan-

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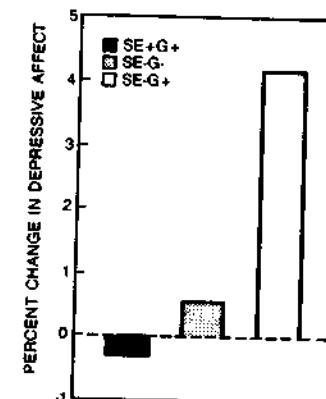


Figure 14.6. Percentage change in depressive mood for people combining strong perceived self-efficacy with goal adherence (SE+G+); weak perceived self-efficacy with goal adherence (SE-G-); and weak perceived self-efficacy with goal abandonment (SE-G+) (Bandura & Abrams, 1986).

dards are socially transmitted, the social and affective properties of the transmitters, and the scope of the transmission sources.

In the Moretti and Higgins portrayal of the socialization process, parents transmit standards by their evaluative reactions to their children's behavior. Direct training is only one of several modes of social transmission. People not only teach and prescribe self-evaluative standards for others; they also exemplify them in reactions to their own conduct. The power of modeling in transmitting standards has been verified in both laboratory and naturalistic studies. The process of acquiring standards is often complicated by conflicts in the standards exemplified by different people, by inconsistencies in the behavior of the same persons under different circumstances, and by contradictions between what people practice and what they preach. Children must construct personal standards from the multifaceted evaluative information conveyed by what is prescribed, modeled, and taught by evaluative reactions (Bandura 1986).

Moretti and Higgins emphasize the informational and cognitive aspects of socialization. However, they do not seem to give much consideration to social and affective factors that often exert strong, if not overriding, influence in developmental transactions. A great deal of research exists showing that the social and affective characteristics of socializers govern the success of their efforts. Their nurturance, interpersonal attraction, social power, and competence affect the extent to which children

adopt their prescripts and modeled standards (Bandura & Walters 1959; Goslin 1969; Perry & Bussey 1984; Sears, Maccoby, & Levin 1957). According to Moretti and Higgins, if parents convey the right contingency information frequently, clearly, consistently, and forcefully, their children will adopt standards that guide them to be aspiring and dutiful. If only it were that simple. Saliency and clarity of prescripts will carry different impacts depending on whether the socializers are liked, admired, disliked, hated, seen as powerful or weak, competent or ineffectual. Socializers, of course, are embedded in a broad network of social influences that can support their efforts or give them Excedrin headaches as sources of strife. The scope of the transmission model is addressed next.

FAMILIAL AND SOCIAL TRANSMISSION MODELS

In their conception of the socialization process, Moretti and Higgins focus almost exclusively on the transmission of standards via parent-child relationships. In a provocative paper, Reiss (1965) contrasts theories based on the familial transmission model with those emphasizing transmission by broader social systems. He offers several reasons why the familial transmission model cannot adequately explain socialization processes and outcomes. Assuming, at least, a twenty-year procreation difference between generations, a long time intervenes between parents' imparting values and standards to their children and when the children can, in turn, pass on those values to their own offspring. The long time lag between succeeding descendants would produce a very slow rate of social change, whereas, in fact, extensive societywide shifts in standards and normative behavior often occur within a single generation. The marked change in sexual standards and practices and cohabitation patterns within a relatively short time span is but one recent example. The common cohabitation of unmarried couples was not occasioned by parents inculcating in their children broad-minded views regarding sexuality. Although the familial subsystem serves as an important agency of cultural transmission, standards of behavior are extensively disseminated by extrafamilial social systems. Thus, for example, racial segregation in public accommodations and infringement of voting rights were changed more rapidly by collective protest and Supreme Court decisions than by waiting for prejudiced parents to inculcate in their children more acceptant attitudes which they would display toward minority groups when they became restaurateurs and motel operators thirty or forty years later.

The adoption of values, standards, and attributes is governed by a much broader and more dynamic social reality than merely the transactions in parent-child relationships (Bandura 1986). Social learning is a continuous process in which acquired standards are elaborated and modified, and new ones are adopted. Children repeatedly observe and learn the standards and behavior patterns not only of parents but also of siblings, peers, and other adults. Moreover, the extensive symbolic modeling provided in the mass media serves as another prominent extrafamilial source of influence (Liebert & Sprafkin 1988). Hence, children's values and personal standards are likely to reflect amalgams of these diverse sources, rather than simply the familial heritage.

THE PSYCHOPATHOLOGIZING OF SELF-DOUBT

Kolligian regards perceived fraudulence as one manifestation of perceived incompetence. Many high-achieving individuals are said to perceive themselves as impostors and frauds. In psychoanalytic theorizing, from which the construct emanates, perceived fraudulence reflects a disturbed sense of reality and identity and a compensatory narcissistic self-enhancement driven by feelings of inadequacy and worthlessness. The impostorous self-enhancement is promoted through imitativeness, verbal fluency, high social skill, personal charm, and sensitivity to others' expectations. Women have never fared well in psychoanalytic theory. It, therefore, comes as no great surprise that they become the tragediennes in the pursuit of high aspirations. Psychoanalytic researchers find that "perceived fraudulence" is a predominantly female experience, especially among the high-achieving ones. So women get it coming and going. Socialization practices instill in women self-doubts about their capabilities and then their self-doubts and striving for intellectual acceptance get psychoanalytically labeled as indicants of perceived fraudulenceness. The psychopathologizing of self-doubts and the negative labeling of efforts at self-enhancement as fraudulence and impostorousness only further undermine a sense of personal efficacy and self-esteem.

Kolligian removes much of the pathologic coloring from the construct of perceived fraudulence. It becomes a self-referential ideation that has both cognitive and affective components. It evolves through an initial self-perception of incompetence to intolerance of the perceived incompetence, especially among those with high achievement strivings, to resort to fraudulent maneuvers as protection against personal and social de-

valuation and then to added stressful concern over acting fraudulently and threats of social exposure. People who belittle themselves and strive to excel and please others get categorized as the perceived frauds.

Labels of deceit for thoughts and feelings of inauthenticity over discrepancies between self-perceptions and social impressions can do psychological harm. The notion of impostor has already entered the pop culture with authors marketing "the impostor phenomenon" on the television circuit under catchy titles concocted by advertising wordsmiths. It is not uncommon for people who have an affinity to the pop culture to now label themselves as impostors for their fallibilities and because their self-view does not always match up to their public image. The field might be better served if self-referent thoughts and feelings of inauthenticity bore less pernicious labels.

CONCLUDING REMARKS

The contributors to this volume have given us a better sense of the origins of perceived competence and the processes by which it affects human motivation, accomplishments, and dysfunctions. The value of psychological theories is judged not only by their explanatory and predictive power but also by their operative power to effect enduring changes in human functioning. Significant progress has been made in creating ways of enhancing human functioning by empowering people with coping skills and resilient self-beliefs of capability that enable them to exercise control over events that affect their lives (Bandura 1988b, 1988c; Rodin 1986; Schunk 1984). There is much to be gained from a better understanding of how to alter self-beliefs of capability in ways that contribute to personal well-being.

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HANDBOOK OF MORAL BEHAVIOR AND DEVELOPMENT

Volume 1: Theory

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1

Social Cognitive Theory of
Moral Thought and Action

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ABSTRACT

A comprehensive theory of morality must explain how moral reasoning, in conjunction with other psychosocial factors, governs moral conduct. Social cognitive theory adopts a cognitive interactionist perspective to moral phenomena. Within this conceptual framework, personal factors in the form of moral thought and affective self-reactions, moral conduct, and environmental factors all operate as interacting determinants that influence each other bidirectionally. Moral thinking is a process in which multidimensional rules or standards are used to judge conduct. Situations with moral implications contain many decisional ingredients that may be given lesser or greater weight depending upon the standards by which they are cognitively processed and the particular constellations of events in given moral predicaments. There are some culturally universal features to the developmental changes of standards of conduct and the locus of moral agency. These commonalities arise from basic uniformities in the types of biopsychosocial changes that occur with increasing age in all cultures. A theory of morality requires a broader conception than is provided by rationalistic approaches cast in terms of skill in abstract reasoning. Moral conduct is motivated and regulated mainly by the ongoing exercise of self-reactive influence. Self-regulatory mechanisms, therefore, form an integral part in the conception of moral agency in social cognitive theory. Development of self-regulatory capabilities does not create an invariant control mechanism within a person. Self-reactive influences do not operate unless they are activated, and there are many psychosocial processes by which self-sanctions can be selectively activated and disengaged from transgressive conduct. Mechanisms of moral disengagement also play a central role in the social cognitive theory of morality.



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Human morality is an issue of considerable import both individually and collectively. Internalization of a set of standards is integral to the achievement of self-directedness and a sense of continuity and purpose in one's everyday life. In the absence of personal standards and the exercise of self-regulatory influence, people would behave like weathervanes, constantly shifting direction to conform with whatever is expedient at a given moment. A shared morality, of course, is vital to the humane functioning of any society. Many forms of behavior are personally advantageous but are detrimental to others or infringe on their rights. Without some consensual moral codes people would disregard each others' rights and welfare whenever their desires come into social conflict. Societal codes and sanctions articulate collective moral imperatives as well as influence social conduct. However, external sanctions are relatively weak deterrents because most transgressive acts can go undetected. But people continuously preside over their own conduct in countless situations presenting little or no external threat. So the exercise of self-sanction must play a central role in the regulation of moral conduct. Self-regulatory mechanisms form an integral part of the conception of moral agency presented in this chapter.

Most of the recent psychological interest in the domain of morality has centered on analyses of moral thought. The conspicuous neglect of moral conduct reflects both the rationalistic bias of many theories of morality and the convenience of investigatory method. It is considerably easier to examine how people reason about hypothetical moral dilemmas than to study their actual moral conduct. People suffer from the wrongs done to them however perpetrators might justify their inhumane actions. The mechanisms governing the self-regulation of moral conduct involve much more than moral thought. Even the moral thought is not solely an intrapsychic affair. The way in which moral principles are applied in coping with diverse moral dilemmas varies, depending on situational imperatives, activity domains and constellations of social influence. It is not uncommon for sophisticated moral justifications to subserve inhumane endeavors.

A comprehensive theory of morality must explain how moral reasoning, in conjunction with other psychosocial factors, governs moral conduct. Social cognitive theory adopts an interactionist perspective to moral phenomena. Within this conceptual framework, personal factors in the form of moral thought and affective self-reactions, moral conduct, and environmental factors all operate as interacting determinants that influence each other bidirectionally. Before presenting the social cognitive theory of morality, the cognitive structural conception will be analyzed briefly.

STAGE THEORIES OF MORAL REASONING

Stage theorists assume that different types of moral thinking appear in an invariant stage sequence from one uniform way of thinking to another. Piagetian theory (1948) favors a developmental sequence progressing from moral realism,

in which rules are seen as unchangeable and conduct is judged in terms of damage done, to relativistic morality in which conduct is judged primarily by the performer's intentions. In the latter stage, well-intentioned acts that produce much harm are viewed as less reprehensible than ill-intentioned acts that cause little harm. Moral absolutism stems from unquestioning acceptance of adult prescripts and the egocentric outlook of young children; moral relativism develops from increasing personal experiences and reciprocal relationships with peers.

Following the lead of Piaget, Kohlberg developed an expanded cognitive structural theory of morality that revitalized and altered the direction of the field. Kohlberg (1969, 1976) postulates a six-stage sequential typology of moral rules, beginning with punishment-based obedience, evolving through opportunistic self-interest, approval-seeking conformity, respect for authority, contractual legalistic observance, and culminating in principled morality based on standards of justice. Changes in the standards of moral reasoning are produced by cognitive conflict arising from exposure to higher levels of moral reasoning. Because the stages constitute a fixed developmental sequence, individuals cannot acquire a given form of moral reasoning without first acquiring each of the preceding modes of reasoning in order. The presumption is that exposures to moral reasoning that are too discrepant from one's dominant stage have little impact because they are insufficiently understood to activate any changes. Judgmental standards of lesser complexity are similarly rejected because they have already been displaced in attaining more advanced forms of thinking. Views that diverge moderately above one's stage presumably create the necessary cognitive perturbations which are reduced by adopting the higher stage of moral reasoning.

HIERARCHICAL MORAL SUPERIORITY

A universal, though not inborn, latent preference for higher modes of moral thinking is posited to explain why people do not preserve their cognitive equilibrium simply by adhering to their own opinions and rejecting conflicting ones (Rest, Turiel, & Kohlberg, 1969). What makes higher-stage reasoning morally superior is not entirely clear. In thoughtful reviews of the stage theory of morality, Locke (1979, 1980) identifies and refutes alternative bases of hierarchical superiority. It is not that higher stages of reasoning are cognitively superior because, in most of their judgments, people do not use the highest mode of thinking they understand. Such findings suggest that in many instances tests of maturity in moral reasoning may be measuring personal preferences more than level of competence in moral reasoning (Mischel & Mischel, 1976). On the matter of stage progression, if people are actuated by an inherent drive for higher ways of moral thinking it is puzzling why they rarely adopt the uppermost level as their dominant mode even though they comprehend it (Rest, 1973). It is similarly arguable that higher stage reasons are morally superior. By what logical

reasoning is a morality rooted in law and order (stage 4) morally superior to one relying on social regard and concern for others (stage 3)? Minorities oppressed by a social order that benefits the majority and those subjected to the rule of apartheid would not think so. Nor would writers who argue that social responsibility and concern for others should be the guiding rule of morality (Gilligan, 1982).

Higher-stage reasoning cannot be functionally superior because stages provide the rationale for supporting either side of a moral issue but they do not prescribe particular solutions. Developmental stages determine the reasons given for actions, not what actions should be taken. Different types of moral thinking can justify stealing, cheating on income taxes, and military bombing of foes. Immorality can thus be served as well, or better, by sophisticated reasoning as by simpler reasoning. Indeed, the destructive social policies advocated by enlightened graduates of renowned academies is better explained by the social dynamics of group thinking than by the collective level of moral maturity (Janis, 1972). When people reason about moral conflicts they commonly face in their environment, Kohlberg and his associates find that moral reasoning is more a function of the social influences operating in the situation than of persons' stages of moral competence (Higgins, Power, & Kohlberg, 1984).

Kohlberg (1971a) underscores the point that his hierarchical stages of reasoning are behaviorally nonprescriptive because they are concerned with the *form* of reasoning not its *content*. However, the end point of moral reasoning, which construes morality as justice, carries a fixed behavioral mandate. Unlike the preceding stages, where it is acknowledged that a given type of moral thinking can support either the transgressive or the conforming side of a moral issue, at the end-point stage, thought is said to prescribe what courses of action are morally right. Because movement through the stages is said to be achieved naturally by the force of reasoning, empirical "is" thus becomes philosophical "ought." Rationality dictates morality. The ordering of moral priorities is presumably revealed by switching perspectives in impartial cognitive role taking of the position of each party in a moral conflict. However, as Bloom (1986) notes, simple perspective shifting in no way guarantees consensus on what aspects of a situation are morally relevant, the moral principles considered inherent in those aspects, and which principle should be granted priority unless there is already prior agreement on which principle should take precedence. It should also be noted that impartial role reversibility is imaginable in the abstract, but social experiences create too many human biases for impartiality of view and universalization of interests to be achievable in reality. For example, no amount of perspective shifting is likely to produce consensus among those who hold pro- and antiabortion views. The principle of freedom—for women and personalized fetuses—provides justification for both moral stances. The consensus most likely to be achieved is agreeing to disagree.

The evidence for the cultural universality of the "is" has not gone uncontested

(Locke, 1979; Simpson, 1974). Other theorists argue that the moral idealization in Kohlberg's theory reflects preference for Western views of moral adequacy rather than objective standards or the dictates of reason (Bloom, 1986; Shweder, 1982). Societies that are less inclined toward ethical abstractions and idealization of autonomy come out looking morally underdeveloped even though in their moral conduct they may exhibit fewer inhumanities than Western societies that are ranked as morally superior. Kohlberg's (1971b) prescriptive stance that moral education in the classroom should consist of moving children through the stages of moral reasoning, even regardless of parental wishes, draws understandable heavy fire (Aron, 1977; Wonderly & Kupfersmid, 1980) and belies the egalitarian characterization of the theory. The view of moral superiority as an autonomous self operating above communal norms and concerns does not sit well with many moral theorists.

Some moral philosophers, who hardly lack competence for principled reasoning, regard the principle of justice as only one among other moral principles that either compete for the role of chief yardstick of morality or share a pluralistic system of judgment (Carter, 1980; Codd, 1977). If, however, principled reasoning is defined as using justice as the supreme judgmental rule it becomes a conceptual truth incapable of empirical disproof (Peters, 1971). The common finding is that adults comprehend different moral principles but use them selectively or in a complementary way, depending on the interplay of circumstances and the domain of functioning. Moral development produces multiform moral thinking rather than follows a single developmental track.

Empirical analyses of Kohlberg's theory generally rely on a test that includes only a few moral dilemmas sampling a narrow range of moral conflicts. They are stripped of factors that can greatly complicate efforts to find moral solutions. To contend that a few sketchy items verify moral truths is to invest a simple assessment tool with extraordinary revelatory power. A test that can offer only a limited glimpse of moral predicaments lacking systematic variation of ingredients may provide a shaky empirical basis on which to found a theory of morality or to classify people into moral types. A person's propensity for principled moral reasoning will vary, depending on the information included in the depicted moral conflicts. For example, the moral dilemmas devised by Kohlberg are ambiguous about the likely consequences of transgressive behavior. In the transactional realities of everyday life, people not only have to live with the consequences of their moral choices, which they weigh anticipatorily in their moral reasoning, but experience of consequences is likely to affect their subsequent moral reasoning. Possible consequences are not taken lightly when moral decisions can alter the course of one's life. Indeed, when information about different types of consequences are added even to hypothetical moral dilemmas used to verify the stage theory, as the severity of personal consequences increases, people favor self-interest over principled reasoning (Sobesky, 1983). How often people offer principled solutions for moral conflicts may partly reflect

the gravity of the consequences they happen to imagine for the sketchy portrayals rather than their competence for principled reasoning.

The way in which hypothetical moral dilemmas are structured can exert considerable influence on the priority given to different moral principles and the amount of agreement obtained in moral judgment. To pit petty theft against human life, as in the oft-quoted conflict of the husband faced with stealing an overpriced drug to cure his wife's cancer, will draw consensual judgments from principled thinkers. Adding more substance to the moral dilemmas in the form of complicating elements will elicit disagreement among principled thinkers over which moral claims should take precedence (Bloom, 1986; Reed, 1987). The moral dilemmas over which people agonize and feud often involve abhorrent alternatives that do not lend themselves easily to moral solutions. We shall have occasion to review some of these later.

PRESCRIPTIVE AMBIGUITY OF ABSTRACT PRINCIPLES

Skeletonized abstract principles do not provide much guidance for judgment or action until they are fleshed out with relevant details of concrete situations that are inevitably laden with evaluative biases. For purposes of illustration, consider the example given by Peters (1971) on judging what is just payment for service rendered under a given set of circumstances. The abstract principle of justness does not yield a uniform answer. For instance, what is a just fee for a surgeon? Different people can arrive at different judgments from the same principle of justness, depending on what factors they consider relevant and how they weight them: such as the amount and expense of past training required, operating costs, the price of malpractice insurance, the effort and risks involved, the surgeon's financial needs, the benefits to patients, the patients' financial status, and the like. The judgmental thicket becomes even more ensnarled if social comparative information of remuneration for other occupations, such as poorly paid teachers and exorbitantly paid superstar singers, is considered.

Given the prescriptive ambiguity of abstract principles, it is not surprising that cognitively facile people can find ways to serve their self-interests under the cloak of justice or social contract. The advantaged members of a society have considerable say in how justice is defined at the operational level. Social systems that contain institutionalized inequities provide a set of social justifications that make inequitable practices appear just (Bandura, 1986). For example, people can be persuaded that inequitably high compensation is deserved for activities that carry substantial responsibility and risks, incur high personal costs, require specialized skills that are acquirable only through long arduous effort, and that produce widespread social benefits. An abstract principle of justness does not say much about where to set the boundary between just and unjust disparity in compensation. Clearly, theories of morality framed in terms of moral abstrac-

tions cannot remain divorced from the social realities of how people go about judging the moral dilemmas they confront in real life.

SEQUENTIAL TYPOLOGIES AND MULTIFACETED MORAL JUDGMENT

Stage theories assume that, over the course of development, moral judgments change into a series of uniform types representing discontinuous stages. A major problem with typologies is that people hardly ever fit them. Because differing circumstances call for different judgments and actions, unvarying human judgment is a rarity. A person's moral judgments typically rely on reasoning from several different moral standards rather than being based on only one type of moral standard. So stage theorists have to create transitional categories and substages. Stage theories classify people into types according to their modal form of reasoning, although any given individual usually displays coexisting mixtures of reasoning that span several "stages." Most people get categorized as being in varying degrees of transition between stages.

