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# Students' achievement values, goal orientations, and interest: Definitions, development, and relations to achievement outcomes

Allan Wigfield\*, Jenna Cambria

*Department of Human Development, University of Maryland, 3304 Benjamin, College Park, MD 20742, United States*

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### ABSTRACT

Students' achievement task values, goal orientations, and interest are motivation-related constructs which concern students' purposes and reasons for doing achievement activities. The authors review the extant research on these constructs and describe and compare many of the most frequently used measures of these constructs. They also discuss their development during childhood and adolescence. They review the research on the relations of these constructs to achievement outcomes, and their relations to each other both contiguously and over time. Suggestions for future research include testing theoretically derived predictions about how students' achievement values, goal orientations, and interest together predict various achievement outcomes; and examining how their relations with one another become established and change over time.

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### Overview

Work on social cognitive models of achievement motivation has burgeoned over the last 30 years. These models emphasize individuals' beliefs, achievement values, goals, and interests as major influences on their motivation and ultimately, their achievement (Eccles & Wigfield, 2002; Pintrich, 2003; Weiner, 1992). These models also emphasize the influence of the achievement context on individuals' motivation and achievement (Pintrich, 2003; Wigfield, Eccles, & Rodriguez, 1998; Wigfield, Eccles, Schiefele, Roeser, & Davis-Kean, 2006).

There are a variety of motivation related beliefs, achievement values, and goals included in these models. Pintrich, Marx, and Boyle (1993) organized these constructs into two broad categories, those

\* Corresponding author. Fax: +1 301 405 2891.  
E-mail address: [awigfiel@umd.edu](mailto:awigfiel@umd.edu) (A. Wigfield).

having to do with beliefs about capabilities to do different tasks, and those having to do with students' reasons for doing different tasks. Pintrich (2003) divided these two broad categories into five "families" of constructs: efficacy and competence beliefs, attributions and control beliefs (these comprise Pintrich et al.'s first category), interest and intrinsic motivation, achievement values, and goals (Pintrich et al.'s second category). For many years individuals' beliefs about their capabilities, such as their self-efficacy, expectancies for success, control beliefs, and attributions for success and failure, were emphasized by motivation researchers. The crux of this work is that when individuals believe they have the capability to succeed at different activities they will be more likely to engage in them, persist in the face of difficulties, and do well on those activities (Bandura, 1997; Graham & Williams, 2009; Schunk & Pajares, 2009; Weiner, 1992).

There has been increasing interest in the set of motivation-related constructs that broadly concern the purposes or reasons individuals have for doing different activities and their interest in them; Eccles, Wigfield, and Schiefele (1998) characterized these constructs as reflecting the question "Do I Want to Do This Activity and Why?" Answering these questions positively is crucial to students' engagement in different activities; if they see little purpose or reason for doing an activity (such as math homework) they probably would not, even if they believe they can do the activity (see Elliot, 2005; Wigfield & Eccles, 1992; Wigfield, Tonks, & Klauda, 2009).

The purpose of this article is to review the work on major constructs having to do with students' purposes for doing different activities: achievement values, goal orientations, and interest. There have been important review articles and chapters in the developmental and educational psychology literatures on the value, goal orientation, and interest constructs separately. Eccles (2005), Wigfield (1994), Wigfield and Eccles (1992), and Wigfield et al. (2009) review the work on achievement values; Anderman, Austin, and Johnson (2002), Elliot (2005), Hidi and Harackiewicz (2000), and Maehr and Zusho (2009) review the work on achievement goal orientations; and Krapp (2002), Hidi and Renninger (2006), Renninger and Hidi (2002), and Schiefele (2009) discuss the work on interest. With respect to more integrative reviews, Hidi and Harackiewicz (2000) discuss relations of interest and goal orientations, and Anderman and Wolters (2006) review the research on goal orientations, achievement values, and affect. We know of no article that reviews the work on achievement values, goal orientations, and interest in one place.

