7

Interest and Affect

*S*everal high school teachers are talking in the lunchroom about one of their favorite topics—student motivation. The teachers have somewhat different views about motivation, but all are concerned because their students do not have much interest in schoolwork.

Ms. Duncan: *I'm really worried. None of my students has any interest in math. They just don't care about anything to do with school. They don't have the right values. All they care about are their girlfriends or boyfriends, instant messaging, cell phones, and partying.*

Mr. Anderson: *Well, I don't know. I have some kids who are interested in learning. They do get involved and I try to make the work meaningful to them. They have to talk and discuss things; at least some of them seem to like it. And sometimes, very rarely, but on those really great days, the class discussion really gets going and some of the kids are so into it, you can see that they are so involved they are not really thinking of anything else. You know I live for those days; that's what makes teaching worthwhile.*

Mr. Lopez: *Well, at least you have those AP and honors kids. They do get turned on to some academic things. The kids I have in the regular math classes are not interested and don't think it's that important. But I do some puzzles and games with them. When we have game day they get interested for at least a little while. I also try to teach them some skills. They are going to need them when they get in the real world, so I try to hold them to some standards.*

Mr. Anderson: *Yes, or at least when they go to college, that is always a good thing to try to motivate them, the threat of college. But, you know, sometimes my kids get so wound up about going to college, making good grades, and scoring high on the SAT, that they get so nervous they bomb the test. You can just see them getting all anxious before the test, and then during the test, you can see them wriggling around, sweating, looking all panicky. Some of them make themselves sick with nerves. Some of my best students have trouble on the tests. They will do great on the homework but then really blow it on the test. I don't know what to do with them.*

Ms. Duncan: *Well, I have some like that, too. They don't seem too interested in the math, but they do get anxious for a test. I just try to make them feel good about themselves. You know that is the biggest thing for all adolescents—they're so self-conscious and need all the positive strokes and positive feedback and self-esteem we can give them. They are dealing with so many things, it's no wonder they have self-esteem problems. I just wish they would get more interested in school.*

Mr. Lopez: *Well, I don't know if that's all there is to it. I think self-esteem is important, but there is more to motivation than that. I used to be really nervous before tests, too. I would think I was prepared because I could do the problems correctly on homework assignments, but then once I started on the test, it seemed like I couldn't do the problems. I would start to think, "Oh no, I'm going to fail this test, I'm going to flunk out, my parents will really be mad because I'm doing so badly." I would look around and everyone else seemed to be just working away, doing fine, which would just make me more nervous. It was so hard to concentrate. Eventually, I had a teacher who helped me. He showed me some tricks to help me control my nerves. He also helped me see that if I did poorly I was not stupid. He helped me see that I had the ability to do math. In fact, he's probably the reason I became a math teacher. Now, I try to help my students the same way he helped me and it is not just by giving them positive strokes, or warm fuzzies, or trying to raise their self-esteem. I have high standards and try to make sure my students have the skills to meet them. They will feel better about themselves if they can actually do the math problems than if I just tell them how great they are. They can spot a phony right away and they think, just like Holden Caulfield, that most adults are phonies, so they don't need their teachers to be that way.*

This chapter discusses student interests and the various affective or emotional variables that have been linked to student learning and achievement. Given the diversity of such variables this chapter is not organized around one theoretical perspective like the preceding chapters, but it includes the most relevant and common variables.

We begin with a short discussion of the historical foundations of interest and affect to include the general issues in research on emotions and affect. We then move to a commonly cited

description and explanation of motivation: the role of interest in learning and achievement. The self-worth theory of achievement motivation is presented, which is highly relevant to interest and affect. We then cover research on the role of affects and emotions in achievement settings. The chapter concludes with a discussion of one of the most researched constructs in achievement motivation research—test anxiety—to include how it can constrain learning and performance.

After studying this chapter, you should be able to:

- Distinguish between emotions and moods and understand the potential emotional responses that could be generated in a classroom context.
- Distinguish between situational and personal interest and explain how both are related to student motivation and learning in achievement contexts.
- Describe the major points of the self-worth theory of achievement motivation and explain how self-worth variables can affect motivation and achievement.
- Discuss the major findings on the role of emotions and affects in learning and motivation.
- Define text anxiety and explain how it operates to influence student learning, as well as how classroom contexts can increase or decrease anxiety.

HISTORICAL FOUNDATIONS OF INTEREST AND AFFECT

Interest refers to the liking and willful engagement in an activity (Schraw & Lehman, 2001). Research on interest has increased in recent years, but the topic has a long history in psychology and education (Hidi, 1990). In the 1800s the German philosopher Herbart wrote that interest in a subject can promote motivation and learning. Many early psychologists emphasized that interest can energize, among them William James (1890). John Dewey (1913) explained his position forcefully by noting that the individual and the environment interact to raise interest. Thorndike (1935) also stressed the person and the situation by contending that learning is affected by people's interests and by the interest value of tasks. Bartlett (1932), noted for work in human memory, believed that interest facilitated it.

Research on interest waned when behaviorism became dominant in psychology. The situation did not change immediately when cognitive psychology moved to the forefront because early cognitive theories focused on information processing to the exclusion of motivational processes. Fortunately that situation now has changed as researchers from educational, developmental, social, and cognitive psychology began to integrate motivational and cognitive variables to better explain student learning and achievement (Hidi, 1990).

Researchers today commonly draw a distinction between personal (or individual) interest and situational interest. *Personal interest* is a more stable personal disposition toward a specific topic or domain, whereas *situational interest* represents a more temporary, situation-specific attention to a topic (Urdan & Turner, 2005). This distinction is not uniformly accepted and sometimes becomes cloudy because researchers always do not attempt to measure both types. We distinguish these two types because many investigators do and report results on each type.

With respect to affect, we noted in Chapter 1 that some of the earliest work in psychology was focused on affects and emotions. Freudian and psychodynamic theories, in particular, stressed the importance of unconscious wishes or desires giving rise to various emotions and behaviors. However, as behaviorism came to its dominant position, questions regarding the role of emotions and affect became less central to mainstream research. With the ascent of cognitive psychology, cognitive models and computer metaphors came to guide much of the research on cognition, learning,

and performance. Although these models were not intentionally designed to ignore affect, they emphasized rational and cognitive processes, not affective or emotional processes.

This is not to say that research on emotions and affect was absent for many years. There was research conducted on emotional development by developmental psychologists (Saarni, Mumme, & Campos, 1998), as well as research on attitudes and emotions in social psychology (Eagly & Chaiken, 1998; Schwarz & Clore, 1996; Zajonc, 1998); however, research on cognition and learning did not necessarily integrate this work. Brown, Bransford, Ferrara, and Campione (1983), in the *Handbook of Child Psychology*, stated, "Bleak though it may sound, academic cognition is relatively effortful, isolated, and cold . . . Academic cognition is cold, in that the principal concern is with the knowledge and strategies necessary for efficiency, with little emphasis placed on the emotional factors that might promote or impede that efficiency" (p. 78). It is unlikely that this statement would be made today, but it reflects the general zeitgeist of research in the heyday of pure cognitive models.

In addition, much of the research on achievement motivation has been dominated by cognitive theories such as expectancy-value theory, attribution theory, social cognitive theory, goal theory, and self-determination theory. Although these theories include emotions, they focus on cognitions such as attributions, judgments of self-efficacy and competence, goals, and value beliefs. Attribution theory (Chapter 3) addresses emotions the most directly of all these theories, but in attribution theory emotions are the direct outcome of a cognitive-attributional analysis of success or failure. In this case, cognitions (i.e., attributions) are still the most important construct in the theory and emotions flow from the nature of the attributions made in a situation (Weiner, 1986, 1995). Accordingly, cognition is still the dominant construct, not emotions. As with interest, however, researchers are increasingly exploring emotion and affect as they recognize their importance in achievement motivation.

PERSONAL AND SITUATIONAL INTEREST

A common belief is that people will learn or do well if they are interested and will not learn or perform well if they are uninterested. For example, at the beginning of this chapter, Ms. Duncan talks about how her students are not interested in learning. Many parents believe that their children's low motivation and poor performance in school are due to a lack of interest. Students will say that when they do not learn it is because school and classes are boring and that they cannot become interested in the work. These intuitive views of motivation propose interest as an important aspect of motivation that causally influences attention, learning, thinking, and performance. In addition, most people believe that they know what interest is and that they understand how it operates to influence learning. Although these intuitive notions about interest are plausible, their popularity has sometimes hindered the development of careful psychological research on interest.

As noted in Chapter 2, the construct of interest is similar to what Eccles and Wigfield termed *intrinsic interest*. However, research on interest, broadly defined, has been pursued by researchers from a number of different perspectives, beyond expectancy-value theory and motivational theories in general.

