

THE ORIGINS AND INFLUENCES OF PROMOTION-FOCUSED AND PREVENTION-FOCUSED ACHIEVEMENT MOTIVATIONS

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Needs for achievement and mastery are among the most fundamental of human motives. As infants, we are "active knowers" striving to learn about the environments into which we were born. As children, we engage in a tireless pursuit of new skills that can be used to further explore and influence the world around us. Through adolescence and adulthood, our unique areas of mastery emerge as core aspects of our identity and, for many of us, become an essential part of our life's purpose.

Accordingly, research on achievement motivation has long held a prominent place in experimental psychology (see Eccles & Wigfield, 2002). This research has examined the numerous ways in which achievement motivation can manifest itself, including as a component of one's expectations for success (Bandura, 1997; Skinner, Zimmer-Gembeck, & Connell, 1998), as a determinant of how and why such success is valued (Covington, 2000; Weiner, 1985), and as a drive to pursue the optimal combination of these expectations and values (Atkinson, 1957; Feather, 1988; Wigfield & Eccles, 1992). Yet, a common thread that has repeatedly emerged from research on achievement motivation is that, in order to understand how and when people's basic motivations for achievement affect

their learning and development, it is often necessary to understand what "achievement" actually means to them (see Urdan & Mestas, 2006). Is it a validation of one's native ability or a sign of mastery that has been developed through effort (Dweck, 1999; Molden & Dweck, 2000, 2006)? Does it mean reaping the rewards of success or avoiding the humiliation of failure (Atkinson, 1957; Elliot, 1997; Moller & Elliot, 2006; Skaalvik, 1997)? Is it a personal triumph that fulfills one's inner needs and desires or a status symbol that wins the approval of others (deCharms, 1968; Ryan & Deci, 2000; Ryan & Stiller, 1991)?

In this chapter, we discuss yet another factor that can give meaning to one's achievements: whether an achievement is perceived as serving a fundamental motivation for growth or for security. We begin by (a) characterizing growth (i.e., *promotion*) and security (i.e., *prevention*) motivations from the perspective of regulatory focus theory (Higgins, 1997; Molden, Lee, & Higgins, 2008), (b) distinguishing these motivations from other needs that are commonly explored in achievement contexts, and (c) discussing the social or environmental factors that can activate these motivations. We then review the basic effects of promotion and prevention motivations on goal pursuit, task engagement, information processing, and retention. Although nearly all of this research comes from laboratory studies performed with college students, we discuss its possible relevance for anticipating, understanding, and altering students' achievement motivations at various levels of education. Our primary objectives throughout the chapter are to provide educational researchers with a new perspective from which to examine achievement motivations and to suggest important ways in which this perspective might be put into practice.

REGULATORY FOCUS THEORY: MOTIVATIONS FOR PROMOTION AND PREVENTION

People are motivated to fulfill a variety of basic needs that are central to both their physical and social well-being. Of these needs, researchers have frequently distinguished those concerned with advancement (i.e., nourishment, growth, and development) from those concerned with security (i.e., shelter, safety, and protection; see Bowlby, 1969; Maslow, 1955). Building upon this distinction, regulatory focus theory (Higgins, 1997) proposes that, beyond originating in different needs, motivations for advancement and security also foster different modes of goal-pursuit. That is, people represent

and experience motivations for advancement (*promotion concerns*) quite differently from how they represent and experience motivations for security (*prevention concerns*).

Representing the Pursuit of Promotion or Prevention Concerns

When pursuing promotion concerns, people are focused on identifying and exploiting opportunities for gain that will bring them closer to the ideals they hope to attain. That is, they see themselves as striving toward the presence of positive outcomes (i.e., *gains*), while attempting to avoid the absence of positive outcomes (i.e., unrealized opportunities, or *non-gains*). In contrast, when pursuing prevention concerns, people are focused on anticipating and protecting against potential losses that might keep them from fulfilling their responsibilities. That is, they see themselves as striving toward the absence of negative outcomes (i.e., safety from threats, or *non-losses*), while attempting to avoid the presence of negative outcomes (i.e., *losses*; see Higgins, 1997; Molden et al., 2008).

Experiencing Promotion-Focused or Prevention-Focused Outcomes

In addition to differing in how they are represented, promotion and prevention concerns differ in how they are experienced throughout the course of goal pursuit. Although both promotion-focused and prevention-focused goals are pleasurable when achieved, the specific nature of this pleasure is influenced by the association of success with either gains and advancement or non-losses and security, respectively (Higgins, 1987, 1997). Because gains are represented as the presence of positive outcomes, promotion-related success elicits more intense, high-arousal emotions (such as elation and cheerfulness) that reflect one's improved circumstances. In contrast, because non-losses are represented as the absence (i.e., elimination) of negative outcomes, prevention-related success elicits less intense, low-arousal emotions (such as relaxation and quiescence) that reflect one's more secure circumstances (Idson, Liberman, & Higgins, 2000; Liberman, Idson, & Higgins, 2005).

Similarly, although both promotion-focused and prevention-focused goals are painful when not achieved, the nature of this pain is influenced by the association of failure with non-gains and lack of advancement or losses and insecurity, respectively (Higgins, 1987, 1997). Because non-gains

are experienced as the absence of positive outcomes, promotion-related failure elicits less intense, low-arousal emotions (such as sadness and dejection) that reflect one's unimproved circumstances. In contrast, because losses are represented as the presence of negative outcomes, prevention-related failure elicits more intense, high-arousal emotions (such as nervousness and agitation) that reflect one's less secure circumstances (Idson et al., 2000; Liberman et al., 2005).

Distinguishing Promotion and Prevention Concerns from Other Achievement Motivations

Although the distinction between promotion and prevention concerns may appear similar to several other distinctions in the achievement literature (e.g., between approach versus avoidance motivations, learning versus performance goals, and experiences of autonomy versus control), its theoretical foundations are unique, as are its implications for learning and achievement. Examples illustrating the independence of promotion and prevention concerns from these other motivational perspectives are displayed in Table 1, and we elaborate upon these examples below.

Approach-Oriented and Avoidance-Oriented Achievement Goals

One of the oldest motivational distinctions in the achievement literature is between the desire to approach success and the desire to avoid failure

Table 1a. Illustrations of the Independence of Promotion versus Prevention Concerns from Approach versus Avoidance Motivations.

Regulatory Focus	Valence of Motivation	
	Approach	Avoidance
Promotion	A student is focused on attaining the positive outcome of earning an A, which she views as an <i>opportunity</i> to improve her class rank	A student is focused on avoiding the negative outcome of earning a C, which she views as a <i>missed opportunity</i> to improve her class rank
Prevention	A student if focused on attaining the positive outcome of earning an A, which she views as a way to <i>secure</i> her good standing in the pre-medical program	A student is focused on avoiding the negative outcome of earning a C, which she views as a <i>threat</i> to her chances of getting into medical school

Table 1b. Illustrations of the Independence of Promotion versus Prevention Concerns from Learning versus Performance Goals.

Regulatory Focus	Type of Goal	
	Learning	Performance
Promotion	A student is focused on developing her math skills as a way of <i>gaining</i> opportunities to explore more advanced areas of study	A student is focused on demonstrating her math skills as a way of <i>gaining</i> academic status and self-esteem
Prevention	A student is focused on developing her math skills as a way of <i>securing</i> her chance to explore more advanced areas of study	A student is focused on demonstrating her math skills as a way of <i>securing</i> her academic status and self-esteem

Table 1c. Illustrations of the Independence of Promotion versus Prevention Concerns from Intrinsic versus Extrinsic Motivations.

Regulatory Focus	Source of Motivation	
	Intrinsic	Extrinsic
Promotion	A student decides to pursue a career as a lawyer because of the inherent sense of <i>growth</i> and <i>advancement</i> she experiences when studying the law	A student decides to pursue a career as a lawyer in order to <i>attain</i> the money and status to which she <i>aspires</i>
Prevention	A student decides to pursue a career as a lawyer because of the inherent sense of <i>dutifulness</i> and <i>security</i> she experiences when studying the law	A student decides to pursue a career as a lawyer in order to meet the <i>minimal</i> financial and social <i>standards</i> that she feels will provide her with a sense of <i>security</i>

(Atkinson, 1957; McClelland, Atkinson, Clark, & Lowell, 1953). Approach motivations are defined by a focus on pleasurable outcomes and a striving to reduce discrepancies between one's current state and a desired end-state. In contrast, avoidance motivations are defined by a focus on painful outcomes and a striving to enlarge discrepancies between one's current state and an undesired end-state (Carver, 2004; Elliot & Covington, 2001).