We think it is important to explore these constructs together for several reasons. Following Murphy and Alexander (2000), it is necessary for motivation researchers and theorists to articulate clearly the nature of the constructs they study. At the broad conceptual level, achievement values, goal orientations, and interest are said to concern the purposes individuals have for doing activities; is their impact on this purpose similar or different, and how so? More specifically, one of the components of task value defined by Eccles and her colleagues is interest value; how is this aspect of achievement values similar or different from the interest construct? Second, some researchers are exploring the empirical relations among these constructs, and this work will further our understanding of their similarities and differences; we review this work in this article. Third, to understand the overall development of children's motivation it is important to look at the interrelations of these constructs over time, and determine which may have causal impact on the other constructs. Such an analysis has potentially important implications for theoretical models of motivation. Fourth, it is important to understand the kinds of outcomes these variables relate to, whether each relates to similar outcomes, and whether they add predictive power to our understanding of achievement outcomes beyond what competence and efficacy beliefs predict.

We constrained our review in the following ways because the literature on each of these constructs and their extensions is voluminous, and because we are especially interested in motivation constructs connected directly with achievement. First, we focus on achievement values as defined in expectancy-value theory rather than broader values with respect to desirable modes of behavior discussed by researchers such as Rohan (2000) and Rokeach (1973, 1979). Second we focus primarily on goal orientations, in large part because of their prominence in much of the recent research on motivational goals in school settings. Third, although interest and intrinsic motivation are related, we do not review the literature on intrinsic and extrinsic motivation stemming from Self-Determination Theory (SDT) because it is so vast and has been thoroughly reviewed elsewhere (see Ryan & Deci, 2009). Additionally, intrinsic motivation has been characterized as a broader construct than the values, goal

orientation and interest constructs we discuss here, and so differs from these other constructs in this and other important respects (see Deci, 1992, 1998; Renninger & Hidi, 2002). We note in some places where certain constructs in SDT relate to values and interest in particular. Fourth, we focus primarily on research done with elementary and secondary school students; the main exception to this is research by Elliot and his colleagues, Greene, Miller and their colleagues, and Harackiewicz and her colleagues on college students' goal orientations and how they relate to task values, interest, and outcomes; and Schiefele's (2009) research on interest. We include this work because these researchers have developed important measures of the constructs and examine relations among them.

We begin this article by defining each construct as researchers have discussed them in the literature, and then describe some of the most frequently used measures of each construct. We then describe research on their developmental trajectories, how they relate to different achievement outcomes, and relations among the constructs. We close with discussion of conceptual similarities and differences among them, and suggestions for future research.

## Achievement values

Within the achievement motivation area the construct of values primarily has been discussed and studied from the perspective of expectancy-value theory (Eccles et al., 1983; Higgins, 2007; Pekrun, 2006; Rose & Sherman, 2007; Weiner, 1992; Wigfield & Eccles, 1992). Lewin (1938) initially defined the value (or valence) of an activity with respect to its importance to the individual. Higgins (2007) defined value both in terms of the relative worth of a commodity, activity, or person and also as the psychological experience of being attracted to (or repulsed by) an object or activity. Valuing something means wishing to attain it; thus for Higgins value is a motivational force and not just a belief. Atkinson (1957) and Atkinson (1964) developed the first formal, mathematical expectancy-value model of achievement motivation in an attempt to explain different kinds of achievement-related behaviors, such as striving for success, choice among achievement tasks, and persistence. Atkinson (1957) postulated that achievement behaviors are determined by achievement motives, expectancies for success, and incentive values. He viewed achievement motives as relatively stable dispositions, and included both a motive to approach success and a motive to avoid failure in the theory, stating that individuals can be described by the relative strength of these approach and avoidance motives. Atkinson defined expectancies for success as the individual's expected probability for success on a specific task (which can range from zero to one). He defined incentive value as the relative attractiveness of succeeding on a given achievement task, and also stated that incentive value is inversely related to the probability for success. Thus for Atkinson expectancies and values were linked to particular tasks or activities, rather than being general dispositions. Further, their inverse relationship means that highly-valued tasks are ones that individuals think are difficult to do (see Atkinson, 1964; Wigfield & Eccles, 1992, for further discussion of this theory and research emanating from it).