People not only display substantial variability in their moral reasoning at any given period, but many years elapse from the time they first adopt a new standard of morality and when they come to use it as a preferred one (Colby, Kohlberg, Gibbs, & Lieberman, 1983). Fischer (1983) comments that such evidence is at variance with stage theory, which depicts changes in thinking as occurring by pervasive transformations of preceding modes of thought. Clearly, moral thought is not hamstrung by a single cognitive structure that undergoes disjunctive developmental changes, nor does adoption of one standard pre-empt all others. Rather than exhibiting wholistic reorganization of their moral thinking, people gradually adopt new moral standards, eventually discard simpler ones, and draw from among a coexisting set of standards in judging different moral predicaments. The mature mode of thinking is characterized by sensitivity to the diverse factors that are morally relevant in any given situation. Choice of judgmental standards depends partly on which factors are most germane to a particular moral problem.

One might question the practice of treating reasoning that draws on more than one moral standard as evidence of moral immaturity evolving toward justness as the ultimate standard of morality. Different moral standards are not necessarily contradictory. Hence, adoption of a certain standard need not require jettisoning another. To judge the morality of conduct by a system of complementary standards, such as justness and compassion, reflects a high level of moral reasoning rather than transitional immaturity in thinking. Indeed, Peters (1966) argues that justice is necessary but not sufficient for a moral system. He points out that people can be brutal, but entirely impartial or just in their brutality. A society that subscribes to a morality that integrates standards of justness and compassion will be more humane than a society concerned solely with justness.

DEVELOPMENTAL CHANGES IN MORAL JUDGMENT

There are some culturally universal features of the developmental changes of standards of conduct and the locus of moral agency. These commonalities arise from basic uniformities in the types of biopsychosocial changes that occur with increasing age in all cultures. Growth of personal competencies and increasing autonomy alter the types of morally relevant situations with which the growing child must contend and the social structures within which these transactions take place. A broadening social reality changes the nature of the moral concerns as well as the social sanctions for transgressive conduct. Expanding moral choices require more generalized and complex moral standards. Change in reasoning from concrete to more abstract form with maturation and experience is also a natural order of development that all theories acknowledge. No one would contend that young children begin as sophisticated reasoners and become progressively more simple minded as they mature. Nor do young children recognize the prescripts of the social system before they recognize the prescripts of their immediate caretakers or companions. Another obvious natural order of development involves a broadening of perspective from individual to institutional prescripts for promoting human well-being. Change from external regulation to increasing autonomy and self-regulation is still another natural order of development.

The major theoretical disputes center not on whether there are some universalities in the order of development, but on the validity of casting developmental changes in discrete lock-step stages. Preparation for adult roles in society require adoption of standards appropriate to the new social realities and set of roles. The standards must serve as guides for conduct over an expanding range of moral domains in a variety of settings involving multiple sources of influence. Therefore, developmental change in moral standards is not simply a cumulative process. With increasing age, new standards are adopted rather than merely being appended to earlier ones. People vary in the standards they teach, model, and sanction with children of different ages.

The development and exercise of moral self-sanctions are rooted in human relations and the way in which they are structured by the larger society. At first, guidance of behavior is necessarily external and physically oriented. To discourage hazardous conduct in children who do not understand speech, parents must rely on physical guidance. They structure situations physically to reduce the likelihood of problem behavior, such as injurious aggression and, should it arise, they try to check it by introducing competing activities or by disciplinary action. Sometimes they pair simple verbal prohibitions with physical intervention, so that eventually a "no" alone will suffice as a restrainer. At the earliest period of development, there is little that is asked of young children and there is little they can do that is transgressive. Their behavior is regulated and channeled mainly by physical sanctions and verbal proxies for them.

As children mature, they begin to pursue activities some of which inevitably come into conflict with others and with social norms. Such occasions elicit social reactions designed to promote culturally valued behavior. Social sanctions increasingly replace physical ones as influential guides for how to behave in different situations. Parents and other adults explain standards of conduct and the reasons for them. Social sanctions that disapprove transgressive acts and commend valued conduct add substance to the standards. It is not long before children learn to discriminate between approved and disapproved forms of conduct and to regulate their actions on the basis of anticipated social consequences (Bandura & Walters, 1959; Sears, Maccoby, & Levin, 1957; Walters & Grusec, 1977).

Studies of socialization practices show that social sanctions combined with reasoning foster self-restraints better than do sanctions alone (Parke, 1974; Sears, Maccoby, & Levin, 1957). The reasoning that is especially conducive to development of self-regulatory capabilities appeals to behavioral standards and to empathetic concern for the adverse effects that detrimental conduct inflicts on others (Bandura & Walters, 1959; Hoffman, 1977; Perry & Bussey, 1984). Discipline that is used as an occasion for explaining rules of conduct is more effective in instilling a generalized self-regulatory capability than if a specific act is simply punished (LaVoie, 1974). Coercive threat may extract situational compliance, but cognitive guides provide a basis for regulating future conduct under changing circumstances.

The social consequences that transgressors might bring on themselves through their actions do not materialize if they avoid detection. But the injury and suffering such actions cause others occur regardless of whether or not the wrongdoer is discovered. Thoughts of punishing consequences gain force through self-interest. However, if the punishment is seen as avoidable or easily tolerable, it may be less restraining than concerns over possible injuries to others. There is some evidence that negative sanctions accompanied by reasons arousing empathy for the victims tend to promote stronger self-restraints than those that try to impress on wrongdoers that their conduct is likely to bring negative consequences to themselves (Walters & Grusec, 1977). The effectiveness of appeals to empathy increases with age (LaVoie, 1974). Qualitative differences in the use of reasoning are evident when comparing families of aggressively antisocial and prosocial adolescents (Bandura & Walters, 1959). The former families emphasize the punishments misconduct can bring one, the latter families stress the injury and suffering misconduct inflicts on others.

The extent to which the influence of social sanctions is enhanced by reasoning depends on its content and on a person's cognitive capabilities. Appealing to abstractions is likely to be lost on young children who lack the experience to comprehend them. They are swayed more by reasons centered on the tangible consequences of misdeeds than on abstract rules (Parke, 1974). As children gain social experience and knowledge about what is right, they become more respon-

sive to abstract appeals to rules and moral directives (Cheyne & Walters, 1970; LaVoie, 1974).

Parents cannot always be present to guide their children's behavior. Successful socialization requires gradual substitution of symbolic and internal controls for external sanctions and demands. As moral standards are gradually internalized, they begin to serve as guides and deterrents to conduct by the self-approving and self-reprimanding consequences children produce for themselves. Not only do the sanctions change from a social to a personal locus, but with advancing age the range of moral considerations expands. As the nature and seriousness of possible transgressions change with age, parents and other significant adults in the child's life add new aspects to the moral persuasion. For example, they do not appeal to legal arguments when handling preschoolers' misconduct, but they do explain legal codes and penalties to preadolescents to influence future behavior that can have serious legal consequences. It is hardly surprising that adolescents are more likely than young children to consider legalities in their reasoning about transgressive acts.

People develop moral standards from a variety of influences. They form standards for judging their own behavior partly on the basis of how significant persons in their lives react to it. Parents and others are generally pleased when children meet or exceed valued standards and disappointed when their performances fall short of them. As a result of such differential evaluative reactions, children eventually come to respond to their own behavior in self-approving and self-critical ways, depending on how it compares with the evaluative standards set by others.

Standards can be acquired through direct instruction in the precepts of conduct as well as through the evaluative reactions of others toward one's actions (Liebert & Ora, 1968; Rosenhan, Frederick, & Burrowes, 1968). In this form of transmission, moral standards are drawn from the tutelage of persons in one's social environment or those prescribed in the writings of influential figures. The moral standards to which adults subscribe guide the type of morality they teach to children (Olejnik, 1980). As in other forms of influence, direct tuition is most effective in fostering development of standards when it is based on shared values and is supported by social feedback to conduct.

People not only prescribe self-evaluative standards for others, they also exemplify them in responding to their own behavior. The power of modeling in influencing standards of conduct is well documented (Bandura, 1986). Modeling is a dynamic constructive process. People do not passively absorb standards of conduct from whatever influences happen to impinge upon them. Rather, they construct generic standards from the numerous evaluative rules that are prescribed, modeled, and taught. This process is complicated because those who serve as socialization influencers, whether designedly or unintentionally, often display inconsistencies between what they practice and what they preach. When these two sources of social influence conflict, example often outweighs the

power of precept (Hildebrandt, Feldman, & Ditrichs, 1973; McMains & Liebert, 1968; Rosenhan, Frederick, & Burrowes, 1968). Moreover, people usually differ in the standards they model, and even the same person may model different standards in different social settings and domains of conduct (Allen & Liebert, 1969). Such discrepancies reduce the impact of modeling on the development of personal standards. Exemplified standards also carry more force when models possess social power and status (Akamatsu & Farudi, 1978; Grusec, 1971; Michel & Liebert, 1967).

Parents' level of moral reasoning predicts the level of their children's moral reasoning (Holstein, 1973). Fine-grained analyses further reveal that children model the form of the rules their parents use to integrate information in judging the morality of transgressive conduct (Leon, 1984). Thus, if parents use simple moral rules so do their children, whereas if parents rely on more complex relativistic rules, their children do likewise. Parents, of course, are not oblivious to their children's cognitive capabilities to grasp the moral implications of their conduct. Parents react differently to their children's misconduct at different ages (Denny & Duffy, 1974). They increase the complexity of their moral reasoning as their children get older. The more complex the parent's moral reasons in dealing with misconduct, the more elaborate is their children's moral reasoning. Variation in social influences contributes to developmental changes in what factors are considered to be morally relevant and the relative weight they are given.

Parents, of course, are not the exclusive source of childrens' standards of moral judgments and conduct. Other adults, peers, and symbolic models, who are by no means uniform in their moral perspectives, play influential roles as well. Children exposed to adult and peer models who exemplify conflicting standards adopt different standards of conduct than if adults alone set the standard, or if adults and peer models subscribe to the same standards (Bandura, Grusec, & Menlove, 1967; Brody & Henderson, 1977). As we have already seen, the power of modeling is attenuated by variation in modeled standards. Peers can also exert strong influence on the application of pre-existing moral standards by evaluative justifications that make transgressive behavior morally permissible. Even when the evaluative reactions of parents carry more weight than those of peers, peers can win out because they are the ones who are present in the behavioral situations to exert influence on moral choices (Dornbusch, 1987). The mechanisms governing the conditional application of moral standards will be analyzed in a later section of this chapter.

To the developing child televised modeling, which dramatizes a vast range of moral conflicts that transcend viewers' immediate social realities, constitutes another integral part of social learning. The values modeled in print can similarly impart moral standards for judging conduct (Walker & Richards, 1976). Symbolic modeling influences the development of moral judgments by what it portrays as acceptable or reprehensible conduct, and by the sanctions and justifica-

tions applied to it. Clearly, a varied array of interacting societal influences contribute to the development of moral perspectives.

FAMILIAL AND SOCIAL TRANSMISSION MODELS

Psychological theories have traditionally assumed that values, standards and behavioral patterns are transmitted via parent-child relationships. In a provocative paper, Reiss (1965) contrasts theories based on the familial transmission model to those emphasizing transmission by broader social systems. He offers several reasons why the familial transmission model cannot adequately explain socialization processes and outcomes. Assuming, at least, a 20-year procreation difference between generations, a long time intervenes between parents' imparting values and standards to their children and when they can, in turn, pass on those values to their own offspring. The long time lag between succeeding descendants would produce a very slow rate of social change, whereas, in fact, extensive society-wide shifts in standards and normative behavior often occur within a single generation. The marked changes in sexual standards and practices and cohabitation patterns within a relatively short time span are but one example. Reiss, therefore, argues that the parent-child relationship cannot be the major agency of cultural transmission. Rather, standards of behavior are primarily disseminated by institutionally organized systems (e.g., educational, mass media, religious, political, and legal agencies) and regulated by collectively enforced sanctions. In Reiss's view, psychosocial changes originate primarily at the social systems level, whereas changes emerging within the family are of lesser social impact. Thus, for example, racial segregation in public accommodations and infringements of voting rights were changed more rapidly by collective protest and Supreme Court decisions than by waiting for prejudiced parents to inculcate in their children more acceptant attitudes and values which they would display toward minority groups when they became restaurateurs and motel operators 30 or 40 years later.

In accord with Reiss's main thesis, social cognitive theory assumes that values and standards of conduct arise from diverse sources of influence and are promoted by institutional backing. Because social agencies possess considerable rewarding and coercive power, collectively enforced sanctions can produce rapid and widespread societal changes. However, social systems theory alone is insufficient to explain why there is often substantial variation in values and standards, even within the same subcultures. Differences arise partly because institutional prescriptions for the youth of a society must be implemented by parents, teachers, and community members. Those who, for whatever reason, do not subscribe to the institutional codes, will undermine the broader social transmission effort. Barring strong sanctions, parents often find new values discordant and resist

adopting them for some time. Families who are estranged from the mainstream social systems also pay little or no heed to institutional values.

A comprehensive theory of social transmission must also explain what produces and sustains the values, standards and behavioral norms promulgated by the cultural institutions. They are products of influences wielded by members of the society. Changes in social systems are often initiated by determined dissenters acting on values modeled largely from individuals who have opposed prevailing social practices (Bandura, 1973; Keniston, 1968; Rosenhan, 1970). Dissenters create their own subsystems to support their efforts to reform social systems (King, 1958).

In discussing the limitations of personality theories of socialization, Reiss states that, in such approaches, social change can arise only when there is a breakdown in transmission between generations. This type of criticism is applicable to theories assuming that parental values are introjected by children in toto and then are later passed on unmodified to their progeny. In social cognitive theory, the adoption of values, standards and attributes is governed by a much broader and more dynamic social reality. Social learning is a continuous process in which acquired standards are elaborated and modified, and new ones are adopted. As previously mentioned, internalization involves construction of standards from diverse sources of influences rather than mindless mimicry. Children repeatedly observe the standards and behavior patterns not only of parents, but also of siblings, peers, and other adults (Bandura, Grusec, & Menlove, 1967; Davidson & Smith, 1982). Moreover, the extensive symbolic modeling provided in the mass media serves as another prominent extrafamilial source of influence (Liebert, Sprafkin, & Davidson, 1982). Hence, children's values and attributes are likely to reflect amalgams of these diverse sources, rather than simply the unaltered familial heritage. Even if psychosocial patterns arose solely from familial sources, significant changes could emerge across generations through familial transmission. This is because the attributes and standards of the two parents are rarely identical and siblings add further variety to what is modeled in the familial environment. The attributes children develop are composites of different features of parental and sibling values at each generation. Thus, children within the same family can develop somewhat different composite systems of attributes and values that are neither solely those of the parents nor of the siblings (Bandura, Ross, & Ross, 1963).

Some of the criticisms levied by Reiss against the familial transmission model are debatable, but his contention that social institutions often play a heavier role in perpetuating and changing standards and psychosocial patterns than do familial influences is well taken. However, an interactional theory that treats human development as a product of both familial and social system influences holds greater promise of furthering our understanding of the process than does a dichotomized view that pits one system against the other. This broader transmission model provides the vehicle for cultural evolution and the transmission of

cultural patterns both within generations and from one generation to the next (Boyd & Richerson, 1985).

MULTIFACETED NATURE OF MORAL JUDGMENT AND ACTION

Adoption of internal standards does not necessarily encompass every domain of activity or completely supplant other forms of control. Even the most principled individuals may, in some domains of activity and under some circumstances, regulate their behavior mainly by anticipated social or legal consequences. Moreover, during the course of development, children learn how to get around moral consequences of culpable behavior that can gain them personal benefits. They discover that they can reduce the likelihood of reprimands by invoking extenuating circumstances for their misdeeds (Bandura & Walters, 1959). As a result, different types of vindications become salient factors in moral judgments. Even very young children are quite skilled in using mitigating factors to excuse wrongdoing (Darley, Klosson, & Zanna, 1978). Later they learn to weaken, if not completely avoid, self-censure for reprehensible conduct by invoking self-exonerating justifications. A theory of moral reasoning must, therefore, be concerned as well with how exonerative moral reasoning can make the immoral inconsequential or even moral. We shall return later to the forms that these mechanisms of moral disengagement take.

Stage theories attribute changes in moral judgment chiefly to internal reorganization of thought by stage-regulated mental perturbations for modifications channelled by latent preferences for higher moral stages. Such views make light of the prominent role social influences play in cultivating moral standards and commitments. It is not that stage theories take no notice of social factors. They do, but they grant social influences a narrow function—the views of others serve mainly as external perturbators for autoregulated change. In fact, they do much more. People impart moral standards and provide a great deal of social support for moral commitments.

Developmental trends obviously exist in moral reasoning and judgment, as they do in everything else. But the conditions of social learning are much too varied to produce uniform moral types. Even at the more advanced levels, some behaviors come under the rule of law, others under social sanctions, and still others under personal sanctions (Bandura, 1986). When statistical controls for other causal factors are not applied, developmental changes, which have been attributed to stagelike unfolding of moral modes of thought, may reflect changes in general intelligence, information-processing skills, educational level, and socialization practices with which moral reasoning correlates (Kay, 1982). Evidence of age trends, which every theory predicts, is often accepted as validating stage theories of morality. The validity of stage propositions, however, demands

much more than age trends: They assume (1) That there is uniformity of judgment when a person is at any given stage; (2) That a person cannot evaluate conduct in terms of a given moral principle without first adopting a series of preceding principles; and (3) That attainment of a given judgmental principle replaces preceding modes of thought by transforming them. These presumptions do not fare well when compared to empirical findings.

SOCIAL CHANGE OF THE MORAL STANDARDS OF STAGE THEORIES

Moral reasoning involves interpreting available information in moral predicaments against personal standards and situational circumstances for evaluating the rightness or wrongness of conduct. The standards for moral reasoning, are much more amenable to social influence than stage theories would lead one to expect. Numerous studies have been conducted in which children with differing moral standards are exposed to opposing views of models who use either malevolent intentions or severity of harm as the standard for judging the reprehensibility of conduct. Such modeling influences alter how heavily children weigh intentions and harm when they judge transgressive acts: Children who had previously judged wrongdoing mainly by intentions judge conduct by the harm caused, and those who previously evaluated wrongdoing by the amount of harm caused adopt intentions as the principal indicant of reprehensibility (Bandura & McDonald, 1963; Cowan, Langer, Heavnerich, & Nathanson, 1969; Le Furg & Woloshin, 1969). These altered moral perspectives are reflected in moral reasoning as well as in the judgments made, they generalize across transgressive situations and different patterns of intentions and damages, and they endure over time (Dorr & Fey, 1974; Schleifer & Douglas, 1973). Although the modeled perspectives of both adults and peers are persuasive, the moral reasoning of adults is usually the more influential (Brody & Henderson, 1977; Dorr & Fey, 1974).

Evidence that children apply their altered moral perspective to new moral predicaments and adhere to it over time attests to the significance of the achieved effects. Changes promoted by structured social influence are sometimes called into question by tautological arguments that cognitive change is a slow process, so if changes are achieved in a short time they must not be "genuine." One can, of course, point to instances where superficial influences produce circumscribed change. But it is studies that effect generalized, enduring changes by influences of some substance that speak most persuasively to the issue of whether moral reasoning skills can be socially cultivated.

Efforts aimed at altering moral reasoning have relied heavily on the influence of example. Exposure to others modeling an opposing view can alter moral judgments in several ways. Moral judgment involves two separable processes. Firstly, elements that are viewed as having moral relevance are selected from the

configurations of information available in given predicaments. Secondly, the selected elements are weighted and integrated on the basis of moral rules for judging conduct. By singling out certain elements in their moral reasoning, models call attention to the factors the moral standards embody. The views models express also provide supporting justifications for reweighing various factors in making decisions about the wrongness of certain acts. Things that were regarded as minor may become important, and visa versa. Evidence will be presented later that models convey the moral rules as well as invest particular elements with moral salience. In areas of morality, for which society places a premium on socially acceptable attitudes, public opinions may differ substantially from those that are privately held. Expression of moral convictions by models provides the social sanctions for others to voice similar opinions. Modeling of opposing viewpoints can thus effect changes in moral judgments through attentional, cognitive, and disinhibitory mechanisms.

As in other areas of functioning, modeling influences do not invariably alter moral reasoning. When lack of effects do occur, they can result from either comprehension deficits or performance preferences. People cannot be influenced much by modeled opinions if they do not understand them. Pre-existing knowledge and cognitive skills place limits on what can be learned from brief exposure to opposing opinions. There is substantial difference, however, between making social influence dependent on knowledge of cognitive-processing skills than on concatenated unitary thought. In social cognitive theory (Bandura, 1986), cognitive development is analyzed in terms of the sets of cognitive competencies governing given domains of functioning rather than discrete uniform ways of thinking.