Although promotion concerns involve the presence and absence of positive outcomes, this is not equivalent to a focus on desired end-states;

and, although prevention concerns involve the presence and absence of negative outcomes, this is not equivalent to a focus on undesired end-states. Instead, promotion and prevention concerns determine whether a desired or undesired end-state is represented in terms of growth and advancement or safety and security (Higgins, 1997; Molden et al., 2008; cf. Urdan & Mestas, 2006). For example, imagine two students in an upper-level college course. Though both students are strongly focused on approaching the positive outcome of earning an A, the first student views this outcome as an opportunity to improve her class rank (i.e., as a gain that would bring happiness), whereas the second student views this outcome as a responsibility that must be fulfilled in order to secure her good standing in the pre-medical program (i.e., as a non-loss that would produce relaxation). That is, as illustrated in Table 1a, both students share the same approach motivation, but the first student experiences this motivation in terms of promotion concerns, whereas the second student experiences it in terms of prevention concerns.

This example can be extended to avoidance motivations as well. Imagine two more students in the same upper-level college course. Though both students are strongly focused on avoiding the negative outcome of earning a C (or worse), the first student views this outcome as a missed opportunity to improve her class rank (i.e., as a non-gain that would bring sadness), whereas the second views it as a threat that might keep her from getting into medical school (i.e., as a loss that would produce anxiety). Thus, as is also illustrated in Table 1a, both students share the same avoidance motivation, but the first student experiences this motivation in terms of promotion concerns, whereas the second student experiences it in terms of prevention concerns. Studies simultaneously examining the effects of a focus on approach versus avoidance and a concern with promotion versus prevention have repeatedly confirmed the independence of these two motivational dimensions (Carver, Lawrence, & Scheier, 1999; Forster, Higgins, & Idson, 1998; Higgins, Roney, Crowe, & Hymes, 1994).¹

Learning Goals and Performance Goals

A more recent motivational distinction in the achievement literature (and one that is often discussed in conjunction with the approach/avoidance distinction, see Elliot, 1997; Moller & Elliot, 2006; Skarvick, 1997) is between pursuing achievement with a focus on learning and mastery (i.e., a *learning goal*) and pursuing achievement with a focus on performance and validation (i.e., a *performance goal*; see Dweck & Leggett, 1988; Nicholls, 1984; Maehr & Midgley, 1991). Although there has been some debate about

exactly how to characterize these two types of goals (Dweck & Leggett, 1988; Elliot, 1997; see Grant & Dweck, 2003), researchers generally agree that people with learning goals strive to acquire new skills and develop their abilities, whereas people with performance goals strive to assess their existing skills and demonstrate their abilities.

Much like approach and avoidance motivations, the goals of developing and demonstrating one's abilities can be represented as either promotion or prevention concerns. As illustrated in Table 1b, students who are motivated to develop their abilities (e.g., in mathematics) can represent this motivation in terms of promoting opportunities for exploring more advanced topics (e.g., physics or economics) or in terms of securing the necessary prerequisites for exploring such topics. Thus, efforts to enhance learning, development, and mastery do not necessarily imply a focus on gains and advancement; such mastery can also be pursued with the aim of fulfilling responsibilities and securing non-losses. As also illustrated in Table 1b, students who adopt a performance goal of demonstrating their abilities can represent this goal in terms of successfully advancing their academic status and self-esteem (e.g., making dean's list) or in terms of successfully securing such status and self-esteem (e.g., protecting against academic probation). Thus, striving for performance and validation does not necessarily imply a focus on losses and security; such validation can also be pursued with the aim of attaining ideals and achieving gains. Although, to our knowledge, no research exists that simultaneously examines the effects of promotion versus prevention concerns and learning versus performance goals, future studies might reveal important ways in which the interaction of these two motivational orientations influences achievement.

Intrinsic and Extrinsic Motivations

Finally, another longstanding distinction in the achievement literature is between motivations that are intrinsic and autonomous and motivations that are extrinsic and controlled. Whereas people who are intrinsically motivated feel free to follow their inner interests, people who are extrinsically motivated experience their behavior as controlled by external rewards and contingencies (see deCharms, 1968; Deci & Ryan, 2000; Ryan & Deci, 2000; Ryan & Stiller, 1991). That is, when people are intrinsically motivated, they pursue goals merely for the satisfaction that comes from completing them; but, when they are extrinsically motivated, they pursue goals as a means to obtain rewards or approval from others.

Although promotion concerns are represented as hopes and aspirations and prevention concerns are represented as duties and responsibilities, this is not equivalent to the difference between autonomy and control. That is, both hopes and responsibilities can be either freely chosen (i.e., originate internally) or imposed by others (i.e., originate externally; see Higgins, 1987; Moretti & Higgins, 1999a, 1999b). For example, as illustrated in Table 1c, a student who decides to pursue a career as a lawyer because of the intrinsic enjoyment she derives from studying jurisprudence can experience this enjoyment either as an inherent feeling of happiness that comes from fulfilling her personal aspirations or as an inherent feeling of relaxation that comes from fulfilling what she perceives as her basic responsibilities. Thus, motivations that are autonomous, self-chosen, and inherently satisfying do not always stem from a desire for growth or advancement (i.e., promotion concerns); upholding one's personal responsibilities and meeting the minimal standards one has freely set for oneself (i.e., prevention concerns) can be intrinsically enjoyable as well.² Similarly, as also illustrated in Table 1c, a student who decides to pursue a career as a lawyer because of the extrinsic rewards (e.g., money and status) it provides can perceive these rewards as gains that she has the opportunity to earn or as standards that she feels a responsibility to meet. Thus, motivations that are controlling, external, and that serve as means to some further end do not always stem from a desire for safety and security (i.e., prevention concerns); aspiring to achieve gains and advancement (i.e., promotion concerns) can involve extrinsic pursuits as well.

Despite the theoretical independence of intrinsic versus extrinsic motivations and promotion versus prevention concerns, there is some evidence that, at times, the experience of promotion-focused goal pursuit more strongly resembles the autonomous feelings of intrinsic motivation, whereas the experience of prevention-focused goal pursuit more strongly resembles the controlled feelings of extrinsic motivation. In a study by Grant and Higgins (2003), there was a small but significant correlation ($r = .21$) between the strength of people's general promotion concerns and their global feelings of autonomy, but no correlation ($r = .01$) between the strength of their general prevention concerns and their feelings of autonomy (see also Friedman, 1999). However, additional studies have confirmed that both promotion and prevention concerns can be either intrinsic or extrinsic in nature.³ Furthermore, studies by Moretti and Higgins (1999a) have demonstrated that the more intrinsic people's promotion or prevention concerns are, the greater impact each set of concerns has on self-regulation (see also Moretti & Higgins, 1999b). Thus, key principles that have emerged

from research on intrinsic versus extrinsic motivations (Deci & Ryan, 2000; Ryan & Deci, 2000) appear to operate in the same way regardless of whether people are pursuing promotion-focused or prevention-focused goals.

Activating and Instilling Promotion or Prevention Concerns

In addition to the unique ways in which they are represented and experienced, promotion and prevention concerns differ from other achievement motivations in how they are activated and instilled by the larger social context in which learning or performance occurs. As noted above, fundamental needs for both advancement and security play an important role in the pursuit of well-being and, thus, are generally possessed by everyone. However, certain environmental cues can make one of these needs more salient than the other, leading people to temporarily represent the goal they are pursuing predominately in terms of either promotion or prevention concerns. In addition, long-term exposure to social environments that repeatedly present one type of motivational cue over the other can instill a chronic tendency to generally represent one's goals in terms of either promotion or prevention concerns.