### *Modern expectancy-value models in developmental and educational psychology*

Modern expectancy-value theories (e.g., Eccles, 1987, 1993, 2005; Eccles et al., 1983; Feather, 1982, 1988; Pekrun, 1993, 2000, 2006, 2009; Wigfield & Eccles, 1992, 2000, 2002) are based in Atkinson's (1957, 1964) work in that they link achievement performance, persistence, and choice most directly to individuals' expectancy-related and task value beliefs. However, they differ from Atkinson's expectancy-value theory in several ways. First, both the expectancy and value components are defined in richer ways, and are linked to a broader array of psychological, social, and cultural determinants. Second, these models have been tested in real-world achievement situations rather than with the laboratory tasks often used to test Atkinson's theory.

### *The Eccles et al. expectancy-value model*

Eccles and her colleagues' expectancy-value model proposes that these constructs are the most immediate or direct predictors of achievement performance and choice, and are themselves influenced by a variety of psychological, social, and cultural influences (e.g., Eccles, 1987, 1993,

2005; Eccles & Wigfield, 1995; Eccles et al., 1983; Meece, Wigfield, & Eccles, 1990; Wigfield, 1994; Wigfield & Eccles, 1992, 2000, 2002). In their research, Eccles and her colleagues have focused on how expectancies, values, and their determinants influence choice, persistence, and performance.

In this model expectancies and values are hypothesized to influence performance and task choice directly. Expectancies and values themselves are influenced by task-specific beliefs such as perceptions of competence, perceptions of the difficulty of different tasks, and individuals' goals and self-schema, along with their affective memories for different achievement-related events. These beliefs, goals, and affective memories are influenced by individuals' perceptions of other peoples' attitudes and expectations for them, and by their own interpretations of their previous achievement outcomes. Children's perceptions and interpretations are influenced by a broad array of social and cultural factors. These include socializers' (especially parents and teachers) beliefs and behaviors, children's specific achievement experiences and aptitudes, and the cultural milieu in which they live.

Eccles and her colleagues define values with respect to the qualities of different tasks and how those qualities influence the individual's desire to do the task; hence the term *task value* (Eccles, 2005; Eccles et al., 1983; Wigfield & Eccles, 1992). Like Higgins' (2007) definition, this definition stresses the motivational aspects of task value. Further, these values are *subjective* because various individuals assign different values to the same activity; math achievement is valuable to some students but not to others.

Eccles et al. (1983) proposed four major components of achievement task values: attainment value or importance, intrinsic or interest value, utility value or usefulness of the task, and cost (see Eccles et al. (1983), and Wigfield and Eccles (1992) for more detailed discussion of these components). Building on Battle's (1965, 1966) work, Eccles et al. defined attainment value as the importance of doing well on a given task. Attainment value incorporates identity issues; tasks are important when individuals view them as central to their own sense of themselves, or allow them to express or confirm important aspects of self. This aspect of value also can be tied to the integrated regulation construct in self-determination theory, which refers to integrating one's actions so that they are coherent with the individual's sense of self and goals (Ryan & Deci, 2009).

Intrinsic or interest value is the enjoyment one gains from doing the task. This component is similar in certain respects to notions of intrinsic motivation and also to interest (see Renninger, 2000; Ryan & Deci, 2000; Schiefele, 2001). That is, when children intrinsically value an activity they often become deeply engaged in it and can persist at it for a long time, which also are described as characteristics of intrinsically motivated behavior and interest. However, it is important to acknowledge that because these constructs come from different theoretical traditions they have different intellectual roots and therefore have inherently different meanings. Specifically, in expectancy-value theory interest value is one type of value and must be considered in conjunction with the other types of values in thinking about its relations to children's engagement in different activities. Also, as noted earlier in this model value is primarily discussed with respect to different tasks or activities; thus the construct is relatively specific. Intrinsic motivation often is defined and measured more generally, and as will be discussed in the next section interest theorists define different aspects of interest. We will return later to a discussion of how this component of value relates to the construct of interest as defined by interest theorists.