When models voice opinions they transmit their ideas and preferences. But modeling does not, itself, guarantee that the views so learned will be articulated by the learner. Where apparent uninfluenceability reflects performance preferences, modeled standards have been learned but are simply not expressed because they are personally or socially disfavored. The ease with which judgmental standards can be shifted in one direction or another depends on the conceptual skills they require and the social effects they have. In addition, judgmental standards vary in how easily they can be discerned, which affects the facility with which they can be learned. It is much easier to recognize damage than to infer the historical antecedents or intentions of actions. When information about intentions is provided in ways that aid its recall, young children use the intentions of wrongdoers to judge culpability (Austen, Ruble, & Trabasso, 1977). The claim, sometimes attributed to social learning theory, that different moral standards are equally modifiable has no foundation. Some judgmental changes are obviously more difficult to achieve than others. It might also be noted in passing that, contrary to what is sometimes alleged (Murray, 1983), social learning theory has never proposed the implausible assumption that erroneous reasoning in matters of fact is just as producible by social influence as is accurate reason-

ing. Once children have learned to reason in accord with evident fact (e.g., changing the shape of a clay ball does not change its mass), they will not revert to fallacious reasoning by exposure to arguments they know to be untrue.

COGNITIVE CONFLICT AS AN AUTOMOTIVATOR

A theory of morality must explain both the motivators for cognitive change in moral principles and the motivators for acting morally. Stage theorists address the motivation for cognitive change but largely ignore the motivation for pursuing moral courses of action, some of which are self-denying while others may bring adverse reactions from certain quarters. Standards alone do not drive action. Cognitive conflict is posited as the major motivator of cognitive change in stage theories. According to this equilibration mechanism (Piaget, 1960), discrepancies between the cognitive schemas that children already possess and perceived events create internal conflict that motivates exploration of the source of discrepancy until the internal schemas are altered to accommodate to the contradictory experiences. Events that differ markedly from what one knows or expects are too bewildering and those that differ minimally are too familiar to arouse interest and exploration. It is moderately discrepant experiences that presumably arouse cognitive conflict that prompts cognitive reorganization. Piagetian theory thus proposes cognitive perturbations by moderately discrepant experiences as the basic automotivator for cognitive change.

Empirical tests of this type of automotivator reveal that discrepancy of experience alone does not guarantee cognitive change (Kupfersmid & Wonderly, 1982; Wachs, 1977). Indeed, if disparities between perceived events and mental structure were, in fact, automatically motivating, everyone should be highly knowledgeable about the world around them and continually progressing toward ever higher levels of reasoning. The evidence does not seem to bear this out. Although motivation presumably springs from cognitive conflict between beliefs held and the information conveyed by situations encountered, surprisingly little effort has been made to verify the causal links between discrepant influences, indicants of internal conflict, and the quest for new understanding. What little evidence there is on this point shows that discrepant influences foster cognitive changes but they seem unrelated to level of cognitive conflict (Zimmerman & Blom, 1983). This finding receives support from a study by Haan (1985) comparing the power of induced social and cognitive disequilibrium to change moral reasoning. Cognitive disequilibrium has little effect on moral reasoning. However, the experiences of coping with social discord around issues of morality produced changes in moral reasoning. The impact of divergent views seems to stem from how persuasive they are than from how cognitively conflictual they are. Role-playing higher levels of moral reasoning is no more effective in alter-

ing moral judgments than simply observing the same moral arguments being modeled (Matefy & Acksen, 1976).

Simply demonstrating that children are unmoved either by what they already know or by what they do not comprehend because it exceeds their cognitive capabilities is a mundane finding that can be explained without requiring an elaborate automotivating mismatch mechanism. Until objective criteria are specified for what level of disparity constitutes moderate discrepancy, the equilibration model of self-motivation does not lend itself readily to empirical test. Langer (1969) maintains that it is the cognitive perturbations children spontaneously produce by themselves rather than those externally activated by discrepant events that are the effective instigators of cognitive change. Moreover, the cognitive conflict is said to be often unconscious, which makes it even less accessible to study. Unless independent measures of unconscious self-perturbation are provided, the posited incongruity motivator is incapable of verification.

As a rule, people do not pursue most activities that differ moderately from what they know or can do. Indeed, if they were driven by every moderately discrepant event encountered in their daily lives they would be rapidly overwhelmed by innumerable imperatives for cognitive change. Effective functioning requires selective deployment of attention and inquiry. Self-motivation through cognitive comparison requires distinguishing between standards of what one knows and standards of what one desires to know. It is the latter standards that exert selective influence over which of many activities that create discrepant experiences will be actively pursued. A moderately discrepant experience, even in areas of high personal involvement, does not guarantee cognitive change. When faced with views that are discordant from their own conceptions, people often resolve the conflict by discounting or reinterpreting the discrepant information rather than by changing their way of thinking. It has been shown in other domains of cognitive functioning that the degree of cognitive change generated by exposure to discrepant information is better predicted from the credibility of those voicing discrepant views than from the degree of disparity per se. Sources of high credibility produce increasing cognitive change the more their views differ from those held by the person being influenced whereas, for sources of low credibility, the more discrepant their view, the more they are rejected (Bergin, 1962; McGuire, 1985). Social factors exert a powerful influence on how discrepant conceptions are cognitively processed and received.

Some efforts have been made to test the equilibration mechanism of developmental change within Kohlberg's framework by exposing children to moral arguments that increasingly diverge from the views children already hold. In the initial investigations of stage constraints on moral change, children were presented with a few hypothetical moral dilemmas and they were given conflicting moral advice by persons using reasons from different stages (Rest, Turiel, & Kohlberg, 1969; Turiel, 1966). The investigators report that children reject modeled opinions below their dominant mode of thinking, are unaffected by those

that are too advanced, but are likely to adopt modeled views one stage above their own.

Subsequent research indicates that the restricted changeability of moral reasoning may lie more in how the modeling influence was used than in constraints of children's stages. It is unreasonable to expect entrenched moral perspectives to be altered markedly by a transitory influence, especially if presented in a weak form. Theories predicting null results should apply social influences in their most powerful form because one can easily fail to produce cognitive changes by using weak influences. Children do not remember the essential details of moral situations presented to them briefly, but they show good recall with greater exposure (Austen, Ruble, & Trabasso, 1977). Fleeting information that goes by unrecognized or unrecalled cannot affect moral thinking. In the studies conducted by Rest and Kohlberg, not only is the modeling influence unusually brief, but the models disagree with their views by advocating opposing solutions. Although results are not entirely uniform (Walker, 1983), models who are consistent in how they judge different moral predicaments generally have greater impact on children's moral reasoning than do models who disagree with each other (Brody & Henderson, 1977; Keasey, 1973). When the modeled views are consistent, children's moral perspectives are changed more by exposure to moral reasoning two stages above their own than by reasoning one stage more advanced (Arbuthnot, 1975; Matefy & Acksen, 1976). These findings are in accordance with substantial evidence in social psychology cited earlier that the more discrepant persuasive reasoning is from one's own views, the more one's attitudes change. Immaturity, of course, places some limits on the power of discrepant influences. Young children cannot be influenced by reasoning so advanced that it is completely incomprehensible to them.

Children also adopt modeled modes of reasoning labeled as more primitive in the stage hierarchy, but the findings are mixed on how well they adhere to them over time. Here, too, the variable adherence may reflect more how persuasively modeling is used than stage constraints. The views of a lone model, or one who disagrees, can be easily discounted as atypical. It is consensual multiple modeling that carries the strong persuasive impact necessary to override pre-existing orientations. Indeed, the propensity of children to pattern their preferences after models increases as the level of consensus among models increases (Perry & Bussey, 1979). Viewers are likely to conclude that if everyone firmly believes something, it must have merit.

It could be argued that judging by the intentionality of actions does not necessarily represent a higher level of reasoning than judging by the consequences that flow from the acts. In judging the morality of nuclear strategies, for example, the awesome destructiveness of a nuclear attack should be the overriding consideration, rather than the intentions of the launchers of such attacks. To give utmost priority to the devastating consequences of a nuclear strike would hardly be considered "regressive" or "primitive" thinking. Rather, to judge as

morally well intended, nuclear strikes that can take a massive toll on human life and render much of the planet uninhabitable would reflect an unthinking reverence for intention and personal principle.

Results showing that there are some age trends in moral judgment, that children fail to adopt standards they do not fully comprehend or about which there is disagreement, and that they are disinclined to stick to views considered immature for their age can be adequately explained without requiring stage propositions. Evidence that moral reasoning can be changed by exposure to modes of thinking that invert or skip stages is at variance with the contention of stage theory that, to alter how one thinks about moral issues, one has to pass through an invariant sequence of stages, each displacing lower ones along the way from which there can be no return. Acknowledging the intraindividual diversity of moral reasoning, some stage theorists (Rest, 1975) have redefined stage progression as a shifting distribution of mixed modes of thinking that are affected by many environmental factors. Such a view reduces the mismatch between the theoretical conception and the actuality. But it raises the issue of what purpose is served by adhering to a stage doctrine stripped of its major defining properties of change by structural displacement, steplike discontinuity, uniformity of cognitive structure, and judgment unarbitrated by either the situational factors or the domain of activity? If stage progression is recast as a multiform gradualistic process cultivated by environmental influences, such a model differs little from developmental theories that do not invoke stages.

Apparent deficiencies in moral reasoning, often attributed to cognitive limitations or insensitivity to certain moral issues, have also been shown to depend partly on how moral thought is assessed (Chandler, Greenspan, & Barenboim, 1973; Gutkin, 1972; Hatano, 1970; Leming, 1978). The same individuals express different types of moral judgments, depending on how morally relevant factors are presented, whether children judge verbal accounts or behavioral portrayals of transgressions, whether they judge common or outlandish moral conflicts, whether they reveal their moral orientations in abstract opinions or in the severity of the sanctions they apply to different acts, and whether they judge the transgressive acts of others or give moral reasons for how they would behave if faced with similar moral dilemmas. The view that stages constrain people to think in a uniform way receives little support in the notable variability of moral thinking even with small changes in how moral conflicts are presented and how judgments are rendered.

MORAL JUDGMENT AS APPLICATION OF MULTIDIMENSIONAL RULES

In the social cognitive view, moral thinking is a process in which multidimensional rules or standards are used to judge conduct. Situations with moral implications contain many decisional ingredients that not only vary in importance

but may be given lesser or greater weight, depending on the particular constellation of events in a given moral predicament. Among the many factors that enter into judging the reprehensibility of conduct are the nature of the transgression; its base rate of occurrence and degree of norm variation; the contexts in which it is performed and the perceived situational and personal motivators for it; the immediate and long-range consequences of the actions; whether it produces personal injury or property damage; whether it is directed at faceless agencies and corporations or at individuals; the characteristics of the wrongdoers, such as their age, sex, ethnic, and social status; and the characteristics of the victims and their perceived blameworthiness. In dealing with moral dilemmas, people must extract, weigh, and integrate the morally relevant information in the situations confronting them.

We saw earlier that moral rules or standards of conduct are fashioned from varied social sources including precepts, evaluative social reactions, and models of moral commitments. From such diverse experiences people learn which factors are morally relevant and how much weight to attach to them. With increasing experience and cognitive competence, moral judgments change from single-dimensional rules to multidimensional rules of conduct. The more complex rules involve configural or relativistic weighting of morally relevant information. That is, factors that are weighed heavily under some combinations of circumstances may be disregarded or considered of lesser import under a different set of conditions.

Researchers who approach moral thinking as a process of information integration have studied the rules by which children weigh and combine information about different factors in making moral judgments (Kaplan, 1989; Lane & Anderson, 1976; Surber, 1985). Much of this research has examined how children combine information about intentions and consequences in judging transgressive actions. When presented with situations varying in degree of maliciousness and harm, children do not reason dichotomously, that is, using harm when young and intention when older, as proposed by Piagetian theory. Rather, they apply varied integration rules in which the different factors are combined additively with the same absolute weight regardless of other information, or configurally in which the amount of weight given to a factor depends on the nature of another factor. However, additive rules seem to predominate (Leon, 1980, 1982). The form of the integration rule used varies more across individuals than ages. Parental modeling accounts for a large part of the individual differences in complexity of moral decision making (Leon, 1984). Parents differ in how they integrate information into moral judgments, ranging from a simple rule based solely on damage done, to a composite linear rule combining intent and damage, to a more complicated configural rule that weighs damage differentially, depending on intent. In their own cognitive processing of information regarding the morality of conduct, children model their parents' rules in form and complexity.

Children at all ages use both intention and harm in forming their judgments,

with developmental changes in the weight given these factors being gradual rather than stagelike (Grueneich, 1982; Surber, 1977). Analyses that separate what judgmental factors are selected from constellations of events, what weight is given to the factors that are singled out, and the decision rule by which they are combined are especially well suited to clarify developmental changes in moral reasoning. Multifaced analyses of judgments of factorial combinations of different types of information are more informative than coding verbal protocols or selecting global attributions of whether outcomes are attributed to personal causation or to external circumstances.

Kaplan (1989) has examined the integrative rules of moral decision making with scenarios that include different combinations of factors characterizing the various stages of Kohlberg's theory. For example, a transgressive act may be portrayed as both fulfilling a social obligation and serving a moral principle, or as inflicting punishment but fulfilling a social obligation. People's judgments reveal how much weight they give to the different factors and the type of integration rule they use. The findings show that students combine factors from different stages in their moral decision making rather than reason in terms of a particular stage-constrained moral rule. Efforts to develop morality based on Kohlberg's framework rely on guided moral argumentation that provides exposure to more mature levels of reasoning. This form of moral training presumably improves cognitive skill in making decisions about moral problems rather than inculcates particular values. Kaplan found that such training is more likely to inculcate values than to increase the complexity of moral reasoning. However, students can learn to combine information in configurational or relativistic moral rules through discussions of nonmoral problems in which they come to understand that particular factors may be given more or less weight, depending on the configuration of other elements.

More work remains to be done on how people deal with large sets of morally relevant factors, how social influences alter the weight they give to different factors, what types of combinatorial rules they use, and how these different aspects of moral judgment change with development. Humans are not all that adept at integrating diverse information (Kahneman, Slovic, & Tversky, 1982). As in other judgmental domains, when faced with complexities most people probably fall back on judgmental heuristics that give too much weight to a few moral factors while ignoring other relevant ones. Consistent social feedback can produce lasting changes in the rules used to judge the morality of action (Schleifer & Douglas, 1973). However, in everyday life social consensus on morality is difficult to come by, thus creating ambiguity about the correctness of judgment. In the absence of consistent feedback, reliance on convenient heuristics may become routinized to the point where moral judgments are rendered without giving much thought to individuating features of moral situations. The susceptibility of moral judgment to change depends in part on the effects of

the actions it fosters. Over time, people alter what they think by experiencing the social effects of their actions.

RELATION BETWEEN MORAL REASONING AND CONDUCT

An issue that has received surprisingly little attention is the relationship between moral reasoning and moral conduct. The relationship between thought and conduct is mediated through the exercise of moral agency (Bandura, 1986; Rottschaefer, 1986). The nature of moral agency will be examined shortly. The study of moral reasoning would be of limited interest if people's moral codes and thoughts had no effect on how they behaved. In the stage theory of moral maturity the form of moral thought is not linked to particular conduct. This is because each level of moral reasoning can be used to support or to disavow transgressive conduct. People may act prosocially or transgressively out of mutual obligation, for social approval, for duty to the social order, or for reasons of principle. A person's level of moral development may indicate the types of reasons likely to be most persuasive to that person, but it does not ensure any particular kind of conduct.

The implications for human conduct of the stage theory of moral maturity are difficult to test empirically because conflicting claims are made about how moral reasoning is linked to behavior. On the one hand, it is contended that the level of moral reasoning does not sponsor a particular kind of behavior (Kohlberg, 1971a). The theory is concerned with the form of the reasoning not with the moralness of the conduct. Hence, in studies designed to alter moral perspectives through exposure to moral argument, the same level of reasoning is used, for example, for and against stealing (Rest, Turiel, & Kohlberg, 1969). On the other hand, a positive relationship is claimed between level of moral reasoning and moral conduct—the higher the moral reasoning, the more likely is moral conduct, and the greater is the consistency between moral judgment and conduct (Kohlberg & Candee, 1984).

Studies on whether stages of moral reasoning are linked to characteristic types of conduct are inconsistent in their findings (Blasi, 1980; Kurtines & Greif, 1974). Some researchers report that moral conduct is related to the level of moral reasoning, but others have failed to find strong evidence of such a relationship. Some of the studies routinely cited as corroborating such a link have not withstood replication. Others are seen under close scrutiny as contradicting it or as uninterpretable because of methodological deficiencies (Kupfersmid & Wonderly, 1980). Moreover, relationships may disappear when controls are applied for other differences between persons at varying levels of moral reasoning, such as general intelligence (Rushton, 1975).

Efforts to verify the link between moral thought and action have raised disputes about the designation of moral conduct. Kohlberg and Candee (1984) argue that it is performers' intentions that define their actions as moral or immoral. If the morality of conduct is defined by the intentions voiced by transgressors, then most behavior that violates the moral codes of society will come out lauded as righteous. People can easily find moral reasons to redefine their misdeeds as really well-intentioned acts. They become more adept at self-serving justifications as they gain cognitive facility. Presumed intent always enters in as one factor in the social labeling of behavior (Bandura, 1973), but intention is never used as the decisive definer of conduct. A robber who had a good intent would not thereby transform robbery into nonrobbery. A theory of morality must explain the determinants and the mechanisms governing transgressive conduct, not only how perpetrators justify it. This requires a broader conception of morality than is provided by a rationalistic approach cast in terms of skill in abstract reasoning. Affective factors play a vital regulative role in moral conduct.

CONCEPTION OF MORAL AGENCY IN TERMS OF SELF-REGULATORY MECHANISMS

Moral self-regulation is not achieved by disembodied moral thought or by a feat of willpower. Explanation of the relation between moral reasoning and conduct must specify the psychological mechanisms by which moral standards get translated into actions. 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 transgressing because they anticipate that such conduct will bring them social censure and other adverse consequences. In self-reactive control, they behave prosocially because it produces self-satisfaction and self-respect and they refrain from transgressing because such conduct will give rise to self-reproof.

For reasons given earlier, moral conduct is motivated and regulated mainly by the ongoing exercise of self-reactive influence. The major self-regulatory mechanism, which is developed and mobilized in concert with situational factors, operates through three major subfunctions. These include self-monitoring of conduct; judgment of conduct in relation to personal standards and environmental circumstances; and affective self-reaction. To exercise self-influence, people have to monitor their behavior and the situational circumstances in which they find themselves enmeshed. The process of self-monitoring is not simply a mechanical audit of one's performances and social instigators. Pre-existing conceptions and affective states can bias how one's actions and the instigators for it are perceived and cognitively processed.

Self-monitoring is the first step toward exercising influence over one's con-

duct but, in itself, such information provides little basis for self-directed reactions. Actions give use to self-reactions through a judgmental function in which conduct is evaluated against moral standards and environmental circumstances. We saw earlier that situations with moral implications contain many judgmental ingredients that not only vary in importance but may be given lesser or greater weight, depending on the particular constellation of events in a given moral predicament. In dealing with moral dilemmas, people must, therefore, extract, weight, and integrate the morally relevant information in the situations confronting them. Factors that are weighted heavily under some combinations of circumstances may be disregarded or considered of lesser import under a different set of conditions. This process of moral reasoning is guided by multidimensional rules for judging conduct.

Self-regulation of moral conduct involves more than moral thought. Moral judgment sets the occasion for self-reactive influence. Affective self-reactions provide the mechanism by which standards regulate conduct. The anticipatory self-respect and self-censure for actions that correspond with, or violate personal standards serve as the regulatory influences. People do things that give them self-satisfaction and a sense of self-worth. They ordinarily refrain from behaving in ways that violate their moral standards because it will bring self-condemnation. There is no greater punishment than self-contempt. Anticipatory self-sanctions thus keep conduct in line with internal standards.

There is a difference between possessing self-regulatory capabilities and being able to apply them effectively and consistently under the pressure of contravening influences. Effective self-regulation of conduct requires not only self-regulatory skills but also strong self-belief in one's capabilities to achieve personal control. Therefore, people's belief in their efficacy to exercise control over their own motivation, thought patterns and actions also plays an important role in the exercise of human agency (Bandura, 1986). The stronger the perceived self-regulatory efficacy, the more perseverant people are in their self-controlling efforts and the greater is their success in resisting social pressures to behave in ways that violate their standards. A low sense of self-regulatory efficacy heightens vulnerability to social pressures for transgressive conduct.

If people encounter essentially similar constellations of events time and again, they do not have to go through the same moral judgmental process of weighting and integrating moral factors each time before they act. Nor do they have to conjure up self-sanctions anticipatorily on each repeated occasion. They routinize their judgment and action to the point when they execute their behavior with little accompanying thought. However, significant changes in morally relevant factors reactivate evaluative processes for how to behave under the altered circumstances.

