

Regulatory Focus and Strategic Inclinations: Promotion and Prevention in Decision-Making

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A promotion focus is concerned with advancement, growth, and accomplishment, whereas a prevention focus is concerned with security, safety, and responsibility. We hypothesized that the promotion focus inclination is to insure hits and insure against errors of omission, whereas the prevention focus inclination is to insure correct rejections and insure against errors of commission. This hypothesis yielded three predictions: (a) when individuals work on a difficult task or have just experienced failure, those in a promotion focus should perform better, and those in a prevention focus should quit more readily; (b) when individuals work on a task where generating any number of alternatives is correct, those in a promotion focus should generate more distinct alternatives, and those in a prevention focus should be more repetitive; and (c) when individuals work on a signal detection task that requires them to decide whether they did or did not detect a signal, those in a promotion focus should have a “risky” response bias, and those in a prevention focus should have a “conservative” response bias and take more time to respond. These predictions were supported in two framing studies in which regulatory focus was experimentally manipulated independent of valence.

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A strategy refers to a pattern of decisions in the acquisition, retention, and utilization of information that serves to meet certain objectives, i.e., to insure certain forms of outcome and to insure against certain others.

Bruner, Goodnow, & Austin (1956, p. 54)

Probably no motivational principle has received more attention than the hedonic principle that people approach pleasure and avoid pain. Biological models have

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distinguished between the appetitive system involving approach and the defensive or aversive system involving avoidance (e.g., Gray, 1982; Konorski, 1967; Lang, 1995). Models in personality and social psychology have distinguished between the motive to move toward desired end-states and the motive to move away from undesired end-states (e.g., Atkinson, 1964; Bandura, 1986; Carver & Scheier, 1981, 1990; Lewin, 1935, 1951; McClelland, Atkinson, Clark, & Lowell, 1953; Roseman, 1984; Roseman, Spindel, & Jose, 1990). But it is not only hedonism that underlies approach and avoidance strategies. The present paper considers the approach and avoidance strategies that derive from an independent principle of motivation, “regulatory focus,” and examines their implications for decision-making while problem-solving.

A self-regulatory system can have either a desired or an undesired end-state functioning as the reference value. The system attempts to move the current actual-self state as close as possible to a desired end-state and as far away as possible from an undesired reference point. Carver and Scheier (1981, 1990) refer to the former discrepancy-reducing system as an approach system and the latter discrepancy-amplifying system as an avoidance system. They also suggest that the discrepancy-reducing system is more common than the discrepancy-amplifying system. Higgins, Roney, Crowe, and Hymes (1994) proposed that there are two alternative means or strategies for accomplishing discrepancy reduction—approach actual self states that match the desired end-state or avoid actual self states that mismatch the desired end-state. A person who wants to get a good grade on a quiz (a desired end-state), for example, could either study hard at the library the day before the quiz (approaching a match to the desired end-state) or turn down an invitation to go out drinking with friends the night before the quiz (avoiding a mismatch to the desired end-state). Thus, different approach and avoidance strategies can be used in the service of the same general approach system. Higgins

et al. (1994) proposed that individuals' chronic self-regulation in relation to different types of desired selves exemplifies this strategic distinction.

Self-discrepancy theory (Higgins, 1987) distinguishes between two types of desired end-states: (a) ideal self-guides, which are individuals' representations of someone's (self or other) hopes, wishes, or aspirations for them; and (b) ought self-guides, which are individuals' representations of someone's beliefs about their duties, obligations, and responsibilities. Self-regulation in relation to either ideal or ought self-guides is discrepancy-reducing and involves approach at the general system level. Higgins et al. (1994) proposed, however, that ideal and ought self-regulation differ in their strategic inclination.

Actual self congruencies to hopes, wishes, or aspirations represent the presence of positive outcomes whereas discrepancies represent the absence of positive outcomes. Thus, the psychological situations involved in ideal self-regulation are the presence and absence of positive outcomes (see Higgins, 1989). Unlike hopes, wishes, and aspirations that function like maximal goals, duties, obligations, and responsibilities function more like minimal goals (see Brendl & Higgins, 1996). These are goals that a person must attain or standards that must be met. When strong enough, such as biblical commandments, oughts can even function like necessities. Discrepancies to such minimal goals represent the presence of negative outcomes whereas congruencies represent the absence of negative outcomes (see Gould, 1939; Rotter, 1982). Thus, the psychological situations involved in ought self-regulation are the absence and presence of negative outcomes.

Higgins et al. (1994) proposed that the concern of ideal self-regulation with positive outcomes (their presence and absence) should engender an inclination to *approach matches* to hopes and aspirations as a strategy for ideal self-regulation. In contrast, the concern of ought self-regulation with negative outcomes (their absence and presence) should engender an inclination to *avoid mismatches* to duties and obligations as a strategy for ought self-regulation. In one of their studies, Higgins et al. (1994) tested these predictions by first asking undergraduates to report either on how their hopes and aspirations have changed over time (to prime or activate ideal self-guides) or on how their duties and obligations have changed over time (to prime ought self-guides). Next, the participants read about several episodes that occurred over a few days in the life of another student, completed a filler task, and then tried to remember the episodes in a free recall task. The episodes all described the target as trying to experience a desired end-state but varied in the strategy used, as in the following examples: (a) "Because I wanted to be

at school for the beginning of my 8:30 psychology class which is usually excellent, I woke up early this morning." [approaching a match to a desired end-state]; and (b) "I wanted to take a class in photography at the community center, so I didn't register for a class in Spanish that was scheduled at the same time." [avoiding a mismatch to a desired end-state]

As predicted, the participants remembered episodes that exemplified approaching matches to desired end-states significantly better when ideal versus ought self-regulation was activated, whereas they remembered episodes that exemplified avoiding mismatches to desired end-states significantly better when ought versus ideal self-regulation was activated. A second study found that individuals with strong ideal self-regulation versus strong ought self-regulation selected different tactics when asked about their strategies for friendship, with the former selecting tactics that involved approaching matches (e.g., "Be supportive to your friends. Be emotionally supportive") and the latter selecting tactics that involved avoiding mismatches (e.g., "Stay in touch. Don't lose contact with friends").

The results of this and other studies (see Higgins et al., 1994; Higgins & Tykocinski, 1992) supported the proposal that ideal self-regulation involved a concern with positive outcomes (presence and absence) and a predilection for approach means to obtain desired end-states, whereas ought self-regulation involved a concern with negative outcomes (absence and presence) and a predilection for avoidance means to obtain desired end-states. But more generally, ideal and ought self-regulation can be considered as involving two types of *regulatory focus* (see Higgins, 1996a). Ideal self-regulation has a *promotion focus* whereas ought self-regulation has a *prevention focus*. To appreciate better the nature of these two types of regulatory focus, their hypothesized involvement in self-guide acquisition will be described briefly (for a fuller discussion of socialization processes, see Higgins, 1996a).

The child experiences the presence of positive outcomes when caretakers, for example, encourage the child to overcome difficulties or set up opportunities for the child to engage in rewarding activities, and the child experiences the absence of positive outcomes when caretakers, for example, take away a toy when the child refuses to share it or stop a story when the child is not paying attention. The caretaker's message to the child in both cases is that what matters is attaining accomplishments or fulfilling hopes and aspirations, but it is communicated in reference to either a desired or an undesired state of the child—either "This is what I would *ideally* like you to do" or "This is *not* what I would ideally like you to do". The regulatory focus is one of

promotion, i.e., a concern with advancement, growth, accomplishment.

In contrast, the child experiences the absence of negative outcomes when caretakers, for example, train the child to be alert to potential dangers or teach the child to "mind your manners," and the child experiences the presence of negative outcomes when caretakers, for example, yell at the child when he or she does not listen or criticize the child when he or she makes a mistake. The caretaker's message to the child in both cases is that what matters is insuring safety, being responsible, and meeting obligations, but it is communicated in reference to either a desired or an undesired state of the child—either "This is what I believe you *ought* to do" or "This is *not* what I believe you ought to do." The regulatory focus is one of *prevention*, i.e., a concern with protection, safety, responsibility.