We stated earlier that research on interest has waxed and waned in psychology and education over the years (Krapp, Hidi, & Renninger, 1992). Early views (e.g., Herbart, James, Dewey) were based more on philosophy than on psychology and there was little empirical research to support their ideas. During the heyday of behaviorism, there was little research on interest in the United States, although related concepts such as curiosity (Berlyne, 1960) and attitudes (Evans, 1971) were examined (Krapp et al., 1992). However, with the development of cognitive and
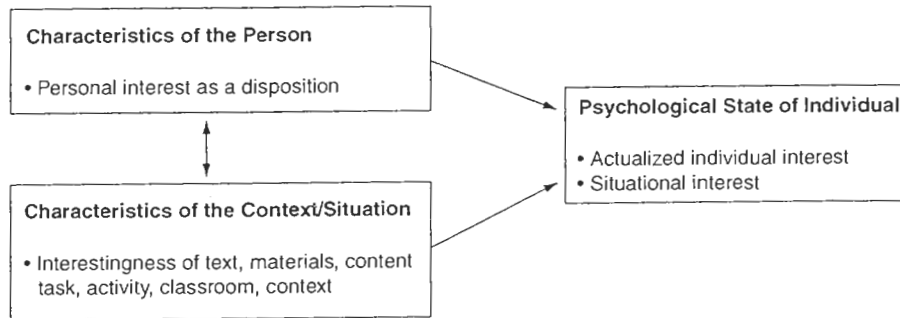
Figure 6.1   Three approaches to interest research
Adapted from Krapp et al., 1992.

constructivist models of learning and development, research on interest became more popular in the 1980s and 1990s. Nevertheless, current theoretical and empirical work on interest is still young compared with the traditions of expectancy-value theory, attribution theory, social cognitive theory, and intrinsic motivation theory (Chapter 7).

Three Perspectives on Interest

One of the issues that have plagued research on interest is the theoretical and conceptual definition of the construct. In the recent research on interest by motivational psychologists, developmental psychologists, educational psychologists, and reading and literacy researchers, many different definitions of interest have been given. Krapp et al. (1992) proposed three general perspectives on interest that can help us understand this diverse body of research (see Figure 6.1). The three approaches cover personal interest (an individual disposition), interestingness (an aspect of the context), and interest as a psychological state (including situational interest). Each of these three perspectives is explained in the following text along with its relations to the other two general definitions of interest. It is clear from these definitions that interest includes an affective component (e.g., positive affect) and cognitive components such as knowledge and values (Krapp, 1999).

Personal Interest
Researchers conceptualize **personal interest** as a relatively stable enduring disposition, personality trait, or characteristic of the individual (Krapp et al., 1992). Personal interest usually is assumed to be directed toward some specific activity or topic (e.g., a particular interest in sports, science, music, dance, or computers) in contrast to *curiosity*, which is assumed to be a characteristic of the person that is more diffusely directed (e.g., someone who is generally curious about many things).

For example, much of the vocational education and career choice literature is based on assessing individuals' interests in different activities and careers. Eccles and Wigfield's concept of intrinsic interest (see Chapter 2) would be conceptually similar to personal interest. Other researchers have measured personal interest as a preference for certain topics (e.g., "I prefer math to science"), a general liking for the subject area (e.g., "I like math"), personal enjoyment (e.g., "I enjoy working on math problems"), and sometimes importance or personal significance of the topic (e.g., "Math is important to me") (Schiefele, Krapp, & Winteler, 1992). In Eccles and Wigfield's model, this last aspect would be a separate construct of importance or attainment value,

not interest (see Chapter 2). Given these definitions, research has focused on individual differences in personal interest and how these individual differences are related to learning and performance. It is important to note, however, that personal interest—the personal liking or positive attitude or affect—is directed toward a specific content or activity and is relatively stable over time.

Interestingness as a Contextual Factor That Leads to Situational Interest

Another research approach is to study the contextual features that make some task or activity interesting (see Figure 6.1); in other words, study the interestingness of the context (Krapp et al., 1992). In this work, the interestingness of the context should result in the generation of situational interest (Krapp et al., 1992), which is the psychological state of being interested in the task or activity. Thus, reading researchers have studied situational interest by investigating text-based interest, trying to understand how different aspects of texts can generate and sustain interest on the part of readers. There are many different features of texts that can generate interest, such as novelty, surprise, complexity, ambiguity, and inclusion of certain types of themes (e.g., love). Given this situated perspective, researchers have tended to ignore individual differences and have looked for general principles to describe how the features of the environment (e.g., classrooms, media, computers, textbooks) can generate situational interest. Brophy (1999) and Bergin (1999) discussed many of the factors in classrooms that can generate student interest.

Hidi and Anderson (1992) noted, however, that situational interest is different from arousal or curiosity (Berlyne, 1960), because situational interest may be tied to specific content (e.g., a story about space travel) rather than to structural features of the text or environment such as novelty and surprise, and situational interest may last longer than arousal and develop into a personal interest. Although situational interest is more context-dependent than personal interest, it is still usually tied to specific features of the text or context. Hidi (2000) suggested that situational interest involves both positive affect and increased attention to the task as a function of the affective involvement.

In addition, there may be two phases of situational interest. In the first phase, situational interest is triggered or activated. In the second, interest is further maintained (Hidi, 1990, 2000; Hidi & Baird, 1986; Hidi & Harackiewicz, 2000). Mitchell (1993) referred to these phrases as *catching* and *holding* interest, following a distinction by Dewey (1913). However, Hidi (2000) suggested that catching refers to the direction or diversion of already activated situational interest, whereas triggering suggests the initial activation of situational interest.

Interest as a Psychological State

As shown in Figure 6.1, situational interest is one type of interest as a psychological state. The previous section noted that situational interest is aroused or activated as a function of interestingness of the context. Some texts (a novel versus a dry textbook) are more interesting than others, some content areas generate more interest than others, and some teachers or lecturers are very good at making their classrooms or lectures interesting, all of which can generate situational interest. This situational interest derives from contextual features and may not include any personal interest.

Individuals can develop *actualized individual interest* in which an individual's personal interest interacts with the interesting environmental features to produce heightened interest (Krapp et al., 1992). For example, Meg, a middle grades student with a high level of personal interest in science-related topics, occasionally reads expository texts about science topics in her language arts class. On these occasions, Meg experiences a heightened psychological state of interest in contrast to other occasions during language arts class when she reads about nonscientific topics. Her personal interest in science also is activated in the science class and she experiences actualized individual interest.

Figure 6.2   Contrasting models of the relations between interest and knowledge

Renninger's research on interest reflects this relational construct of interest as a psychological state (Renninger, 1990, 1992; Renninger & Wozniak, 1985). As shown in Figure 6.2, she conceptualized interest as comprising both high value for an activity (choosing to do it, thinking it is important) and high stored knowledge about the activity or topic (a cognitive component). If individuals have very little knowledge of an activity or topic, it is hard for them to judge their interest in it. Individuals usually have more knowledge about activities that have a high level of interest and value for them. Accordingly, if a person has a high value for an activity but low knowledge of the activity, this is not interest but rather *attraction*. *Noninterests* are defined by high stored knowledge for an activity but low value for the activity. The fourth cell in this two-by-two matrix of knowledge and value is not labeled; it represents low value and low knowledge, and the psychological state would include unconcern, indifference, and ignorance about the topic.

This position that interest is evoked only when an individual has both high value and high knowledge of an activity or topic has not been accepted by all interest researchers. For example, Alexander, Kulikowich, and Jetton (1994) and Tobias (1994) argued that interest/value is orthogonal to prior knowledge. They assumed that individuals can have high interest and high knowledge (cell 4 in Figure 6.2), which is similar to Renninger's interest cell. However, these researchers assumed that individuals can have high interest in a topic even though they may have low knowledge about it (cell 2 in Figure 6.2). Tobias (1994) did not assign specific labels to his cells, but noted that although the low knowledge–high personal interest cell (cell 2) may not be found often in adults, there could be domains in which children are interested in the content but have little knowledge or expertise in that domain. Accordingly, Tobias (1994) suggested that this

state of high interest–low knowledge would be transitory over the course of development. He noted that cells 1 and 3 are similar to the ignorance and noninterest cells in Renninger's matrix. It seems intuitively possible that individuals could have high interest and low knowledge, but Renninger's (1992) logic about this state representing only attraction also seems plausible.

This controversy over the relation between prior knowledge and interest/value reflects the theoretical and conceptual difficulties in research on interest. At the same time, it makes it clear that interest and cognition (knowledge) are inseparably linked in these models, unlike many models of motivation and affect that keep them separate. We need better theoretical models and more empirical research on the construct of interest. Fortunately, work is ongoing and is an important area of research in motivation theory.

Measures of Interest and Research Findings

In addition to the various definitions and theories of interest, different self-report and other methods have been used to measure interest. Research on personal interest has often used self-report instruments like questionnaires that ask students to rate various topics or activities on Likert-scaled items. Items are rated in a number of different ways, depending on the theoretical framework for personal interest, including general attitude toward the activity, specific preference for or liking the activity, enjoyment of the activity, personal importance or significance of the activity to the individual, intrinsic interest in the content of the activity, and reported choice of or participation in the activity (Schiefele et al., 1992; Wigfield, 1994; Wigfield & Eccles, 1992). Students' responses to these various aspects of interest are then used to create scales that reflect different levels of interest in different activities (e.g., mathematics versus English, academics versus sports).

These scales represent individual differences in interest (i.e., some people will have high interest for academics, others will have high interest for sports) that are then used to predict various outcomes such as choice to do an activity in the future, persistence, level of effort or engagement in the activity, and actual performance. Although these self-reports of interest can be used quite easily and efficiently, there remain validity problems with using them because they require some metacognition or self-awareness on the part of individuals responding to them. This is not just a problem with interest self-report items; it may be difficult for some individuals (young children) to accurately report on their interests.