Sources of Temporary Activation

Because promotion concerns are represented and experienced in terms of aspirations and seeking opportunities for gain, social environments that frame students' achievement goals in terms of gain-focused incentives can evoke a predominant promotion orientation. For example, when successful performance of a task brings rewards (e.g., "if you receive an A in the class, you will *earn* a spot on the debate team") and failure results in the absence of rewards, students' motivation to complete the task will be primarily promotion-focused. In contrast, because prevention concerns are represented and experienced in terms of responsibilities and protecting against the possibility of loss, social environments that frame students' achievement goals in terms of loss-focused incentives can evoke a predominant prevention orientation. For example, when successful performance of a task brings security (e.g., "If you receive an A in the class, you will *retain* your spot on the debate team") and failure results in punishment, students' motivation to complete the task will be primarily prevention-focused (e.g., Forster, Grant, Idson, & Higgins, 2001; Forster, Higgins, and Bianco, 2003; Forster et al., 1998; Shah & Higgins, 1997; Shah, Higgins, & Friedman, 1998; see Higgins, 1997; Molden et al., 2008).

However, external incentives are not the only way in which promotion or prevention concerns can be temporarily activated. The predominant meaning that a specific task or outcome assumes with regard to a person's individual self-concept can also influence how these concerns are elicited in achievement situations (see Higgins, 1987, 1997). For example, when individuals view the outcome they are striving toward as particularly relevant to the hopes and aspirations they have set for themselves (e.g., they would ideally like to be a member of the debate team), they will be primarily promotion-focused in attempting to achieve this outcome (even in the absence of special incentives). Similarly, when individuals view the outcome they are striving toward as particularly relevant to the responsibilities and minimal standards they have set for themselves (e.g., they feel they ought to be a member of the debate team), they will be primarily prevention-focused in attempting to achieve this outcome (e.g., Forster et al., 1998, 2001, 2003; Shah & Higgins, 1997; Shah et al., 1998).

In addition to specific incentives and individual aspirations or responsibilities, there are general circumstances that can predominantly evoke either students' promotion or prevention concerns. For instance, situations that stress individuality and encourage positive distinction from others (i.e., that activate *independent self-construals*) have been found to increase people's focus on advancement and gains, whereas situations that emphasize social harmony and encourage the fulfillment of responsibilities to others (i.e., that activate *interdependent self-construals*) tend to increase people's focus on security and loss-prevention (Aaker & Lee, 2001; Lee et al., 2000). Thus, classrooms, courses, or specific projects that emphasize independence and individual achievement are more likely to activate promotion-focused achievement motivations, whereas classrooms that emphasize interdependence and collective achievement are more likely to activate prevention-focused achievement motivations.

Another example of general circumstances that predominantly evoke either students' promotion or prevention concerns has to do with the broad versus narrow outlook people adopt during goal-pursuit. Situations that encourage people to think about their goals in a more global and abstract way (e.g., envisioning an outcome in the somewhat distant future) have been found to increase people's focus on opportunities for maximizing gains, whereas situations that encourage people to think about their goals in a more specific and concrete way (e.g., envisioning an outcome in the immediate future) have been found to increase people's focus on the importance of securing against losses (Forster & Higgins, 2005; Pennington & Roese, 2003). Thus, at the beginning of a unit or a term (when due dates for exams and

papers are still somewhat distant and abstract), students may be likely to pursue their learning and preparation with a focus on promotion concerns, whereas at the end of the unit or term (when papers and exams loom larger) students may be more likely to pursue their learning with a focus on prevention concerns.

A final example of general circumstances that predominantly evoke either promotion or prevention concerns involves the expectations students may face from other people as they strive to achieve their learning goals. Situations in which students encounter positive expectations about their abilities or performance (e.g., an instructor who thinks highly of his students' abilities) have been found to induce a focus on opportunities for achieving gains, whereas situations in which students encounter negative expectations about their performance (e.g., an instructor who does not think highly of his students' abilities) have been found to induce a focus on the importance of securing against losses (Seibt & Forster, 2004). Thus, the achievement motivations of students who have "proven" themselves to their instructors or who feel that they have been labeled with positive stereotypes ("women are good writers") are likely to be promotion-focused, whereas the achievement motivations of students who have failed to prove themselves or who feel that they have been labeled with negative stereotypes ("women are bad at math") are likely to be prevention-focused.

Sources of Chronic Activation

Just as certain momentary incentives or features of the environment can temporarily activate one's predominant focus on promotion or prevention concerns, prolonged exposure to such incentives or an extended upbringing within a particular type of environment can instill chronic differences in one's predominant focus. That is, when the same types of circumstances that temporarily create either promotion-focused or prevention-focused achievement motivations frequently reoccur over an extended period of time, more stable and permanent promotion-focused or prevention-focused achievement orientations tend to develop.

People are often exposed to a stable system of promotion-focused or prevention-focused incentives when they interact with their caretakers during childhood (see Higgins & Silberman, 1998; Manian, Strahan, & Denney, 1998). Caretakers who predominantly reward children's successes with praise and love (e.g., a special celebration following a good report card) while punishing children's failures with disappointment and the withdrawal of affection (e.g., the cancellation of a planned outing following a bad report

card) are socializing them to seek the pleasure associated with positive outcomes and to avoid the pain associated with failing to attain positive outcomes. That is, by responding to a child's achievements in a pattern that primarily reinforces an orientation toward gains and non-gains, parents and teachers end up selectively strengthening the child's chronic focus on promotion. Similarly, caretakers who predominantly punish children's failures with criticism and sanctions (e.g., assigning extra chores following a bad report card) while rewarding children's successes with calmness and the withdrawal of threats (e.g., the cancellation of a threatened "grounding" following a good report card) are socializing them to avoid the pain associated with negative outcomes and to seek the pleasure associated with preventing negative outcomes. That is, by responding to a child's achievements in a pattern that primarily reinforces an orientation toward losses and non-losses, parents and teachers end up selectively strengthening the child's chronic focus on prevention.

Beyond parental socialization, the broader culture in which people (children or adults) live can also create a stable system of incentives and an environment that predominantly reinforces promotion or prevention concerns (Aaker & Lee, 2001; Lee et al., 2000). For example, the culture of a particular community or school system may encourage students to primarily focus on either their hopes and aspirations or on their responsibilities and obligations. In addition, cultural values that differ at the regional or national level may encourage a predominant focus on independence and personal aspirations (as is typically stressed in cultures of Western-European origin) or interdependence and responsibility toward others (as is typically stressed in cultures of East-Asian origin; see Markus & Kitayama, 1991). In both cases, the greater salience of one type of self-construal over another can lead individuals within a particular culture to develop primarily promotion-focused or primarily prevention-focused achievement motivations (see Kesebir, Gardner, Utal, & Miele, 2007).

Although people's parental upbringing and cultural environment have been the most widely studied influences on chronic concerns with promotion or prevention, prolonged and consistent exposure to any of the sources of temporary activation discussed in the previous sections (e.g., gain-focused or loss-focused incentives from peers or teachers) can also instill chronic concerns. Thus, students' repeated experiences with the same instructor or the same classmates throughout the course of a school year could potentially influence their chronic focus on either promotion or prevention concerns.

Interactions between Temporary and Chronic Activation

Because promotion-focused and prevention-focused achievement orientations can be both temporarily activated and chronically instilled, it is important to consider the interplay between these distinct sources of motivation. When one orientation has been chronically instilled, this does not preclude the other orientation from being temporarily activated. Everyone possesses basic motivations for both advancement and security to some degree; therefore, when circumstances challenge or evoke one of these fundamental needs, everyone should experience an elevation in either promotion or prevention concerns regardless of his or her chronic motivational orientation. That is, when a learning task is framed with strong gain or non-gain incentives, even chronically prevention-focused students can be expected to approach the task in a promotion-focused manner; conversely, when a learning task is framed with strong loss or non-loss incentives, chronically promotion-focused students can be expected to approach the task in a prevention-focused manner (e.g., Forster et al., 2001; Shah & Higgins, 1997; Shah et al., 1998).

This malleability in people's achievement orientations suggests that promotion and prevention concerns can at times overlap. Though someone who is chronically promotion-focused may define most goals in terms of advancement and gains, there might be certain instances in which he or she is more prevention-focused. It is also possible that a person may be promotion-focused about a particular goal at one point in time and, following a change in circumstances or events, prevention-focused about this goal at another.⁴ Yet, even when situations arise in which a particular goal simultaneously evokes both strong promotion concerns and strong prevention concerns (i.e., in which there are large incentives both for attaining gains and protecting against losses), whichever concern is currently the *most* prominent is likely to "capture" one's representation of this goal and define how it is experienced and pursued (see Higgins, 1990, 1997).