These caretaker-child interactions occur over long periods and consist of a child's significant other communicating about the child's contingencies in the world. The different messages engender ideal self-regulation involving a promotion focus concerned with advancement, growth, accomplishment or ought self-regulation involving a prevention focus concerned with protection, safety, responsibility. But regulatory focus should *not* be limited to such chronic individual differences. After all, momentary situations should also be capable of temporarily inducing either a promotion focus or a prevention focus. Just as the responses of caretakers to their children's actions provide feedback to the children about how to attain desired (rather than undesired) end-states, feedback from a boss or a teacher communicates to an employee or a student, respectively, how to attain desired end-states. And such feedback can occur in a momentary situation without there being a long history or strong relationship between the interactants. Thus, promotion or prevention *feedback*, whether it concerns a desired state (positive feedback) or an undesired state (negative feedback), should be capable of inducing a temporary state of regulatory focus that influences motivation.

This possibility was tested in a recent study by Roney, Higgins, and Shah (1995). Undergraduate participants worked on a set of anagrams that included both solvable anagrams and unsolvable anagrams. The participants were given 45 s to solve each anagram but they could quit before the time was up. Success or failure feedback was given after each problem. Half of the participants received promotion focus feedback, such as "Right, you got that one" (presence of positive) when they solved an anagram or "You didn't get that one right" (absence of positive) when they did not solve an anagram. The other half of the participants received prevention focus feedback, such as "No, you missed that one" (presence

of negative) when they did not solve an anagram and "You didn't miss that one" (absence of negative) when they solved an anagram. After the first trial in which feedback was given, the participants immediately performed a second trial without feedback. The results for this trial are of special interest because there was no longer feedback but a regulatory focus had been induced from the first trial. For the unsolvable anagrams, the study found that participants with a prevention focus quit before the time was up on 19% of the problems, whereas participants with a promotion focus quit on only 4% of the problems.

The results of this study suggest that feedback is capable of inducing temporarily either a promotion focus or a prevention focus, and this in turn can influence motivation to persist on a task. But feedback is not the only situational variable that should be capable of inducing different types of regulatory focus. To use again the analogy of caretaker-child interactions, it should be possible to induce a regulatory focus with instructions that present a *task contingency* concerning which actions produce which consequences, i.e., how to attain desired (versus undesired) end-states. This possibility was tested in a second study by Roney et al. (1995) on motivational persistence.

Undergraduate participants were told that they would perform two tasks. For everyone the first task was an anagrams task that included both easy anagrams pretested to be solvable by everyone and unsolvable anagrams. All of the participants were told that the second task would be either a computer simulation of the popular "Wheel of Fortune" game or a task called "unvaried repetition" described in such a way as to appear very boring. Although the performance contingency for playing the fun game rather than the boring game as the second task was the same for everyone, the framing of the contingency was experimentally varied.

Half of the participants were given a promotion focus in which they were told that if they solved 22 (or more) out of the 25 anagrams they would get to play the "Wheel of Fortune" game, otherwise they would do the "unvaried repetition" task. The other half of the participants were given a prevention focus in which they were told that if they got four (or more) out of the 25 anagrams wrong, they would do the "unvaried repetition" task, otherwise they would play the "Wheel of Fortune" game. The time participants spent working on the unsolvable anagrams was recorded. Consistent with the results of the first study described earlier, this study found that participants with a promotion focus persisted over one-third longer on the unsolvable anagrams than participants with a prevention focus.

The results of these two recent studies suggest that

regulatory focus can be induced situationally and influence motivation. Thus, regulatory focus is not just an individual difference variable relevant to chronic personal predilections. Rather, it concerns different self-regulatory states. Individuals can be chronically predisposed to experience a particular state or it can be induced in them temporarily by properties of the current situation. In either case, individuals in a promotion focus state versus a prevention focus state will have different strategic inclinations. Let us reconsider, then, the nature of this difference in strategic inclinations.

A promotion focus is concerned with advancement, growth, accomplishment. Goals are hopes and aspirations. The strategic inclination is to make progress by approaching matches to the desired end-state. In contrast, a prevention focus is concerned with security, safety, responsibility. Goals are duties and obligations or even necessities. The strategic inclination is to be prudent and precautionary and avoid mismatches to the desired end-state. Given these differences, one would expect that people's self-regulatory states would be different when their focus is promotion versus prevention. With a promotion focus, the state should be *eagerness* to attain advancement and gains. With a prevention focus, the state should be *vigilance* to assure safety and nonlosses.

How might a state of eagerness versus a state of vigilance impact strategic inclinations? In signal detection terms (e.g., Tanner & Swets, 1954; see also Trope & Liberman, 1996), individuals in a state of eagerness from a promotion focus should want, especially, to accomplish "hits" and to avoid errors of omission (i.e., a loss of accomplishment). In contrast, individuals in a state of vigilance from a prevention focus should want, especially, to attain correct rejections and avoid errors of commission (i.e., making a mistake). Thus, to use Bruner et al.'s (1956) classic terminology cited earlier, the promotion focus inclination is to insure hits and insure against errors of omission, whereas the prevention focus inclination is to insure correct rejections and insure against errors of commission.

How might these different strategic inclination impact behavior on an anagram task as used by Roney et al. (1995)? An anagram task requires participants to find one or more words hidden in a letter string. Success at finding a word would be a correct acceptance or "hit" whereas failure to find a word would be an error of omission. On this task, then, the promotion focus individuals should be eager to find words ("hits") and to avoid omitting any possible words. This should yield high persistence and a strong desire to find words following a failure to find any. In contrast, the prevention focus individuals should be vigilant against nonwords and want to avoid committing the error of producing them. When difficulty

is experienced, this orientation might motivate quitting to avoid explicitly committing an error.

The findings of Roney et al. (1995) need to be reconsidered in light of this analysis. The unsolvable anagrams in their studies appeared among the first few problems, and thus the participants experienced failure early on in the tasks. This early failure experience might have been necessary to produce the regulatory focus difference that was found. One of the aims of our first study was to examine directly for the first time whether anagram performance on solvable anagrams is better with a promotion focus than a prevention focus only when participants are experiencing difficulty. A new "embedded figures" task was also included in our first study in order to consider this possibility more generally. It was expected that individuals in a prevention focus would quit an especially difficult hidden figure before the time limit was up in order to avoid committing a mistake, whereas individuals in a promotion focus would persist longer to prolong the opportunity for a "hit." To broaden our examination of this issue still further, an additional counting backward task was also included that had an easy sequence followed by a difficult sequence. It was expected that a performance advantage of the promotion focus would emerge only during the difficult sequence.

A more central purpose of our first study (as well as the second study) was to address a limitation of the Roney et al. (1995) studies that is evident in the general literature as well. In manipulating regulatory focus, the first "feedback" study controlled for valence by including both positive and negative feedback within each regulatory focus condition. The second "task contingency" study confounded regulatory focus and valence by framing the contingency positively for the promotion focus and negatively for the prevention focus. To address this limitation, the present studies used the "task contingency" paradigm and independently manipulated *both* the regulatory focus *and* the valence of the contingency framing. Thus in the context of contingency framing, the present studies examine for the first time how regulatory focus as one motivational principle and valence or hedonic value as a separate motivational principal influence strategic inclinations, both independently and in combination.