Interest also has been measured with the **Experience Sampling Method (ESM)**. This method was developed by Csikszentmihalyi (1982). In his research, designed to measure the motivational state of *flow* (see Chapter 7), adults carry beepers that sound several times a week. When they sound people rate themselves on affect (comprising items "happy," "cheerful," and "sociable") and on activation (comprising "active," "alert," and "strong"). They also judge their present situation for challenges and the skills available to them. The ESM often is referred to as the "beeper methodology."

Wild, Krapp, Schreyer, and Lewalter (1998) used the ESM-beeper method and asked students about their interests, moods, motivation, and cognition during both school and work activities. This research also used self-reports in that students were asked to report on their affect, interest, and cognition in questionnaire format, but they were beeped and completed the self-report forms at that specific time. This allows for a more situation-specific measure of interest than that provided by general self-report questionnaires that ask students to report on their interest for a course in general. In the latter case, students are essentially summing up their experiences over many occasions, and it is not clear whether students actually perform this cognitive calculation or whether they make their judgments based on specific salient times when they were interested or bored. In contrast, the ESM method asks for a self-report at a specific time and should be a

better indicator of students' experienced interest. Although ESM data usually are summed over time or settings across individuals, this method provides a rich dataset that can be used to more accurately estimate the experience of interest in comparison to general questionnaires.

Renninger (1990, 1992; Renninger & Wozniak, 1985) also used actual observations of the play of young children to measure interest as a psychological state. Students were observed during 240 minutes of free play and interest was coded for objects that the children (a) returned to play with repeatedly, (b) spent more time with than other objects, (c) played with in solitary play, and (d) played with in other than manipulative play (Renninger, 1992). Objects could then be classified as high or low interest in relation to the individual child's actual behavior with the object. This procedure provided a sensitive measure of interest for each individual.

The results showed that play objects that were of high interest to some children were not of much interest to other children (e.g., some boys had a high interest in trucks, but other boys did not). This type of behavioral measure also allowed Renninger to examine interest without having to ask children specifically about their interests. Accordingly, this type of measure does not assume that individuals have to be metacognitively aware of their interests as do explicit questionnaire items that ask about personal interest. Actual observations allow for the investigation of interest in young children who may be lacking in the verbal, cognitive, or metacognitive skills to answer questionnaire items. Moreover, by focusing on behavior, observational measures do not introduce the term *interest* and avoid the validity problems associated with invoking participants' prior conceptions of interest that they then might use to interpret questionnaire items differently than the researcher intended.

Finally, situational interest researchers who have been concerned with the influence of text-based interest on students' learning have employed a number of different measures of interest (Alexander et al., 1994). They have used self-report questionnaires of students' interest in the general domain of the reading (e.g., science) and the specific topic of the reading (e.g., space travel) in much the same way as noted in the research on personal interest. These researchers have also used students' personal ratings of the interestingness of the text (e.g., text on space travel written in an interesting style), as well as specific details of the text (e.g., walking on the moon or living in outer space). More recently, Ainley and Hidi (2002) developed a computer methodology that allows for the assessment of interest as students read a text. Boekaerts (2002) developed and validated an *On-line Motivation Questionnaire (OMQ)* that is not computer-based but can be used before and after students engage in classroom tasks or activities and generates situational measures of motivation, positive and negative affect, and interest.

The research on text-based interest also has used ratings of the text by others (other students, adults, teachers, experts) in terms of interest and then assigned students to high- and low-interest groups based on these ratings by others (Hidi & Anderson, 1992). This strategy assumes that one can normatively classify a text as generally interesting or uninteresting without considering how an individual student will perceive the text. This methodology also raises questions of validity concerning the normative and idiographic measurement of interest, another problem that will have to be resolved in future research.

Although there are problems in both the theoretical conceptions of interest and in the measurement of interest, the research has revealed fairly consistent results regarding how interest is related to other cognitive and achievement outcomes. In terms of cognitive outcomes, both situational interest and actualized personal interest are generally related positively to measures of memory, attention, comprehension, deeper cognitive engagement, thinking, and achievement (Hidi, 2000; Hidi & Harackiewicz, 2000; Schiefele, 1991, 1992; Schiefele & Krapp, 1996; Schiefele et al., 1992; Tobias, 1994). For example, Renninger and Wozniak (1985) showed that preschoolers' interest in

different activities predicts their attention, recognition, and recall memory for these objects at a later time. Schiefele (1991), using experimental and correlational designs, found that college students' personal interest related positively to their use of deeper cognitive processing strategies such as elaboration, seeking information when confronted with a problem, engagement in critical thinking, and self-reported time and effort investment. Schiefele (1991) also reported that personal interest related negatively to the use of a surface processing strategy—rehearsal.

Pintrich and his colleagues (Pintrich, 1989; Pintrich & De Groot, 1990; Pintrich & Garcia, 1991) found that personal interest and task value measures correlated positively with deeper processing strategies such as the use of elaboration and organizational strategies, as well as with reports of critical thinking and time and effort regulation strategies, among college and junior high school students. The research on situational interest and text-based learning shows basically the same pattern of relations (Ainley, Hidi, & Berndorff, 2002; Alexander et al., 1994; Hidi, 2000; Hidi & Anderson, 1992; Hidi & Harackiewicz, 2000; Tobias, 1994), although the findings are complicated by the type of text involved (narrative versus expository text, linear versus nonlinear text) and levels of student prior knowledge.

Given these generally consistent and positive findings on the role of interest in learning, future research should address the issue of how interest has an influence on learning, not whether it has an effect (Hidi, Renninger, & Krapp, 1992). Such research will broaden our understanding of the four general pathways by which affect can influence learning and performance that are described later in this chapter. As we note in that section, the third pathway deals with attentional resources and interest. Research has generally hypothesized that interest affects learning through attention. Higher levels of interest are supposed to lead to greater attention to the task, which in turn produces better memory and learning.

Although this selective attention explanation has some empirical support (Shirey, 1992), others argue that interest may actually result in less conscious attention given to the task (Hidi, 1990). Hidi and Anderson (1992) suggested that when interest is high, there does not have to be as much effortful selective attention; that, in fact, interest could result in more spontaneous attention and less cognitive effort, but still have a positive influence on learning. Tobias (1994) also contended that high interest might make it easier for students to activate a richer network of prior knowledge about the topic or activity that would make memory and learning easier (the first pathway mentioned in the beginning of this chapter). High levels of personal interest also might decrease the demands for self-regulation of time and effort (i.e., students trying to maintain their effort level in the face of a boring task) and thereby free up more cognitive capacity for actual learning of the task content, rather than for self-regulation. Researchers will continue to examine these and other possibilities to help us understand how interest can influence learning.

Developmental and Individual Differences in Interest

In comparison to the research on some motivational variables, there has been less research on developmental and group differences in interest. In terms of development, the research suggests that even young children (3–4 years old) have relatively stable personal interests and that these interests are related to their choice of activities and their learning (Renninger, 1992). There has been little research, however, on how interests develop over time and experience.

Interest may play a larger role in directing and guiding the behavior of younger children for a larger number of tasks than it does for older children and adults. Older children and adults often have to engage in tasks that do not interest them much (e.g., tasks in school, job-related tasks).

In these situations, interest may have a more differential effect, depending on the task and content area, than the diverse effect it has for younger children on many tasks (Krapp et al., 1992). For example, Hidi and Anderson (1992) found that situational interest had a stronger effect on reading for upper elementary school children than it did for writing. The functional role of interest in learning may vary depending on the age of the child. In terms of developmental differences in levels of interest, research shows that students' interest in school and school tasks declines with age and that interest in mathematics and science may drop the most (Eccles et al., 1998; Kahle et al., 1993; Tracey, 2002; Tracey & Ward, 1998; Wigfield, 1994; Wigfield & Eccles, 1992). There is a need for more research on the domain and developmental differences in the role of interest in learning and development.

The development of situational interest is often seen as one pathway to the development of stable personal interests. The general idea is that teachers should try to create situational interest in their courses with the hope that over time this situational interest will help students develop personal interest in the content or topics of the course. In addition, by attempting to generate situational interest in all students, teachers do not have to deal with the problems of trying to ascertain all the personal interests of their students (which will vary a great deal) and then trying to structure the course to fit these different personal interests (Hidi & Harackiewicz, 2000).

Following a distinction suggested by Hidi and Baird (1986) between factors that stimulate situational interest versus those that maintain interest, Mitchell (1993) found that in secondary mathematics classrooms certain factors catch student interest and other factors hold it. Mitchell found that group work, puzzles, and the use of computers helped to activate interest, but did not hold student interest. In contrast, the use of meaningful work and the active involvement of students as learners were related to the maintenance of situational interest. In the vignette at the start of this chapter, Mr. Anderson and Mr. Lopez talk about ways they try to catch and hold student interest using games and puzzles as well as meaningfulness and involvement. Harackiewicz et al. (2000) found similar results in a college classroom setting. The simple experience of enjoyment of the course and the lectures, similar to the catch aspect, was not related to continued interest over time or to performance. However, a measure of interest in course content that reflected perceptions of meaningfulness of the content and intrinsic interest (similar to the hold component) was related to continued interest over time and short-term performance. Accordingly, the long-term development of interest seems to be served better by the use of meaningful tasks and student involvement in active learning, than by using gimmicks to make the class interesting and stimulating. Applied Research 6.1 discusses how combining personal with situational interest can help relieve school boredom.