In sum, because promotion-focused and prevention-focused achievement motivations can either be temporarily induced or differ chronically between individuals, they are relevant for understanding both the educational effects of specific teaching practices and individual variations in student learning and performance. Research examining how tasks framed with different promotion-focused or prevention-focused incentives affect students' learning and achievement addresses the former objective, whereas research assessing how students' chronic focus on promotion or prevention influences their learning and achievement addresses the latter objective. The studies reviewed in the following sections include examples of both types of research.

CONSEQUENCES OF PROMOTION VERSUS PREVENTION CONCERNS ON LEARNING AND ACHIEVEMENT

Having discussed the unique ways in which promotion and prevention concerns are represented, experienced, and activated, we now turn to research that illustrates the important effects these concerns have on goal-pursuit and information processing. In the first half of this section, we describe the general effects of promotion or prevention concerns on goal pursuit and then discuss the implications of these effects for students' motivation and task engagement. In the second half, we describe the specific effects of promotion and prevention concerns on the strategies students use to absorb, retain, and apply new information and then discuss the educational implications of these effects for student learning and mastery.

Promotion-Focused and Prevention-Focused Goal Pursuit

As previously discussed, promotion concerns are rooted in advancement needs and thus lead people to focus on the presence or absence of gains, whereas prevention concerns are rooted in security needs and thus lead people to focus on the presence or absence of losses. Consequently, people who are promotion-focused should show a special interest in and sensitivity to information that is relevant to advancement or gains, whereas people who are prevention-focused should show a special interest in and sensitivity to information that is relevant to security or losses (cf. Kunda, 1990; Molden & Higgins, 2005).

Such sensitivities and interests have been confirmed across several studies. For example, chronically promotion-focused individuals processed a product description more carefully when its selling points were framed in terms of advancement needs (e.g., "This product addresses our optimal dreams, desires, aims, and intentions ..."), whereas chronically prevention-focused individuals processed the description more carefully when its selling points were framed in terms of security needs (e.g., "This product addresses our responsibilities: those things we ought to do and should do ..."; Evans & Petty, 2003; see also Aaker & Lee, 2001; Lee & Aaker, 2004). In addition, promotion-focused individuals who read an essay about a day in the life of a fellow student retained and recalled more events related to the presence and absence of positive outcomes (e.g., finding a \$20 bill on the street, or missing an anticipated date at the movies), whereas prevention-focused individuals

who read the same essay recalled more events related to the presence and absence of negative outcomes (e.g., being stuck in a crowded subway, or having a vacation from a typically difficult class schedule; Higgins & Tykocinski, 1992).

These greater sensitivities to gains and advancement or losses and security can have a profound influence on the initiation and regulation of goal pursuit (Higgins, 1997; Molden et al., 2008). Here, we consider several effects of promotion or prevention concerns that are particularly relevant for understanding students' achievement motivations, including differences in how people select specific goals to pursue, how they choose which of these goals to pursue first, how engaged they are during goal pursuit, and how this engagement is affected by success and failure feedback.

Choosing Among Goals

Traditional accounts of achievement motivation discuss goal selection in terms of two primary factors: (a) the perceived likelihood that some outcome will be achieved, and (b) the value accorded to this outcome (see Atkinson, 1957; Feather, 1988; Wigfield & Eccles, 1992). Research has shown that each of these factors has an overall effect on goal selection, such that an increase in either the perceived likelihood or value of success produces a corresponding increase in people's desire to approach or avoid a particular outcome. These factors typically have an interactive effect as well, such that perceived likelihood for success becomes increasingly important in choosing an outcome to pursue as the value of that outcome increases (and vice versa).

Studies by Shah and Higgins (1997) have demonstrated, however, that the interactive effect between expectancy and value differs for promotion-focused and prevention-focused individuals. Because promotion concerns generate an interest in maximizing potential gains (i.e., in attaining an ideal level of achievement), they motivate people to pursue goals that are highly valuable *and* that afford a high likelihood of success. Thus, promotion-focused individuals should exhibit the typical expectancy \times value interaction: the more valuable the goal, the more that expectations of success should influence their decision to pursue it. Consistent with this prediction, Shah and Higgins found that the more valuable promotion-focused college students perceived a hypothetical course to be (i.e., the more important the course was for gaining acceptance into an honor society), the more their expectations for success (i.e., the perceived probability of receiving a high grade) influenced their desire to enroll. Moreover, the same pattern of results was found regardless of whether students' promotion concerns were

temporarily induced (by framing admission to the honors society in terms of advancement and gains) or measured as a chronic individual difference.

In contrast, because prevention concerns generate an interest in protecting against potential losses (i.e., in maintaining an acceptable level of achievement), they motivate people to pursue highly valued goals regardless of the perceived likelihood of success (i.e., the more important a goal is for maintaining an acceptable level of achievement, the harder one must pursue it, whatever the odds). Thus, prevention-focused individuals should exhibit the opposite expectancy \times value interaction: the more valuable the goal, the less expectations of success should influence their decision to pursue it. Consistent with this prediction, Shah and Higgins (1997) also found that the more valuable prevention-focused college students perceived a hypothetical course to be for admittance to an honor society, the *less* their expectations for success influenced their desire to enroll. Once again, this pattern of results was found regardless of whether students' prevention concerns had been temporarily induced (by framing admittance to the honors society in terms of security and protection against losses) or measured as a chronic individual difference.

In addition to expectancy-value considerations, people often base their choice of goals on whether they serve to maintain a currently stable and desirable situation or whether they help to bring about some novel and (equally) desirable situation. Typically, people exhibit a *status-quo bias* in their goal-choice and, thus, tend to focus on maintenance over attainment (Kahneman, Knetsch, & Thaler, 1991). However, because maintaining a desirable situation primarily concerns security, whereas attaining something new primarily concerns advancement, this status quo bias should be influenced by people's promotion and prevention concerns. Liberman, Idson, Camacho, and Higgins (1999) confirmed this hypothesis by giving college students a choice between maintaining their pursuit of a current goal or pursuing an entirely new goal. Prevention-focused college students exhibited the typical status quo bias (across studies, only 19–33% of these participants chose to work toward the new goal), whereas promotion-focused students were equally likely to pursue old and new objectives. Additional research by Brodscholl, Kober, and Higgins (2008) has further shown that, even when everyone is given the exact same goal to pursue, prevention-focused students value the goal more when they believe it involves working to maintain something they already have, whereas promotion-focused students value it more when they believe it involves working to attain something new. Once again, in all of these studies, the same pattern of results was found regardless of whether students'

predominant concerns with promotion or prevention were temporarily induced (by framing the goal in terms of advancement or safety) or measured as a chronic individual difference.

Initiating Goal-Directed Action

After choosing one or more goals to work toward, people must decide when to initiate goal-pursuit. Several classic theories of self-regulation (e.g., Maslow, 1955; Rotter, 1954/1982) suggest that goal initiation depends on whether a goal is construed as a *minimal* standard that one must attain immediately or as a *maximal* standard that one hopes to attain eventually. Because minimal standards are associated with a focus on security and loss-prevention, whereas maximal standards are associated with a focus on advancement and gains, Freitas, Liberman, Salovey, and Higgins (2002b) hypothesized that prevention concerns would lead students to view their achievement goals in terms of minimal standards, whereas promotion concerns would lead them to view their achievement goals in terms of maximal standards. To test this hypothesis, they asked students who were either chronically promotion-focused or chronically prevention-focused to imagine preparing an essay for a fellowship application. They then asked the students how soon before the application deadline they would want to begin the writing process. The results showed that students who were prevention-focused preferred an earlier starting point than those who were promotion-focused (see also Pennington & Roese, 2003).

Engagement During Goal-pursuit

Once a goal has been selected and initiated, it can be pursued with varying levels of engagement (see Harackiewicz & Sansone, 1991; Higgins, 2006). As with goal choice and goal initiation, goal engagement is influenced by promotion and prevention concerns in a variety of ways. One of these ways can be described as *incentive matching*. When the particular incentives driving goal-pursuit match the interests and sensitivities generated by people's promotion or prevention concerns, greater engagement and better performance should result (cf. Harackiewicz & Sansone, 1991; Sheldon & Elliot, 1999; Petty, Wheeler, & Bizer, 2000). This effect is illustrated by several studies (Shah et al., 1998) in which promotion-focused and prevention-focused college students were asked to perform an anagram task involving incentives that were framed in terms of potential gains (i.e., receiving an extra dollar for performing well and not receiving an extra dollar for performing poorly) or potential losses (i.e., not losing a dollar for performing well and losing a dollar for performing poorly). Across the

studies, promotion-focused students identified a greater number of anagrams when the goal was framed in terms of gain incentives, whereas prevention-focused students identified a greater number of anagrams when the goal was framed in terms of loss incentives.