The other major aim of the present studies was to investigate an additional implication of the hypothesized strategic inclinations that has not previously been examined. Specifically, one would expect differences in the strategic motivation to generate alternatives. Some tasks allow people to produce few or many alternatives without penalty. On a sorting task, for example, individuals could use the same criterion, such as color, to sort a set of fruits and to sort a set of vegetables or they could

use different criteria, such as color for the fruits and shape for the vegetables. Either strategy is considered correct. The requirement is only that the sorting criterion be consistent across all members of a category. Thus, individuals can reduce the likelihood of making a mistake and still be correct by simplifying the task, such as sticking to one criterion for both categories. Individuals in a vigilant state from a prevention focus want to avoid errors of commission and thus should be inclined to be repetitive. In contrast, individuals in an eager state from a promotion focus want to accomplish "hits" and thus should be inclined against a strategy that omits alternatives. Thus, when the task permits, one would expect such individuals to use different criteria.

This hypothesized difference in strategic inclinations for considering alternatives was tested in our first study by including two additional tasks among the initial set of tasks. One of these tasks was a sorting task like the one just described. A second task was a characteristic listing task that permitted generating many different alternatives. Participants are presented with the names of furniture objects, such as desk, couch, or bed, and are asked to write down all of the characteristics they can think of for each object. It was hypothesized that individuals with a promotion focus, compared to individuals with a prevention focus, would be more fluent in listing unique characteristics for the different members of a category because of their stronger strategic inclination to generate many different alternatives when possible. In contrast, individuals with a prevention focus, who are inclined to avoid errors of commission, should be more repetitive than individuals with a promotion focus (controlling for fluency).

The first study examines performance when experiencing difficulty and generating alternatives. Each of these measures permits a test of the proposal that individuals in an eager state from a promotion focus are inclined to insure hits and insure against errors of omission, whereas individuals in a vigilant state from a prevention focus are inclined to insure correct rejections and insure against errors of commission. Given that this proposal was inspired by a signal detection analysis, it would be reasonable to test it as well with a signal detection task. This was the aim of our second study which examined decisions on a recognition memory task.

STUDY 1

Method

Participants

Columbia University undergraduates were paid to complete a battery of questionnaires. Of those who had appropriately filled out the critical questionnaires for

the study, 138 were randomly selected and scheduled to participate as paid subjects in the experiment that took place approximately two months after the battery.

Materials

As part of the battery completed weeks before the experiment, all participants filled out the Task Rating Questionnaire and the Selves Questionnaire.

Task rating questionnaire. This questionnaire asks respondents to rate 16 tasks or activities on a 7-point Likert scale, from -3 (Dislike Very Much) to +3 (Like Very Much). The tasks included such activities as solitaire, alphabetizing, playing a video game, proof-reading, transcribing audiotapes, and playing blackjack ("21"). Each participant's most liked task and least liked task were selected from their ratings to be used as part of the experimental framing to be described later.

Selves questionnaire. This questionnaire asks respondents to list up to 8 or 10 attributes for each of three different self-states: (a) their actual self, the kind of person they believe they actually are; (b) their ideal self, the kind of person that someone (self or other) would ideally like them to be, someone's hopes, wishes, and aspirations for them; and (c) their ought self, the kind of person that someone (self or other) believes they ought to be, someone's beliefs about their duties, obligations and responsibilities. The questionnaire is administered in two sections, the first involving the respondent's own standpoint and the second involving the standpoints of the respondent's significant others (i.e., mother and father). The magnitude of the self-discrepancy between the actual self and each of the ideal and ought self-states is calculated by summing the total number of mismatches with the actual self, then subtracting the total number of matches with the actual self (see Higgins, Bond, Klein, & Strauman, 1986). Because the present studies were concerned with how situationally-induced regulatory focus influences strategic inclinations, we wanted to control for the effects of chronic strategic predispositions. Thus, the different self-discrepancies were included as covariates in the multiple regression analyses.

Mood questionnaire. During the experimental session, measures of participants' mood were taken to check on whether the experimental framing manipulation itself or the tasks themselves had emotional effects. We did not expect to produce changes in emotions because the participants were given no feedback about their level of performance and, indeed, there was no right or wrong answer on two of the five tasks used. Still, we were concerned about this possibility because

any change in the participants' mood might itself influence their strategic inclinations. The mood measures permitted us both to check on and to control for this possibility. Mood was assessed three times—once at the very beginning of the experimental session, once about halfway through the study (i.e., after the sorting task), and again at the very end of the session.

The Mood Questionnaire contained 16 different mood terms. Because ideal self-regulation produces cheerfulness/dejection-related emotions whereas ought self-regulation produces quiescence/agitation-related emotions (see Higgins, 1996b), the mood questionnaire was constructed to include positive and negative items from each of these two emotional dimensions: (a) cheerfulness-related feelings (happy, upbeat and satisfied); (b) dejection-related feelings (discouraged, sad, and disappointed); (c) agitation-related feelings (uneasy, tense, and worried); and (d) quiescence-related feelings (calm, secure, and relaxed). The remaining four mood terms were general feelings unrelated to these two emotional dimensions. Most of the mood terms were taken from two mood factors in the Semantic Differential Mood Scale (Lorr and Wunderlich, 1988)—Cheerful–Depressed, and Relaxed–Anxious. Some more extreme items (e.g., gloomy) were changed to less extreme items (e.g., discouraged). For each mood term, the respondents were asked to indicate which extent rating “best describes HOW YOU FEEL RIGHT NOW” on a 5-point Likert scale that ranged from 0 (Not at all) to 4 (Very).

All of the participants worked on the following five tasks in the order listed:

Characteristic listing. This task was based on an attribute listing task employed by Mikulincer, Kedem, and Paz (1990). Participants were presented with the names of eight objects, each on a separate sheet of paper, and were told to write down all of the characteristics they could think of for each object. Participants were given 1 1/2 min per object. They completed the pages in the order presented, and could not look forward or backward at pages other than the one they were working on. The eight objects, on eight different pages, were (in order of appearance): desk, couch, bookcase, table, cabinet, bed, chair, mirror. All objects were members of the superordinate semantic category of furniture as determined by Rosch (1975).

Counting backwards. Participants in this task verbally counted backwards from a given number by an assigned decrement. They were given 1 min in which to do so, and were told that the purpose of the task was to see how many numbers they could get in a minute. They performed this task two times. The first trial involved decrements of 6, which is relatively easy, and

the second trial involved decrements of 9, which is relatively difficult.

Sorting. This task was based on a sorting task employed by Mikulincer, Kedem, and Paz (1990). Participants were given a set of 12 members of a given category, and were instructed to sort or separate this set of items into subgroups according to a single criterion or dimension which made sense to them. They first sorted a list of fruits and then sorted a list of vegetables. Only the names of the items appeared on each page—no pictures were included. The fruits and vegetables listed were all members of the semantic categories as determined by Rosch (1975). The twelve fruits were [listed in order]: orange, strawberry, banana, pear, lime, pineapple, apple, grapes, blueberry, raspberry, watermelon, plum. The twelve vegetables were [listed in order]: peas, cucumbers, green beans, spinach, eggplant, corn, lettuce, beets, celery, carrots, green peppers, broccoli. There was no time limit, and there were no restrictions on the number of subgroups or the number of items per subgroup. The only stipulation was that the subgroups represent different values on the same dimension (e.g., fruits of different colors). After completing the second page in which they sorted vegetables, the participants were asked on the third page to write down as many *different* criteria as they could think of, as many dimensions as possible, for separating the same set of 12 vegetables into subgroups, excluding the dimension they had used to sort the vegetables on the previous page. They were allowed as much time as they needed to complete this exercise.