Research also has found gender differences in interest. Renninger (1992) obtained gender differences in the nature of preschool boys' and girls' play with objects of interest to them. Girls were more likely to use their interest objects in a number of different ways in their play, whereas boys showed more play actions only when using their objects to mimic the real-world use of the object. In addition, Renninger (1992) found gender differences in the role of interest in elementary school students' solution of arithmetic problems. Boys were more likely to make errors on uninteresting math problems, whereas the girls made more errors when they worked on interesting math problems. Renninger interpreted this gender-by-interest interaction by suggesting that interest facilitates boys' problem solving because it helps them to understand and work on the problems. In contrast, interest seems to interfere and becomes a distraction for girls on the problems. Schiefele et al. (1992) also found that the interest-achievement linkage was stronger for male students; about 12% of the variance in their achievement was accounted for by interest, whereas the variance was only 6% for female students. On the other hand, research shows that self-concept predicts interest

APPLIED RESEARCH 6.1
What Can Be Done to Reduce School Dropout?

School dropout is a major problem in the United States today. This issue is discussed in greater depth later in this text (Chapter 10). There are many reasons why students drop out of school. Many are at high risk for failure and have serious deficits in reading, writing, mathematical, reasoning, and learning skills. Aside from these problems, however, most students who drop out of school find school boring and show little excitement about school learning. This chapter suggests that such students lack personal interest in topics covered in school, and that the school setting is not helping to generate situational interest.

The conditions in many classrooms do little to raise situational interest. Such interest will not be increased when teachers predominantly lecture, vary the classroom format little from day to day, give students few choices in topics to study or research, and make little attempt to link the material to relevant issues in everyday life. Studying quadratic equations, for example, can be a dull exercise when teachers explain how to solve them to the whole class and then assign problems to solve in class and for homework. The problems can be made more interesting by linking them to real-life phenomena, such as how high a ball will rise when thrown into the air. Creative teachers will use classroom and outdoor activities to demonstrate the properties of mathematical equations.

All students have personal interests, and creative teachers will find ways to link these interests to the classroom topics. Such linking combines personal with situational interest, which will prevent boredom and ultimately could help to reduce school dropout. A good example is found in the increasingly popular senior projects, where high school seniors select a topic in which they have personal interest, research it, write a paper on it, and prepare and deliver a presentation that includes props. This assignment is part of the school's academic program and is used in one of the classes (e.g., English). It allows students to explore in greater depth a topic in which they are interested and which they choose. The assignment includes different activities, thereby ensuring a varied format. Students set their own schedules to complete the assignment and choose their presentation formats and props. Senior projects combine personal with situational interest and show students how school learning can be enjoyable and can facilitate their understanding of a topic of high interest to them. Students who do not plan to attend college could choose a senior project linked to a vocational interest. Teachers could show students how the project will improve their work skills and potentially help them in their careers. This belief might help students stay in school.

We do not mean to downplay skill deficits, because no amount of interest will lead to a skillful performance when capabilities are lacking. Most students at risk for school dropout need remedial assistance in order to enjoy some measure of success. Skill remediation programs, combined with linking students' interests with learning, may help to reduce the dropout rate and thus contribute to a more productive citizenry.

among seventh graders and that this effect is consistent across gender (Marsh, Trautwein, Lüdtke, Köller, & Baumert, 2005). There is a need for more research on gender differences in both situational and personal interest. Application 6.1 suggests some possible strategies that teachers might use to increase both situational and personal interest in their classrooms.

APPLICATION 6.1

Promoting Interest in the Classroom

Given the difficulties in adapting instruction to diverse personal interests, it may be easier for teachers to attempt to create situational interest, but many of these strategies also may stimulate personal interest.

1. *Use original source materials.* These materials often have interesting content or details that get left out of more generic texts and can help spark situational interest. Mr. Forrester, a high school American history teacher, uses a number of different texts and sources in his class, not just the textbook. These texts include more detailed, scholarly books, as well as original source material. The students find these materials more interesting than the rather dry textbook.

2. *Model your own enthusiasm and interest for the content.* By modeling interest in the material, the teacher can communicate that the content is interesting. Ms. Rose, a high school biology and chemistry teacher, consciously tries to model her own interest in the science material she is teaching by talking about her learning of it and how it interests her.

3. *Create surprise and disequilibrium in the classroom.* Creating surprise by presenting material that goes against expectations or prior knowledge can create cognitive disequilibrium on the part of students. They then may be drawn to the material to attempt to figure out why their beliefs or knowledge are discrepant, and then they become more engaged and involved.

   Ms. Putnam attempts to create surprise and disequilibrium by having students predict what will happen in different science experiments and then showing that the students' predictions are wrong when she does the model experiment. She spends the remainder of the class talking about how the students derived their predictions and how the experiment and related theory disprove their predictions.

4. *Use variety and novelty.* As common sense, as well as interest research, tells us, if students are doing the same activity day in and day out, boredom will inevitably set in. It is useful to have a variety of activities throughout the week, month, and school year. In addition, the introduction of novel ideas, content, tasks, and activities may facilitate situational interest.

   Ms. Bakko is a third-grade elementary school teacher who uses a wide variety of activity and task formats to keep her children engaged. The class has a regular structure and organization, so the novelty is not overwhelming, but within the structure. The students do many different activities for reading, arithmetic, science, and social studies. Moreover, the same activities are used not only within one content area domain (e.g., plays in reading) but also across different domains. Students enjoy the diversity of activities and are always waiting to see the next new thing that Ms. Bakko will do in class.

5. *Provide some choice of topics based on personal interest.* Motivation theories suggest that providing some choice increases motivation. In this case, the focus is on building on individual's personal interest in a particular topic.

   Mr. Knight, a middle school social studies teacher, assigns geography projects every year to his students. However, students are allowed to choose their own topic or area of study based on their personal interests. Some students want to investigate Alaska because their parents visited there once. Others are very interested in Africa because of their heritage. Still others want

to explore the Caribbean because they have gone there on spring break. Although there is quite a bit of diversity in the topics, Mr. Knight finds that the students are much more engaged because they work on something that connects to their own lives and personal interests.

6. *Build on and integrate student personal interest in designing lessons.* Although there is clearly a diversity of personal interests, many students share some interests. When teachers connect the lesson content to personal interests or common interests of the students, it can facilitate attention and situational interest.

Ms. Wright is a sixth-grade elementary school teacher who was having difficulty getting a group of Latino boys in her class interested in some review of basic arithmetic principles. Although the rest of the class was engaged in the games she designed, this group of boys thought it was boring. However, she noticed that the boys spent time discussing baseball and the different star Latino baseball players in the major leagues. She then designed a set of activities around computing various baseball statistics such as batting average, earned run average, and slugging percentage. She found that although some other students did not like this homework activity, the group of Latino boys got engaged in this and came to ask for more so they could get better at computing these statistics.

SELF-WORTH THEORY

Overview

Another variable relevant to personal and situational interest is self-worth (or self-esteem), which concerns individuals' affects, emotions, or feelings about themselves or evaluations of themselves. At the beginning of this chapter, Ms. Duncan invoked self-esteem as an explanation for some students' motivational problems. Self-worth should not be confused with individuals' perceptions of their own competence or self-efficacy, which are cognitive appraisals or beliefs about the self (see Chapters 2 and 4). Self-worth is a more affective or emotional reaction to the self. It can mean taking pride in yourself and your behavior, feeling good about yourself and accomplishments, and having a general positive image of yourself. In addition, self-worth is usually a more diffuse and less specific reaction to the self than a specific appraisal of personal ability to do a specific task or of competence in a specific domain (Harter, 1985a, 1990). Accordingly, if Matt believed that he was not very good at tennis (a low perception of tennis competence), this would not necessarily influence his overall positive or negative feelings toward himself as a person, as long as tennis was not that important to him. Harter (1985a, 1990) proposed that self-worth can be linked differentially to a number of different domains across the life span rather than linked to all domains in a global and diffuse fashion.

This distinction is often lost in the popular views of self-esteem, not just in schools but in many domains of life, much to the detriment of our understanding of motivation and how self-beliefs can play a role in influencing behavior. For example, on many TV talk shows or in popular self-help books, high self-esteem is offered as a panacea for problems. Poor or low self-esteem is seen at the root of problems such as child abuse, spousal abuse, substance abuse, weight or body image problems, marital infidelity, delinquency, personal unemployment, criminality, learning problems, and personal unhappiness and depression. It then follows that increasing self-esteem will result in remediation of these problems. As Lazarus (1991) noted, this logic leads

people to believe that they will avoid these problems by rehearsing simple positive statements about the self (i.e., "I'm a good person, student, or worker.") or having others give them the same type of noncontingent positive feedback. This view is simplistic in the face of the complexity of these problems (Crocker & Wolfe, 2001).