Another illustration of this incentive matching effect can be found in a study by Markman, Baldwin, and Maddox (2005). Though all of the participants were asked to perform the same visual discrimination task (i.e., to determine which of two categories a stimulus belonged to based on its screen position), some of the participants were given performance incentives that involved gaining points for correct responses and not gaining points for incorrect responses, whereas others were given incentives that involved losing points for incorrect responses and not losing points for correct responses. As expected, promotion-focused participants performed optimally (i.e., earned close to the maximum number of points) when provided with gain or non-gain incentives, whereas prevention-focused participants performed optimally when provided with loss or non-loss incentives.⁵

A second way in which promotion or prevention concerns influence engagement is through *regulatory fit* (Higgins, 2000, 2006). Regulatory fit occurs when the specific *strategies* people use to pursue their goals match and sustain their current motivational orientation. Such fit has also been shown to increase levels of engagement and performance. In one study illustrating this effect (Freitas, Liberman, & Higgins, 2002a), college students completed a set of math problems while a set of distracting video clips were (or were not) played in the background. The presence of the videos required students to vigilantly maintain their attention to the math problems. Because resisting the distraction of the videos protects against losses in performance, this kind of strategy should fit better with a prevention orientation. The results of the study confirmed this prediction. In the presence of the videos, students whose prevention concerns had been temporarily activated enjoyed the math problems more and performed better on them than did students whose promotion concerns had been temporarily activated; these effects did not occur in the absence of the video.

In another study illustrating the effect of regulatory fit on engagement, college students who were chronically promotion-focused or prevention-focused wrote a list of suggestions for improving the transition from elementary school to middle school (Higgins, Idson, Freitas, Spiegel, & Molden, 2003). Some of these students were told to list improvements that would "maximize the positive aspects" of middle school, a strategy which fits better with a promotion orientation; whereas others were told to list improvements that would "eliminate the negative aspects" of middle school,

a strategy which fits better with a prevention orientation. Students who completed this task while experiencing fit (i.e., promotion-focused students using the maximizing strategy and prevention-focused students using the elimination strategy) displayed increased engagement; that is, they listed a greater number of possible improvements and attributed greater importance to the goal of improving middle school.

Responding to Success or Failure Feedback

Finally, when engaged in goal pursuit, people often receive feedback about their progress that influences their motivation to continue. Classic psychological theories of motivation suggest that success feedback raises expectations for a positive outcome and increases task engagement, whereas failure feedback lowers expectations for a positive outcome and decreases task engagement (Carver, 2004; Lewin, 1935; McClelland et al., 1953). However, a large-scale meta-analysis of existing research revealed few overall differences between the effects of success and failure feedback (Kluger & DeNisi, 1996). Thus, it is important to investigate exactly *when* success or failure feedback influences engagement and performance.

Recently, several lines of research have suggested that promotion and prevention concerns can moderate the effects of success and failure feedback on task engagement (Forster et al., 2001; Idson & Higgins, 2000). Because (a) promotion concerns lead people to represent their goals in terms of advancement, and (b) successful advancement produces relatively intense positive emotions (Idson et al., 2000; Liberman et al., 2005), success feedback should motivate promotion-focused individuals to pursue their goals with increased levels of engagement (i.e., to ensure that these positive emotions continue). However, because (a) prevention concerns lead people to represent their goals in terms of security, and (b) a heightened sense of security produces less-intense positive emotions (Idson et al., 2000; Liberman et al., 2005), success feedback should not motivate prevention-focused individuals to the same extent and should not result in the same increases in engagement. To test these hypotheses, Idson and Higgins (2000) had chronically promotion-focused or prevention-focused college students complete a set of anagrams. Halfway through the task, some of the students received success feedback. Although all of these students performed well on the anagrams that preceded the feedback, promotion-focused students performed better than prevention-focused students on the anagrams that followed this success feedback (see also Forster et al., 2001).

In contrast, promotion and prevention concerns have been shown to influence the effect of failure feedback on task engagement in the opposite manner. Because a threatened sense of security produces relatively intense negative emotions (Idson et al., 2000; Liberman et al., 2005), failure feedback should motivate prevention-focused individuals to pursue their goals with increased levels of engagement (i.e., to ensure that these negative emotions do not continue). However, because missed opportunities for advancement produce less intense negative emotions (Idson et al., 2000; Liberman et al., 2005), failure feedback should not motivate promotion-focused individuals to display the same increases in engagement. These hypotheses were also tested by Idson and Higgins (2000). Halfway through the anagram task described above, some of the students received failure instead of success feedback. Although, once again, all of these students performed equally well on the anagrams that preceded the feedback, prevention-focused students performed better than promotion-focused students on the anagrams that followed this failure feedback (see also Forster et al., 2001).

Implications of Promotion-Focused and Prevention-Focused Achievement Motivations

Framing Achievement in Terms of Promotion-Focused or Prevention-Focused Incentives

The wide-ranging effects of promotion and prevention concerns on goal pursuit are important for understanding and enhancing students' achievement motivation in several ways. To begin with, students often enter the classroom with different motivational orientations, and thus may not respond in the same manner to incentives or feedback that are designed to boost their achievement motivation (cf., Nolen, 1988). To sustain their academic engagement and enhance their performance, students who are chronically promotion-focused may require incentives focused on advancement and gains, as well as feedback that emphasizes their potential for success; students who are chronically prevention-focused may instead require incentives focused on security and protection from losses, as well as feedback that emphasizes their risk of failure (cf. Norem, 2000).

Differences in the incentives required to optimally motivate promotion-focused and prevention-focused achievement have several implications for educators. First, knowledge of these differences might aid educators in understanding why large-scale initiatives aimed at increasing achievement motivation (e.g., Head Start and Upward Bound) often produce mixed

results (Currie & Thomas, 1998; Scheier & Kraut, 1979; see also Mecca, Smelser, & Vasconcellos, 1989). Such knowledge might also be useful when identifying smaller groups of individuals for whom these initiatives seem to have a particular benefit. Second, appreciating the differences between promotion-oriented and prevention-oriented incentives might help educators anticipate difficulties they are likely to experience when importing successful educational practices from one culture (e.g., China or Japan) to another (e.g., the United States), especially when these cultures differ in the extent to which students are generally promotion-focused or prevention-focused. Finally (as hinted at above), measuring individual differences in regulatory focus could aid educators in their attempts to provide students with the kinds of incentives and feedback that motivate them to perform well.

Yet do differences in the incentives required to motivate promotion-focused and prevention-focused students imply that teaching practices must always be tailored to individual students' motivations? That is, without investing the great amount of time and resources necessary to (a) identify whether students are promotion-focused or prevention-focused, and (b) create two different sets of activities and assessments, is there a way to target promotion-focused and prevention-focused students simultaneously?

One possibility is to ensure that students always have both promotion-relevant and prevention-relevant incentives available. Although many educators have long recognized the importance of presenting their materials to students in several different ways, the research we have reviewed should serve as another reminder that a concerted effort to accommodate students' different motivational orientations could have significant educational benefits. Studies on promotion-focused and prevention-focused interests and sensitivities (Aaker & Lee, 2001; Evans & Petty, 2003; Lee & Aaker, 2004) suggest that educators may be able to use both types of incentives (simultaneously) to frame general topics of study. For example, an instructor might emphasize the importance of studying Earth Science in terms of the gains associated with sustainable development *and* the losses associated with global climate change. Alternatively, studies on incentive matching (Markman et al., 2005; Shah et al., 1998) suggest that educators could use both types of incentives to frame specific classroom activities. For example, instructors might establish opportunities for extra credit, as well as penalties for late or incomplete assignments. Or, they might provide a system of feedback that explicitly notes areas in which students are performing well, as well as areas in which they are performing poorly. Finally, studies on regulatory fit (Freitas et al., 2002a; Higgins et al., 2003)

suggest that, even if students are not provided with general or specific incentives, educators can provide different types of learning strategies, such as eagerly reading beyond the syllabus (a promotion-oriented strategy) or vigilantly testing oneself on the assigned reading (a prevention-oriented strategy; such strategies are discussed in more detail below). Although circumstances in which both promotion-focused and prevention-focused incentives or strategies are simultaneously available have not yet been studied systematically, there is much evidence suggesting that students would respond only to what was motivationally relevant (Kunda, 1990; Molden & Higgins, 2005) and, thus, that everyone would benefit from this type of "multiple framing."