Embedded figures. This task was developed by Witkin, Oltman, Raskin, and Karp (1971; see also Ruebush, 1960). As described by them, the participant's “task on each trial is to locate a previously seen simple figure within a larger complex figure which has been so organized as to obscure or embed the sought-after simple figure (p. 3).” The simple and complex figures were geometric shapes that fit on 3" × 5" cards. The simple design was always present in the complex one. Additionally, the simple figure was always right side up and had the same size inside the complex figure. Three minutes (180 s) was allotted for each figure. Given that the norms for college students fall in the range of 46 to 70 s per figure for this test (Witkin et al., 1971), this was considered to be an ample amount of time for participants to work on each figure. The participants were given seven embedded figures. Six of the figures were in color and one was in black and white. Pretesting of the figures had indicated that the black and white figure was clearly the most difficult. This difficult figure

permitted a test of persistence by measuring the percentage of participants in each condition who quit working on the figure.

Anagrams. The participants were asked to complete four anagrams, one per page. The instructions were to complete the pages in order, and the participants were not allowed to return to a page once they had completed it. There was no time limit per page. The four anagrams, in order, were: “cleets”, “tisrnp”, “tohcass” and “wderra”. The first two had two solutions each, and the last had four solutions. The third anagram was unsolvable. Participants were told that each anagram could have multiple solutions or no solution. Before beginning, the participants were given a practice anagram that was easier than the task anagrams.

Procedure

Upon arriving at the experimental session, the participants were asked to complete the Mood Questionnaire. They were told that studies have shown that mood can influence performance and such effects would interfere with the aims of our research. Thus, we would like to determine whether mood is influencing performance on our study so that we can correct for it if it is.

Using the participants' earlier idiographic responses to the Task Rating Questionnaire, one activity was selected for the experiment that a participant clearly liked and another was selected that the participant clearly disliked. After completing the Mood Questionnaire, the participants were told that they would first perform an initial set of five exercises [the experimental tasks described above] and then they would be assigned a final task. The liked activity (e.g., playing a video game) and the disliked activity (e.g., proofreading) were each fully described as an alternative final task that a participant might perform. Props related to a participant's alternative final task were also included (e.g., a deck of cards for solitaire) to convince participants that either of these tasks could be their final task. The debriefing at the end of the experimental session indicated that the participants believed that they would perform one of these tasks during the session.

Four of the experimental framing conditions were *contingency* conditions in which participants were told that which of the alternative final tasks they would work on at the end of the session depended on their performance on an initial set of five exercises [the five experimental tasks providing the dependent measures]. The relation between the initial set of exercises and the final task was described as contingent for everyone, but the framing varied in different conditions as a function of both regulatory focus and valence. All instructions began with, “We're now going to have you

complete a series of different attention and problem-solving measures. Your performance on these tasks will determine what your final task will be, and it will be one of 2 things, either [participant's liked task] or [participant's disliked task].” The instructions then varied across conditions, as follows:

(a) Promotion Working—“If you do well on the exercises I'm about to give you, you will get to do the [participant's liked task] instead of the other task.”

(b) Promotion Not Working—“If you don't do well on the exercises I'm about to give you, you won't get to do the [participant's liked task] but will do the other task instead.”

(c) Prevention Working—“As long as you don't do poorly on the exercises I'm about to give you, you won't have to do the [participant's disliked task] but will do the other task instead.”

(d) Prevention Not Working—“If you do poorly on the exercises I'm about to give you, you will have to do the [participant's disliked task] instead of the other task.”

In addition to these four *contingent* framing conditions, there was also one experimental *noncontingent* framing condition. Here the relation between the initial set of exercises and the final task was described as noncontingent. The two alternative final tasks were described and the participants were told that one of these tasks would be *randomly* assigned to them, as follows: “We're now going to have you complete a series of different attention and problem-solving measures. After you have completed these tasks, your *final task will be randomly assigned to you*, and it will be one of two things, either [participant's liked task] or [participant's disliked task].” By including a noncontingent framing condition, it was possible to examine how the variable of contingency per se influenced strategic inclinations.

The participants were randomly assigned to one of the above five framing conditions upon arrival at the experiment. There were 28 participants in the “Promotion Not Working” condition and 29 in the “Prevention Working” condition. There were 27 participants in each of the remaining three conditions. Each participant remained in one of these five conditions while working on all of the initial set of exercises. The participants were reminded of their specific contingency or noncontingency condition halfway through the initial set of tasks (i.e., after the sorting task), and they filled out the Mood Questionnaire for the second time at this point.

After finishing the Anagrams task, the participants filled out the Mood Questionnaire for a third time. At this point, the experiment was over. All participants were told that they had done well on the exercises. They were then thanked and fully debriefed.

Results and Discussion

Methods of Analysis

Multiple regression analyses were performed on the dependent variables to assess the independent effects of each framing variable while controlling for all the other variables. Differences among the four contingency framing conditions were examined by including two different framing variables in the analysis. The first framing variable was *Regulatory Focus*, distinguishing between promotion focus conditions (Promotion Working; Promotion Not Working) and prevention focus conditions (Prevention Working; Prevention Not Working). The second framing variable was *Valence*, distinguishing between pleasant or positive valence conditions (Promotion Working; Prevention Working) and painful or negative valence conditions (Promotion Not Working; Prevention Not Working).

Differences between the four contingency framing conditions combined and the noncontingency framing condition were also analysed as a *Contingency* variable (Contingency Framing; Noncontingency Framing). Two- and three-way interaction terms were also included in the multiple regression to determine whether any interaction effects occurred among Regulatory Focus, Valence, and Contingency. Finally, each regression analysis included participants' ideal and ought discrepancy scores as covariates. (Possible interactions between self-discrepancies and the other variables were also investigated but none were significant.)

Motivational Response to Difficulty

It was proposed earlier that the promotion focus inclination is to insure hits and insure against errors of omission, whereas the prevention focus inclination is to insure correct rejections and insure against errors of commission. When a task becomes difficult, or just following failure, promotion focus individuals should be eager to find "hits" and insure against omitting any possible "hits," whereas prevention focus individuals should be vigilant against mistakes and insure against committing the error of producing them. When a task becomes difficult, then, one would expect promotion focus individuals to perform better and prevention focus individuals to quit more readily. The results on three of the tasks are relevant to this hypothesis.

Anagrams. The participants completed two solvable anagrams before encountering the unsolvable anagram. They were given as much time as they wanted to work on each of the anagrams and time spent working on the anagrams was included as a covariate. A regression analysis on the number of solutions found for the first two solvable anagrams revealed no significant

effects (all F s < 1). In contrast, a regression analysis on the number of solutions found for the solvable anagram that *followed* the unsolvable anagram (controlling for solutions to the anagrams preceding the unsolvable anagram and time spent on the unsolvable anagram) revealed a significant effect of regulatory focus, $F(1,115) = 4.6$, $p < .05$. As predicted, participants in the promotion focus condition found more solutions ($M = 1.5$; with a maximum of 4) than participants in the prevention focus condition ($M = 1.0$). There were no other significant effects.

Embedded figures. As discussed earlier, the embedded figures task permitted an additional test of the effects of task difficulty on persistence because it included one especially difficult problem. The participants were given the option of quitting any embedded figure and moving on to the next one if they wanted; that is, they were told that at any time they could stop searching for any simple figure they had not yet found. The participants rarely quit searching for more than one of the embedded figures and, as expected, the figure that they typically quit was the most difficult one. (It was the fifth problem in the sequence of seven problems.) A logistic regression analysis on quitting this difficult figure revealed a borderline significant effect of regulatory focus, Wald = 3.37, $p < .07$. As expected, the participants in the prevention focus condition were more likely to quit this difficult figure (54%) than the participants in the promotion focus condition (35%).

Counting backwards. This task included both relatively easy and relatively difficult trials of counting backwards. It was hypothesized that higher motivation and performance with a promotion than a prevention focus would appear when the task became difficult. The participants were given two trials of counting backwards, counting first by an interval of 6 and then by an interval of 9. As expected, the participants found the first trial easier as reflected in their counting markedly faster on the first trial ($M = 21.7$ numbers/min) than on the second trial ($M = 14.8$ numbers/min), $F(1,117) = 10.9$, $p < .0001$.