Utility value or usefulness refers to how a task fits into an individual's future plans, for instance, taking a math class to fulfill a requirement for a science degree. In certain respects utility value is similar to extrinsic motivation, and more specifically, to the self determination theory construct of identified regulation because when doing an activity out of utility value, the activity is a means to an end rather than an end in itself (see Ryan & Deci, 2000, 2009). However, Eccles (2005) discusses how utility value also can reflect that the activity ties to some important goals that the person holds deeply, such as attaining a certain occupation. In this sense utility value also connects to personal goals and sense of self, and so also can be connected to integrated regulation in SDT.

Cost refers to what the individual has to give up to do a task (e.g., do I do my math homework or call my friend?), as well as the anticipated effort one will need to put into task completion. Is working this hard to get an A in math worth it? Eccles et al. (1983) emphasized that cost is especially important to choice. Choices are influenced by both negative and positive task characteristics and all choices are assumed to have costs associated with them because one choice often eliminates other options. For instance, choosing to major in history means that one cannot major in another field that also may have

some value to the individual. Despite the theoretical importance of cost, it has been the least studied of the different components of subjective values.

#### *Pekrun's control-value model*

Pekrun (1993, 2000, 2006, 2009) developed a model of achievement motivation based in the expectancy-value tradition. He calls his theory a control-value theory, using the construct of “control” to capture different kinds of beliefs having to do with individuals' appraisals of different possible cause-effect relationships between actions and outcomes in achievement settings. Indeed, the notion of appraisal is fundamental to his work; he argues that individuals' appraisals of their actions, the likelihood that the action will produce certain outcomes, and the appraisal of the values of both actions and outcomes are fundamental determinants of motivation. He also has been quite interested in linkages between control beliefs, value, and motivation.

Pekrun (1993, 2000, 2006, 2009) distinguished three kinds of expectancy beliefs that comprise the main control beliefs in his model. Situation-outcome expectancies are expectancies that a situation will produce an outcome; thus the individual's own action is not essential when these linkages operate. Action-outcome expectancies refer to individuals' beliefs about the consequences of their own actions. Action-control expectancies concern individuals' beliefs about whether they can do a certain action. These expectancies are conceptually similar to Bandura's (1997) self-efficacy construct; Pekrun prefers the term action control because it deals directly with individuals' beliefs about whether they can successfully control their actions, and also ties to the literature on volition.

Pekrun (1993, 2000, 2006, 2009) also distinguished different kinds of achievement values, or value cognitions, to use his term. He differentiates between the value of outcomes and the value of actions, and further separated intrinsic and extrinsic aspects of each. Intrinsic values of outcomes concern the intrinsic enjoyment of an outcome, whereas extrinsic outcome values reflect the instrumentality of an outcome. In the same vein, intrinsic values of action have to do with the inherent value of the action to the individual, whereas extrinsic action values have to do with actions that lead to an instrumental outcome (e.g., studying to get a good grade on a test in order to maximize one's chances of getting into graduate school).

One important aspect of this model is Pekrun's (1993) specification of how individuals' appraisals of different activities leads to motivation to undertake an action or not, and also to their performance. The process starts with an appraisal of the value of a given outcome; if it is valued, then the individual forms situation-outcome expectancies, action-outcome expectancies, and action-control expectancies. If the situation totally determines an outcome the other expectancies do not function; however, if it does not then both action-outcome and action-control expectancies determine motivation, particularly if the action is valued. Ultimately, the individual's motivation is determined by the complex interplay of these appraisals.