Activating Students' Promotion or Prevention Concerns

Another important implication of the studies we reviewed is that, in all cases, similar effects were found regardless of whether predominant concerns with promotion or prevention were measured or were temporarily induced (e.g., Brodscholl et al., 2008; Forster et al., 2001; Freitas et al., 2002a; Higgins et al., 2003; Idson & Higgins, 2000; Liberman et al., 1999; Shah & Higgins, 1997). That is, as noted earlier, despite a student's general tendency to adopt either promotion or prevention concerns during goal pursuit, both sets of concerns can be temporarily activated by the types of circumstances described above (see Higgins, 1997; Molden et al., 2008).

Therefore, in specific instances where one would want students to adopt more promotion-focused or prevention-focused achievement motivations, it may be desirable to selectively employ the practices and incentives that evoke that particular motivation. For example, educators might want all of their students to be more prevention-focused when attempting to master fundamental skills that are at the core of a particular discipline. Prevention-focused achievement motivations are likely to (a) encourage early initiation of the goal to develop such skills (Freitas et al., 2002b; Pennington & Roese, 2003), (b) sustain commitment to this goal in the face of initial failure and lowered expectations (Forster et al., 2001; Idson & Higgins, 2000; Shah & Higgins, 1997), and (c) help maintain focus on the goal regardless of other goals that might arise (Brodscholl et al., 2008; Liberman et al., 1999). Instilling prevention-focused motivations might therefore be particularly effective when attempting to teach topics that *must* be learned in order to master a particular discipline, such as grammar, algebraic substitution, or the periodic table of elements. In contrast, educators might want all of their students to be more promotion-focused when planning for their educational future. Promotion-focused achievement motivations are likely to encourage

them to (a) consider the long-term implications of their actions (Freitas et al., 2002b; Pennington & Roese, 2003), (b) focus on an area in which reasonable expectations for success exist (Forster et al., 2001; Idson & Higgins, 2000; Shah & Higgins, 1997), and (c) shift their focus toward more promising educational opportunities as they arise (Brodscholl et al., 2008; Liberman et al., 1999). Instilling promotion-focused motivations might therefore be particularly effective when counseling students about their major or choice of career.

Promotion-Focused and Prevention-Focused Strategies for Information Processing

In addition to influencing the interests and incentives that generally drive goal pursuit, predominant concerns with promotion or prevention have been found to affect the specific types of strategies people employ when processing goal-related information (see Higgins & Molden, 2003; Molden & Higgins, 2005; Molden et al., 2008). Because promotion concerns generate a focus on advancement, they motivate people to adopt judgment and information-processing strategies that involve eagerly seeking gains (even at the risk of committing errors). That is, promotion-focused individuals prefer to take chances and to be overly inclusive when evaluating information, so as not to overlook anything that would allow them to advance their understanding. In contrast, because prevention concerns generate a focus on security, they motivate people to adopt judgment and information-processing strategies that involve vigilantly protecting against losses (even at the risk of forgoing possible gains). That is, prevention-focused individuals prefer to play it safe and to be overly exclusive when evaluating information, so as not to commit to something that might produce a false understanding.

A basic illustration of the difference between promotion-focused and prevention-focused judgment strategies can be found in a study by Crowe and Higgins (1997). After studying a list of nonsense words, college students completed a test of recognition memory that included all of the items from the original list as well as an equal number of new words (see also Friedman & Forster, 2001). Although students generally did not show differences in their level of sensitivity when choosing between old and new words (see Tanner & Swets, 1954), those with a temporarily induced promotion focus were more biased toward saying that they had seen a particular word before (indicating an eager strategy of being overly inclusive), whereas those with a temporarily induced prevention focus were more biased toward saying

that they had not seen a particular word before (indicating a vigilant strategy of being overly exclusive).

The eager judgment strategies generated by promotion concerns and the vigilant judgment strategies generated by prevention concerns have important effects on the various ways in which people process and retain information (Higgins, 1997; Molden et al., 2008). In this section, we review evidence from several lines of research that are particularly relevant for learning, including how students use promotion-focused or prevention-focused strategies to (a) generate and test hypotheses while solving problems, (b) monitor their progress while attempting to understand new information, and (c) retain new information once it has been learned.

Hypothesis Testing During Problem Solving

The generation and testing of alternative hypotheses is a basic process involved in most forms of problem solving (Slooman, 2005). However, recent research has shown that this basic process is altered by promotion and prevention concerns. The eager, inclusive strategies produced by promotion concerns involve being open to numerous alternatives (i.e., setting a relatively low threshold for evaluating alternatives as plausible), which increases the likelihood of identifying correct hypotheses and decreases the likelihood of omitting information that might be important. In contrast, the vigilant, exclusive strategies produced by prevention concerns involve narrowing down the number of reasonable alternatives (i.e., setting a relatively high threshold for evaluating alternatives as plausible), which increases the likelihood of eliminating incorrect hypotheses and decreases the likelihood of making false assertions. Overall, this suggests that people with promotion concerns should be more "open-minded" and endorse a greater number of alternative hypotheses during problem solving than people with prevention concerns (Higgins & Molden, 2003; Molden & Higgins, 2005; Molden et al., 2008).

Such effects have been demonstrated across a wide variety of problem solving tasks. For example, Liberman, Molden, Idson, and Higgins (2001) showed that promotion-focused college students who were attempting to identify everyday objects from magnified photographs taken at unfamiliar angles listed more hypotheses about what these objects might be than did prevention-focused students. Similar effects were also found when college students were asked to generate hypotheses about another person's traits (based on the person's actions) or to endorse different explanations for their own and others' behaviors (Molden & Higgins, 2004, in press).

An additional series of studies by Friedman & Forster (2001) demonstrated that promotion-focused individuals' eager strategy of considering hypotheses also facilitates an "exploratory" and imaginative processing style, whereas prevention-focused individuals' vigilant strategy of considering hypotheses facilitates a "cautious" and less imaginative processing style. For example, when asked to list possible uses for common, everyday objects, promotion-focused college students generated a greater number of innovative suggestions than did prevention-focused students. Promotion-focused students also performed better than prevention-focused students on the Snowy Pictures Test (Ekstrom, French, Harman, & Dermen, 1976), which involves trying to identify images of simple objects that are embedded within complex patterns of visual noise (and which is often used as a measure of insight-problem solving). Finally, promotion-focused participants were better than prevention-focused students at overcoming previous associations in memory in order to provide novel responses on a word completion task (see also Crowe & Higgins, 1997). Across all of these studies, the same pattern of results was found regardless of whether students' promotion or prevention concerns had been temporarily activated or measured as a chronic individual difference.

Prioritizing Speed versus Accuracy

In addition to influencing the way in which people consider alternative hypotheses during problem solving, promotion-focused and prevention-focused judgment strategies affect the way in which they monitor their information processing. A basic decision that people must make when engaged in such monitoring is whether to prioritize the speed or accuracy of processing (see Sanders, 1998). Prioritizing speed is a "risky" strategy focused on maximizing advancement and minimizing missed opportunities for reviewing all available information. Therefore, people should be more likely to utilize this strategy when their promotion concerns have been activated. In contrast, prioritizing accuracy is a "cautious" strategy focused on maximizing security and minimizing the possibility of misinterpreting the available information. Therefore, people should be more likely to utilize this strategy when their prevention concerns have been activated.

To test these predictions, Forster et al. (2003) instructed college students to proofread a text as quickly and as accurately as possible within a limited amount of time. The text contained two kinds of errors: surface errors, which were simple typos and misspellings that could be identified without reading the text closely, and contextual errors, which were punctuation mistakes and homonyms that could only be identified by taking the meaning

of the text into account. Overall, students with a temporarily induced promotion focus proofread the text at a faster rate than students with a temporarily induced prevention focus (i.e., they identified a higher percentage of the total errors in the time available). However, promotion-focused students primarily identified simple surface errors, whereas prevention-focused students were more accurate at identifying complex contextual errors.