A regression analysis first revealed a significant effect of contingency on counting speed during the first trial, $F(1,118) = 7.9$, $p < .01$, reflecting the fact that on the first trial participants in the contingency condition counted more quickly ($M = 22.4$ numbers/min) than participants in the noncontingency condition ($M = 18.7$ numbers/min). The effect was in the same direction on the second trial but it was nonsignificant. There were no other main effects but there was a significant Regulatory Focus \times Trial Order interaction, $F(1,117) = 3.9$, $p = .05$. Consistent with our prediction, on the easier

first trial the participants in the prevention focus condition were somewhat faster ($M = 22.9$ numbers/min) than participants in the promotion focus condition ($M = 21.9$ numbers/min), whereas on the more difficult second trial the prevention focus participants were somewhat slower ($M = 14.7$ numbers/min) than the promotion focus participants ($M = 15.3$ numbers/min). It should be noted, moreover, that the slower speed of the prevention focus participants on the second trial was not in the service of reducing errors because, if anything, they also had more errors on the second trial ($M = 1.3$) than the promotion focus participants ($M = 0.9$).

Generating Alternatives

It was proposed earlier that, given a task where generating any number of alternatives is correct, individuals in a prevention focus state would tend to be relatively repetitive and generate less alternatives than individuals in a promotion focus state. We proposed that individuals in a vigilant state from a prevention focus want to avoid errors of commission and thus should be inclined to use the strategy of sticking to as few alternatives as possible and repeating ones already used. On the other hand, sticking to as few alternatives as possible means that some possibilities will be omitted during the task. We proposed that individuals in an eager state from a promotion focus want to accomplish "hits" and thus should *not* be inclined to use this strategy. Indeed, in a task where many different alternatives could be produced, we proposed that these individuals would be inclined to generate many different alternatives. Both the characteristic listing task and the sorting task directly tested this hypothesis.

Characteristic listing. When counting the number of characteristics listed for each item, all repetitions, including synonyms, were excluded. The average number of characteristics that participants listed per item on this task is a measure of their fluency in generating unique aspects of these different members of the furniture category. The multiple regression analysis on this fluency measure revealed a borderline significant effect of regulatory focus, $F(1,117) = 3.7, p < .06$. As predicted, participants in the promotion focus condition displayed more fluency ($M = 10.0$) than participants in the prevention focus condition ($M = 9.0$). No other effects were significant. As another indicator of characteristic listing style, the average number of times a subject *repeated* terms or words when describing more than one item was calculated. The number of possible repetitions for any specific term varied from 2 to 8. A multiple regression analysis on the mean number of term repetitions across all items (controlling for fluency) revealed

a borderline significant effect of regulatory focus, $F(1,116) = 3.7, p < .06$. As predicted, participants in the prevention focus condition had higher repetition scores ($M = 2.8$) than participants in promotion focus condition ($M = 2.5$). There were no other significant effects.

Sorting. The first measure was the total number of subgroups that participants generated in both the fruit and vegetable sortings together. There was no time limit on the sorting task and participants varied in how much time they spent. Although the conditions themselves did not differ in time spent sorting, time spent was included as a covariate in the analysis. Multiple regression on this measure of total number of subgroups generated revealed both a borderline significant effect of regulatory focus, $F(1,117) = 3.2, p < .07$, and a significant effect of valence, $F(1,117) = 4.4, p < .05$. As predicted, participants in the promotion focus condition sorted the items into more subgroups ($M = 6.3$) than participants in the prevention focus condition ($M = 5.7$). In addition, participants in the positive valence condition produced more subgroups ($M = 6.4$) than participants in the negative valence condition ($M = 5.7$). There were no other significant effects.

The two main effects meant that participants in the Prevention Not Working condition produced an especially low number of subgroups ($M = 5.5$), whereas participants in the Promotion Working condition produced an especially high number of subgroups ($M = 6.7$). One possible explanation for this difference is that participants in these conditions selected different categories that naturally varied in their subgrouping potential, such as the category "Has seeds [Yes; No]" versus "color" [green, red, yellow, etc.]. A review of the categories selected in the different conditions indicated that this was *not* the case. Instead, the difference was due more to participants in the Prevention Not Working condition employing the strategy of choosing one subgroup, "X," as a reference point and creating the two subgroups, "X" and "not X." For example, a participant might choose to sort vegetables into "green" and "not green".

To eliminate any possibility that differences in subgroup production was due to choice of category for grouping, an analysis was performed on just the number of subgroups used when sorting vegetables by "color." The category of "color" was selected because it was the most frequently employed category for sorting both fruits and vegetables, and the analysis was performed on vegetables because color was more frequently used in sorting vegetables than in sorting fruit. The framing conditions did not differ in how often participants used color as their sorting category. The logistic

regression analysis revealed a significant effect of regulatory focus, $Wald = 5.2$, $p = .02$. As expected, participants in the prevention focus condition were more likely to use an "X"/not "X" color sorting strategy (58%) than participants in the promotion focus condition (41%). There were no other significant effects.

Most of the criteria that were employed by participants in the sorting task, such as "color," "size," or "taste," could have been used to sort both the fruits and the vegetables listed. Some criteria, such as "citrus/noncitrus" for fruits, could be applied to only one list. The participants were given no instructions regarding whether or not they could repeat the criterion employed for sorting the fruits when sorting the vegetables, and it was certainly correct to do so. A logistic regression analysis on *repeating* the sorting category with vegetables that had been previously used with fruits (controlling for the number of subgroups produced) revealed a significant effect of regulatory focus, $Wald = 5.8$, $p < .02$. As expected, the participants in the prevention focus condition were more likely to repeat their sorting criteria with both fruits and vegetables (28%) than participants in the promotion focus condition (14%). There were no other significant effects.

After the participants had sorted both the set of fruits and then the set of vegetables, they were asked to list as many additional criteria or dimensions as they could think of for sorting the same set of vegetables (i.e., excluding the criteria they had just employed when sorting the vegetables.) A regression analysis of the number of different sorting criteria participants produced (controlling for time spent) revealed a borderline significant effect of regulatory focus, $F(1,116) = 3.0$, $p < .09$. As expected, the participants in the promotion focus condition produced more different sorting criteria ($M = 8.7$) than participants in the prevention focus condition ($M = 7.6$). There were no other significant effects.

Mood

One possible way that the different framing conditions might influence performance was that they could influence the participants' mood and their mood could influence their performance. Although this might be interesting in its own right, we were more interested in the strategic effects of our framing variables, independent of any mood effects. Thus, we needed both to check for and control for mood effects.

There were three emotions each for cheerfulness, dejection, quiescence, and agitation as the four general types of emotion. Thus, because each scale measuring current feelings was from 0 (Not at all) to 4 (Very), each of these four general types of emotion had a total score that ranged from 0 to 12, with 6 being the midpoint of

the scale. At each of the three measurement times, both the dejection-related and agitation-related emotions had scores below 3.5, i.e., slightly dejected and slightly agitated. At each of the three measurement times, both the cheerfulness-related and the quiescence-related emotions had scores above 5.5, i.e., moderately cheerful and moderately quiescent.

A repeated measures analysis by framing condition was conducted for each mood type across the three measurement times. There were no significant mood effects as a function of framing condition. Equally important, each of the significant findings reported earlier on the different task measures remained significant when the four types of emotions at the different measurement times, and the changes in emotions between measurement times, were included in the regression analyses.