Reflecting the emphasis it receives in our popular culture, some educators subscribe to this simplistic view. Teachers are often afraid to say anything negative to students about their performance because they believe it will hurt the students' self-esteem. There are schools and classrooms that engage in self-esteem programs whereby children are asked to chant positive statements about themselves in order to enhance self-esteem (see Ms. Duncan's comments at the beginning of this chapter) or teachers are directed to give unconditional positive feedback to all students. In contrast to these popular but misleading views of self-esteem, Covington (1992, 1998; Covington & Beery, 1976) proposed a model of self-worth based on current theories of student motivation. He has developed a program of empirical research that helps us understand self-worth in school contexts.

Conceptual Model

Covington (1992) proposed that the need for self-worth is a basic need of all individuals. This need is represented in the universal search for self-acceptance. In Western society, worth for school-age children often is determined by their academic achievements and is assessed in competitive ways (i.e., doing better than other students). To the extent that children internalize or accept this general societal value, their self-worth will depend on their school achievement.

Covington (1992) suggested that the need for self-worth will generate a number of different patterns of motivational beliefs and behaviors. Children and adults often want to make attributions to ability for their successes because these attributions increase self-worth more than do effort attributions (see Chapter 3). The need for self-worth is driving the types of attributions individuals make in situations. This is an important addition to attribution theory, which does not include the possibility that personal needs can influence the attribution process. Covington suggested that individuals often will try to hide how much effort they put forth on a task so that others will think they simply have high ability. For example, some students will not tell their peers that they studied hard for a test. If they then do well, the usual attribution logic is that they must have high ability because they did not study hard (Covington, 1992, 1998).

Covington (1992, 1998) has shown that students often engage in self-handicapping behaviors (i.e., doing things that impede success) to protect their self-worth. For example, students may procrastinate in studying for an exam or doing a paper or project for a class. If they wait until the last minute to do the work, it is likely that they will not be as successful as they could be. Over the long run, this behavior is self-handicapping because performance is lower than possible. However, from a self-worth and attribution perspective, procrastination can have a positive motivational effect. If the students do poorly, they can attribute their performance to lack of effort, thereby protecting their self-worth because they do not have to conclude they lack ability. At the same time, if they end up doing well, even with the procrastination, they can make an attribution that they must have high ability. Otherwise, how could they explain success with a low level of effort? Conversely, if they do try hard and do not procrastinate and still do poorly, it is likely that the students will conclude they lack ability and their self-worth will suffer. By combining his self-worth perspective with attribution theory, Covington showed that the dynamics of self-worth are more complicated than a simple self-esteem perspective would have us believe.

The issue is not that self-esteem is not an important outcome of schooling. Harter (1998, 1999) reviewed the research on self-concept and self-esteem and it is clear that these concepts are correlated, albeit they are not the same construct. More importantly, it is clear from developmental research that self-esteem or self-worth often declines over the course of development, and in particular during adolescence (Harter, 1998, 1999). This decline often is accompanied by an increase in depression and other mental health problems (Harter, 1998, 1999). This decline in self-esteem is not just a function of personal cognitive-developmental changes or contextual changes (transition to middle schools/high schools), but rather an interaction between the personal and contextual factors. Nevertheless, the fact that self-esteem declines with age—and it appears that it may decline more for girls than for boys (Harter, 1998, 1999)—is an important issue. Interestingly, Harter, Waters, and Whitesell (1997) suggested that some of the decline may be a function not of gender status but rather of the individual's endorsement of masculinity-femininity values, with more feminine individuals showing a bigger drop in self-esteem over time.

Accordingly, although schools should be sensitive to these issues of self-esteem and more general issues of mental health (Roeser, 1998; Roeser, Eccles, & Strobel, 1998), the simple, causal linkage of self-esteem to school achievement is questionable. Many laypeople and teachers automatically assume that if self-esteem is important and should be encouraged, they should work on it directly, often by praising the students indiscriminately. By working on increasing self-esteem, they assume that learning, motivation, and achievement will be automatically improved.

The causal ordering in this simple model is most likely incorrect, as self-esteem tends to flow from actual accomplishments and achievements, not vice versa. Crocker and Wolfe (2001) discussed the key role of self-worth contingencies, or those outcomes on which people base their sense of self-worth. As Damon (1995) pointed out (and as stated by Mr. Lopez in the opening vignette of this chapter), praising students noncontingently can be detrimental. It leads students to think they should be praised for just existing, not for their actual accomplishments and skills. In the long run, students will not benefit from this type of empty praise; they will not get feedback to help develop their skills and expertise. Without accurate feedback about skill development, it is difficult for students to change or regulate their behavior. For example, praising students indiscriminately for their reading, even when many of them cannot read very well, can lead to students who think they can read when they cannot. At some point in their lives, they will have to confront the fact they cannot read well, and it is better to have them work on improving their reading early in their education than to find out in adolescence that they lack basic literacy skills. In addition, although the causal influence between self-esteem and achievement is bidirectional (Blumenfeld et al., 1982; Wigfield & Karpathian, 1991), it is easier to help students learn the skills and knowledge they need to be successful academically than to boost their self-esteem noncontingently.

EMOTIONS AND EDUCATIONAL OUTCOMES

Self-worth theory emphasizes that affects about the self, or self-esteem, can have important consequences for interest and motivation. In the past few years the topic of emotions in education has seen greater emphasis among researchers and practitioners, and especially in how emotions and cognitions may interact to affect learning and motivation. In this section we discuss the interplay of emotions and educational outcomes.

Taxonomy of Emotions

There are a number of different taxonomies or ways of defining emotions that have been used by personality and social psychologists (Frijda, 1986; Plutchik, 1980; Russell & Barrett, 1999; Watson & Tellegen, 1985; Watson, Wiese, Vaidya, & Tellegen, 1999), but we use a taxonomy that has been related to student motivation, learning, and performance (Pekrun, 1992; Pekrun & Frese, 1992). Before describing the taxonomy, it will help to clarify a few terms.

As Forgas (2000) pointed out, the definition of terms such as *affect, feelings, emotions,* and *mood* is difficult because there is a lack of broad agreement among researchers about their meaning. This is not unusual in research on motivation (Murphy & Alexander, 2000), but it is a problem in doing research on emotions and moods.

Forgas (2000) noted that **affect** can be considered the broadest and most inclusive term because it comprises specific emotions and general moods. Forgas defined **mood** in terms of relatively low-intensity, diffuse, and enduring affective states that have no salient antecedent cause and little cognitive content. People can feel good or bad or be in a good or bad mood without any salient antecedent event or without really knowing why (the cognitive antecedent) they feel the way they do. In contrast, Forgas (2000) suggested that **emotions** are more short-lived, intense phenomena that usually have a salient cause (e.g., failing an exam). The individual typically is aware of the cause of the emotion. In addition, emotions usually have some clear cognitive content or referent. Specific emotions such as pride, anger, pity, fear, shame, and guilt often are the target of emotions research in contrast to the general and more diffuse good and bad moods that mood researchers examine.

Pekrun (1992; Pekrun & Frese, 1992) proposed a general taxonomy of emotions that is relevant to student motivation, learning, and achievement. Table 6.1 displays a summary of his taxonomy. The columns reflect the common dimension of the positivity/negativity of the emotions (also

Table 6.1   Taxonomy of Student Emotions

	Positive	Negative
Task-related		
Process-related	Enjoyment	Boredom
Prospective	Hope Anticipatory joy	Anxiety Hopelessness (Resignation/despair)
Retrospective	Relief Outcome-related joy Pride	— Sadness Disappointment Shame/guilt
Social		
	Gratitude Empathy Admiration Sympathy/love	Anger Jealousy/envy Contempt Antipathy/hate

Adapted from Pekrun, 1992.

labeled pleasantness/unpleasantness; Russell & Barrett, 1999; Watson et al., 1999). In other emotions research, there often is a second dimension of activation/deactivation (or engagement/disengagement; Russell & Barrett, 1999; Watson et al., 1999), but that is not reflected in the taxonomy in Table 6.1. In contrast, the taxonomy divides emotions into two general categories: task-related and social. *Task-related emotions* are relevant to achievement or learning tasks in school or other settings, as well as to work-related tasks in occupations (Pekrun & Frese, 1992). *Social emotions* refer to potential emotions that could be generated from social interactions with other individuals.

Within the task-related section of Table 6.1, a distinction is made between emotions that are experienced while engaged in a task, which includes the process-related emotions of enjoyment and boredom. The second main category reflects prospective emotions that students might experience as they approach a task or think about engaging in a task and the expected outcomes. These prospective emotions include hope or anticipatory joy, as well as anxiety about the task, hopelessness, or despair. The third category includes retrospective emotions that a student might experience after the task is completed, such as relief, joy, and pride, as well as negative emotions such as sadness, disappointment, shame, or guilt. Many of these retrospective emotions are the same as those discussed in Chapter 3 as outcomes of attributional processes. It is likely that retrospective emotions such as pride, shame, and guilt are linked closely with the type and nature of the attributions that individuals make for their task performance (Weiner, 1986, 1995).

The taxonomy in Table 6.1 displays the specific emotions that might be engendered in school achievement contexts. It is clear that these emotions are more specific than general good or bad moods. In addition, many of these emotions have a cognitive component in terms of some type of referent for the emotion. That is, moods are more diffuse and do not have any specific content associated with them, while emotions such as pride, shame, or guilt, usually are experienced in reference to some specific task, behavior, or achievement. Individuals can be in a bad mood without much forethought. If they feel pride or shame, however, they usually are thinking about a particular event such as succeeding or failing on an exam, or doing well or poorly in a competition or game. Although some individuals may feel general ("free-floating") anxiety or anger that is not tied to any specific cognitive content or event, most likely there also will be cognitive rumination or thinking about why they are anxious or angry.