Monitoring Comprehension

These preferences for speed versus accuracy suggest that promotion and prevention concerns might also influence the more precise ways in which students monitor their comprehension of new information. Research on metacognition suggests that people use their *judgments of learning* (i.e., their assessments of how well they understand or remember the material they are studying) to decide how to allocate their study time (see Kornell & Metcalfe, 2006; Son & Metcalfe, 2000). For instance, a student who feels confused about something she just read may decide to go back and reread an earlier paragraph or to continue reading and hope that the remainder of the text helps to resolve her confusion. Because prevention concerns produce a focus on maximizing accuracy and minimizing mistakes, prevention-focused students should be highly responsive to their feelings of incomprehension and thus more likely than promotion-focused students to attempt to actively resolve their confusion (by reprocessing or rereading the material).

We recently tested this hypothesis by asking college students to read a 12-paragraph essay describing the rules and strategies of an obscure card game called German Whist (Miele, Molden, & Gardner, 2007). Half of the students read a version of the text in which a statement in the fifth paragraph made a highly contradictory and *irresolvable* reference to a statement in the second paragraph. The other half of the students read an alternate version in which a statement in the fifth paragraph made a slightly confusing but *resolvable* reference to the statement in the second paragraph. After reading the essay, students rated their understanding of the text and took a short comprehension test. When processing the irresolvable passage, chronically promotion-focused and prevention-focused students both displayed a strong tendency to engage in targeted rereading (i.e., to reread the second paragraph after reading the fifth paragraph). However, when processing the resolvable passage, prevention-focused students still displayed a strong tendency to engage in targeted rereading, but promotion-focused students did not. Thus, although everyone sought to reprocess information in response to the high level of confusion produced by the

irresolvable passage, only prevention-focused students vigilantly reprocessed information in response to the low levels of confusion produced by the resolvable passage. Furthermore, this reprocessing increased prevention-focused students' ratings of comprehension and improved their performance on the comprehension test (but only for the latter passage, which allowed them resolve their confusion).

Retaining Information Following Goal Completion

Finally, in addition to influencing the ways in which people monitor their information processing as it unfolds, promotion and prevention judgment strategies affect the ways in which people retain information once information processing is complete. Following goal completion, information that was relevant to goal pursuit tends to fade quickly from memory (Lewin, 1935). For example, students are often unable to recall important information once they have achieved their goal of passing an exam. Although this forgetting can serve a functional purpose (e.g., by "freeing up" cognitive resources that can be applied to new learning objectives), it is obviously important for students to retain information that might be useful in the future.

Hedberg and Higgins (2006) recently proposed that promotion and prevention concerns influence people's strategies for retaining goal-relevant information. Because promotion-focused individuals are concerned with advancement, they should be less concerned with retention following goal completion (in order to maximize the cognitive resources available for seeking additional gains). In contrast, because prevention-focused individuals are concerned with security, they should be more concerned with retention following goal completion (in order to minimize the chance of being unprepared for a similar goal in the future). In a study testing this hypothesis, chronically promotion-focused or prevention-focused college students viewed a series of images while attempting to identify how many times a picture of eyeglasses was followed by a picture of scissors. Thus, the concept "eyeglasses" signaled the possibility of goal completion and should have been highly active in working memory during the task; however, because the concept of eyeglasses was highly specific to the task, its activation should have faded once the task was over. Consistent with this prediction, promotion-focused students showed a marked decay in the activation of eyeglass-related concepts (assessed using a lexical decision task) as early as one minute after the identification task, whereas prevention-focused students continued to show heightened activation of these concepts up to 15 min later.

Implications of Promotion-Focused or Prevention-Focused Strategies for Learning

Overall, research on promotion and prevention judgment strategies indicates that promotion-focused individuals typically employ a faster, more creative, and less inhibited style of information processing, whereas prevention-focused individuals employ a slower, less imaginative, and more meticulous style of processing. These findings have several important implications for anticipating, understanding, and altering the processes by which students learn.

To begin with, promotion-focused students might be expected to exhibit more divergent thinking (Guilford, 1967; McCrae, 1987), which includes drawing a greater number of novel inferences and making broad connections between the current topic of study and seemingly unrelated areas of interest (see Crowe & Higgins, 1997; Friedman & Forster, 2001). They should also complete course readings and assignments relatively quickly (but perhaps superficially) by forging ahead even when confusion or uncertainty arises (Forster et al., 2003; Miele et al., 2007). Finally, promotion-focused students should retain less information following the completion of a particular unit or course, especially if they do not anticipate studying something similar in the future (Hedberg & Higgins, 2006).

In contrast, prevention-focused students might be expected to exhibit more convergent thinking (Guilford, 1967; McCrae, 1987), which includes consolidating material in a highly ordered (but perhaps conventional) manner, as well as making relatively narrow connections between the current topic of study and closely related areas of interest (see Crowe & Higgins, 1997; Friedman & Forster, 2001). These students should also complete course readings and assignments relatively slowly (but perhaps thoroughly) as a result of trying to resolve their incomprehension when confusion or uncertainty arises (Forster et al., 2003; Miele et al., 2007). Finally, prevention-focused students should retain more information following the completion of a particular unit or course, especially if they anticipate studying something similar in the future (Hedberg & Higgins, 2006).

Although promotion-focused and prevention-focused approaches to learning appear to have their respective strengths (e.g., creativity versus thoroughness), they have their respective weaknesses as well (e.g., cursory analysis and weak retention versus an oversensitivity to confusion and uncertainty). Therefore, identifying individual students who have relatively strong promotion or prevention concerns, as well as particular topics, courses, or classrooms in which promotion or prevention concerns are

emphasized, might aid educators in understanding the areas in which certain students are likely to excel or struggle. That is, accounting for the influence of promotion and prevention concerns might help educators anticipate the strengths and weaknesses of individual students, as well as the potential problem areas these students might encounter.

In addition, considering the effects of promotion or prevention concerns on learning might also help educators construct learning environments that are suitable for *all* students regardless of their specific motivational orientation. Much like the research on goal pursuit reviewed earlier, the research on judgment strategies revealed the same pattern of results regardless of whether promotion or prevention concerns were measured or temporarily induced (Forster et al., 2003; Friedman & Forster, 2001; Liberman et al., 2001; Miele et al., 2007; Molden & Higgins, 2004, *in press*). Thus, educators who want students to master and retain new information at a relatively deep level (e.g., when learning the fundamental theorem of calculus or how to properly structure a five paragraph essay) should use incentives and feedback that create prevention concerns (e.g., emphasize responsibilities and potential losses or provide negative feedback when students are not adequately engaged). In contrast, educators who want students to elaborate and extend new information in creative ways (e.g., to propose a novel scientific hypothesis or to write an original sonnet) should use incentives and feedback that create promotion concerns (e.g., emphasize aspirations and potential gains or provide positive feedback to keep students optimally engaged).

SUMMARY AND CONCLUSIONS: THE COSTS AND BENEFITS OF PROMOTION-FOCUSED OR PREVENTION-FOCUSED ACHIEVEMENT MOTIVATIONS

In this chapter, we have described a wide range of effects that promotion and prevention motivations have on goal pursuit and information processing. We have also discussed the implications of such effects for students' learning and achievement. Considering these effects as a whole, it may be tempting to ask whether one motivational orientation is "better" for students than the other. That is, are promotion-focused or prevention-focused students in a better position to achieve academic success?

As we have discussed throughout this article, promotion-focused and prevention-focused achievement motivations each have advantages and disadvantages for learning and performance. Compared to prevention-focused individuals, promotion-focused individuals are faster and more open-minded in their processing of information and thus propose a greater number of creative solutions during problem solving (Crowe & Higgins, 1997; Forster et al., 2003; Friedman & Forster, 2001; Liberman et al., 2001; Molden & Higgins, 2004, in press). In addition, promotion-focused individuals are more flexible in choosing which goals to pursue and are more likely to switch goals when faced with an obstacle (Liberman et al., 1999; Shah & Higgins, 1997). Whereas these motivational qualities serve as assets in many circumstances, they can also serve as liabilities. For example, when a clear and definite answer is needed, being more open-minded about possible hypotheses can actually leave people more uncertain and indecisive about which alternative to select (cf. Liberman et al., 2001; Molden & Higgins, in press). In addition, greater flexibility during goal pursuit can at times lead to the abandonment of important goals, especially if success appears unlikely or negative feedback has been received (Liberman et al., 1999; Shah & Higgins, 1997). Finally, attempts to quickly comprehend new information often come at the expense of deeply understanding the material (Forster et al., 2003; Miele et al., 2007).