Much of Pekrun's recent work focuses on relations of motivation and emotion (e.g., Pekrun, 2006, 2009). We discuss this work only briefly because emotions are not a major focus of this review (see Anderman & Wolters, 2006; Pekrun, 2009). Pekrun distinguishes three general kinds of emotions. Anticipatory (or prospective) emotions are those that occur before an individual undertakes an achievement activity, and Pekrun argues that these are influenced by individuals' expectancies and values for the activity. For instance, if the individual expects to do well at the activity and values it, then she will experience emotions such as hope and joy. If not, anxiety and hopelessness will be experienced. Concurrent emotions are experienced as the individual does different activities, and Pekrun stated that enjoyment and boredom are two fundamental emotions that occur as an activity is ongoing. Finally, retrospective emotions occur as individuals reflect on an activity. These emotions include joy, pride, sadness, or shame, and again are based in the individual's appraisal of the activity and how it went.

The two models just reviewed are similar in a number of ways. One important difference between them is that in Pekrun's (2000, 2006) model the expectancy construct is elaborated more fully. There also is a clearer distinction of action and outcome in this model. Eccles and her colleagues discuss a wider variety of components of task value. They also include a more elaborate set of antecedents of both expectancies and values. Pekrun's model includes a more inclusive set of achievement-related emotions and predictions about how they relate to achievement values.

### *Self-concept, importance, and interest*

Although not stemming directly from the expectancy-value tradition, work by some self-concept researchers has explored relations of self-concept to the importance individuals attach to different activities, and their interest in the activities, and thus is related to the expectancy-value work just reviewed. Harter has done extensive research on children, adolescents, and adults' self-perceptions in different areas (see Harter (1990, 1998, 2006) for review). Her self-perception measure focuses in large part on perceptions of competence in different domains, and so relates conceptually to the self-concept of ability and expectancy constructs in expectancy-value theory. One major focus of her research is how individuals' self-perceptions in different areas relate to their general self-esteem. Following James (1890), Harter also studied how individuals' relative valuing of their competence in different areas of self related to their self-esteem. She postulated that it is not competence per se but competence in valued areas of self that are the most important correlate of self-esteem. She devised a measure of importance of the different domains of self that she measured in her self-perception scale, and calculated the discrepancy scores between children's ratings of the importance of the domain and perceptions of competence in it. She argued that when children's ratings of the importance of a domain exceeded their sense of competence in it they should have lower self-esteem. By contrast, believing one is competent in areas deemed unimportant should not impact self-esteem. In several studies Harter found that children who are competent in areas deemed important have the highest self-esteem (see Harter (1990, 1998) for review). When children's importance ratings were greater than their ratings of competence, their self-esteem was lower. Thus it is not competence alone but value and competence that relate to self-esteem. Expectancy-value theorists make similar predictions about relations of competence and values to self-esteem (Eccles, 2005).

Marsh and his colleagues also have done extensive work on self-concept of ability in different areas (e.g., Marsh, 1989, 1993; Marsh, Köller, Trautwein, Lüdtke, & Baumert, 2005). One of the major foci of their work is how self-concept of ability relates to achievement in different areas, and in a series of longitudinal studies they have shown that the two variables relate reciprocally (Marsh, 1990; Marsh & Yeung, 1998). Marsh et al. (2005) extended this work by including a measure of interest along with achievement, to examine reciprocal relations across all three variables in the domain of math. The interest measure asked how much students enjoy math, how important it was for them to be good at math, and if they would do math in their spare time. The major findings of this work were that math self-concept and achievement related reciprocally over time, and math interest and achievement (while correlated) did not relate reciprocally. Math self-concept and interest did relate reciprocally, but there was stronger evidence for the prediction of math interest from math self-concept than the reverse. These results support those of Eccles and her colleagues (discussed later) who have shown that ability-related beliefs predict achievement more strongly than do achievement values.