The results of Study 1 provide support for the hypothesized difference in strategic inclinations between individuals in a promotion focus and individuals in a prevention focus. We had proposed earlier that the promotion focus inclination is to insure hits and insure against errors of omission, whereas the prevention focus inclination is to insure correct rejections and insure against errors of commission. One implication of this difference was that promotion focus individuals should be eager to find "hits" and insure against omitting any possible "hits", whereas prevention focus individuals should be vigilant against mistakes and insure against committing the error of producing them. Thus, when a task becomes difficult, individuals in a promotion focus should perform better than individuals in a prevention focus, and the latter should quit more readily. This implication was supported by the results on the anagram task (participants in the promotion focus condition found more solutions for the solvable anagrams than participants in the prevention focus condition following the difficult, unsolvable anagram), the results on the embedded figures task (more participants in the prevention focus condition than in the promotion focus condition quit the difficult figure), and the results on the counting backwards task (participants in the promotion focus condition were faster than participants in the prevention focus condition on the more difficult second trial but not on the easier first trial). We believe that these results for the three tasks taken together provide strong support for the first implication.

Another implication of the proposed difference in strategic inclinations was that, given a task where generating any number of alternative categories is acceptable, individuals in a vigilant state from a prevention focus should tend to be relatively repetitive and generate few alternatives in order to avoid errors of commission, whereas individuals in an eager state from a promotion focus want to accomplish "hits" and thus should

be inclined to generate more alternatives. This implication was supported by the results on the character listing task (participants in the promotion focus condition were more fluent in generating alternatives than participants in the prevention focus condition, and, independent of this effect, participants in the prevention focus condition repeated terms or words more across items than participants in the promotion focus condition), and the results on the sorting task (participants in the promotion focus condition generated more subgroups than participants in the prevention focus condition, with the latter being much more likely to use a simple "X"/not "X" sorting strategy, and, independent of the number of subgroups generated, participants in the prevention focus condition were more likely than participants in the promotion focus condition to repeat their sorting strategy across object categories). We believe that these results taken together provide strong support for the second implication.

In sum, the results of Study 1 support our proposal that individuals in an eager state from a promotion focus are inclined to insure hits and insure against errors of omission, whereas individuals in a vigilant state from a prevention focus are inclined to insure correct rejections and insure against errors of commission. This proposed difference in strategic inclinations was inspired by a signal detection analysis (e.g., Tanner & Swets, 1954; see also Trope & Liberman, 1996). It would be useful, then, to use a signal detection task to test more directly the hypothesized differences in strategic inclinations or response biases. A recognition memory task was selected for our second study to accomplish this aim.

Study 2 used the same basic paradigm as Study 1. Undergraduate participants filled out a questionnaire where they expressed their liking for different kinds of activities during a large survey held weeks before the experiment. Each participant's responses were used idiosyncratically to select one activity that the participant clearly liked and another he or she clearly disliked. When the participants arrived for the study, they were told that they would first perform a recognition memory task and then would be assigned a second task. The liked and the disliked activity previously selected were each described as an alternative second task.

The recognition memory task is a signal detection task that requires participants to make decisions. In signal detection tasks, a signal is either presented or not presented, and a respondent says either "yes" (they detected a signal) or "no" (no signal was detected). There are four possible outcomes for a signal detection trial: (a) a "Hit"—saying "yes" when a signal was presented; (b) a "Miss"—saying "no" when a signal was presented; (c) a "False Alarm"—saying "yes" when there was no

signal; and (d) a "Correct Rejection"—saying "no" when there was no signal. The decisional criterion employed by a person is assumed to depend upon the weights or payoffs that the person assigns to these possible outcomes. If the gain for getting a Hit is greater than the gain for a Correct Rejection and the cost for "Missing" a signal is greater than the cost of getting a False Alarm, then the person will be inclined (or have a bias) to say "yes." In contrast, if the gain for getting a Correct Rejection is greater than the gain for a Hit and the cost for getting a False Alarm is greater than the cost of Missing a signal, then the person will be inclined (or have a bias) to say "no."

Signal detection theory *per se* is silent on motivational determinants of a person's payoff matrix. The principle of regulatory focus, however, does make a prediction. Participants with a promotion focus are in a state of eagerness. This state should induce advancement tactics, an inclination to approach accomplishments. They want to insure hits and insure against errors of omission. These participants, then, should want to insure Hits (successfully recognizing a true target) and insure against Misses (omitting a true target). That is, these participants should try to recognize as many items as possible, producing an inclination to say "yes" (i.e., a risky bias).

In contrast, participants with a prevention focus are in a state of vigilance. This state should induce precautionary tactics, an inclination to avoid mistakes. They want to insure correct rejections and insure against errors of commission. These participants, then, should want to insure Correct Rejections (i.e., successfully avoiding a false distractor) and insure against False Alarms (failing to avoid a false distractor). That is, these participants should try not to commit mistakes, producing an inclination to say "no" (i.e., a conservative bias). In addition, because of their vigilance against errors of commission, these individuals should take more time to respond. Thus, we also predicted that the response latencies would be longer for participants in the prevention focus condition than those in the promotion focus condition.

STUDY 2

Method

Participants

Columbia University undergraduates were paid to complete a battery of questionnaires. Of those who had appropriately filled out the critical questionnaires for the study, 65 were randomly selected and scheduled to participate as paid subjects in the experiment that took place approximately 1 month after the battery. There

were 13 participants randomly assigned to each of the five framing conditions.

Materials

The Task Rating Questionnaire, Selves Questionnaire, and Mood Questionnaire were the same as those used in Study 1. The recognition memory task that was used was part of a software system developed by Eugene Galanter at Columbia University. It was developed for the Macintosh computer and was designed to allow undergraduate psychology students to run their own experiments. No modifications of the software were necessary in order to use it in this experiment. The program itself randomly generated the nonsense words used to assess subjects' recognition memory.

Procedure

The initial procedure when participants arrived at the experimental session was basically the same as in Study 1. The participants were told that their mood would be measured during the session to correct for any possible influence it might have on their performance. After completing the first Mood Questionnaire, the participants were told that they would first perform an initial recognition memory task [the experimental tasks described above] and then they would be assigned a second, final task. The participants' earlier idiographic responses to the Task Rating Questionnaire were used to select one liked activity and one disliked activity. The liked activity (e.g., playing a video game) and the disliked activity (e.g., proofreading) were each fully described as an alternative second task that a participant might perform. Props related to a participant's alternative second task were again included, and the debriefing at the end of the experimental session indicated that the participants believed that they would perform one of these tasks during the session.

As in Study 1, four of the experimental framing conditions were *contingency* conditions in which participants were told that which of the alternative final tasks they would work on at the end of the session depended on their performance on the initial recognition memory task. The relation between the initial memory task and the second, final task was described as contingent for everyone, but the framing varied in different conditions as a function of both regulatory focus and valence. All the participants were told that they would first be given a word recognition memory task. The instructions then varied across conditions, as follows:

(a) Promotion Working—"If you do well on the word recognition memory task, you will get to do the [participant's liked task] instead of the other task."

(b) Promotion Not Working—"If you don't do well

on the word recognition memory task, you won't get to do the [participant's liked task] but will have to do the other task instead."

(c) Prevention Working—"As long as you don't do poorly on the word recognition memory task, you won't have to do the [participant's disliked task] and will do the other task instead."

(d) Prevention Not Working—"If you do poorly on the word recognition memory task, you will have to do the [participant's disliked task] instead of the other task."

In addition to these four *contingent* framing conditions, there was also the experimental *noncontingent* framing condition. As in Study 1, the relation between the initial recognition memory task and the second, final task was described as noncontingent. The two alternative final tasks were described and the participants were told that one of these tasks would be *randomly* assigned to them after they had completed the recognition memory task.

For the recognition memory task, the participants completed three trials. (The computer program automatically combined the results for the three trials.) In the first part of each trial, they were shown 20 nonsense words, one at a time for 2 s. Each nonsense word consisted of five letters in which the first, third, and fifth letters were consonants and the second and fourth letters were vowels. The participants then performed a vowel-consonant filler task in which they identified letters as either vowels or consonants for 20 s. Next, they were shown another set of 40 nonsense words and asked whether or not they had seen them before. Of these 40 nonsense words, 20 were nonsense words that they had seen before in the trial, and the other 20 were new nonsense words that they had not seen in the trial (or in any earlier trial). Participants first ran through a practice trial. After the practice trial, they performed the three consecutive experimental trials, with a pause of 30 s between each. There was no time limit for the last recognition phase of the trial. The experimenter recorded the duration of this recognition phase for each trial. After all the trials were completed, the participants filled out the Mood Questionnaire for a second and final time.