In social cognitive theory, the self is not disembodied from social reality. People make causal contribution to their actions and the nature of their environment by exercising self-influence. However, in accord with the model of re-

ciprocal causation, social influences affect the operation of the self system in at least three major ways. They contribute importantly to the development of self-regulatory competence. Analyses of regulation of moral action through affective self-reaction distinguish between two sources of incentive motivation operating in the process. There are the conditional self-generated incentives that provide guides and proximal motivators for moral courses of action. Then there are the more distal social incentives for holding to a moral system. Thus, the second way in which social influences contribute to morality is by providing collective support for adherence to moral standards. The third way in which social realities affect moral functioning is by facilitating selective activation and disengagement of moral self-regulation. The forms that the various psychosocial mechanisms of moral disengagement take are analyzed in the sections that follow. It might be noted in passing that the wealth of particularized knowledge on how self-regulatory competence is acquired and exercised (Bandura, 1986) stands in stark contrast to the ill-defined internalization process commonly invoked in theories of morality. A complete theory of morality, whatever its theoretical allegiance, must include these verified mechanisms of self-regulation.

INTERPLAY OF PERSONAL AND SOCIAL SANCTIONS

The self-regulation of conduct is not entirely an intrapsychic affair as the more radical forms of cognitivism might lead one to believe. Nor do people operate as autonomous moral agents impervious to the social realities in which they are enmeshed. Social cognitive theory favors a causal model involving triadic reciprocal causation (Bandura 1986). The three constituent sources of influence—*behavior, cognition and other personal factors, and environmental influences*—all operate as interacting determinants of each other. From this interactionist perspective, moral conduct is similarly regulated by a reciprocity of influence between thought and self-sanctions, conduct, and a network of social influences. After standards and self-reactive functions are developed, behavior usually produces two sets of consequences; self-evaluative reactions and social effects. These two sources of consequences may operate as complementary or opposing influences on behavior.

Conduct is most congruent with moral standards when transgressive behavior is not easily self-excusable and the evaluative reactions of significant others are compatible with personal standards. Under conditions of shared moral standards, socially approvable acts are a source of self-pride and socially punishable ones are self-censured. To enhance the compatibility between personal and social influences, people generally select associates who share similar standards of conduct and thus ensure social support for their own system of self-evaluation (Bandura & Walters, 1959; Elkin & Westley, 1955; Emmons & Diener, 1986).

Diversity of standards in a society, therefore, does not necessarily create personal conflict. Selective association can forge consistency out of diversity.

Behavior is especially susceptible to external influences in the absence of strong countervailing internal standards. People who are not much committed to personal standards adopt a pragmatic orientation, tailoring their behavior to fit whatever the situation seems to call for (Snyder & Campbell, 1982). They become adept at reading social situations and guiding their actions by expediency.

One type of conflict between social and self-produced consequences arises when individuals are socially punished for behavior they highly value. Principled dissenters and nonconformists often find themselves in this predicament. Here, the relative strength of self-approval and social censure determine whether the behavior will be restrained or expressed. Should the threatened social consequences be severe, people hold in check self-praiseworthy acts in risky situations but perform them readily in relatively safe settings. There are individuals, however, whose sense of self-worth is so strongly invested in certain convictions that they will submit to prolonged maltreatment, rather than accede to what they regard as unjust or immoral.

People commonly experience conflicts in which they are socially pressured to engage in behavior that violates their moral standards. When self-devaluative consequences outweigh the benefit for socially accommodating behavior, the social influences do not have much sway. However, the self-regulation of conduct operates through conditional application of moral standards. Self-sanctions can be weakened or nullified by exonerative moral reasoning and social circumstances. People display different levels of detrimental behavior and offer different types of moral reasons for it, depending on whether they find themselves in social situations that are conducive to humane or to hurtful conduct (Bandura, Underwood, & Fromson, 1975). Because almost any conduct can be morally justified, the same moral principles can support different actions, and the same actions can be championed on the basis of different moral principles. However, moral justification is only one of many mechanisms that affect the operation of moral standards in the regulation of conduct.

SELECTIVE ACTIVATION AND DISENGAGEMENT OF MORAL CONTROL

Development of self-regulatory capabilities does not create an invariant control mechanism within a person, as implied by theories of internalization that incorporate entities such as conscience or superego as continuous internal overseers of conduct. Self-reactive influences do not operate unless they are activated, and there are many processes by which self-sanctions can be disengaged from inhumane conduct (Bandura, 1986, 1990). Selective activation and disengagement of internal control permits different types of conduct with the same moral stan-

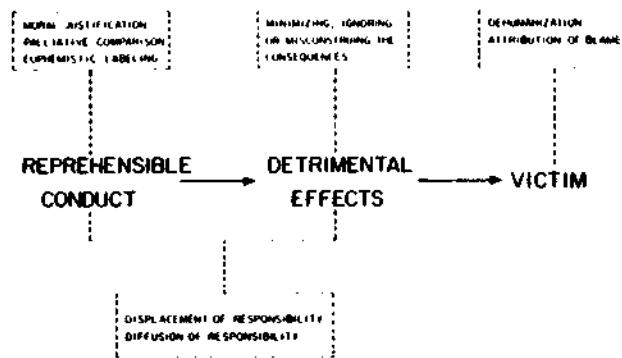


FIG. 1.1. Mechanisms through which internal control is selectively activated or disengaged from reprehensible conduct at different points in the regulatory process (Bandura, 1986).

dards. Figure 1.1 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 devaluing the victims.

These mechanisms of moral disengagement have been examined most extensively in the expression of violent conduct. But selective disengagement of moral self-sanctions is by no means confined to extraordinary inducements to violence. People often experience conflicts in which behavior they themselves devalue can serve as the means for attaining 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. The processes by which self-regulatory capabilities are acquired have been examined in some detail. However, the selective activation and disengagement of internal control, which have considerable theoretical and social import, have only recently received systematic study.

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 con-

duct is made personally and socially acceptable by portraying it in the service of moral purposes. People then act on a moral imperative.

Radical shifts in destructive behavior through moral justification is most strikingly revealed in military conduct. People who have been socialized to deplore killing as morally condemnable can be transformed rapidly into skilled combatants, who may feel little compunction and even a sense of pride in taking human life. Moral reconstrual of killing is dramatically illustrated in the case of Sergeant York, one of the phenomenal fighters in the history of modern warfare (Skeyhill, 1928). Because of his deep religious convictions, he registered as a conscientious objector, but his numerous appeals were denied. At camp, his battalion commander quoted chapter and verse from the Bible to persuade him that under appropriate conditions it was Christian to fight and kill. A marathon mountaintop prayer finally convinced him that he could serve both God and country by becoming a dedicated fighter.

The conversion of socialized people into dedicated combatants 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 (Kelman, 1973; Sanford & Comstock, 1971). Through moral sanction of violent means, people see themselves as fighting ruthless oppressors who have an unquenchable appetite for conquest, protecting their cherished values and way of life, preserving world peace, saving humanity from subjugation to an evil ideology, and 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 years, much reprehensible and destructive conduct has been perpetrated by ordinary, decent people in the name of religious principles, righteous 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 consider 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.

Although moral 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. Powerholders often resist, by forcible means if necessary, making 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. Powerholders, in turn, condemn such activism as representing impatient resort to violent solutions or efforts to coerce changes that lack popular support.

There are those who argue for a high moral threshold as a criterion of coercive activism (Bickel, 1974). In this view, unlawful conduct is justified only if traditional means have failed and those who break the law do so publicly and then willingly accept the consequences of their transgressive behavior. In this way, specific unjust practices can be challenged while maintaining respect for the judicial process itself. It is presumably the suffering endured by the aggrieved protesters that shakes the moral complacency of compassionate citizens and, thereby, mobilizes the widespread support required to force warranted reforms. If challengers demand amnesty for unlawful conduct, it not only defeats the purpose of conscientious disobedience, but it is morally wrong. If individuals do not have to accept responsibility for their actions, violent tactics and threats of force will be quickly used whenever grievances arise. It is further argued that illegal defiance of the rules in a representative society fosters contempt for the principle of democratic authority. Anarchy would flourish in a climate in which individuals acted on private moral principles and considered coercive tactics acceptable whenever they disliked particular social practices or policies representing majority decisions.

Challengers refute such moral arguments by appeal to what they regard as a higher level of morality, derived from communal concerns. Their constituencies are expanded to include all people, both at home and abroad, victimized either directly or indirectly by injurious social practices. Challengers argue that when many people benefit from a system that is deleterious to disfavored segments of the society the harmful social practices secure widespread public support. From the challengers' perspective, they are acting under a moral imperative to stop the maltreatment of people who have no way of modifying injurious social policies because they are either outside the victimizing system, or they lack the social power to effect changes from within by peaceable means. Some are disenfranchised, most feel they have no voice in decision making, and legal efforts to remedy their grievances are repeatedly thwarted. Even if the judicial procedures were impartially administered, few could afford the heavy expenses and the protracted time required to exhaust legal remedies. Not only is one not obligated to obey authorities who preside over inequitable systems that protect them with layers of bureaucratic barriers and coercive power, so the reasoning goes, but one is morally right to disobey them. When leaders gain widespread support from a populace that benefits from exploitative policies, the social activism of an aggrieved minority is more likely to arouse demands for coercive social control, rather than sympathy for them. Indeed, people in advantaged positions excuse high levels of violence for social control, but they are quick to condemn dissent and protest for social change as acts of violence (Blumenthal, Kahn, Andrews, &

Head, 1972). Submitting to the punitive consequences of their disruptive protest, challengers argue, places institutional procedures above the welfare of human beings and simply allows the system to perpetuate its exploitation of the disadvantaged.

As the preceding discussion shows, adversaries can easily marshal moral reasons for aggressive actions for social control or for social change. When viewed from divergent perspectives, violent acts are different things to different people. In conflicts of power, one person's violence is another person's selfless benevolence. It is often proclaimed that one group's criminal 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.

Terrorists invoke moral principles to justify human atrocities. 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. Terrorists can wield greater power over nations that place high value on human life and are thereby constrained in the ways they can act. Hostage taking has become a common terroristic strategy for wielding control over governments. If nations make the release of hostages a dominant national concern they place themselves in a highly manipulatable position. Tightly concealed captivity thwarts rescue action. Heightened national attention along with an inability to free hostages independently conveys a sense of weakness and invests terrorists with considerable importance and coercive power to extract concessions. Overreactions in which nations render themselves hostage to a small band of terrorists inspires and invites further terrorist acts. Hostage taking is stripped of functional value if it is treated as a criminal act that gains terrorists neither any coercive concessionary power nor much media attention.

Democratic societies face the dilemma of how to justify morally countermeasures to stop terrorists' atrocities without violating the societies' own fundamental principles and standards of civilized conduct (Carmichael, 1982). It is hard to find any inherent moral rightness in violent acts designed to kill assailants or to deter them from future assaults but that sacrifice the lives of some innocent people in the process as well. Because of many uncertain factors, the toll that counterterrorist assaults will take on innocent life is neither easily controllable nor accurately calculable in advance. 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. It is generally considered legitimate to resort to violent defense in response to grave

threats that inflict extensive human suffering or that endanger the very survival of the society. The gravity criterion is fine in principle but slippery in specific application. Like most human judgments, gauging the gravity of threats involves some subjectivity. Moreover, violence is often used as a weapon against threats of lesser magnitude on the grounds that, if left unchecked, they will escalate in severity to the point where they will eventually extract a high toll on human liberties and suffering. Gauging potential gravity involves even greater subjectivity and fallibility of judgment than does assessment of present danger. Construal of gravity prescribes choice of options, but it is also often true that choice of violent options shapes construal of gravity. Thus, projected grave dangers to the society are commonly invoked morally to justify violent means to squelch limited present threats.

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).

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 on nuclear retaliatory policies (Churchill, 1983; Johnson, 1984; Lackey, 1984). Proponents of the deterrence doctrine justify threat of nuclear retaliation as a necessary means to protect against a nuclear attack by rival powers. The moral justifications take the following form: Self-defense against grave dangers is morally obligatory. Threats to strike back in kind if attacked with nuclear weapons not only safeguards the populous from adversaries with nuclear arsenals, but deters them from nonnuclear assaults against vulnerable allies as well. Unilateral disarmament is untenable because it leaves a nation open to coercive control by adversaries through extortive nuclear threats.

Threats of nuclear retaliation have no deterrent effect unless the feuding nations believe that their adversary has every intention to use such weapons in the event of a nuclear attack. But virtually everyone concedes that it would be suicidal to use them. A nuclear deterrence doctrine paradoxically seeks to achieve a deterrent effect with threats that no one in their right mind could conceive of ever using. 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 semi-automatically. The intent is to strengthen the deterrent threat by creating the mindset that retaliatory reactions cannot be checked by a loss of retaliatory nerve. In the justificatory arguments of proponents, national security is ensured by maintaining a balance of nuclear destructiveness that will be mutually deterring. They remain suspect of treaties aimed at limiting or reducing ballistic arsenals on the grounds

that agreements are unlikely to be honored and verification procedures are inadequate to safeguard against cheating.

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 to a failed deterrence would most likely achieve only massive mutual destruction through a series of nuclear exchanges with surviving missiles dispersed on land, in aircraft, and in submarines. In the aftermath, survivors would find themselves in a largely uninhabitable environment. Drifting radioactive fallout would spread the devastating human and ecological toll both within and across nations. These are unique indiscriminate consequences of nuclear weapons that limit the value of deterrence models developed for conventional armed conflicts. In short, the moral logic of counterstrike threat is undermined by its self-destructive consequences. Nuclear deterrence thus rests on a retaliatory threat that paradoxically is too self-destructively irrational and too immoral in innocent human toll to carry out. What is immoral to do is immoral to threaten (Kavka, 1988). Deterrent credibility must depend on perception of one's adversary as sufficiently irrational and immoral to be able to launch nuclear missiles that can destroy each other's societies. Opponents call into question other aspects of deterrent effect. The heavy military involvements of superpowers with nuclear stockpiles (e.g., in Korea, Eastern Europe, Vietnam, Afghanistan) dispute the argument that the existence of a nuclear threat deters nonnuclear military venturesomeness (Lackey, 1984). Nations are understandably unwilling to risk self-destruction to repulse invaders abroad.

Development and deployment of nuclear weapons consume huge financial, technical and creative resources. To justify and gain public support for continual investment of a large share of national resources in nuclear bombs, proponents usually portray their adversaries as possessing nuclear superiority. Mutual disadvantageous comparison has fostered spiraling escalation of ever deadlier arsenals. Any advancement in either offensive or defensive missile technology is likely to create a destabilizing effect that sparks a new escalation of destructive potential. Proponents contend that a powerful deterrent threat must be maintained until such time as a space-based impenetrable defense system is developed against ballistic missiles. Critics argue that any defensive shield will be porous and orbiting battle stations would be highly vulnerable to countermeasures, thus requiring continued reliance on deterrence by retaliatory nuclear threat to bolster the partial defense (Long, Hafner, & Boutwell, 1986). Rather than shifting the effort from retaliatory deterrence to defensive self-protection, adding a new defensive system to offensive retaliatory forces will only create more sophisticated nuclear systems poised for mutual destruction. Erecting new defensive systems undercuts efforts to reduce offensive nuclear forces.

No technical system is ever foolproof. As long as nuclear weapons exist there is always a risk that some day they may be fired accidentally through malfunction of missile-monitoring systems or human error, or launched intentionally in an extreme crisis by an enraged, panic-stricken, or suicidal leadership. On four occasions the United States went into a state of nuclear war alert and only last-minute efforts revealed malfunctions or errors in the computer warning system (Falk, 1983). Nuclear proliferation and swifter missile systems that cut short the time for decisions raise the level of risk. To seek security in a fallible system that can produce massive nuclear annihilation is to invite human calamity of appalling proportions. Because of the vast scope and magnitude of indiscriminate nuclear devastation, the traditional just-war tenets that sanction self-defense to avert grave harm affords little guidance in the use of nuclear weapons. 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.

It is generally acknowledged that human security is advanced by multilateral nuclear disarmament. However, control of behavior by mutual threat has become deeply entrenched in the political rhetoric and military doctrines and practices of nations. They seek to gain nuclear advantage as a bargaining chip and, in so doing, spur reciprocal escalation of destructive power. Human survival in the nuclear age requires nations to develop and learn de-escalative modes of thinking and behaving in regard to nuclear weapons. Some models of graduated de-escalative reciprocation have been proposed (Osgood, 1980) and occasionally tried successfully (Scoville, 1985). In this approach to reversing the nuclear arms race, a nation initiates a calculated de-escalation designed to prompt a reciprocating action by an opponent. For example, President Kennedy announced that the United States would cease nuclear tests in the atmosphere as long as the Soviet Union exercised similar restraint. This publicized initiative quickly produced an international agreement barring atmospheric nuclear tests. De-escalative initiatives are thus gradually introduced within security limits to prod reciprocation. If concordantly applied, such initiatives might achieve drastic multilateral reductions in nuclear arsenals. Proliferation of nuclear weapons among nations that distrust and fear each other makes this task more difficult. As long as some nations refuse to part with their bombs, others insist on remaining nuclearly armed to deter nuclear threats. Graduated de-escalative strategies that are exercisable when nuclear weapons are in the hands of only a few nations encounter greater obstacles when many nations with chronic animosities are nuclearly armed. Therefore, to add social and moral force to de-escalative modes of change, social mechanisms need to be created whereby societies collectively applaud reciprocation to initiatives and reprove failures to reciprocate.

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, Dineen, Endresen, Beaman, & Fraser, 1975). Adults behave much more aggressively when 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) identifies 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 handicrafts of the operating room, and the civilians they kill are linguistically converted to collateral damage (Hilgartner, Bell, & O'Connor, 1982).

Sanitizing euphemisms, of course, perform heavy duty in less loathsome but unpleasant activities that people are called upon to do 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. A corporate memo speaks not of laying people off work, but of resizing our operations to the level of profitable market opportunities. 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 acidity 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, 1979a).

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. Even inanimate objects are sometimes invested with agentive properties: *The telephone pole was approaching. I was attempting to swerve out of its way when it struck my front end* (San Francisco Chronicle, 1979b). Gambino further documents 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* 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 what is compared against. Thus, self-deplored acts can be made righteous by contrasting them to flagrant inhumanities. The more outrageous the comparison practices, 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 as a way of checking massive Communist enslavement. Given the trifling comparison, perpetrators of 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 slayings as the only defense 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 retaliatory violence as trifling, or even laudable, by comparing them with 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 of violence. Advocates of terrorist tactics are quick to note that the democracies of England, France, and the United States were born of violence against oppressive rule. A former director of the CIA effectively deflected, by favorable comparison, embarrassing questions about the morality and legality of CIA-directed

covert operations designed to overthrow of an authoritarian regime. He explained that French covert operations and military supplies greatly aided the overthrow of oppressive British rule during the War of Independence, thereby creating the modern model of democracy for other subjugated people to emulate.

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 airlines 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.

Displacement of Responsibility

Self-sanctions are activated most strongly when personal agency for detrimental effects is unambiguous. Another set of dissociative 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 their being personally responsible for them. Since 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 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, unforeseeable, or 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 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 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 themselves accusable of authorizing heinous acts. They are concerned not only with adverse social consequences to themselves should advocated courses of action miscarry, but with the loss of self-regard for 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 reproachful practices are publicized, they are officially dismissed as only isolated incidents arising through misunderstanding of what, in fact, had been authorized.

Kramer (1990) describes the great lengths to which Shi'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 religious code permits neither suicide nor terrorizing innocent people. On the 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 rout 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 simply 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, clerics sanction terrorism by indirection, they vindicate successful ventures retrospectively, and they disclaim endorsing terroristic operations beforehand.

States sponsor terrorist operations through disguised roundabout routes that make it difficult to pin the blame on them. Moreover, the intended purpose of sanctioned destructiveness is usually linguistically disguised so that neither issuers nor perpetrators regard the activity as censurable. When culpable practices gain public attention, they are officially dismissed as only isolated incidents arising through misunderstanding of what, in fact, had been authorized. Efforts are made to limit the blame to subordinates who are portrayed as misguided or overzealous.