### **Goal orientations**

Work on achievement goal orientations has flourished over the last nearly 30 years. These orientations refer to broader approaches children take to their learning and their approaches to competence, rather than goals for specific activities, although of course goal orientations can also influence the approach one takes to a specific task (Elliot, 2005; Maehr & Zusho, 2009). Of the three constructs discussed in this article, goal orientations are in certain respects the clearest exemplar of a construct relating to the individual's purposes or aims with respect to developing competence at an activity or set of activities; as stated by Elliot and Murayama (2008), "a goal is conceptualized as an aim that one is committed to that serves as a guide for future behavior (p. 614)."

### *Mastery, performance, and work avoidant goal orientations*

Researchers (e.g., Ames, 1992; Blumenfeld, 1992; Butler, 1993; Dweck & Leggett, 1988; Maehr & Midgley, 1996; Nicholls, 1984) initially distinguished three broad goal orientations that students can have toward their learning (see Elliot (2005) and Maehr and Zusho (2009) for detailed review).

One orientation, called learning, task involved, or mastery goal orientation, means that the child is focused on improving their skills, mastering material, and learning new things. Questions such as “How can I do this task?” and “What will I learn?” reflect mastery goals. The second goal orientation, called performance or ego orientation, means that the child focuses on maximizing favorable evaluations of their competence and minimizing negative evaluations of competence. Questions such as “Am I doing this task better than my friend?” and “Does completing this task make me look smart?” reflect performance goals. Nicholls and his colleagues (e.g., Nicholls, Cobb, Wood, Yackel, & Patashnick, 1990; Nicholls, Cobb, Yackel, Wood, & Wheatley, 1990) and Meece (1991, 1994) also have described a work avoidant goal orientation, which means that the child does not wish to engage in academic activities. This orientation has received less research attention compared to the other two, although Harackiewicz and her colleagues have been researching it in college students (Harackiewicz, Durik, Barron, Linnenbrink-Garcia, & Tauer, 2008; Hulleman, Durik, Schweigert, & Harackiewicz, 2008).

The different terms used to label the first two goal orientations occurred because different researchers were working on them simultaneously, with each having a somewhat distinctive view of each orientation (see Pintrich (2000a) and Thorkildsen and Nicholls (1998) for discussion of the intellectual roots of different researchers’ definitions of these goal orientations). For instance, Dweck and Leggett (1988) proposed that children’s goal orientations stem from their theories of intelligence. Children believing intelligence is malleable tend to hold a learning (mastery) goal orientation, and children adopting the entity view take on performance goals; we return to this point below. By contrast, Ames (1992) focused primarily on classroom antecedents of these goal orientations, rather than characteristics of children, which implies that goal orientations are more a product of context rather than the person, and so may vary more widely across different achievement situations. We acknowledge that the different terminology used by these theorists reflects some important distinctions in the conceptualization of these goal orientations, but also believe that the similarities are stronger than the distinctions between them (see Midgley, Kaplan, and Middleton (2001) and Pintrich (2000a) for a similar conclusion). We will use the terms mastery and performance goal orientations in this chapter, except when discussing Nicholls and colleagues’ work on developing measures of task and ego orientation.

### *Approach and avoidance components of goal orientations*

In the 1990s, researchers differentiated approach and avoid components of goal orientations. This occurred first for the performance goal orientation, beginning with work by Elliot and Harackiewicz (1996) and Skaalvik (1997), among others. These further distinctions emerged for two main reasons. Empirically, findings concerning the outcomes of having a performance goal orientation were somewhat contradictory, leading researchers to wonder why this occurred. Theoretically, Elliot and Harackiewicz noted that traditional achievement motivation theories, such as Atkinson’s (1957) expectancy-value model, included both approach and avoidance motives. By contrast, most modern theories focus primarily on the approach aspect, thus overlooking the importance of avoidance motivation.

Therefore, Elliot and Harackiewicz (1996) proposed approach and avoidance aspects of performance goals, as did Skaalvik (1997). Performance-approach goals refer to the students’ desire to demonstrate competence and outperform others. Performance-avoidance goals involve the desire to avoid looking incompetent. Researchers began to disentangle the effects of these two kinds of performance orientations. As we will see later, there is evidence that performance-approach goals can have a positive impact on different outcomes such as grades, whereas the impact of performance-avoidance goals is nearly always negative.