Results and Discussion

Methods of Analysis

As in Study 1, multiple regression analyses were performed on the dependent variables to assess the independent effects of each framing variable while controlling for all the other variables.

Response Bias

The statistics for signal detection parameters are based on the standardized frequency distributions of the “noise” alone distribution and the “signal plus noise” distribution, plus the location of a person’s decision criterion in relation to these two distributions. This criterion line, which is also in standard scores, is referenced with respect to the noise distribution (Galanter, 1994, p. 142). For this study, the response bias statistic β (b), which is based on the criterion statistic, was used to represent each participant’s decision criterion point for giving a “yes” or “no” answer. β is calculated by taking the ordinate value of the signal plus noise distribution at the criterion line (indicating the proportion of Hits) and dividing it by the ordinate value of the noise distribution at the criterion line (indicating the proportion of False Alarms) [$b = f(H)/f(FA)$, where f is the height of the ordinate, also known as the density function]. A β value of 1 indicates no bias, whereas $\beta > 1$ indicates a bias toward saying “no” and $\beta < 1$ indicates a bias toward saying “yes”.

A regression analysis on the β values revealed a significant effect of regulatory focus, $F(1,60) = 6.9$, $p = .01$. As predicted, participants in the promotion focus condition had a risky bias to say “yes” as indicated in scores lower than one ($M = 0.92$), and participants in the prevention focus condition had a conservative bias to say “no” as indicated by scores greater than one ($M = 1.13$). There were no other significant effects.

Response Latency

The response latency of each participant was the number of seconds waited on average before saying “yes” or “no” to a presented nonsense word. A regression analysis on the response latencies revealed a significant effect of regulatory focus, $F(1,60) = 6.2$, $p < .02$, reflecting the fact that, as predicted, participants in the prevention focus condition waited longer on average to respond ($M = 1.40$ s) than participants in the promotion focus condition ($M = 1.23$ s). Response latency was uncorrelated with β in this study, but to make certain the two were independent the multiple regression was repeated with β included as a covariate. The effect of regulatory focus remained significant. There were no other significant effects.

Recognition Accuracy

The participants’ recognition memory accuracy is their accuracy rate in detecting the presence and absence of signals, a standardized score known as d' (“ d prime”). This measure was calculated with reference to the two distributions of noise alone and signal plus noise. The d' measure is the distance in standard scores

between the two distributions, and is calculated using the formula, $d' = Z(FA) - Z(H)$ (i.e., the z -score for False Alarms minus the z -score for Hits) (Galanter, 1994, pg. 141). A larger d' value indicates greater sensitivity to the signals, or a greater ability to distinguish between noise alone and signal plus noise.

A regression analysis on the accuracy scores revealed a significant effect of valence, $F(1,60) = 4.6$, $p < .04$, reflecting the fact that participants in the negative valence condition had a higher recognition accuracy score ($M = 1.58$) than participants in the positive valence condition ($M = 1.40$). This effect was due mostly to the very high recognition accuracy scores of participants in the Prevention Not Working condition ($M = 1.72$). This condition differed significantly from all other conditions combined ($M = 1.40$), $F(1,60) = 4.4$, $p < .05$, whereas the other conditions did not differ significantly from each other. The participants’ recognition accuracy scores were not correlated with either their β values or their response times in this study, but to make certain the accuracy scores were independent the multiple regression was repeated with β and response time included as covariates. The effect of valence and the difference between Prevention Not Working and all the other conditions combined remained significant. There were no other significant effects.

Mood

As in Study 1, we were interested in the strategic effects of our framing variables, independent of any mood effects. Thus, we needed both to check for and control for mood effects. Again, the four general types of emotion were cheerfulness, dejection, quiescence, and agitation, and each of these four general types of emotion had a total score that ranged from 0 to 12, with 6 being the midpoint of the scale. At each of the two measurement times, both the dejection-related and agitation-related emotions had scores below 4.0 and mostly below 3.0, i.e., slightly dejected and slightly agitated. At each of the three measurement times, both the cheerfulness-related and the quiescence-related emotions had scores above 5.0 and mostly above 6.0, i.e., moderately cheerful and moderately quiescent.

A repeated measures analysis by framing condition was conducted for each mood type across the two measurement times. There were no significant mood effects as a function of framing condition. Equally important, each of the significant findings reported earlier remained significant when the four types of emotions at the different measurement times, and the changes in emotions between measurement times, were included in the regression analyses.

GENERAL SUMMARY AND CONCLUSIONS

A promotion focus is concerned with advancement, growth, and accomplishment and the strategic inclination is to make progress by approaching matches to the desired end-state. In contrast, a prevention focus is concerned with security, safety, responsibility and the strategic inclination is to be prudent and precautionary and avoid mismatches to the desired end-state. A promotion focus, then, would involve a state of eagerness to attain advancement and gains whereas a prevention focus would involve a state of vigilance to assure safety and non-losses. Given these differences, we hypothesized that the promotion focus inclination is to insure hits and insure against errors of omission, whereas the prevention focus inclination is to insure correct rejections and insure against errors of commission.

This general hypothesis yielded three basic predictions. One prediction was that when individuals work on a difficult task or have just experienced failure, those in a promotion focus should be eager to find hits and insure against omitting any possible hits, whereas those in a prevention focus should be vigilant against mistakes and insure against committing the error of producing them. Under these circumstances, then, individuals in a promotion focus should perform better than individuals in a prevention focus and the latter should quit more readily.

Taken together, the results of Study 1 on the anagrams task, the embedded figures task, and the counting backwards task strongly support this prediction. Participants in the promotion focus condition, compared to those in the prevention focus condition, found more solutions on the anagram following their failure on the unsolvable anagram, and counted backwards more quickly on the difficult sequence. Participants in the prevention focus, compared to those in the promotion focus, were more likely to quit the difficult embedded figure.

The second prediction was that when individuals work on a task where generating any number of alternatives is correct, those in a prevention focus should want to avoid errors of commission by sticking to as few alternatives as possible and repeating ones already used, and those in a promotion focus should want to accomplish hits and insure against omitting possible alternatives. Under these circumstances, then, individuals in a prevention focus should be more repetitive than individuals in a promotion focus and the latter should generate more distinct alternatives.

Taken together, the results of Study 1 on the characteristic listing task and the sorting task strongly support this prediction. Participants in the promotion condition, compared to those in the prevention focus

condition, were more fluent in generating unique characteristics of different members of a category, sorted different members of a category into more subgroups, and used a greater number of different sorting criteria across categories. Participants in the prevention condition, compared to those in the promotion condition, repeated more characteristics across category members (controlling for fluency) and repeated the same sorting criteria more across categories (controlling for the number of subgroups produced in each category).

The third prediction was that when individuals work on a signal detection task that requires them to decide whether they did or did not detect a signal, those in a promotion focus should want to insure hits and insure against errors of omission by deciding that a signal was presented, whereas those in a prevention focus should want to insure correct rejections and insure against errors of commission by deciding that a signal was not presented. In a recognition memory task, then, individuals in a promotion focus should be inclined to recognize as many items as possible and thus to respond "yes" (a risky response bias), whereas individuals in a prevention focus should be inclined to try not to commit mistakes and thus to respond "no" (a conservative response bias). Moreover, individuals in a prevention focus vigilant against errors of commission should take more time to respond than individuals in a promotion focus eager for hits. The results of Study 2 for response bias and for response latency (controlling for response bias) supported these predictions.