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 their release, terrorists continue to displace the responsibility for the safety of hostages on the reactions of the regime. If the captivity drags on, terrorists blame the suffering and injuries 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. As can be seen in Figure 1.2, 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 amenable are people to defer to them. Modeled disobedience, which challenges the legitimacy of the activists, 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 first-hand 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

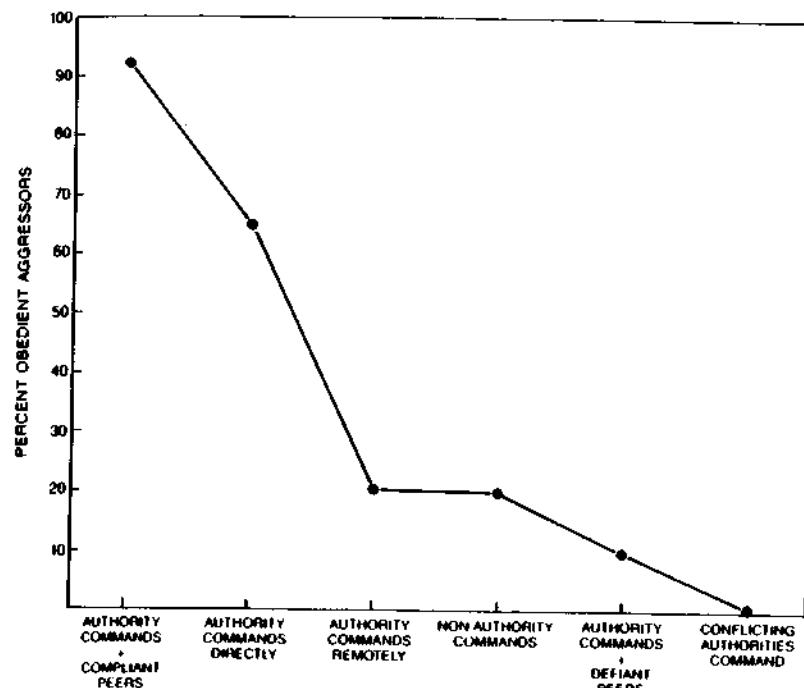


FIG. 1.2. Percent of people fully obedient to injurious commands as a function of the legitimization and closeness of the authority issuing the commands (plotted from data by Milgram, 1974).

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 (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). Figure 1.3 shows the level of punitiveness of individuals given punitive power over others under conditions in which the severity of their sanctions was determined personally or jointly by a group (Bandura, Underwood, & Fromson, 1975).

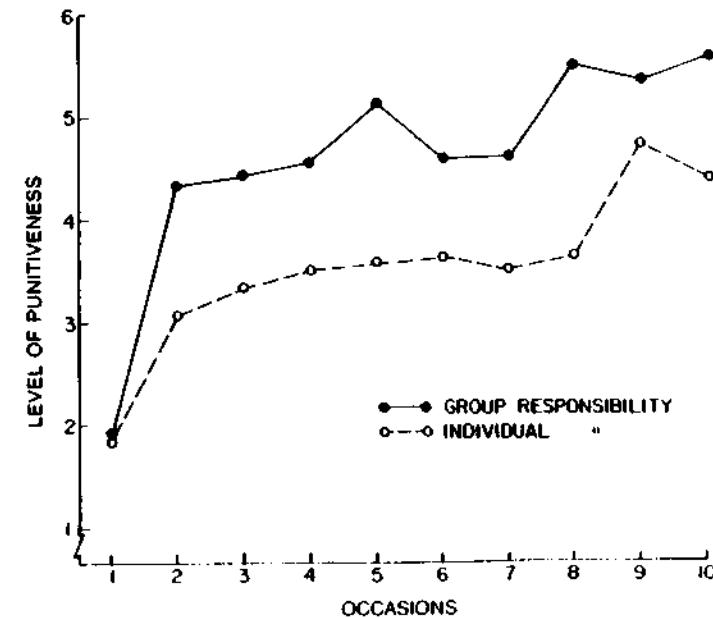


FIG. 1.3. Level of punitiveness by individuals under conditions in which severity of their punitiveness was determined personally or jointly by a group. Occasions represent successive times at which punitive sanctions could be applied (Bandura, Underwood, & Fromson, 1975).

This is not to say that shared responsibility has no legitimate purpose. In efforts to serve diverse constituencies, actions beneficial to one group may be detrimental to another. Because differences are not always reconcilable, someone will inevitably be hurt, whatever is done. Those who must make tough decisions and perform society's nasty duties are at least spared some personal distress by sharing the accountability. They could not function for long if they had to bear the full load alone.

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. They pollute the air they breathe with their automobiles and 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 good polluters by blaming 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 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 in which many people can be put to death by destructive forces unleashed remotely, illustrates such depersonalized action. Even high personal responsibility is a weak retractor 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) obtained diminishing obedience as the victims' pain became more evident and personalized (Figure 1.4).

Most organizations involve hierarchical chains of command in which superiors formulate plans and intermediaries transmit them to executors, who then

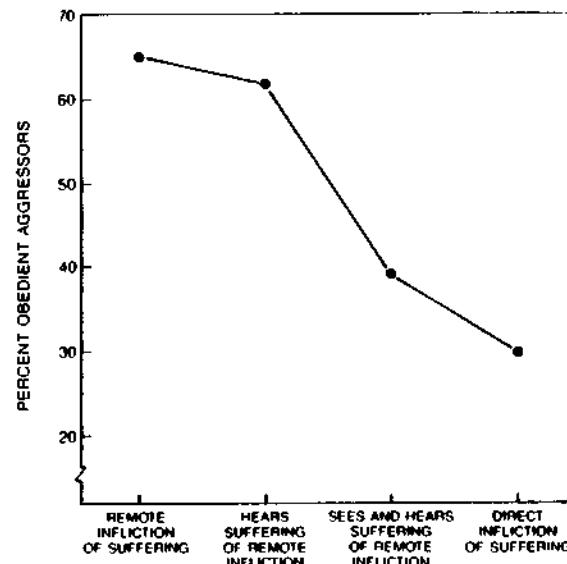


FIG. 1.4. Percentage of people fully obedient to injurious commands issued by an authority as the victim's suffering becomes more evident and personalized (plotted from data by Milgram, 1974).

carry them out. The farther removed individuals are from the end results, the weaker is the restraining power of the foreseeable destructive effects. Kilham and Mann (1974) set forth the view 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 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).

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, 1991). The joys and sufferings of similar persons are more vicariously arousing than are those of strangers or 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. 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. People are unmoved by "unfeeling" recipients of maltreatment. 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, and the other despicable wretches. If dispossessing antagonists of humanness does not 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 they were going to kill anyway was not a matter of purposeless cruelty (Levi, 1987). Rather, the victims had to be degraded to the point of subhuman objects so that those who operated the gas chambers would be less burdened by distress. 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 those who have been invested with human qualities (Figure 1.5). Dehumanization fosters different self-exonerative patterns of thought (Bandura, Underwood, & Fromson, 1975). People seldom condemn punitive conduct and they create justifications for it when they direct it toward individuals who have been deprived of their humanness. However, people strongly disapprove of punitive actions and rarely excuse their use toward individuals depicted in humanized terms.

When several disengagement factors are combined, they potentiate each other rather than simply produce 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 (Figure 1.6).

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 estrangements that fosters dehumanization. Strangers can be more easily cast as insensate than can impersonal acquaintances.

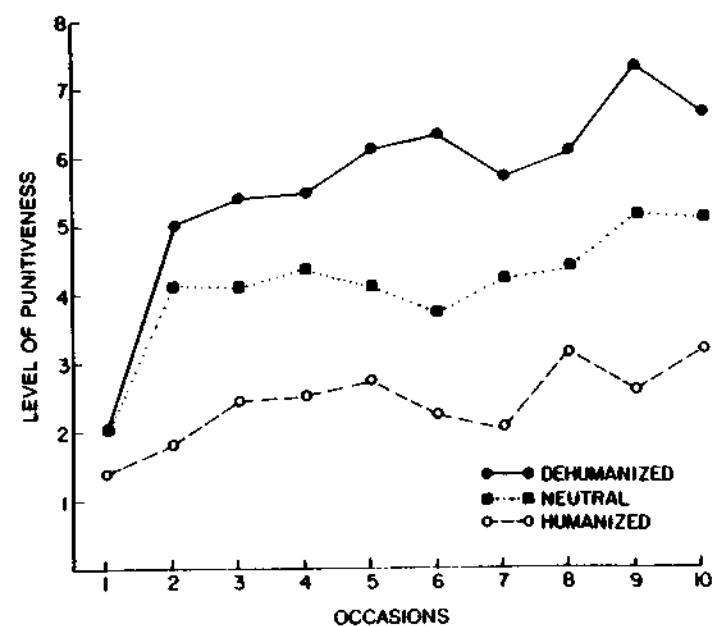


FIG. 1.5. Level of punitiveness on repeated occasions toward people characterized in humanized terms, not personalized with any characterization (neutral), or portrayed in dehumanized terms (Bandura, Underwood, & Fromson, 1975).

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 powerholders are lacking. Powerholders 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 given unilateral power, began to treat their charges in degrading, tyrannical ways as guards. Thus, role assignment that authorizes 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 requires conducive social conditions rather than monstrous people to produce

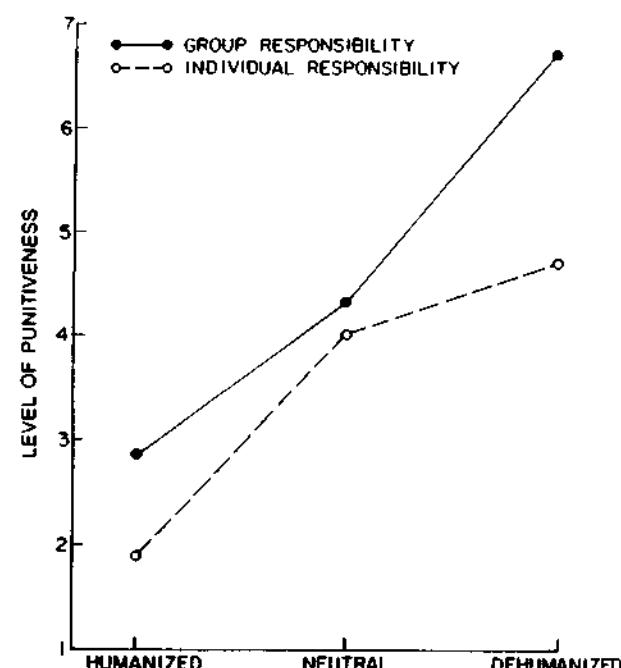


FIG. 1.6. Level of punitiveness as a function of diffusion of responsibility and dehumanization of the recipients (Bandura, Underwood, & Fromson, 1975).

heinous deeds. Given appropriate social conditions, decent, ordinary people can be led to do extraordinarily cruel things.

Power of Humanization. Psychological research tends to focus extensively on how easily 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, repeatedly ordering them to act cruelly as they voiced their 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) note, 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 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 emphasis on obedient aggression is understandable considering the prevalence and harmfulness of people's inhumanities to one another. However, of considerable theoretical and social significance is 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, Underwood, & Fromson, 1975). Even under conditions in which punitive sanctions are the only means available and they are highly functional in producing desired results, those exercising that power cannot get themselves to behave punitively toward humanized individuals (Figure 1.7). The affirmation of common humanity can bring out the best in others. In contrast, when 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 that justifies intensified punitiveness toward them.

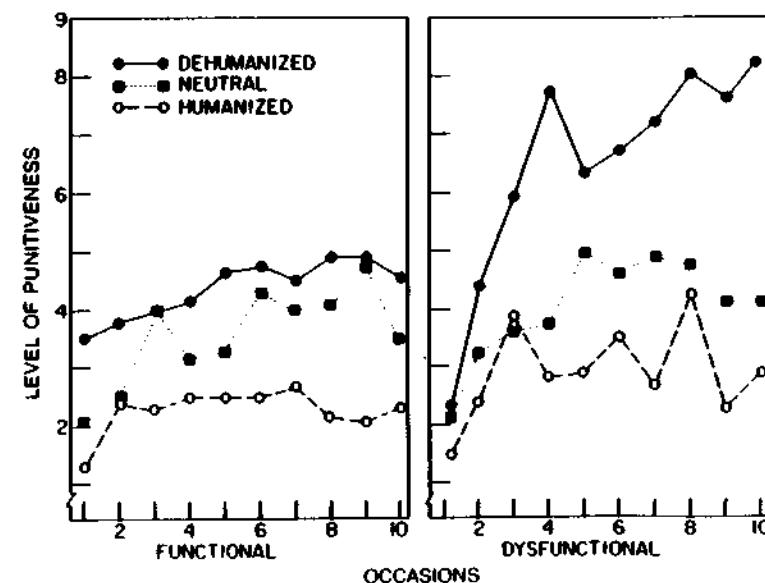


FIG. 1.7. Level of punitiveness on repeated occasions as a result of dehumanization and the effectiveness of punitive actions. Under the functional condition, punishment consistently produced good results; under the dysfunctional condition, punishment usually failed to achieve desired results (Bandura, Underwood, & Fromson, 1975).

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 is graphically illustrated in a Stockholm incident in which people who were held hostage for 6 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, 1990). Most people support the death penalty in the abstract, but the more they know about particular cases, 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 their detrimental conduct as compelled by forcible provocation. Detrimental interactions usually involve a series of reciprocally escalative 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. 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 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, provides 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 towards women. Rapists and males who acknowledge a proclivity to rape subscribe to myths about rape embodying the various mecha-

nisms 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 and 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 that 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 industry of pornography that dehumanizes them contribute further 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 install self-contempt in victims than inhumanity that does not attempt to justify itself.

Gradualistic Moral Disengagement

The aforementioned disengagement devices will not instantaneously transform a considerate person into an unprincipled, callous one. Rather, the change is usually achieved through gradual diminution of self-sanctions in 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-disinhibition is accelerated if inhumane behavior is con-

strued as serving moral purposes and the people being subjected to maltreatment are divested of human qualities (Bandura, Underwood, & Fromson, 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 impression that selective disengagement of self-sanctions occurs only under extraordinary circumstances. 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-exonerations are needed to neutralize self-sanctions and to preserve self-esteem. For example, institutionalized discrimination, a practice which takes a heavy toll on its victims, requires social justification, attributions of blame, dehumanization, impersonalized agencies to carry it out, and inattention to the injurious effects it causes. 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.

Disengagement of Self-Sanctions and Self-Deception

The issue arises as to whether disengagement of self-sanctions involves self-deception. Because of the incompatibility of being simultaneously a deceiver and the one deceived, literal self-deception cannot exist (Bok, 1980; Champlin, 1977; Haight, 1980). It is logically impossible to deceive oneself into believing something, while simultaneously knowing it to be false. Efforts to resolve the paradox of how one can be the agent and the object at the same time have met with little success (Bandura, 1986). These attempts usually involve creating split selves and rendering one of them unconscious. However, the self-splitting solution annihilates such a phenomenon rather than explains it. The split-self conceptions fail to specify how a conscious self can lie to an unconscious self without some awareness of what the other self believes. The deceiving self has to be aware of what the deceived self believes in order to know how to concoct the deceptions. Different levels of awareness are sometimes proposed as another possible solution to the paradox. It is said that "deep down" people really know what they believe. This attempt to reacquaint the split selves only reinstates the paradox of how one can be the deceiver and the one deceived at the same time. People, of course, often misconstrue events, they lead themselves astray by their biases and misbeliefs, and they act uniformly. However, to be misdirected by one's beliefs or ignorance does not mean that one is lying to oneself.

People's values and beliefs affect what information they seek and how they interpret what they see and hear. Most strive to maintain or enhance their positive self-regard. Therefore, they do not go looking for evidence of their culpability or adverse effects of their actions. Selective self-exposure and distorted interpretations of events, which confirm and strengthen preexisting beliefs, reflect biased

self-persuasion, not a case of self-deception. To be misdirected by one's preconceptions does not mean that one is lying to oneself.

Self-deception is often invoked when people choose to ignore possibly countervailing evidence. It could be argued that they must believe its validity in order to avoid it, otherwise they would not know what to shun. This is not necessarily so. Staunch believers often choose not to waste their time scrutinizing opposing arguments or evidence because they are already convinced of their fallacy. When confronted with evidence that disputes their beliefs, they question its credibility, dismiss its relevance, or twist it to fit their views. However, if the evidence is compellingly persuasive, they alter their original beliefs to accommodate the discrepant evidence.

People may harbor some doubts concerning their beliefs but avoid seeking certain evidence because they have an inkling the evidence might disconfirm what they wish to believe. Indeed, they may engage in all kinds of maneuvers, both in thought and in action, to avoid finding out the actual state of affairs. Suspecting something is not the same as knowing it to be true. Inkings can always be discounted as possibly being ill-founded. As long as one does not find out the truth, what one believes is not personally known to be false. Both Haight (1980) and Fingarette (1969) give considerable attention to processes whereby people avoid painful or incriminating truth by either not taking actions that would reveal it or not spelling out fully what they are doing or undergoing that would make it known. They act in ways that keep themselves intentionally uninformed. They do not go looking for evidence of their culpability or the harmful effects of their actions. Obvious questions that would reveal unwelcome information remain unasked so they do not find out what they do not want to know. Implicit agreements and social arrangements are created that leave the foreseeable unforeseen and the knowable unknown.

In addition to contending with their own self-censure, people are concerned about how they appear in the eyes of others when they engage in conduct that is morally suspect. This adds a social evaluative factor to the process. Haight (1980) argues that, in much of what is called self-deception, persons are aware of the reality they are trying to deny, but they create the public appearance that they are deceiving themselves. Others are thus left uncertain about how to judge and treat persons who seem to be sincerely deluding themselves in efforts to avoid an unpleasant truth. The public pretense is designed to head off social reproof. When people are caught up in the same painful predicament, the result may be a lot of collective public pretense.

The mechanisms of moral disengagement involve cognitive and social machinations but not literal self-deception. In moral justification, for example, people may be misled by those they trust into believing that destructive means are morally right because the means will check the human suffering of tyranny. The persuasive depictions of the perils and benefits may be accurate, exaggerated, or just pious rhetoric masking less honorable purposes. The same persuasory pro-

cess applies to weakening of self-censure by dehumanizing and blaming adversaries. In the rhetoric of conflict, opinion shapers ascribe to their foes irrationalities, barbarities, and culpabilities that color public beliefs (Ivie, 1980). In these different instances, those who have been persuaded are not lying to themselves. The misleaders and the misled are different persons. When the misleaders are themselves operating under erroneous beliefs, the views they voice are not intentional deceptions. They seek to persuade others into believing what they themselves believe. In social deception, public declarations by others may belie their private beliefs, which are concealed from those being deceived.

In reduction of self-censure by ignoring, minimizing, or misconstruing the deleterious effects of their actions, people lack the evidence to disbelieve what they already believe. The issue of self-dishonesty does not arise as long as one remains uninformed or misinformed about the outcomes of one's actions. When disengagement of self-censure is promoted by diffused and displaced responsibility, functionaries carry out the orders of superiors and often perform only a small subfunction, at that. Such arrangements enable people to think of themselves merely as subordinate instruments, rather than as agents, of the entire enterprise. If they regard themselves as cogs in the intricate social machinery, they have little reason to believe otherwise concerning their initiatory power. This is not to say that disengagement of self-censure operates flawlessly. If serious disbelief arises, especially at the point of moral justification, people cannot get themselves to behave inhumanely, and if they do, they pay the price of self-contempt.

ACKNOWLEDGMENTS

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BANDURA, ALBERT; BARBARANELLI, CLAUDIO; CAPRARA, GIAN VITTORIO; and PASTORELLI, CONCETTA. *Multifaceted Impact of Self-Efficacy Beliefs on Academic Functioning*. *CHILD DEVELOPMENT*, 1996, 67, 1206-1222. This research analyzed the network of psychosocial influences through which efficacy beliefs affect academic achievement. Parents' sense of academic efficacy and aspirations for their children were linked to their children's scholastic achievement through their perceived academic capabilities and aspirations. Children's beliefs in their efficacy to regulate their own learning and academic attainments, in turn, contributed to scholastic achievement both independently and by promoting high academic aspirations and prosocial behavior and reducing vulnerability to feelings of futility and depression. Children's perceived social efficacy and efficacy to manage peer pressure for detrimental conduct also contributed to academic attainments but through partially different paths of affective and self-regulatory influence. The impact of perceived social efficacy was mediated through academic aspirations and a low level of depression. Perceived self-regulatory efficacy was related to academic achievement both directly and through adherence to moral self-sanctions for detrimental conduct and problem behavior that can subvert academic pursuits. Familial socioeconomic status was linked to children's academic achievement only indirectly through its effects on parental aspirations and children's prosocialness. The full set of self-efficacy, aspirational, and psychosocial factors accounted for a sizable share of the variance in academic achievement.

The recent years have witnessed a resurgence of interest in the self processes by which human agency is exercised. Among the mechanisms of personal agency, none is more central or pervasive than people's beliefs in their capabilities to exercise control over their level of functioning and environmental demands. Unless people believe that they can produce desired effects by their actions, they have little incentive to act. The findings of diverse lines of research reveal that efficacy beliefs exert considerable impact on human development and adaptation (Bandura, 1992, 1995, in press; Schwarzer, 1992). Such beliefs influence aspirations and strength of goal commitments, level of motivation and perseverance in the face of difficulties and setbacks, resilience to adversity, quality of analytic thinking, causal attributions for successes and failures, and vulnerability to stress and depression.