Elliot (1999), Elliot and McGregor (2001), and Pintrich (2000c) proposed that the mastery goal orientation also may be divided into approach and avoid components, rather than being solely conceived as reflecting an approach tendency. These researchers argued that mastery-avoidance goals include such things as working to avoid misunderstanding, or the use of standards to not be wrong when doing an achievement activity. As Elliot and McGregor and Pintrich both noted perfectionists may be characterized as holding mastery-avoidance goals. Research by Elliot and his colleagues (Elliot & McGregor, 2001; Elliot & Murayama, 2008) and Pintrich (2000b) provide empirical support for the mastery-avoid construct.

One issue with the approach-avoidance distinction that continues among goal orientation theorists is the relative merits of the different kinds of goal orientation, and debate about how they relate to achievement and other outcomes. Most goal orientation theorists note the benefits of mastery goals for both students and teachers and many of these theorists state that such goal orientations should be focused on more strongly in school. There is debate, however, about the relative merits of performance-approach goals. Because these goals relate positively to some important achievement outcomes some theorists believe that performance-approach goals can be beneficial to students; other theorists continue to think that mastery goals are the most favorable goals students can have. A complete discussion of this debate is beyond the scope of this article; interested readers should see Harackiewicz, Barron, Pintrich, Elliot, and Thrash (2002), Kaplan and Middleton (2002), Kaplan and Maehr (2007), Linnenbrink (2005), Midgley et al. (2001), and Maehr and Zusho (2009).

### *Motivation systems theory and achievement goals*

Although the primary focus of this review on goals is work on students' achievement goal orientations, Ford and his colleagues also have discussed goals using an approach and avoidance dichotomy based in their Motivational Systems Theory (Ford, 1992; Ford & Smith, 2007). We include a brief discussion of this work here because these broader goals are assumed to relate to achievement and also influence subjective task value as defined in expectancy-value models. Also, certain goals defined in this framework can be related to mastery and performance goals. Researchers evaluating motivation within this theoretical framework have examined how personal goals, personal agency beliefs, and context beliefs influence individual's goals across a broad spectrum of needs using the Taxonomy of Human Goals (Ford & Nichols, 1991). This taxonomy includes a range of within person and person-environment goals that people desire to achieve and are assumed to be attainable in a responsive social context and, in certain portions of the taxonomy, has made similar assertions and used comparable terminology as achievement goal orientation theory as well as work on values.

Portions of the Taxonomy of Human Goals (Ford & Nichols, 1991) discussed within Motivational Systems Theory (Ford, 1992) are comparable with mastery and performance goals as discussed in achievement goal orientation theory. For instance, superiority, a social relationship goal, is the need to succeed comparatively and avoid unfavorable comparisons and is conceptually similar to performance-approach and performance-avoidance goals (Ames, 1992; Blumenfeld, 1992; Dweck & Leggett, 1988). Mastery goals, which are described as task goals in the taxonomy, reflect the desire to meet standards, improve, and avoid mediocrity. The goals described in both of these theories have made the key distinction of socially comparative versus self-referential goals.

Ford also has considered values. Ford and Smith (2007) distinguished between two ways that the term values has been used in relation to goals in the motivation literature. Values can drive goal selection and the amount of effort that is put into each goal or they can represent the criteria that individuals use to evaluate their successes and failures (Ford, 1992, 1996; Ford & Smith, 2007). They stated that the former conceptualization of values is similar to subjective task value in expectancy-value theory which is synonymous with goals (Ford & Smith, 2007). Although there are clear associations between values and goals in both of these conceptualizations, Ford and Smith (2007) caution against use of the word values in Motivation Systems Theory because of these different interpretations of the term.