In contrast, prevention-focused individuals process information more thoroughly and are more resilient in pursuing important goals (even in the face of low expectations or negative feedback) than promotion-focused individuals (Forster et al., 2003; Liberman et al., 1999; Miele et al., 2007; Shah & Higgins, 1997). Again, although these motivational qualities serve as assets, they can also serve as liabilities. For example, when a fast solution or a quick action is needed, a commitment to deep processing can result in missed opportunities and a failure to finish assigned tasks in the allotted time. Additionally, situations often arise in which certain goals must be abandoned due to a decreasing likelihood of success; in such cases, resilience can give way to over-persistence and result in wasted time and effort.

Therefore, when comparing the advantages of promotion-focused and prevention-focused achievement motivations, it is probably best to think of them as involving a series of complementary compromises. A promotion focus prioritizes open-mindedness, flexibility, and speed, but it does so at the expense of decisiveness, commitment, and accuracy; conversely, a prevention focus prioritizes decisiveness, commitment and accuracy, but does so at the expense of open-mindedness, flexibility, and speed. Optimal achievement

may thus involve a careful balancing of promotion and prevention concerns. That is, students may be most successful when they are (a) especially mindful of these motivational compromises, (b) able to properly assess the motivational demands of a particular task (i.e., whether the task requires fast and superficial versus slow and deep processing), and (c) able to temporarily adopt the promotion-focused or prevention-focused strategies that fit with these demands. For example, imagine a student writing an essay for her English class. By initially adopting a promotion focus, she is able to quickly turn out a first draft that outlines a broad and innovative set of ideas. Then, by shifting to a prevention focus, she is able to methodically craft these ideas into a second draft that presents a coherent, detailed, and polished narrative.

Similarly, educators may be most successful when they are able to provide incentives and feedback that evoke their student's promotion or prevention concerns at particularly effective moments. For example, the instructor who assigns an English essay may discuss the assignment in terms of hopes and aspirations and provide positive feedback (when it is warranted) in order to ensure that students approach the initial draft with a promotion focus. However, when it is time for the students to finish their essays, the instructor might shift to emphasizing the standards they need to meet and provide negative feedback (again, when warranted) in order to ensure that they approach the draft with a prevention focus. Thus, overall, the most crucial factor in determining the advantages of promotion-focused versus prevention-focused achievement motivations may be how well such motivations fit the demands or incentives of the task at hand (cf. Higgins, 2000).

To conclude, the research we have reviewed in this chapter has demonstrated that concerns with advancement (i.e., promoting gains) and concerns with security (i.e., preventing losses) are fundamentally distinct in terms of how they are represented and experienced and thus have dramatically different effects on the processes involved in goal pursuit, problem solving, comprehension, and memory. We have also argued that this research provides new ways in which to understand and anticipate students' strengths and weaknesses and suggests strategies for how these strengths and weaknesses might be exploited or addressed. However, as of yet, no studies have directly examined the effects of promotion or prevention concerns in actual classrooms. Therefore, we hope that this chapter will motivate educational researchers to begin incorporating measures and manipulations of students' promotion and prevention concerns into their studies, so that in the future our arguments can be accompanied with data from a variety of educational settings.

NOTES

1. These findings indicate that researchers testing hypotheses uniquely tied to motivations for promotion or prevention should take extra care to ensure that their measurements or manipulations focus on a single end-state (i.e., either a desired end-state that everyone approaches or an undesired end-state that everyone avoids; see e.g., Molden & Higgins, 2004, in press; Roese, Pennington, & Hur, 1999). Another effective strategy would be to utilize experimental conditions representing all four combinations of promotion/prevention versus approach/avoidance motivations as illustrated in Table 1a (e.g., Forster et al., 1998; Higgins et al., 1994; Idson et al., 2000; Lee, Aaker, & Gardner, 2000; Studies 2 and 4; Shah & Higgins, 1997).
2. Deci and Ryan (2000) have suggested that psychological motivations for security are never intrinsic and arise only as a deficit in one's fulfillment of autonomy, competence, or relatedness needs. Although our theorizing is consistent with the majority of Deci and Ryan's larger analysis of intrinsic versus extrinsic motivations, we take a different perspective on the point of security. We instead adopt the perspective that security is indeed an inherent need in and of itself, as is consistent with many traditional theories of motivation (Bowlby, 1969; Maslow, 1955; see Higgins, 1997; Molden et al., 2008).
3. In one series of studies, Shah et al. (1998) induced participants to temporarily adopt either a promotion focus or a prevention focus by promising either an opportunity to gain extra compensation for the experiment or by promising a chance to prevent the loss of compensation, respectively. Although everyone thus experienced the same extrinsic performance incentives, those with promotion-focused incentives displayed marked differences in goal pursuit compared to those with prevention-focused incentives (see also Forster et al., 2003; Idson et al., 2000; Liberman et al., 2005). In another series of studies, Higgins and colleagues (Higgins et al., 1994) induced participants to temporarily adopt either a promotion focus or a prevention focus by having them describe their own intrinsic hopes and aspirations or their own intrinsic duties and obligations, respectively. Similar to the Shah et al. (1998) studies, although everyone thus affirmed their intrinsic commitment to an important personal goal, those whose affirmations were promotion-focused displayed marked differences in goal pursuit as compared to those whose affirmations were prevention-focused (see also Forster et al., 1998; Liberman et al., 1999; Liberman et al., 2001; Shah & Higgins, 1997).
4. The potential flexibility of and overlap between chronic concerns with promotion or prevention is reflected in the way in which these concerns are most often assessed. People's chronic promotion concerns are typically measured in terms of their beliefs about how well they are fulfilling the personal goals they view primarily in terms of advancement (i.e., their hopes, aspirations, and ideals), as well as the extent to which these goals are currently "on their mind" (i.e., readily accessible in memory). People's chronic prevention concerns are typically measured in terms of their beliefs about how well they are fulfilling the personal goals they view primarily in terms of security (i.e., their responsibilities, duties, and obligations), as well as the extent to which these goals are currently accessible. Individuals who believe they are primarily failing to fulfill their advancement-oriented goals as compared to their security-oriented goals, or whose

advancement-oriented goals are currently more accessible than their security-oriented goals, are considered to be promotion-focused; individuals for whom the reverse is true are considered to be prevention-focused (Higgins et al., 1994; Higgins, Shah, & Friedman, 1997; Higgins et al., 2001; Shah, Brazeal, & Higgins, 2004; see Higgins, 1987, 1997). Thus, although the perceived fulfillment or accessibility of advancement versus security needs can be measured as stable individual differences, this perceived fulfillment or accessibility is also malleable and can be modified by the different contexts and incentives described above.

5. Note that in both of these studies, the incentives that produced greater performance for those with promotion or prevention concerns did not merely involve approaching positive and avoiding negative outcomes (see Carver, 2004; Elliot & Covington, 2001). Instead promotion-focused individuals responded best when incentives were defined both by approaching gains and avoiding non-gains and prevention-focused individuals responded best when incentives were defined both by approaching non-losses and avoiding losses (see Table 1a).

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MOTIVATED THINKERS AND THE MISTAKES THEY MAKE: THE GOALS UNDERLYING SOCIAL COGNITIONS AND THEIR CONSEQUENCES FOR ACHIEVEMENT

Hunter Gehlbach and Maureen E. Brinkworth

Social psychologists have spent many long hours contemplating the terrain where motivation intersects with thinking. Specifically, the field of social cognition has developed a rich literature describing how we perceive our social worlds and the ways in which we might be motivated to think about those social worlds (Fiske, 1995). In particular, these scholars have documented numerous flaws resulting from the goals that motivate our social thinking. These errors and biases seem likely to pose serious problems in educational and achievement contexts. In spite of the extensive literature in this area, social cognition scholars have rarely focused on these settings. Thus, great potential exists for applying social psychological research on the goals that underlie our social cognitions to educational contexts.

In this chapter, we review research on social cognition and suggest ways that it might illuminate our understanding of and enhance our social interactions in achievement settings. We focus particularly on flaws in our

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