The various psychological processes through which self-efficacy beliefs exert their influence are intimately involved in the development of cognitive competencies. Children's beliefs in their efficacy to regulate their own learning activities and to master difficult subject matters affect their academic motivation, interest, and scholastic achievement (Bandura, 1993; Schunk, 1989; Zimmerman, 1995). These lines of theorizing and research integrate the cognitive, metacognitive, and motivational mechanisms of self-regulation (Bandura, in press; Schunk & Zimmerman, 1994). Moreover, efficacy beliefs shape career aspirations and pursuits during early formative years. The stronger the students' beliefs in their efficacy, the more occupational options they consider possible, the greater the interest they show in them, the better they prepare themselves educationally for different ca-

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reer pursuits, and the greater their persistence and success in their academic coursework (Betz & Hackett, 1986; Lent, Brown, & Hackett, 1994).

The preceding lines of research have added greatly to understanding of how efficacy beliefs affect intellectual development and functioning both directly and through their impact on mediating cognitive, affective, and motivational processes. However, 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 (Bandura, 1993; Vygotsky, 1962). In social cognitive theory, personal agency operates within a broad network of sociostructural and psychosocial influences in which efficacy beliefs play an influential regulative function (Bandura, in press; Elder, 1995).

The present program of research examines how diverse sources of influence, including socioeconomic, familial, peer, and self processes, operate in concert to shape the course of academic achievement. In the conceptual scheme guiding this research, the impact of the socioeconomic status of the families on children's academic achievement is mediated through its effects on parental academic efficacy and aspirations. Parents' sense of efficacy to promote their children's academic development and the educational aspirations they hold for them enhance their children's beliefs in their own academic efficacy and raise their aspirations. The children's beliefs and aspirations, in turn, contribute to their academic achievement both directly and by fostering peer acceptance and reducing depression and problem behavior that can undermine productive

engagement in academic pursuits. The proposed structure of the causal model is summarized schematically in Figure 1. The rationale and evidence for the different postulated paths of influence are presented in the sections that follow.

The first link in the conceptual model concerns the impact of socioeconomic status on familial belief systems. In social cognitive theory (Bandura, 1986, 1995), socioeconomic factors affect children's developmental courses principally through their impact on familial, peer, and self processes. Several lines of research lend support to this view. Elder (1995) has shown that economic hardship exerts its impact on children's developmental trajectories through familial processes rather than directly by undermining parents' sense of efficacy to cultivate their children's competencies and to safeguard them from environmental risks that can jeopardize successful development. Baldwin and his colleagues report that, when variations in parents' child management practices are controlled, socioeconomic status has no independent effects on child outcomes (Baldwin, Baldwin, Sameroff, & Seifer, 1989). In the conceptual model being tested, increases in socioeconomic status raise parental academic aspirations for their children and parents' sense of efficacy that they can promote their children's academic development.

The second pattern of influences in the conceptual model specifies the impact of parental beliefs on their children's appraisal of their own academic capabilities and their educational vision. Parental aspirations and perceived efficacy build children's sense of efficacy and academic aspirations. There is a small but growing body of evidence that

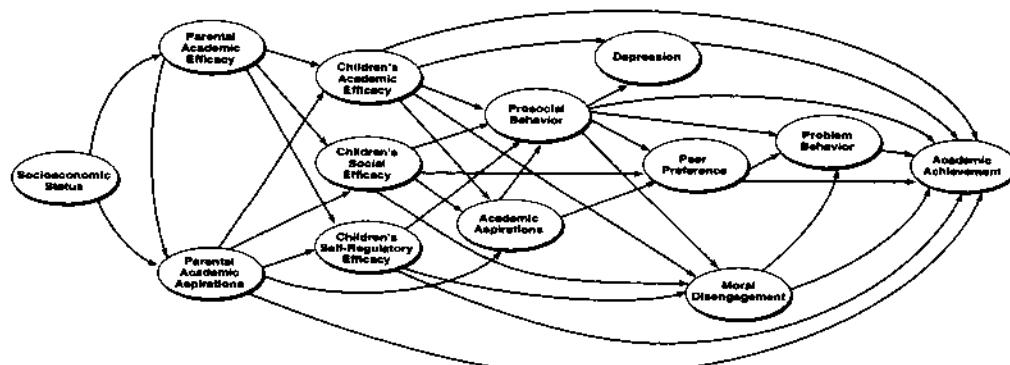


FIG. 1.—Proposed causal structure of the paths of influence through which parental and children's efficacy beliefs and academic aspirations affect academic achievement.

parents who believe that they can exercise some influence over their children's development are more proactive and successful in cultivating their children's competencies than parents who doubt they can do much to affect their children's developmental course (Elder, 1995; Gross, Fogg, & Tucker, 1995; Schneewind, 1995; Teti & Gelfand, 1991). The developmental benefits of parenting efficacy have been verified across different socioeconomic statuses and family structures, under conditions of economic adversity that severely tax parental resilience, and in different cultural milieus.

Efficacy beliefs vary across domains of functioning rather than represent an undifferentiated disposition (Bandura, *in press*). Because the present study centered on children's academic achievement, parents were assessed for belief in their capability to cultivate their children's valuation and involvement in academic pursuits. It was predicted that parental academic efficacy would enhance children's sense of academic efficacy. Academically efficacious parents are likely to promote not only educational activities but interpersonal and self-management skills conducive to learning, especially if they hold high academic aspirations for their children. This could raise children's beliefs in their social and self-regulatory efficacy. However, because of the differing domains of functioning, parental beliefs in their academic efficacy were expected to have a weaker direct influence on children's perceived efficacy to form and maintain satisfying peer relationships and to resist peer pressure to engage in detrimental behavior. The latter two efficacy domains were included because both peer estrangement and problem behavior can detract from academic pursuits.

Aspirations are influenced by self-appraisal of capabilities. The stronger the perceived self-efficacy, the higher the goal aspirations people adopt and the firmer is their commitment to them (Bandura, 1991a; Locke & Latham, 1990). It was hypothesized, therefore, that parents with high academic efficacy would favor high educational aspirations, which in turn would foster scholastic aspirations in their children. Previous research corroborates the positive influence of parental academic aspirations on children's academic aspirations (Zimmerman, Bandura, & Martinez-Pons, 1992) and academic achievement (Entwistle & Hayduk, 1978; Marjoribanks, 1979). To the extent that academic aspirations convey to children be-

lief in their capability to fulfill them, it can raise their perceived efficacy for academic pursuits as well. Moreover, as previously noted, parents who have high aspirations for their children are likely to foster their self-regulatory efficacy to resist peer pressure to engage in activities that can jeopardize educational development and work hard to keep them out of trouble.

So far, the presentation of the conceptual model has centered on parental influences mediated through their impact on children's sense of efficacy and aspirations. Parents who have high educational aspirations for their children and believe they can contribute to their realization can also affect intellectual development independently of their impact on their children. They can do so by conveying to teachers the importance they place on education and serving as advocates on behalf of their children in relation to the school system. Parents' positive involvement in the educational process can increase teachers' educational commitment to the children. By influencing what teachers expect of their children academically, parents can have a more pervasive educational impact than if their influence is solely mediated through its effects on their children. Indeed, when equated for level of ability, children whose parents convey high scholastic expectations to the school system are generally placed in more challenging academic tracks and achieve greater academic progress than those whose parents show low involvement in the educational process (Dornbusch, 1994). Among economically disadvantaged parents, those with high academic aspirations and involvement in school activities generally have academically successful children (Kao & Tienda, 1995).

A direct effect of parental efficacy on academic achievement would operate largely through parental beliefs that they can influence school personnel and their instructional activities. However, the present study assessed parental efficacy to foster their children's engagement in academic activities rather than beliefs in their efficacy to influence the school system itself, which is quite a different matter. School staffs have mixed feelings about parental involvement in the school's instructional practices, especially when it subjects teachers to critical scrutiny and parental pressures to produce higher academic attainments. Most parents are understandably reluctant to try to encroach on the learning activities in school. Teachers' sense of instructional efficacy partly determines

the level of parental participation they encourage in their children's scholastic activities (Hoover-Dempsey, Bassler, & Brissie, 1987). Teachers of low efficacy discourage parental involvement in the educational process. Parents will have little effect on their children's schooling through influence on their teachers if they have little interaction with them. It is much easier for parents to influence the school system by conveying high valuation of education for their children than to try to alter teachers' instructional practices. Hence, it was hypothesized that parents' sense of academic efficacy would influence academic achievement, independently of its impact on their children, through its effects on parental academic aspirations.

The next phase in the proposed conceptual model specifies how children's aspirations and perceived academic efficacy affect their academic achievement both independently and through the mediated effects of peer relations, despondency, and problem behavior. A high sense of efficacy for self-regulated learning and academic mastery in children fosters scholastic achievement both directly and by raising academic aspirations (Zimmerman & Bandura, 1994; Zimmerman et al., 1992). Different facets of perceived self-efficacy additionally affect scholastic achievement through social and emotional effects that, depending on their nature, support or detract from educational development. A high sense of social efficacy promotes satisfying and supportive social relationships (Holahan & Holahan, 1987a, 1987b; Leary & Atherton, 1986; Wheeler & Ladd, 1982). Students who can get themselves to seek academic assistance from knowledgeable adults and classmates achieve higher mastery of academic coursework than those who distrust their social capabilities (Newman, 1991).

Children who are considerate of their peers and are accepted by them will experience the favorable school environment as more conducive to learning than if they behave in socially alienating ways and are repeatedly rejected by their peers. Such experiences can create dysfunctional modes of thinking and behaving and activate emotional states that impair academic accomplishments (Austin & Draper, 1984; Bandura, 1993). Moreover, students who doubt their intellectual efficacy are likely to gravitate to peers who do not subscribe to academic values and pursuits. Engagement in problem behaviors often results in disen-

gagement from academic activities (Jessor, Donovan, & Costa, 1991). The relation between problem behavior and academic deficiencies has been well documented (Dishion, 1990; Hinshaw, 1992; Patterson, Capaldi, & Bank, 1991; Rutter, 1979). Over time, growing self-doubts of intellectual efficacy can have reverberating effects on developmental trajectories well beyond the academic domain. In the structure of the conceptual model, a high sense of academic and social efficacy fosters prosocial behavior, which builds peer acceptance (Ladd & Price, 1987; Ladd, Price, & Hart, 1988).

In the proposed model, a negative emotional and social life, in the form of peer rejection, despondency, and lack of prosocialness, fosters emotional and behavioral problems, that in turn undermine involvement in academic pursuits. A plausible alternative model was also tested in which the structure of the relationships involving socioeconomic status and the efficacy beliefs and academic aspirations of parents and children remain as in the original model, but the causal order of psychosocial factors and problem behavior is reversed. In this alternative conceptual scheme, emotional and behavioral problems produce peer rejection, despondency, and low prosocialness, which in turn detract from academic achievement.

Not all children of low efficacy resort to troublesome conduct. In the course of socialization, children adopt social and moral standards that serve as guides and deterrents for given courses of action. The sanctions children apply to themselves keep conduct in line with personal standards. However, self-sanctions do not operate unless they are activated, and there are many psychological processes by which self-restraints can be disengaged from detrimental conduct. Personal control is selectively disengaged by reconstruing negative conduct as serving worthy purposes, obscuring personal agency by diffusion or displacement of responsibility, disregarding or minimizing the injurious effects of one's actions, and blaming and dehumanizing those who are mistreated (Bandura, 1991b; Bandura, Barbaranelli, Caprara, & Pastorelli, in press). A low sense of academic and self-regulatory efficacy and low prosocial conduct increase the propensity to disengage moral self-sanctions from socially alienating and harmful conduct. Perceived self-regulatory inefficacy thus affects academic attainments by increasing proneness to involvement in detrimental activities that conflict with academic pursuits.

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The final pattern of influences in the conceptual model concerns the emotional effects of perceived inefficacy. A low sense of efficacy to exercise control over stressors and highly valued outcomes gives rise to feelings of futility and depression. It does so in several different ways. One route to depression is through unfulfilled aspiration. People who impose on themselves standards of self-worth they judge they cannot attain drive themselves to bouts of depression (Bandura, 1991a; Kanfer & Zeiss, 1983). 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. Supportive relationships provide models on how to manage difficult situations and cushion the adverse effects of stressors. Perceived social inefficacy to develop satisfying and supportive relationships increases vulnerability to depression through social isolation (Holahan & Holahan, 1987a, 1987b). Much human depression is cognitively generated by dejecting ruminative thought (Nolen-Hoeksema, 1991). A low sense of efficacy to exercise control over ruminative thought contributes to the occurrence, duration, and recurrence of depressive episodes (Kavanagh, 1992). Through these different processes, perceived academic and social inefficacy give rise to bouts of depression. Depression undermines academic performance (Nolen-Hoeksema, Girgus, & Seligman, 1986).

This project extends the line of research on academic development in several important directions. It analyzes within a unified causal structure the direct and mediated paths of influence of sociostructural, familial, peer, and personal classes of determinants. Many of the factors are assessed by different methods with different sources, thereby reducing common method and source biases. Although some of the segments of the proposed model have been tested in prior research, the inclusion of an expanded set of factors from social cognitive theory can provide new knowledge on the codetermination of academic achievement. Parental and children's efficacy beliefs are emerging as influential determinants of sociocognitive development (Bandura, 1995, in press; Zimmerman, 1995). The present study evaluates their contribution to academic development more fully within a broad network of influences. As will be shown later, perceived academic efficacy is a considerably better predictor of academic

achievement than the traditional measures of self-concept of ability that are widely used in this field of study. Research that addresses itself to constructs that increase explanatory and predictive power hold promise of advancing understanding of cognitive development.

Method

Subjects.—The participants in this study were 279 children ranging in age from 11 to 14 years, with a mean age of 12 years. There were 155 males and 124 females.

The students were drawn from the sixth and seventh grades in two middle schools in a residential community located near Rome. The children enrolled in these schools as well as their mothers and teachers participated in the study. The study was structured to the parents and children as a project conducted through the University of Rome to gain better understanding of how children develop. The mothers not only consented to the study, but 88% of them participated in the project themselves. This community represents a 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. Eleven percent were in professional or managerial ranks, 24% were merchants or operators of other businesses, 35% were skilled workers, 24% were unskilled workers, and 1% were retired. Fifty-four percent of the mothers were homemakers, 10% were employed in unskilled work, 25% in skilled work, and 11% were in executive and managerial positions. 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. In addition, data for the variables of interest were collected from the children's parents, teachers, and peers. The scales were administered individually to the teachers and parents.

Children's perceived self-efficacy.—Children's beliefs in their efficacy were measured by 37 items representing seven domains of functioning that formed the three basic efficacy factors described earlier. For each item children rated, using a 5-point response format, their belief in their level of

capability to execute the designated activities. These particular domains are part of a larger set of multidimensional self-efficacy scales (Bandura, 1990).

Perceived efficacy for academic achievement measured the children's belief in their capabilities to master different areas of coursework. These included mathematics, science, biology, reading and writing language skills, computer skills, and social studies. A second set of scales measured perceived efficacy for self-regulated learning (Zimmerman et al., 1992). Specifically, 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 social resources. The item, "How well can you study when there are other interesting things to do?" measured children's perceived efficacy to regulate their motivation for academic pursuits.

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, unprotected sex, and transgressive behavior that can get them into trouble. For example, the following item assessed perceived self-regulatory efficacy to resist peer impositions to use drugs: "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 and to manage different types of interpersonal conflicts. Self-assertive efficacy measured children's perceived capabilities to voice their opinions, 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 one of the items assessing perceived self-assertive efficacy. Perceived self-efficacy to meet others' expectations as-

sessed 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 (Zimmerman & Bandura, 1994; 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 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. These three factors constituted 15.7%, 8.3%, and 7.1% of the variance, respectively.

The reliability of these three factors was assessed by the squared multiple correlations of factor scores. Coefficients of .70 or better are indicators of stable factors (Tabachnik & Fidell, 1989). The estimated reliabilities were .87 for academic self-efficacy, .75 for social self-efficacy, and .80 for self-regulatory efficacy.

Social and emotional behavior.—Data on children's social and emotional behavior were obtained from different sources using diverse methods of assessment. The sources included the children themselves, their parents, teachers, and their peers. The methods of measurement included personality questionnaires and peer sociometric ratings.

Children rated their *prosocial behavior* on a scale containing 10 items developed by Caprara and his colleagues. It 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 as well in the scale. The factor structure and concurrent validity of this measure have been corroborated in studies relating children's self-ratings to level of prosocialness rated by parents, teachers, and peers (Ca-

prara & Pastorelli, 1993). The children and their mothers completed the same 10-item scale; teachers and peers rated the children's level of prosocial behavior on a subsample of six and three items from the larger scale. The alpha reliability coefficients were .79, .78, .88, and .75 for self, parents, teachers, and peer ratings, respectively. Because the different sets of scores were positively intercorrelated, they were standardized, averaged, and aggregated to provide a composite measure of prosocial behavior.

Children rated their severity of depression on the 27-item Children's Depression Inventory developed by Kovacs (1985). Its reliability coefficient was .86. The children's depression was also assessed by teachers on a 10-item scale, and by peers on a three-item scale developed by Caprara. The Cronbach alphas for these two scales were .91 and .88, respectively. The three sets of scores were positively intercorrelated beyond the $p < .001$ level. The correlations are self-peers, $r = .31$; self-teacher, $r = .20$; and teacher-peers, $r = .46$. The scores were standardized, aggregated, and averaged to create a composite measure of depression.

Sociometric peer nominations served as another source of assessment of *peer preference*. The children made their nominations from the roster of classmates in their particular classroom. Since 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. To assess peer popularity, the respondents selected the three classmates with whom they would like to play. To distinguish between children who were disliked by their peers and those who were simply ignored or regarded with indifference, children selected three classmates with whom they would not want to play as a measure of peer rejection. The assessment of both positive and negative status regarding social activities provided a good basis for gauging the impact of the quality of peer preference on academic development. Popularity was negatively correlated, $r = -.34$, $p < .0001$, with rejection. The number of positive and negative nominations the children received were summed separately and standardized. Following the common scoring procedure (Coie, Dodge, & Coppotelli, 1982; Newcomb, Bukowski, & Pattee, 1993), the measure of peer preference was obtained by subtracting the standardized rejection score from the standardized preference score.

Moral disengagement.—Each of the eight mechanisms of moral disengagement was measured by four subsets of items (Bandura et al., in press). They 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 with regard to different forms of transgressive conduct. To cite an example, "If people are careless where they leave things it is their own fault if they get stolen" is 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" measures displacement of responsibility. The scale items encompass diverse forms of detrimental conduct under a variety of contextual conditions and in different types of social relationships. The detrimental 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 32 items, children rated on a 3-point scale their degree of acceptance of moral exonerations for such conduct. Factor analysis of the items revealed a one-factor structure with all the items loading on the principal factor. Responses to the items were, therefore, summed to form a composite measure of moral disengagement. The alpha reliability coefficient for this measure was .83.

Problem behavior.—Problem behavior was measured by 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, McConaughy, & Howell, 1987). The subscale concerned with social unpopularity was deleted to eliminate any overlap with the sociometric measure of popularity and rejection in peer preferences. The items dealt with a wide range of problem behaviors, including hyperactivity, aggressiveness, inattentiveness, transgressive conduct, anxiety and withdrawal, somatic complaints, and obsessiveness. A total of 15 teachers recorded, for the children in their particular classroom, whether they exhibit these various problem behaviors and, if they do, whether they do so only occasionally or often. The reliability coefficient for the total score was .95.

Parental academic efficacy.—Parents' beliefs in their parenting efficacy were mea-

sured by an eight-item subscale selected from the multidimensional scales of perceived parenting efficacy (Bandura, 1990). The items encompassed a diverse set of activities parents have to manage in promoting their children's academic development. Mothers recorded their sense of efficacy on 5-point scales varying in terms of the amount of influence they believed they could exercise over their children's development. The parental self-efficacy scale measured parents' judgments of their personal efficacy to promote their children's interest in, and valuation of, education, to motivate them for academic pursuits, assist them with their schoolwork, and to help them to stay out of trouble in school. The following sample item measured parents' perceived capability to influence their children's schoolwork: "How much can you do to help your children to work hard at their schoolwork?" Parents with more than one child in the sample rated their aspirations and perceived efficacy separately for each child. Factor analysis of these items revealed a single factor that accounted for 46% of the variance. The alpha reliability coefficient was .81.

Parental and children's academic aspirations.—Academic aspirations and valuation of academic pursuits were measured by a set of seven items. Children rated on 5-point scales the importance placed on academic attainments by themselves, their parents, and their friends, and the level of academic performance expectations their parents had for them and they had for themselves. In addition, children rated the educational level they expected to complete and the educational aspirations their parents had for them. The educational levels ranged from completing middle school, high school, specialized technical school, some college work, to graduation from college. These items were combined into an index of academic valuation and aspiration. The mothers completed the four relevant items measuring their valuation of academic activities and the educational aspirations they had for their children. The alpha coefficients were .73 and .77 for the child and parental ratings, respectively.