Another major objective of the present studies was to examine for the first time how regulatory focus as one motivational principle and valence or hedonic value as a separate motivational principal influence strategic inclinations, both independently and in combination. Our studies considered this issue in the context of framing manipulations that created contingencies between performance on the target tasks and assignment of a final task. There were two alternative final tasks, one liked and one disliked by each participant. The same objective contingency was framed in relation to a positive or a negative outcome (valence) and, orthogonally, in relation to a promotion or a prevention focus (regulatory focus). In addition, these contingent conditions were compared to a noncontingent condition in which the final task was randomly assigned, unrelated to previous performance.

As summarized earlier, regulatory focus framing had many significant effects. In contrast, contingency had only one significant effect and valence framing had just two effects. The contingency effect was simply that on the first trial of the counting backwards task, participants in the contingency condition counted more

quickly than participants in the noncontingency condition. This might have reflected greater motivation in the contingency than the noncontingency condition, but there was little evidence for this conclusion on the other tasks. It should also be noted that the effects of valence framing seemed to be driven by specific conditions that involved regulatory focus as well. Specifically, the valence difference in producing subgroups on the sorting task reflected mostly the fact that participants in the Prevention Not Working condition produced an especially low number of subgroups whereas participants in the Promotion Working condition produced an especially high number of subgroups. And the valence difference in recognition accuracy reflected mostly the fact that participants in the Prevention Not Working condition had very high recognition accuracy scores. This suggests that individuals focusing on prevention not working might be especially vigilant under certain circumstances, and vigilance might be an advantage in certain tasks such as recognition memory.

Overall, the present studies clearly indicate that regulatory focus, independent of valence, can influence strategies or decision patterns in task performance and problem-solving. The results support the general hypothesis that the promotion focus inclination is to insure hits and insure against errors of omission, whereas the prevention focus inclination is to insure correct rejections and insure against errors of commission. Our studies found that regulatory focus can be induced using a contingency framing manipulation. This manipulation was inspired by regulatory focus differences in the messages that caretakers give to their children when they respond to them contingently. But such contingency messages are not restricted to caretaker-child interactions. As noted earlier, teacher-pupil and employer-employee interactions also communicate contingencies. More generally, organizations and institutions communicate contingencies through the kinds of formal incentives and feedback that they use. An interesting question for future research is how different kinds of formal incentives and feedback relate to regulatory focus and thereby influence motivation and performance.

REFERENCES

- Atkinson, J. W. (1964). *An introduction to motivation*. Princeton, NJ: Van Nostrand.
- Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice-Hall.
- Brendl, C. M., & Higgins, E. T. (1996). Principles of judging valence: What makes events positive or negative? In M. P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 28, pp. 95-160). New York: Academic Press.
- Bruner, J. S., Goodnow, J. J., & Austin, G. A. (1956). *A study of thinking*. New York: Wiley.
- Carver, C. S., & Scheier, M. F. (1981). *Attention and self-regulation: A control-theory approach to human behavior*. New York: Springer-Verlag.
- Carver, C. S., & Scheier, M. F. (1990). Principles of self-regulation: Action and emotion. In E. T. Higgins and R. M. Sorrentino (Eds.), *Handbook of motivation and cognition: Foundations of social behavior* (Vol. 2, pp. 3-52). New York: Guilford.
- Galanter, E. (1994). *Psych Tech Notes. Version 2.1*. New York: Adams, Bannister, Cox.
- Gray, J. A. (1982). *The neuropsychology of anxiety: An enquiry into the functions of the septohippocampal system*. New York: Oxford University Press.
- Higgins, E. T. (1987). Self-discrepancy: A theory relating self and affect. *Psychological Review*, 94, 319-340.
- Higgins, E. T. (1989). Continuities and discontinuities in self-regulatory and self-evaluative processes: A developmental theory relating self and affect. *Journal of Personality*, 57, 407-444.
- Higgins, E. T. (1996a). The "self digest": Self-knowledge serving self-regulatory functions. *Journal of Personality and Social Psychology*, 71, 1062-1083.
- Higgins, E. T. (1996b). Emotional experiences: The pains and pleasures of distinct regulatory systems. In R. D. Kavanaugh, B. Zimmerberg, and S. Fein (Eds.), *Emotion: Interdisciplinary perspectives* (pp. 203-241). Mahwah, NJ: Erlbaum.
- Higgins, E. T., Bond, R. N., Klein, R., & Strauman, T. (1986). Self-discrepancies and emotional vulnerability: How magnitude, accessibility, and type of discrepancy influence affect. *Journal of Personality and Social Psychology*, 51, 5-15.
- Higgins, E. T., Roney, C., Crowe, E., & Hymes, C. (1994). Ideal versus ought predilections for approach and avoidance: Distinct self-regulatory systems. *Journal of Personality and Social Psychology*, 66, 276-286.
- Higgins, E. T., & Tykocinski, O. (1992). Self-discrepancies and biographical memory: Personality and cognition at the level of psychological situation. *Personality and Social Psychology Bulletin*, 18, 527-535.
- Konorski, J. (1967). *Integrative activity of the brain: An interdisciplinary approach*. Chicago: Univ. of Chicago Press.
- Lang, P. J. (1995). The emotion probe: Studies of motivation and attention. *American Psychologist*, 50, 372-385.
- Lewin, K. (1935). *A dynamic theory of personality*. New York: McGraw-Hill.
- Lewin, K. (1951). *Field theory in social science*. New York: Harper.
- Lewin, K., Dembo, T., Festinger, L., & Sears, P. S. (1944). Level of aspiration. In J. McHunt (Ed.), *Personality and the behavior disorders* (Vol. 1, pp. 333-378). New York: Ronald Press.
- Lorr, M., & Wunderlich, R. A. (1988). A semantic differential mood scale. *Journal of Clinical Psychology*, 44, 33-36.
- McClelland, D. C., Atkinson, J. W., Clark, R. A., & Lowell, E. L. (1953). *The achievement motive*. New York: Appleton-Century-Crofts.
- Mikulincer, M., Kedem, P., & Paz, D. (1990). The impact of trait anxiety and situational stress on the categorization of natural objects. *Anxiety Research*, 2, 85-101.
- Roney, C. J. R., Higgins, E. T., & Shah, J. (1995). Goals and framing: How outcome focus influences motivation and emotion. *Personality and Social Psychology Bulletin*, 21, 1151-1160.
- Rosch, E. (1975). Cognitive representations of semantic categories. *Journal of Experimental Psychology: General*, 104, 192-233.
- Roseman, I. J. (1984). Cognitive determinants of emotion: A structural theory. *Review of Personality and Social Psychology*, 5, 11-36.

- Roseman, I. J., Spindel, M. S., & Jose, P. E. (1990). Appraisals of emotion-eliciting events: Testing a theory of discrete emotions. *Journal of Personality and Social Psychology*, **59**, 899–915.
- Rotter, J. B. (1982). Some implications of a social learning theory for the practice of psychotherapy. In J. B. Rotter (Ed.), *The development and applications of social learning theory* (pp. 237–262). New York: CBS Educational and Professional Publishing.
- Ruebush, B. K. (1960). Interfering and facilitating effects of test anxiety. *Journal of Abnormal and Social Psychology*, **60**, 205–212.
- Tanner, W. P. Jr., & Swets, J. A. (1954). A decision-making theory of visual detection. *Psychological Review*, **61**, 401–409.
- Trope, Y., & Liberman, A. (1996). Social hypothesis testing: Cognitive and motivational mechanisms. In E. T. Higgins and A. W. Kruglanski (Eds.), *Social psychology: Handbook of basic principles* (pp. 239–270). New York: Guilford.
- Witkin, H. A., Oltman, P. K., Raskin, E., & Karp, S. A. (1971). *A manual for the embedded figures test*. Palo Alto, CA: Consulting Psychologists Press.

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