Forgas (2000) also noted that the distinction between mood and emotions parallels, to some extent, the research on the interplay of affect and cognition. For example, emotions researchers tend to focus on the contextual and cognitive antecedents of emotional reactions, including various appraisal strategies like attributions. They attempt to understand how and why people come to experience the specific emotions that are generated in different situations (such as those outlined in Table 6.1). In contrast, mood researchers are usually interested in the consequences of mood on cognition and cognitive processing, so mood becomes the independent variable. For emotion researchers, on the other hand, the emotions often are the dependent variable that results from various cognitive and appraisal processes.

Effects of Emotions on Learning and Motivation

There has been a long history of research on the causal ordering of cognition and affect (Smith & Kirby, 2000; Weiner, 1985b; Zajonc, 1980, 2000). Similar to the debate over the causal ordering of self-concept and achievement (Wigfield & Karpathian, 1991), the current and most sensible perspective on the cognition-affect link is that the influence is bidirectional. Rather than continue to argue over whether cognition precedes affect or vice versa, what is needed is to develop

models that help us understand how, why, and when (under what conditions) cognition precedes and influences affect and how, why, and when affect precedes and influences cognition.

In the Chapter 3 discussion of attribution theory we outlined some of the ways that cognitive appraisals and attributions can influence emotions. This chapter focuses on the links from affect to cognition. In terms of the relations between affect and subsequent cognition, learning, and performance, Pekrun (1992) suggested that there are four general routes by which emotions or mood might influence various outcomes. Three of these routes are through cognitive mediators and the fourth is through a motivational pathway. The different models and constructs discussed in this chapter illustrate all four of these routes quite well (Linnenbrink & Pintrich, 2000).

The first route by which emotions or mood might influence learning and performance is through memory processes such as retrieval and storage of information (Pekrun, 1992). There is quite a bit of research on mood-dependent memory. The general idea is that affective states such as mood are encoded at the same time as other information and that the affect and information are intimately linked in an associative network (Bower, 1981; Forgas, 2000). This leads to findings such as affect-state dependent retrieval, in which retrieval of information is enhanced if the person's mood at the retrieval task matches the person's mood at the encoding phase (Forgas, 2000). Research shows that mood or affective state facilitates the recall of affectively congruent material (Forgas, 2000), such that people in a good mood are more likely to recall positive information and people in a bad mood are more likely to recall negative information. Linnenbrink and Pintrich (2000) and Linnenbrink, Ryan, and Pintrich (1999) suggested that negative affect might influence working memory by mediating the effects of goal orientations. In this research (discussed further later in this chapter), negative affect had a detrimental effect on working memory, but positive affect was unrelated to working memory. This general explanation for the integration of encoding, retrieval, and affective processes is one of the main thrusts of personal and situational interest research.

The second mediational pathway is that affect influences the use of different cognitive, regulatory, and thinking strategies, which could then lead to different types of achievement and performance outcomes (Forgas, 2000; Pekrun, 1992). For example, some of the original research suggested that positive mood produced more rapid, less detailed and less systematic processing of information, while negative mood resulted in more systematic, analytic, or detailed processing of information (Forgas, 2000; Pekrun, 1992). However, recent work shows that this is too simplistic a position and more complex proposals are needed. Fiedler (2000) contended that positive affect as a general approach orientation facilitates more assimilation processes such as generative, top-down, and creative processes, including seeking out novelty. In contrast, negative mood reflects more of an aversive or avoidance orientation and can result in more accommodation, including a focus on external information and details, as well as being more stimulus-bound and less willing to make mistakes.

Other research on the use of cognitive and self-regulatory strategies in school settings has not addressed the role of affect in great detail, but a few studies show that negative affect decreases the probability that students will use cognitive strategies that result in deeper and more elaborated processing of the information (Linnenbrink & Pintrich, 2000). For example, Turner, Thorpe, and Meyer (1998) found that negative affect related negatively to elementary students' deeper strategy use. Moreover, negative affect mediated the negative relation between performance goals and strategy use. If negative affect or emotion is a generally aversive state, it makes sense that students who experience negative affect are less likely to use deeper processing strategies, as these require much more engagement and a positive approach to the academic task. In contrast, positive affect should result in more engagement and deeper strategy use. This latter hypothesis reflects some of the findings from the research on personal and situational interest.

The third cognitive pathway is that affect can increase or decrease the attentional resources that are available to students (Linnenbrink & Pintrich, 2000; Pekrun, 1992). As Pekrun noted, emotions can take up space in working memory and increase the cognitive load for individuals. For example, if a student is trying to do an academic task and at the same time is having feelings of fear or anxiety, these feelings (and their accompanying cognitions about worry and self-doubt) can take up the limited working memory resources and can interfere with the cognitive processing needed to do the academic task (Hembree, 1988; Wine, 1971; Zeidner, 1998). This general interference or cognitive load explanation is a hallmark of work on test anxiety that is discussed in more detail later in this chapter. Under this general cognitive load hypothesis, it might be expected that any emotion (positive or negative) would take up attentional resources and result in reduced cognitive processing or performance. However, this does not seem to be the case, given the differential and asymmetric findings for positive and negative affect (Forgas, 2000). There is a need for further exploration of how emotions and mood can influence attentional resources and ultimately performance.

The fourth and final general pathway that Pekrun (1992) suggested is that emotions can work through their effect on intrinsic and extrinsic motivational processes. Linnenbrink and Pintrich (2000) also suggested that motivational and affective processes can interact to influence cognitive and behavioral outcomes. Under this general assumption, positive emotions, such as the experience of enjoyment in doing a task or the anticipatory or outcome-related joy of a task (see Table 6.1), may lead to intrinsic motivation for the task. In Chapter 7 we discuss different definitions of intrinsic motivation, one of which is the experience of enjoyment and deep engagement in a task. From this perspective, negative emotions such as boredom, sadness, or fear, should decrease intrinsic motivation for doing the task, albeit some of them (e.g., fear) also might increase the extrinsic motivation for the task.

It seems clear that affective and motivational processes can interact and, through these interactions, influence cognition, learning, and performance (Linnenbrink & Pintrich, 2000). At the same time, there is a need for much more research on how to effectively integrate affective processes with the motivational and cognitive processes that have been examined in much more detail. This is sure to be one of the major areas of future research in achievement motivation research.

Emotions and Goals

Interest in emotions has turned in recent years to their interplay with self-regulation. A key process in self-regulation is goal setting. Self-regulation involves setting goals and assessing goal progress while working on tasks. The perception of progress builds self-efficacy (perceived capabilities) and sustains motivation.

Linnenbrink and Pintrich (2002, 2004) presented a model in which students' affects about school and learning influence their classroom goals. Students who feel positively are apt to adopt approach goals (see Chapter 5), whereas those who feel negatively may be more inclined toward avoidance goals. However, the approach or avoidance goals may be either mastery or performance. Students who believe that they have the resources to attain outcomes may be more likely to adopt goals of learning or of demonstrating competence relative to others, and similarly for avoidance goals.

Linnenbrink and Pintrich (2002, 2004) also postulated that achievement goals influence students' specific emotions, which are typically short in duration and over time merge into more general mood states. Approach goals may be associated with elation as one approaches a goal or sadness when one is not approaching a goal. Avoidance goals may be associated with relief when the goal is avoided or anxiety when the goal is not avoided. Approach mastery goals should lead

to an increase in positive emotions and a decrease in negative emotions, whereas performance approach goals may be unrelated to positive emotions and increase negative emotions.

To date there has been little research testing these predictions. The findings from studies have been complex. Research relating positive and negative affect to mathematics learning shows positive effects for effort and cognitive self-regulation but not for learning. In science, positive affect has been shown to be unrelated to conceptual change but moderately associated with adaptive strategy use and cognitive processing.

From these findings we might conclude that positive affect increases effort and strategy use; however, the relation seems complex. Clearly further research is warranted, which should shed light on a topic that is underexplored but potentially important for motivation and achievement.

TEST ANXIETY

At the beginning of this chapter Mr. Anderson and Mr. Lopez discussed the problem of test anxiety and how it can have a negative influence on student performance on tests. Mr. Lopez even talked about how he suffered from it when he was a student. Test anxiety can be a major problem at all levels, from elementary through postsecondary education. It represents a type of emotion that can have a negative effect on learning, in contrast to the positive affect that is generated by personal and situational interest.

In addition, unlike the recent resurgence of empirical research on interest, test anxiety research has been ongoing since at least the 1950s (Tryon, 1980). Today there are professional organizations and journals devoted to test anxiety, as well as a number of edited books on the problems of anxiety and stress (Hagtvet & Johnsen, 1992; Schwarzer, van der Ploeg, & Spielberger, 1989). Zeidner (1998) provided an excellent and comprehensive state-of-the-art review of the research on test anxiety. Readers interested in more detail on the role of test anxiety should consult these sources. Given the extensive research on test anxiety we do not present a comprehensive treatment of the topic here, but rather we highlight some important issues about test anxiety and academic performance.