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 attainment. The two sets of academic grades were combined to provide a composite measure

of academic achievement. The various psychosocial factors were measured prior to the assessments of academic achievement.

Results

Table 1 presents the means and variances for the different sets of variables. It also includes the matrix of relations among the various psychosocial factors and academic achievement. There were few correlates with sex or with age, which spanned a narrow range. Children get more depressed with age ($r = .16$). With regard to sex, girls are more prosocial ($r = .24$), less prone to moral disengagement ($r = -.20$), and have higher academic aspirations than do boys ($r = .17$).

Network of relationships.—The network of relationships is described briefly and then analyzed for how the various socio-cognitive factors operate in concert in the proposed causal structure. Socioeconomic level is accompanied by a high sense of academic efficacy and educational aspiration in parents, and prosocialness, academic aspirations, repudiation of moral disengagement, low problem behavior, and academic achievement in children. Self-efficacious parents hold high academic aspirations for their children. Parental perceived academic efficacy and educational aspirations are both consistently related to their children's perceived academic efficacy and aspiration, prosocial orientation, low depression and problem behaviors, and high scholastic achievement. In addition, parental aspirations are related to children's efficacy to withstand peer pressure for transgressive conduct and adherence to moral self-sanctions.

Children's beliefs in their academic efficacy and aspirations are similarly accompanied by prosocialness, peer acceptance, low despondency, repudiation of moral disengagement, a low level of emotional and behavioral problems, and high scholastic achievement. Children's perceived efficacy to resist peer pressure for detrimental conduct is also related to the psychosocial factors and scholastic achievement, although at a somewhat lower level. Children's social efficacy is primarily linked to their social functioning and emotional well-being. Those who are prone to moral disengagement are more socially discordant, despondent, heavily involved in troublesome behavior, and less academically successful.

TABLE I
CORRELATION MATRIX FOR PERCEIVED SELF-EFFICACY, SOCIAL AND AFFECTIVE FACTORS, AND ACADEMIC ACHIEVEMENT

{OTE = P represent parents; C represents children}

* These variables represent standardized aggregates. For each variable, the means for the constituent measures are given first and the variances second. Prosocial behavior includes parent ratings (.263, .32), peer ratings (.14, .12), self evaluations (2.48; .36), and teacher ratings (1.13, .11) and rejection (.36, .26). Teacher ratings (1.44, .46), and peer ratings (.13, .14). Peer evaluations include ratings of nonarbitrary (1.12, .15).

205

* 2201

- 8 -

** 113,000

Paths of influence.—The conceptual model was tested on the covariance matrix using the EQS program (Bentler, 1989). Academic achievement was the outcome variable in the model. The results of the structural equation modeling are presented in Figure 2. It includes the path coefficients that are significant beyond the .05 level. The goodness of fit of the model to the data was corroborated by all of the fit indices considered. These tests yielded a nonsignificant chi-square of $\chi^2(47, 266) = 61.19$, a Normed Fit Index (NFI) of .93, a Non-Normed Fit Index (NNFI) of .97, and a Comparative Fit Index (CFI) of .98.

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 they have for their children and the greater is their children's prosocialness. The influence of parents' sense of academic efficacy on scholastic achievement is mediated through its impact on children's beliefs in their capability to manage their own learning and master coursework. Parents who believe they can enhance their children's educability also hold higher educational aspirations for them. Parental aspirations contribute to children's scholastic achievement both directly and by raising their academic self-efficacy and aspirations, bolstering their self-regulatory efficacy to ward off peer pressure for detrimental pursuits, and lessening their involvement in problem behaviors that can detract from academic activities.

Children's belief in their academic efficacy is linked to scholastic achievement both directly and through its impact on academic aspirations, prosocial conduct, and lowering proneness to despondency. Perceived self-regulatory efficacy contributes to academic achievement both independently and through adherence to moral self-sanctions and a low level of problem behaviors. Children's belief in their social efficacy had no direct impact on academic achievement, but instead exerted its effect by promoting academic aspirations and reducing vulnerability to depression.

A prosocial orientation played an influential role in academic achievement both directly and by fostering peer liking and curtailing depression, moral disengagement, and problem behavior, each of which, in turn, accounted for variance in academic achievement. Prosocialness also mediated the influence of academic aspiration on scholastic achievement. Peer liking additionally contributed to scholastic achievement independently and by curbing troublesome behavior that can subvert academic pursuits and lowering vulnerability to depression.

An unexpected positive link was found between peer preference and facility in moral disengagement. Previous research revealed no consistent relation between moral disengagement and peer popularity (Bandura et al., in press). The direction of the relation between peer popularity and moral disengagement will vary, of course, depending on the types of peers with whom one affiliates. One can be rejected by prosocial peers and gravitate toward, and gain acceptance

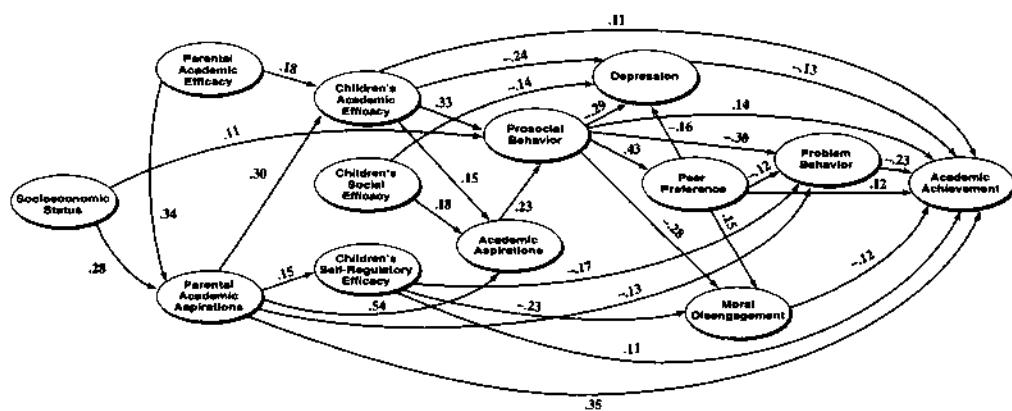


FIG. 2.—Path analysis of the patterns of influence through which parental and children's efficacy beliefs and academic aspirations affect academic achievement. All of the path coefficients are significant beyond the $p < .05$ level.

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from, dissocial or deviant peers (Cairns, Cairns, Neckerman, Gest, & Gariepy, 1988; Dishion, 1990).

The predicted link between proneness to moral disengagement and problem behavior was not verified. In everyday life, academic functioning is likely to be affected by the different types of problem behaviors operating in concert for any given individual. For this reason, the full set of problem behaviors was used in the analysis. They included such things as inattentiveness, anxiety, withdrawal, somatic complaints, and obsessiveness as well as conduct disorders. It is the injurious forms of problem behavior rather than the internalized ones that moral disengagement would affect. Support for this explanation is provided by path analyses performed with each of three main classes of problem behaviors separately. The analyses yielded a significant path from moral disengagement to aggression (.16) and to externalized problems (.19), but no significant path to internalized problems (-.09).

In sum, the conceptual model provides a good fit to the empirical data. The full set of sociocognitive factors accounts for a sizable share of the variance (58%) in academic achievement. The analysis further reveals that the alternative model, in which low prosocialness, peer rejection, and depression are the products of the various types of problem behaviors, does not provide an acceptable fit to the empirical data. It yields a highly significant chi-square, $\chi^2(35, 266) = 76.22, p < .001$, and the following values on the other fit indices: NFI = .92, CFI = .95, and NNFI = .89. Thus, the original model offers a better fit to the data than does the alternate one. In addition, a series of comparative tests was conducted for goodness of fit with each of the key postulated paths deleted. In every instance, deleting a key path produced a less adequate fit to the empirical data, as indicated by statistically significant chi-square values. The significance of the differences between the chi-square values for the full model and the models with a deleted path were also tested. The worsening of the model is significant in each comparative test.

Discussion

The findings of the present research verify the diverse paths of influence through which efficacy beliefs and aspirations contribute to children's academic achievement. Most of the links in the postulated causal

structure were empirically corroborated. The model not only fits the empirical data well, but provides a better fit than a plausible alternative model or ones in which a key path is deleted. Parents' beliefs in their efficacy to promote their children's intellectual development and the educational aspirations they hold for them were both influential factors in the academic process. These findings add to a growing body of evidence that parents' success in their developmental efforts rests partly on their beliefs that they can produce desired effects through their actions. Parents who have a high sense of parenting efficacy select and construct environments conducive to their children's development and serve as strong advocates on their behalf in transactions with educational and other social systems (Elder & Ardet, 1992; Elder, Eccles, Ardet, & Lord, 1993). In contrast, parents who are beset by doubts about their parenting capabilities are reluctant to behave proactively, quickly abort promotive efforts when they encounter difficulties, and fall back increasingly on negative sanctions in efforts to manage problems with their children (Gross et al., 1995). Even among mothers suffering from despondency, those who have a firm belief in their parenting capabilities are, nevertheless, quite resourceful in promoting their children's development (Teti & Gelfand, 1991).

The contribution of parental academic efficacy on scholastic achievement was mediated entirely through its impact on their academic aspirations and children's beliefs that they can regulate their learning activities and master coursework. Parental academic aspirations were linked to scholastic achievement in diverse ways. Parents who convey positive educational aspirations and act on the belief that they can help their children achieve them promoted their scholastic attainments both directly and by enhancing their cognitive and self-regulatory efficacy and raising their academic and occupational sights. Children whose parents have academic aspirations for them are disinclined to become involved in troublesome activities. A high sense of efficacy to resist peer pressure for detrimental conduct increases their likelihood of staying trouble free.

Parents with a high sense of efficacy affected scholastic achievement apart from their impact on their children through the academic aspirations they hold for them. As specified in the hypothesized model, no direct effect of parents' efficacy to influence their children's academic activities on their

children's academic achievement was found. As explained earlier, most parents are highly reluctant to encroach on the school's educational practices. However, we know from the research of Hoover-Dempsey and her associates that parents with a high sense of academic efficacy participate actively in classroom school activities (Hoover-Dempsey et al., 1987, 1992). Predictive relationships depend on the types of parental efficacy beliefs that are measured. It has now been amply documented that efficacy beliefs vary across different realms of functioning (Bandura, in press). The more relevant the assessed efficacy beliefs are to the activities of interest, the higher is their explanatory and predictive power. Parental sense of efficacy that they can influence what teachers expect of their children, how much time they devote to them, and how much they help them academically is, therefore, more likely to yield a direct path of influence than parental efficacy to increase their children's interest and involvement in scholastic activities.

The present research not only corroborates the influential role of parental aspirations for their children on their educational development (Kao & Tienda, 1995; Zimmerman et al., 1992), but identifies the diverse mediational paths through which parental aspirations exert their effects. In addition, the research establishes parental perceived efficacy to guide their children's learning as another key factor in the exercise of successful parental involvement in the educational process. Moreover, parental perceived academic efficacy determines, in large part, the academic aspirations they hold for their children. By providing guidance through standards and supportive efficacious action, parents serve as enabling influences in their children's academic lives.

Children who believe they can exercise some control over their own learning and mastery of coursework achieve success in their academic pursuits. Considerable research over the past several years has shown that beliefs of academic efficacy work in part by heightening motivation and fostering good strategic thinking (Bandura, 1993; Schunk, 1989; Zimmerman, 1995). The present findings reveal that such beliefs enlist a broader set of psychosocial processes that impinge upon academic functioning. They do so by altering the quality of peer preferences in ways that promote or diminish engagement in academic activities. Even the effects of children's academic aspiration is

mediated through interpersonal relationships.

Evidence that different facets of perceived self-efficacy operate on academic achievement through somewhat different mediational paths is another finding of theoretical as well as methodological significance. A major part of the influence of children's perceived academic efficacy is mediated through its impact on academic aspirations, prosocial peer relations, lowered vulnerability to depression, and adherence to moral self-sanctions. In contrast, perceived efficacy to resist peer pressure to engage in detrimental activities exerted its effects more by supporting adherence to self-sanctions for detrimental conduct and curtailing troublesome behavior, as well as directly. The influence of perceived social efficacy was mediated through academic aspirations and vulnerability to depression. Multifaceted measures thus provide a more refined view of causal structures than do conglomerate measures of perceived capability. Numerous studies have compared the relative predictiveness of domain-linked and global measures of perceived efficacy. The findings are consistent in showing that multifaceted measures have greater explanatory and predictive power than do omnibus ones (Bandura, in press). This raises the issue of whether the widespread use of global measures may be underestimating the influence of given psychosocial factors on developmental outcomes.

Much of the research on contributors to academic achievement assesses children's perceived capabilities in terms of self-concept of ability (Felson, 1984; Marsh & O'Neill, 1984). In path analytic tests, Pajares and Miller (1994) show that perceived self-efficacy is a much stronger predictor of academic achievement than is self-concept of ability, which makes only a marginal contribution. Other studies similarly document the value of specificity of self-efficacy assessment in explaining different facets of academic performance (Pajares & Miller, 1995). These findings call for refinement in how children's beliefs in their academic capabilities are conceptualized and assessed.

Belief in one's capability to exercise control over events that affect one's life is a protective factor against feelings of futility and despondency. However, all of the research linking perceived inefficacy to vulnerability to depression has been conducted with adults (Kavanagh, 1992; Maddux &

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Meier, 1995). The results of this study similarly show that children's beliefs that they can manage scholastic demands and have the social efficacy to form and maintain satisfying peer relationships enable them to withstand adversities with reduced risk of despondency. The replication of the affective consequences of perceived inefficacy across age lends support to the generality of the self-efficacy mechanism in depression.

That problem behaviors detract from academic achievement is in accord with a well-documented relationship (Hinshaw, 1992; Jessor et al., 1991). Of special interest, however, is the influential role played by moral disengagement in the pursuit of academic activities. Indeed, the influence of self-regulatory efficacy and prosocialness is partially mediated through this factor. When moral standards are disengaged from detrimental conduct it can be carried out free from restraints of anticipatory self-censure (Bandura et al., *in press*). Skill in self-exoneration for transgressiveness is clearly not conducive to engrossment in scholastic activities.

Although proneness to moral disengagement contributed independently to academic achievement and partially mediated the effects of self-regulatory efficacy and prosocialness, the mediated path through problem behavior in the aggregate was not found. Previous research has shown that proneness to moral disengagement predicts aggressive and delinquent conduct (Bandura et al., *in press*). The findings of Elliott and Rhinehart (1995) further corroborate the generality of the relation. Proclivity to moral disengagement retains its predictiveness for felony and misdemeanor assaults and thefts regardless of age, sex, race, religious affiliation, and social class. The relation between moral disengagement and problem behavior in the present study differed depending on the types of problem behaviors being measured. As would be expected, moral disengagement was accompanied by increased aggression and externalized problems but unrelated to anxiety, withdrawal, and other internalized problems.

The unrelatedness of perceived social efficacy and prosocial behavior is also probably due to the particular nature of the social activity assessed. It was confined to altruistic forms of behavior. People who have a high sense of social efficacy are good at forming social relationships (Holahan & Holahan, 1987a; Leary & Atherton, 1986; Wheeler &

Ladd, 1982), but it does not necessarily mean that they are highly altruistic. The evidence indicates that some are and some are not. The absence of a significant path between perceived social efficacy and peer preference also warrants some comment, especially given that a sense of social efficacy is known to promote social interactions. Peer preference, of course, measures whether one is held in high or low regard by one's peers, not how much one interacts with them. Peers do not form a homogeneous entity. They include social groupings that differ in their interests, values, standards of conduct, and the competencies they invest with importance. Predicting how perceived social efficacy should affect peer preference may, therefore, require information about the values of the prevailing peer clusters and the particular ones with whom given children affiliate. Popularity with dissocial peers may bring rejection from academically oriented peers. Thus, social efficacy may promote positive regard within one's reference group but low regard from peers who do not share the same values. This heterogeneity of peer liking suggests the need to consider the structure of peer relations and the patterns of selective association in the analyses of peer preferences.

A prosocial orientation reduces vulnerability to depression, but peer acceptance also serves as a protective factor. The latter path was not in the proposed model. Peer groups become a major socializing agency during early and later phases of adolescence. Whether children are held in high or low regard by their peers clearly has a significant impact on children's level of depression.

The finding that familial processes mediate the effect of socioeconomic status on children's academic development is in accord with studies of other developmental outcomes (Baldwin et al., 1989; Elder, 1995). However, parents' sense of efficacy that they can have some influence over their children's educational development was independent of their socioeconomic status. Parents had a higher sense of efficacy to promote their children's educability by fostering their interest in academic activities, linking cognitive development to future occupational options, monitoring their schoolwork, and keeping them out of trouble than to assist their children directly with their academic work. These types of promotive efforts are not confined to parents of high socioeconomic status. This is well documented by studies of children from econom-

ically impoverished backgrounds who went on to college and professional careers when it was uncommon to do so (Ellis & Lane, 1963; Krauss, 1964). In these families, the parents themselves could not provide the necessary resources and preparatory academic skills. However, parental valuation of education played a key role in setting the course of their children's educational development during their formative years. The academic values thus instilled were further developed by teachers. These evolving preferences led to selective association with college-oriented peers who, by their interest and example, promoted the attitudes, achievement standards, and cognitive skills conducive to intellectual pursuits.

There are several features of the present study that add to the reliability of the obtained relationships. Data for the different classes of variables were obtained by different methods and from different sources, thus reducing common biases that can inflate relationships. The self-efficacy and psychosocial predictors were measured prior to academic achievement. Moreover, a number of the key posited paths of influence have been previously verified, some through systematic experimental variations of efficacy beliefs (Bandura, 1992, in press). These features remove some of the ambiguity concerning the nature and direction of causation. Nevertheless, causality should be interpreted with caution because the processes were studied correlationally over the course of a single academic year. The present research is part of a larger longitudinal project. The impact of efficacy beliefs on mediating psychosocial factors and academic achievement and their reciprocal interplay will be further tested longitudinally in a multiple panel design.

The findings of this research have a number of educational applications. They document the importance of the educational vision parents hold for their children and the parents' sense of efficacy that they can help their children realize those aspirations. Moreover, the study contributes new knowledge about the psychosocial paths through which these influences flow. Many of the models for restructuring educational systems place heavy emphasis on bonding parents to schools and increasing parental participation in the intellectual lives of their children (Comer, 1988; Levin, 1991, 1993). It is easy to prescribe parental participation, but difficult to achieve it, especially with parents who believe they cannot wield any

influence on how school systems operate. The benefit of examining cognitive development within a self-efficacy framework is that this regulative belief system is embedded in a theory of human agency. The theory specifies the origins of efficacy beliefs, their structure, the mechanism through which they operate, their diverse effects, and the modes by which they can be developed (Bandura, in press). This operative knowledge provides explicit guidelines for interventions that have enhanced the cognitive functioning of children exhibiting severe academic deficits (Schunk, 1995) and enabled parents to perform their parenting role more effectively (Gross et al., 1995).

Another important educational implication concerns the paramount role of self-regulatory influences in educational self-development. Schools try to equip students with the intellectual tools, agentic self-beliefs, and self-regulatory capabilities to educate themselves throughout their lifetime. The accelerated pace of technological change and growth of knowledge are placing a premium on capability for self-directed learning. In the not too distant future, students will be educating themselves increasingly with multimedia instruction presented electronically by master teachers outside the confines of the school. The knowledge gap will widen between good and poor self-directed learners. Some of the most innovative and productive research in the educational field is designed to provide new insights into the determinants and mechanisms of self-directed learning (Brown, 1984; Paris & Newman, 1990; Schunk & Zimmerman, 1994; Weinstein & Mayer, 1986; Zimmerman & Schunk, 1989).

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 recognizing the utility of cognitive strategies (Brown, 1984; Paris, Cross, & Lipson, 1986; Weinstein & Mayer, 1986). Metacognitive training aids academic learning. However, students do not necessarily transfer the skills spontaneously to dissimilar pursuits. Nor do they always use the metacognitive skills with regularity (Deshler, Warner, Schumaker, & Alley, 1983; Tharp & Gallimore, 1985). Clearly, there is room for improvement. 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. Good self-regulators do much better academically than poor self-regulators after controls are applied for other possible determinants (Zimmerman & Martinez-Pons, 1986).

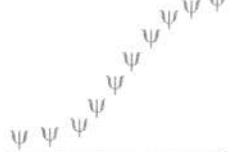
Self-regulatory skills will not contribute much if students cannot get themselves to apply them persistently in the face of difficulties, stressors, and competing attractions. Students' firm belief in their efficacy to manage their own motivation and learning activities provides the staying power and enhances performance accomplishments (Zimmerman & Bandura, 1994; Zimmerman et al., 1992). Knowledge gained from a broadened conception of self-regulation is now being fruitfully applied to the cultivation of academic self-directedness (Bandura, in press).

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Longitudinal Impact of Perceived Self-Regulatory Efficacy on Violent Conduct

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The present study examined the longitudinal impact of perceived self-regulatory efficacy and parental communication on violent conduct. Adolescents' perceived efficacy to resist peer pressure for transgressive activities counteracted engagement in violent conduct both directly and by fostering open communication with parents. Parental communication was linked to violent conduct concurrently but not longitudinally. There were

gender differences in level of engagement in violent activities, but the causal structures were the same. Perceived self-regulatory efficacy contributed to violent conduct both concurrently and longitudinally after controlling for prior level of violent conduct and openness of parental communication.

Keywords: Self-regulatory efficacy, familial communication, violent conduct.

A major concern of parents, teachers, and society at large centers on discovering early determinants of children's developmental trajectories with the goal of promoting socially valued life courses, and preventing detrimental or antisocial ones. Over the years much theorizing and research has been devoted to the major transition that occurs from childhood to adolescence, and the personal and social determinants governing successfulness of the developmental changes (Cairns & Cairns, 1994; Compas, Hinden, & Gerhardt, 1995; Furstenberg, Eccles, Elder, Cook, & Sameroff, 1999).

Much attention has been given to individual and situational factors operating in concert over time in predisposing individuals to lifestyles that jeopardize or foreclose beneficial life courses (Jessor, 1998; Magnusson, 1988; Robins & Rutter, 1993). The transition to adolescence presents special challenges, because adolescents have to manage major biological, educational, and social role transitions concurrently with growing independence. It is also a period of experimentations with risky activities and substance use (Elliott, 1993; Jessor, 1998), and lessening of parental monitoring.

Some authors contend that engagement in some forms of problem behavior is a normal aspect of adolescence, especially for boys (Caspi, 1993; Elliott, 1993). However, not all adolescents get deeply involved in high risk activities that give rise to detrimental lifestyles. The theoretical challenge is to explain why some adolescents remain deeply engaged in risky activities, whereas most give up risky experimentation (Bandura, 1997; Moffitt, 1993).

Some researchers have focused on temperament and global personality characteristics a predisposing to engagement in risky and transgressive behaviors on vulner-

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ability to environmental stressors (Caspi & Elder, 1988). Other researchers have highlighted the influence of the social environment mainly through familial and peer relationships (Brown, 1990; Collins, Maccoby, Steinberg, Hetherington, & Bornstein, 2000; Furstenberg, Eccles, Elder, Cook, & Sameroff, 1999; Sampson, 1992).

The findings of a number of studies lend support to the influential role of parental influences in the development of patterns of antisocial and violent behavior (Aseltine, 1995; Clark & Shields, 1997; Harter, 1999; Jessor, 1998; Patterson, Reid, & Dishion, 1992; Loeber & Hay, 1997). Low levels of parental guidance and support and poor communication and parental monitoring have been linked to adolescents' antisocial orientations that predict hostility and risk-taking in adulthood (Ary, Duncan, Duncan, & Hops, 1999; Barnes & Farrell, 1992; Fisher & Feldman, 1998; Kim, Hetherington, & Reiss, 1999; Juang & Silbereisen, 1999; Sholte, 1999).

As children advance through adolescence, they spend more time in the larger community outside the home. But this change does not diminish the importance of parental support. Parents continue to serve as important sources of guidance, support and trust (Scabini, Lanz, & Marta, 1999). The more parents encourage the expression of personal preferences and aspirations the more children turn to them for guidance and support. The more open the communication between parents and children the more parents can rely upon their children to report their activities outside the home and the more children are dissuaded from activities that would be disapproved by their parents. Positive family relations in adolescence can thus counteract gravitation to deviant peers, whose influence on adolescents' antisocial attitudes and proneness to violence is widely recognized (Emler, Reicher, & Ross, 1987; Thornberry, Krohn, Litzotte, & Chard-Wierschem, 1993).

A growing literature reveals that positive family relations help most adolescents to navigate safely through the important transitions toward adulthood despite the temptations of risky affiliations. The social cognitive theory guiding the present program of research has focused on personal determinants that enable young people to play a proactive role in charting their life course by selecting and structuring their environments in ways that cultivate competencies and set a successful course life (Bandura, 1997). According to this theory people are proactive and self-regulating agents whose psychosocial development takes place in transactions within a broad network of sociostructural and psychosocial influences. In these transactions individuals operate as producers and products of social systems.

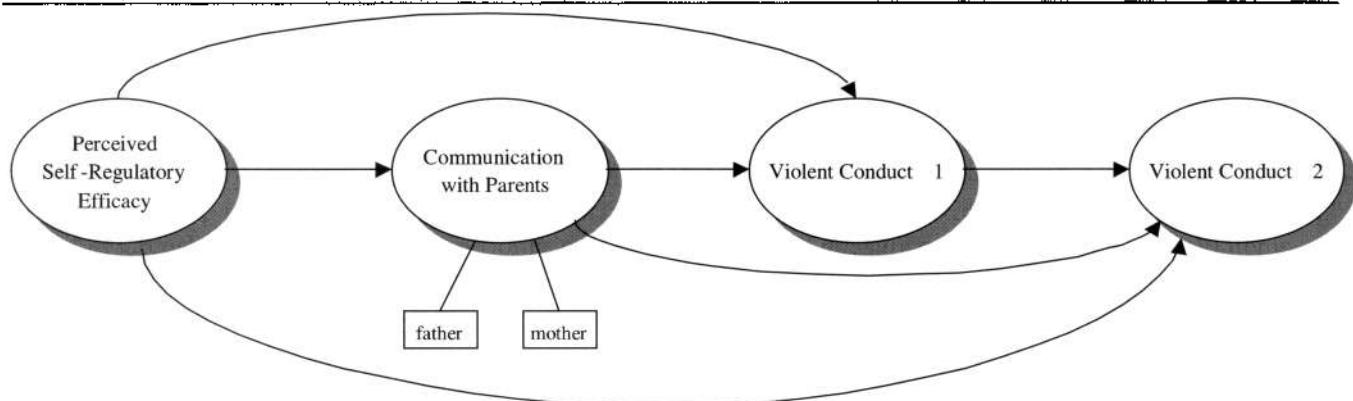
Among the mechanisms of agency, none is more central and pervasive than a sense of personal efficacy. Unless people believe they can produce desired results by their actions, they have little incentive to act or to persevere in the face of difficulties. Whatever other factors may operate as guides and motivators, they are rooted in the core belief that one has the power to produce effects by one's action.

Beliefs of personal efficacy are domain-linked structures that operate as part of the self system that gives unity, continuity, and coherence of personality (Bandura, 1999, 2001a). People build their sense of efficacy through mastery experiences, social modeling and the evaluative feedback of others. Efficacy beliefs affect personal development and functioning through their impact on cognitive, motivational, affective, and choice processes. The findings of diverse lines of research reveal that perceived self-efficacy operates as an influential regulatory factor in diverse spheres of functioning (Bandura, 1997; Maddux, 1995; Schwarzer, 1992).

According to social cognitive theory, 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 life (Allen, Leadbeater, & Aber, 1994; Bandura, 1997). The present research is part of an extended longitudinal project aimed at identifying the developmental determinants and mechanisms of social adaptation during the transitions from childhood to adolescence to adulthood.

Previous studies have verified the influence of multifaceted efficacy beliefs on academic achievement, prosocial behavior, career preference, depression and anti-social behavior (Bandura, Barbaranelli, Caprara, & Pastorelli, 1996, 2001; Bandura, Pastorelli, Barbaranelli, & Caprara, 1999; Caprara, Scabini, Barbaranelli, Pastorelli, Regalia, & Bandura, 1998; Caprara, Scabini, Barbaranelli, Pastorelli, Regalia, & Bandura, 1999). Efficacy beliefs do not operate in isolation from the social relations within which individuals are embedded. Rather, they operate in concert with social and environmental influences.

In a previous study with young adolescents, perceived efficacy to resist peer pressure for detrimental activities reduced antisocial conduct both directly and by fostering supportive parental communication, which, in turn, counteracted substance abuse and delinquency (Caprara et al., 1998). However, the pattern of relations was based on cross-sectional analysis. The present prospective research was designed to further understanding of

**Figure 1**

Posited causal structure through which perceived self-regulatory efficacy and communication with parents affect violent conduct concurrently and longitudinally.

how perceived self-regulatory efficacy affects antisocial conduct longitudinally within a network of familial influences, especially communication with parents. In contrast to the previous study, the adolescents were at a later phase of their development and their antisocial conduct involved more serious forms of violent conduct.

In the conceptual model guiding this longitudinal research, perceived self-regulatory efficacy was posited as a significant determinant of violent conduct in concert with communication with parents (Figure 1).

For reasons given earlier, it was hypothesized that perceived efficacy to resist peer pressures for transgressive activities would reduce engagement in violent conduct both directly and by fostering open communication with parents. By acting on beliefs that they can manage peer pressures, adolescents reduce the likelihood of engaging in violent conduct and feel free to discuss with their parents the predicaments they face outside the home. Open familial communication enables parents to provide guidance and social support, and identifies potential problem situations that may warrant some monitoring and control. Supportive parental communication, in turn, operates as a social safeguard against detrimental involvement in risky activities. By contrast, adolescents who have a weak sense of self-regulatory efficacy are not only less successful in resisting detrimental peer pressures, but are reluctant to discuss their transgressive activities with their parents. The influence of self-regulatory efficacy operating in concert with open communication would longitudinally reduce likelihood of violent actions. Given the differential opportunities and consequences for engaging in delinquent conduct for girls (Loeber & Stouthamer-Loeber, 1998), the

role of gender in the posited conceptual scheme was examined separately. Although boys were expected to engage more highly in delinquent conducts than girls, the posited paths of influence were hypothesized to be similar across gender.

Method

Participants

The participants were 350 adolescents with a mean age of 16 years in the initial phase of this longitudinal study and 18 years in the subsequent phase of the study. There were 170 boys and 180 girls.

The participants were drawn from high schools in a residential community located near Rome. The community represents a socioeconomic microcosm of the larger society, containing the families of skilled workers, farmers, professionals, local merchants and their services staff. The adolescents were contacted by phone and invited to participate in the study, for which they received a small payment. Ninety-five percent of the adolescents agreed to participate in the study. They were administered the set of scales measuring the variables of theoretical interest by three female researchers during specially scheduled sessions in the school to groups of about 30 participants.

Self-Regulatory Efficacy

Adolescents' perceived self-regulatory efficacy to resist peer pressure to engage in high-risk activities that can get them into trouble was measured by thirteen items.

Table 1

Means, standard deviations, and interrelations matrix for self-regulatory efficacy beliefs, familial communication and adolescents' violent behavior assessed concurrently and longitudinally.

	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	1	2	3	4	5
	Males		Females						
1. Perceived Self-Regulatory Efficacy	3.79	.69	4.32	.58	—	.19*	.26**	-.34**	-.29**
2. Open Communication with Mother	36.32	6.78	38.37	7.09	.30**	—	.65**	-.29**	-.08
3. Open Communication with Father	35.63	6.83	35.38	8.48	.22**	.77**	—	-.24**	-.10
4. Violent behavior 1	17.19	6.92	12.56	3.34	-.36**	-.25**	-.20**	—	.42**
5. Violent behavior 2	17.64	6.92	12.91	4.10	-.39**	-.24**	-.19**	.47**	—

Notes: Correlation coefficients for boys ($N = 170$) are below the diagonal, those for girls ($N = 180$) are above the diagonal. Violent behavior scores were normalized by logarithmic transformation. * $p < .05$, ** $p < .01$

For each item, participants rated on a 5-point scale their beliefs in their level of efficacy to withstand pressure to engage in the designed activity. Examples: "How well can you resist peer pressure to use drugs?" and "How well can you resist peer pressure to do things in school that can get you into trouble?" This set of items was shown in factor analysis to be a separate factor in a larger set of multifaceted self-efficacy scales (Bandura et al., 1996). The α reliability coefficient of the scale was .75.

Open Communication with Parents

Communication with parents was measured by a 10-item subscale from the 20-item Parent-Adolescent-Communication Scale developed by Barnes and Olson (1982) to assess adolescents' open and problematic communication with both parents. The adolescents rated, on a 5-point scale, the extent to which they felt free to discuss problems with their parents and that they would respond in an understanding, supportive way. Examples: "If I were in trouble, I could tell my mother/father," and "It is very easy for me to express all my true feelings to my mother/father." Factor analysis confirmed a two-factor structure of the scale: one factor representing open communication and the other problematic communication. In the present study only the open communication subscale was used. The α reliability coefficient of the sub-scale was .83 for communication with both mother and the father.

Violent Conduct

The extent to which the adolescents engaged in violent conduct was assessed by 11 items (Caprara, Mazzotti, & Prezza, 1990). For each item adolescents rated on a 6-point scale how often they engaged in violent actions,

such as fighting, vandalism, or used weapons. Examples: "Have you participated in violent actions of 'gangs'?" and "Have you ever had the occasion to use violence when there are arguments?" Factor analysis confirmed the presence of a single factor. The α coefficient was .91 in the initial phase of assessment and .89 for the second assessment, two years later.

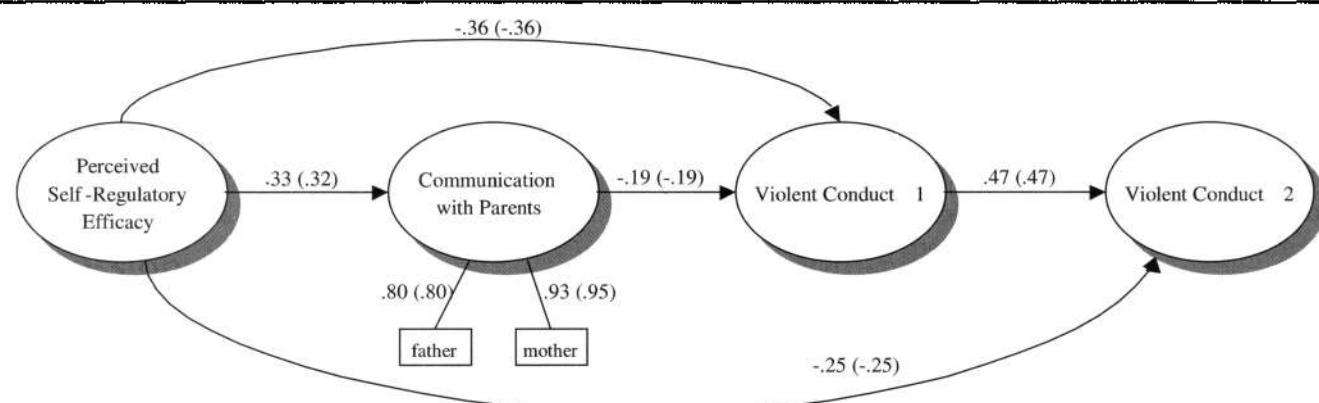
Results

Table 1 presents the means and the standard deviations for the different set of variables and the matrix of relations among them.

One-way ANOVAS of gender variations revealed significant sex differences on all the variables except open communication with father. The degrees of freedom for these analysis are $df = 1,348$. Compared to boys, girls had a stronger sense of self-regulatory efficacy ($F = 50.25, p < .001$), and reported better communication with their mothers ($F = 7.64, p < .005$). Boys engaged in more violent activities both in time 1 ($F = 50.25, p < .001$) and time 2 ($F = 70.42, p < .001$) than did the girls.

The pattern of relationships among the variables was examined by means of structural equation modeling (Bollen, 1989) using the EQS program (Bentler, 1995). 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 sample of boys and girls. Figure 1 presents the results of the structural equation modeling.

As shown in Figure 2, for both boys and girls, perceived self-regulatory efficacy reduced the likelihood of violent conduct concurrently and longitudinally both di-

**Figure 2**

Path analysis of the patterns of influence through which perceived self-regulatory efficacy and communication with parents affect violent conduct. The first path coefficient on each of the structural links is for boys; the second coefficient in brackets is for girls. All the coefficients are significant beyond the $p < .05$ level.

rectly and mediational through enhanced communication with parents. Open communication with parents operated as a protective influence for violent behaviors concurrently but did not affect violent conducts over time. The causal structure was the same for boys and girls.

The model provided an excellent fit to the empirical data as shown by several goodness of fit indices considered. These tests yielded a nonsignificant $\chi^2 (15, 350) = 13.45$, $p = .56$, a comparative fit index (CFI) of 1.00, a nonnormed fit index of 1.00 and RMSEA of .00. The model accounted for 21% of the variance in Time 1 violence for both boys and girls, and 38% of the variance in Time 2 violent conduct for boys, and 37% of the variance in the girls.

Alternative causal models were also tested. In one model, prior violence is assigned causal primacy affecting later violence directly and through its impact on regulatory self-efficacy and parental communication. The second model confers causal primacy on communication with parents, which affects violence concurrently and longitudinally both directly and through self-regulatory efficacy. These alternative models provided a satisfactory fit to the empirical data. However, there are two consistent findings across the alternative causal structures. Communication with parents counteracted engagement in violent conduct concurrently, but had no enduring effect over time. By contrast, perceived self-regulatory efficacy predicted violent conduct both concurrently and longitudinally, regardless of whether it was assigned causal primacy or whether familial communication or prior violent conduct were considered to be the precursors of subsequent violent conduct.

Discussion

The findings of this prospective study lend additional support to the influential role of perceived self-regulatory efficacy in counteracting violent conduct over the course of adolescence. These findings corroborate and extend the paths of influence previously found concurrently (Caprara et al., 1998). Regardless of where self-efficacy was placed into the causal structure, it consistently predicted violent conduct both concurrently and longitudinally for boys and girls alike. It made independent contribution to violent conduct after controlling for the influence of the other determinants, including prior violent conduct and openness of parental communication.

Beliefs of efficacy to resist peer pressure had a longitudinal impact on engagement on violence both directly and through the mediation of communication with parents. To the extent that open communication with parents promotes mutual confidence and reciprocal commitments, adolescents are less inclined to seek to prove their identity by challenging parental guidance either through involvement in high risk or by joining deviant peers. In contrast, adolescents who have low efficacy to resist peer pressure for risky activities do not talk with their parents about what they are doing outside the home. This shuts out a source of assistance on how to manage an expanding social world centered heavily around peers, some of whom get themselves into highly risky situations. Boys and girls differed in their level of engagement in violent activities, but, in accord with prediction, the causal structures were the same.

Contrary to expectation, parental communication was related to violent conduct only concurrently. There are several factors that may account for the lack of a significant longitudinal link. One possible explanation is the reduction over time for the need for parental monitoring and guidance. This is shown in a research examining familial factors that deter development of aggressive lifestyles (Bandura & Walters, 1959). By late adolescence the youngsters had adopted the parental prosocial standard of conduct and were quite capable for guiding and assuming responsibility for their own conduct outside the house. The parents had trust in their sons' judgment and felt that external monitoring and guidance were, therefore, largely unnecessary.

In the present study we measured the extent to which parents talk freely with their adolescents about matters of concern to them but not the specific content of their conversations. Examinations of the quality of the familial transactions and parents' sense of efficacy that their efforts can make a difference in their children management of predicaments outside the home is important to a full understanding of the enabling and protective function of open familial communication. Thus, an appropriate next step in this research is to examine the kinds of social predicaments the adolescents divulge and the types of guidance the parents provide. In the spheres of academic and occupational development, the parents own sense of efficacy enhances their impact on their children's developmental course (Bandura et al., 1996, 2001). Perceived parental efficacy to help their adolescents to manage the social and moral dilemmas they face outside the home may shed further light on how well they navigate the transition to adulthood.

Another fruitful direction in which to extend this research is to examine the role of perceived collective efficacy of families to manage the challenges of adolescents' transitional development. Social cognitive theory extends the conception of agentic causality to collective agency exercised through people's shared belief in their efficacy to affect the quality of their lives (Bandura, 1997, 2000). A growing body of research shows that the higher the perceived collective efficacy the greater the groups' investment in their undertakings, the stronger their staying power in the face of impediments and adversities, and the greater their accomplishments.

The family operates as a social system with multiple interlocking relationships, rather than simply as a collection of members. We have devised a large set of efficacy scales that measure the perceived capabilities of the family as a whole to carry out the various familial functions that promote achievement of the developmental tasks

that adolescents face. Some of the assessments concern adolescents' perceived efficacy to manage different aspects of their relationship with their parents. Results of preliminary research indicate that adolescents' perceived family efficacy predicts their prosocial and anti-social conduct independently of family variables like communication and styles of familial conflict (Regalia, Pastorelli, Barbaranelli, & Gerbino, in press). Analysis of perceived efficacy to manage dyadic family relationships and the families' perceived capabilities to promote each others' well-being hold promise of furthering understanding of how perceived collective family efficacy shapes the course of adolescent development.

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