Defining Test Anxiety

In defining test anxiety there are a number of important issues to consider. A general definition of *anxiety* is "an unpleasant feeling or emotional state that has physiological and behavioral concomitants, and that is experienced in formal testing or other evaluative situations" (Dusek, 1980, p. 88). Test anxiety is a specific form of this generalized evaluative anxiety in reference to test situations. Test anxiety is defined as a set of phenomenological, physiological, and behavioral responses that accompany concern about possible negative consequences or failure on an exam or similar evaluative situation (Zeidner, 1998).

The phenomenological aspect of test anxiety usually includes cognitive and emotional components. The cognitive component is *worry*, and the emotional component is *emotion* or *affect* (Liebert & Morris, 1967; Wigfield & Eccles, 1989; Zeidner, 1998). The cognitive (worry) component refers to the cognitions that accompany anxiety, such as worrying about flunking the test, thinking about the consequences of failing the test (e.g., parents being upset, having to drop out of college), worrying about being unable to finish the test, thinking about items that one cannot answer, and thinking about being embarrassed because of a low grade (see Mr. Lopez's comments

at the start of this chapter). These and similar thoughts might run through highly test-anxious persons' minds as they take a test.

The emotionality component refers to the actual arousal that individuals experience as they take a test, such as fear, unease, or uncomfortableness (Zeidner, 1998). This arousal can become a classically conditioned affective reaction to evaluative situations (Wigfield & Eccles, 1989). It should be noted that, although most people feel some anxiety when put in a performance situation, for test-anxious individuals the anxiety becomes overwhelming and interferes with their ability to perform a task they have mastered in another nonevaluative situation. In the example at the beginning of this chapter, Mr. Lopez recalled how he could do mathematical problems on the homework (nonevaluative situation) but had difficulties during tests. Many performers such as musicians, actors, and athletes may show debilitating effects of anxiety during a performance in contrast to rehearsals or practice. Zeidner (1998) also noted that the physiological aspect can include arousal symptoms such as sweaty palms, upset stomach, and rapid heartbeat.

In Zeidner's (1998) model of test anxiety, these phenomenological, physiological, and behavioral components are the most central to test anxiety. The behavioral aspect of anxiety can include the various coping mechanisms that people use to deal with their anxiety, as well as such behavioral and cognitive outcomes as task-related thinking, cognition, attention, and actual performance. Both contextual and personal factors influence the activation of test anxiety. The nature of the testing situation can create cues that can arouse anxiety. In addition, there are a number of personal characteristics (e.g., personal traits, self-efficacy, actual ability, self-regulatory skills, expertise) that can lead individuals to appraise the same objective testing situation in different ways. For some individuals, tests can be seen as a challenge; for others, they are anxiety-arousing situations (Zeidner, 1998). Regardless of differences in contexts and cues, however, various forms of test anxiety seem to be governed by the same type of cognitive and motivational processes (Zeidner & Matthews, 2005).

A second issue related to the definition of test anxiety concerns its stability. Most models of test anxiety propose that it is both a trait and a state (Covington, 1992; Spielberger, 1972; Zeidner, 1998). This dichotomy parallels the distinction between personal interest as a relatively enduring trait of the individual and a more situational interest fostered by external conditions. Trait test anxiety represents a stable individual difference; some individuals are higher on test anxiety across many different situations in comparison with those low on test anxiety. Highly test-anxious individuals tend to experience anxiety in most testing or evaluative situations. These individuals are likely to enter an evaluative situation primed to interpret it and appraise it in an anxiety-arousing manner. Those low in trait anxiety are less likely to appraise the same evaluative situation in such a threatening manner.

In contrast, state test anxiety is more specific to the situation and may be experienced by many or most people in certain stressful situations. For example, taking a college or graduate school admissions test (e.g., SAT, ACT, GRE, LSAT) that has high importance for most people probably will generate state test anxiety in many test-takers. Besides these high-stakes testing situations, some classrooms in which testing, grading, and competition are emphasized can generate high levels of state test anxiety in many students (Hill & Wigfield, 1984). Most test anxiety models also predict that people who are high in trait test anxiety will be even more anxious in these types of anxiety-arousing situations.

Effects on Learning and Performance

The empirical research on the negative effects of anxiety on academic performance is large and consistent (Zeidner, 1998). Hembree (1988), in a meta-analysis of 562 studies that related test anxiety

and academic achievement, found that test anxiety caused poor performance, related negatively to self-esteem, and was directly related to students' defensiveness and fear of negative evaluation. Hill and Wigfield (1984) reported that studies have found negative correlations up to $r = -.60$ between test anxiety and achievement. Hill and Wigfield estimated that in most classrooms about 10% of the children have a relatively high level of trait anxiety, which translates into about two to three children per classroom. By their estimates, between 4 and 5 million children in elementary and secondary schools in the United States have to cope with high test anxiety. Hill and Wigfield also estimated that another 10–15% of the children in any classroom, although not in the top 10% of the population in test anxiety, experience some anxiety. Taken together, this resulting estimate that 25% of the children in classrooms have problems with anxiety means that approximately 10 million children in the United States may be affected by test anxiety. Accordingly, there is a need to understand how test anxiety works and what can be done to help relieve it (Wigfield & Eccles, 1989).

Several mechanisms or models have been suggested by researchers to explain how anxiety influences learning and performance (Zeidner, 1998). Given that many empirical studies have shown that the worry component is more closely linked to performance decrements than the emotionality component (Covington, 1992; Tryon, 1980), explanations have tended to focus on the role of the worry component. Tobias (1985) provided a model that integrates two explanations of the effects of test anxiety. One explanation is that anxiety interferes with attention because all of the negative thoughts and worry distract the individual from the task (Wine, 1971; Zeidner, 1998). Given the limited capacity of working memory, these distracting thoughts take up cognitive/attentional resources that could be used to work on the task at hand (the test). In some ways, these students suffer at the time of retrieval because they are not able to recall needed information to do well on the test, even if they knew it before the test (Zeidner, 1998). This explanation includes the first and third pathways that were presented in this chapter on how affect might influence learning (Pekrun, 1992).

The other explanation is that highly test-anxious students have deficits in general cognitive learning strategies or test-taking strategies; that is, they do not know how to study very well, do not know how to take a test strategically, and often are not well prepared for the test. This explanation parallels the second pathway for the effect of emotion on cognition (Pekrun, 1992). This lack of skill can result in retrieval problems. More importantly, this model suggests that the problem is really an encoding problem at the time of learning the material. It is not that students cannot remember it well on the exam; it is that these students never learned it very well in the first place (Zeidner, 1998). Tobias (1985) has suggested that these two models are complementary, given our limited cognitive capacity. When students have good study skills and test-taking strategies, more working memory capacity will be freed up to cope with any negative thoughts and worry generated by high test anxiety. In contrast, if students do not have those skills, the worry generated by high test anxiety interferes with attention and cognitive processing and there is a concomitant drop in performance.

Much research needs to be done to tease apart these different explanations, but research that focuses on the interactive nature of anxiety and cognition, learning and coping strategies, and self-regulation is promising. In fact, the most recent models of test anxiety are based in self-regulation theory or coping/appraisal models that combine both explanations and focus on how cognitive and metacognitive strategies, along with motivational and emotional coping strategies, are used (or not used) in testing situations (Zeidner, 1998). For example, Schutz and Davis (2000) presented a detailed model of how emotions, including test anxiety, are related to the use of various cognitive and emotional regulatory strategies in a classroom context. This type of model will be in the vanguard of future research on not only test anxiety but also on all emotions and affect in the classroom.

In terms of how the classroom situation can create state anxiety, Hill and Wigfield (1984) and Wigfield and Eccles (1989) discussed a number of features of classrooms that can heighten anxiety for children. First, they noted that many classroom and standardized achievement tests have time limits that create pressure on students to finish within a certain amount of time. The lack of time (or perceived lack of time) can increase students' anxiety, particularly if anxious students spend part of the testing time worrying about their performance. This distraction not only will reduce cognitive/attentional capacity but also will reduce the amount of overall time spent thinking about the test. In addition, these tests are often introduced or discussed in terms of students' relative ability, which can heighten social comparison and anxiety. Finally, Hill and Wigfield (1984) noted that the format and mechanics of the tests can be unfamiliar to students or more difficult than their usual schoolwork.

Learning settings that have overly high standards for evaluation are associated with higher levels of anxiety (Helmke, 1988; Wigfield & Eccles, 1989; Zatz & Chassin, 1985). Research on aptitude-treatment interactions suggests that organized instruction and fairly easy tasks can help anxious students learn better, whereas less organized and student-centered instruction may not work as well with anxious students (Cronbach & Snow, 1977; Tobias, 1980; Wigfield & Eccles, 1989). Moreover, general changes in grading practices as students move into secondary schools, where grading systems are more normative and strict, can increase student anxiety over testing and evaluation. Finally, standardized testing and grades become more salient and have greater consequences in later (secondary) grades, thereby increasing anxiety (Wigfield & Eccles, 1989). Important as all of these contextual factors are in increasing the probability that students might feel anxious, current models of anxiety stress that the most important factor is how the context is perceived and appraised by the individual student (Zeidner, 1998). That is, it is not just the objective classroom environment that is important, but how students perceive and judge the setting affects the anxiety produced. This general perception-mediating model is in line with theories of motivation discussed in this text.

Interventions

Hill and Wigfield (1984) summarized a number of studies that attempted to change school or classroom use of tests and report cards. These studies suggest that simple changes such as removing time constraints from classroom tests can help anxious students perform better. Of course, this may not be easy when classes are only 45–50 minutes long. However, teachers can develop creative ways to change their test format to ensure that all students have enough time to demonstrate their mastery. If demonstrating mastery of the material is the most important aspect of the assessment, the amount of time taken to do so should not be an issue, particularly given individual differences in students' speed and ability to perform. In addition, Hill and Wigfield found that reducing the amount of importance that teachers placed on tests and decreasing the opportunities for social comparison of report card grades and test grades (e.g., no public displays of grades) helped to create a less anxious classroom climate.

In addition to changing the classroom climate and structure, several studies have attempted to change students' coping strategies for dealing with anxiety (Wigfield & Eccles, 1989; Zeidner, 1998). These interventions would include the "tricks" that Mr. Lopez said that his mathematics teacher taught him. Some of these intervention or treatment studies have mainly addressed the emotionality component, others have addressed the cognitive or worry component, and some have attempted to address both components (Tryon, 1980; Zeidner, 1998). Treatments aimed at the emotionality component usually attempt some type of desensitization to the negative affect generated in the situation, similar to what is done in behavior therapy with desensitization of

individuals with phobias. Some studies have also used self-directed relaxation techniques to help students cope with the negative affect and anxiety (Zeidner, 1998). Tryon (1980) suggested that these studies have had mixed success, which may be due to the fact that by addressing only the emotionality component they are not considering the worry component, which is more closely associated with actual decrements in performance.

Interventions that have been aimed at the worry component have included direct study and strategy skills training, cognitive behavioral self-regulation to control the unwanted and distracting thoughts, and motivational or attribution training to help students control and manage their anxiety (Zeidner, 1998). These cognitive treatments have shown somewhat stronger positive effects on reducing anxiety and improving performance, but most researchers believe that interventions need to address both emotionality and worry components through a diversity of methods (Hill & Wigfield, 1984; Tryon, 1980; Zeidner, 1998). For example, Hill and Wigfield (1984) outlined a school-based anxiety reduction program that includes training in both study and test-taking skills, as well as motivational and attributional training. It seems likely that these types of ecologically valid programs that address the multiple aspects of anxiety in the classroom will be more successful than single treatment or simpler interventions. Anxiety intervention programs need to become more integrated into the school curriculum, be sensitive to developmental differences, and include strategies targeted to help the diverse problems that different types of test-anxious students have (skills training versus anxiety control) (Wigfield & Eccles, 1989). Application 6.2 provides some specific suggestions for decreasing test anxiety in the classroom.

APPLICATION 6.2

Applying Test Anxiety Research in the Classroom

There are a large number of strategies that can be used to reduce test anxiety in the classroom (Zeidner, 1998).

1. *Provide more time to complete the test.* The loosening of time requirements seems to help many text-anxious students. Mr. Frank, an eighth-grade mathematics teacher, makes arrangements for some students to have a longer period of time to complete his end-of-unit tests. He knows his tests usually take about 40–45 minutes of his 50-minute period for most students. However, several students need more time to take the tests because of their test anxiety. He allows them to continue to work on the test into the next class period. His next class is not disrupted because they also are taking the same end-of-unit test. Mr. Frank always explains to the other teachers why some of the students will be a little late to their next class.

2. *Modify test item difficulty and order.* As noted throughout this book, tasks (including tests) should be matched closely to student expertise—challenging, but not overwhelmingly difficult. This principle also applies to anxiety. Tasks that are too difficult create anxiety; test items that are too difficult create test anxiety. It helps to have items that not only are matched to student skill level but also progress in difficulty level, from easier items at the start of the test to harder items later in the test.

   Mr. March, a high school history teacher, designs his multiple-choice tests so that easier items are at the beginning and harder items are at the end. He finds this helps all

students "warm up" to the task, and especially those who are very nervous. As they start the test, they have some success and thus feel more comfortable. Their anxiety dissipates and they can then progress more easily through the test.

3. *Provide students opportunities to comment on test or test items.* When some students can write comments on test items, particularly ambiguous ones or difficult ones, it seems to help them perform better. Ms. Hong always provides space on the test for students to make comments about their thoughts about the items, their difficulty, etc. Students like this and seem to feel less anxiety because of it.

4. *Reduce social comparison and public display of test scores.* When teachers and students have public access to test scores (i.e., through listing on public bulletin boards, by the public calling out of scores in front of whole class), it can create many opportunities for social comparison among students. In this case, students know how others did and they may begin to make negative and maladaptive comparisons and attributions for their own or others' performance. Teachers should strive to reduce social comparison and have students make appropriate attributions for test performance. Ms. Kastleton employs these ideas by not posting students' scores on bulletin boards and talking about test performance as a function of effort and actual skill, not general ability.

5. *Reduce the performance-oriented nature of testing situations to focus on mastery and formative assessment purposes.* If teachers discuss tests as ways of beating out others, as a competition that only a few can win (grading on a strict curve), this can create anxiety for all students, not just for highly anxious students.

Mr. Craven is careful to discuss tests as opportunities for all students to demonstrate what they have learned and as a way for him to evaluate his teaching. He also notes how the information from tests can help students go back and relearn what they have not mastered. The evaluation also provides him with information that he might need to reteach certain concepts if most of the students show on the test that they have not mastered them.

SUMMARY

Interest refers to the liking and willful engagement in an activity. Historical figures in education such as Dewey and Thorndike felt that interest was important for learning and achievement, but little research was conducted on interest while behaviorism was the dominant paradigm in psychology. Today researchers actively are exploring interest to assess its role in learning and motivation.

Personal interest and situational interest are two different types of interest that can influence learning and performance. Personal interest is a more stable personality or individual difference variable. Personal interests are directed at specific activities or topics but

there is a great deal of variability in what activities or topics will be of personal interest to any one individual. In contrast, situational interest is a contextual view of interest, whereby interest is generated by the features of the immediate environment. Situational interest can be increased by the use of interesting texts, media, presentations, and the like, and is generally assumed to be relatively consistent across individuals. Personal and situational interest relate positively to choice of future activities, memory, attention, deeper cognitive processing, and actual achievement and performance.

Self-esteem and self-worth are emotional reactions to the self. Self-worth refers to emotional reactions or

feelings about the self. Popular views of self-esteem are too simplistic to offer much help in our attempts to understand student achievement in the classroom. Covington's self-worth theory addresses the role of self-worth in school learning and is relevant to current theoretical models of motivation, such as attribution theory. Self-worth research shows that self-worth is an important outcome of schooling. The popular notion that increasing self-esteem will lead to better learning and achievement is not a useful perspective on the relations between self-esteem and school learning.

Affect comprises specific emotions and general moods. Emotions are short-lived phenomena that have identifiable causes, whereas moods are low-intensity and diffuse affective states with no salient antecedents and little cognitive content. There are various ways to categorize emotions that students experience. One taxonomy classifies emotions in terms of whether they are positive or negative and task-related or social. Within the task-related category emotions may be process-related, prospective, or retrospective.

There are multiple pathways whereby affect might lead to differential learning and performance: (1) affective experiences influence how information is encoded and recalled, (2) affective experiences influence the types of cognitive and self-regulatory strategies used, (3) affective experiences influence attention and working memory resources, and (4) affective experiences influence intrinsic and extrinsic motivation. Regardless of the exact process, it is important to keep in mind that the relationship of affect and learning is bidirectional; that is, each has an influence on the other.

Test anxiety has several components, but two of the most important are worry and emotionality. The worry component refers to the cognitions or thoughts that individuals have when they worry during a test-taking situation. The emotionality component involves the emotional arousal (fear and negative affect) that often is generated in evaluative situations. Paralleling the distinction between personal and situational interest, test anxiety is often divided into trait and state anxiety. Trait anxiety represents a more stable personality characteristic of an individual, whereas state anxiety is a more situational arousal of anxiety due to stressful testing circumstances. Test anxiety has been consistently shown to have a negative effect on academic learning and performance through its effects on attention, memory, and strategy use. Various strategies have been shown to help decrease test anxiety including allowing students greater time on tests and minimizing public evaluations of performances.

FURTHER READING

Covington, M. V. (1992). *Making the grade: A self-worth perspective on motivation and school reform.* New York: Cambridge University Press.

Forgas, J. (2000). The role of affect in social cognition. In J. Forgas (Ed.), *Feeling and thinking: The role of affect in social cognition* (pp. 1–28). New York: Cambridge University Press.

Hidi, S. (1990). Interest and its contribution as a mental resource for learning. *Review of Educational Research, 60,* 549–571.

Pekrun, R. (1992). The impact of emotions on learning and achievement: Towards a theory of cognitive/motivational mediators. *Applied Psychology: An International Review, 41,* 359–376.

Renninger, K. A. (1992). Individual interest and development: Implications for theory and practice. In K. A. Renninger, S. Hidi, & A. Krapp (Eds.), *The role of interest in learning and development* (pp. 361–395). Hillsdale, NJ: Erlbaum.

Zeidner, M. (1998). *Test anxiety: The state of the art.* New York: Plenum.