Because of these points of overlap between Ford and Nichols's (1991) Taxonomy of Human Goals and other research on goal orientations and values, Motivational Systems Theory informs a discussion of values and goals; however, Motivational Systems Theory is a distinct approach that has a unique theoretical basis. Some of these specific differences in theoretical perspective are the strong emphasis on social context and a discussion that addresses more general issues of psychological wellness and less emphasis on specifically academic goals and values. Researchers should examine further connections between these different approaches to achievement goals.

### *Interest*

The construct of interest has a long history in psychology and education, beginning with Herbart's (1806/1965a, 1841/1965b) view that education should foster unspecialized, multi-faceted interests

which, in turn, would facilitate learning. Dewey (1913) built on this view and emphasized interest and enjoyment as central motivational forces in education. In a seminal publication, Renninger, Hidi, and Krapp (1992) brought together authors from various fields who had conducted empirical studies involving interest. During the past 15 years, work on interest has continued to grow (see Hidi, 2001; Hidi & Harackiewicz, 2000; Hidi, Renninger, & Krapp, 2004; Renninger & Hidi, 2002). Schiefele (2009) provides a thorough review of the work on interest.

Schiefele (2009) defined interest in terms of relations between the individual and an activity or set of activities in a given area (see also Krapp, 2002). Renninger and Hidi (2002) stated that interest includes affective and cognitive components which are part of individuals' engagement in activities. The affective component consists primarily of feelings that are associated with engagement in an activity, while the cognitive components have to do with the perceived engagement and thoughts about the activity. Importantly, Renninger and Hidi (2002) and Mitchell (1993) stated that interest comes from the interactions of individuals with the activities and contexts they experience. That is, both personal and environmental factors can create or diminish interest.

One of the most important distinctions interest researchers make is between individual (or personal) and situational interest (see Hidi and Renninger (2006) and Schiefele (2009) for detailed discussion). Individual or personal interest is a relatively stable evaluative orientation towards certain domains; situational interest is an emotional state aroused by specific features of an activity or a task with physiological, subjective, goal, and behavioral components (Hidi, 2000; Renninger, 2000; Silvia, 2005, 2006). Hidi and Baird (1986) and Mitchell (1993) further distinguished between situational interest that first catches or initiates a person's interest in an activity (e.g., an entertaining or enjoyable activity), and subsequent interest that holds the person's interest, with the likely result that deeper individual interest may emerge. Hidi and Harackiewicz (2000) discussed how to foster situational interest in school settings, and how this potentially can be connected to the development of individual interest. They also caution, however, that it would be difficult for teachers to cater to each student's individual interests, and so suggest that increasing situational interest in different activities is a better approach to engaging students in classroom activities.

How might each of these types of interest relate to interest value? We suggest that interest value as defined in expectancy-value theory contains both situational and enduring aspects. Because the theory concerns the value of *tasks* interest value obviously can vary across different tasks and situations, in a manner similar to situational interest. However, Eccles and her colleagues also have discussed how high levels of interest value can produce long-term engagement with a set of activities, in a fashion analogous to individual interest. As mentioned above, within each of these theoretical perspectives these constructs are linked to a different constellation of other constructs.

Another distinction made by some researchers studying interest is between different kinds of valences or affects associated either with objects or with the person. Person-object theory describes two aspects or components of individual interest that are distinguishable (Schiefele, 1996a, 2001). These are feeling-related and value-related valences (Krapp, 2002, 2005). Feeling-related valences refer to the feelings that are associated with an object or an activity itself – feelings like involvement, stimulation, or flow. Value-related valences refer to the attribution of personal significance or importance to an object. In addition, both feeling-related and value-related valences are directly related to the object rather than to the relation of this object to other objects or events. For example, if students associate mathematics with high personal significance because mathematics can help them get prestigious jobs, then we would not speak of interest. Although feeling-related and value-related valences are highly correlated (Schiefele, 1996a), it is useful to differentiate between them because some individual interests are likely based primarily on feelings, while others' interests are more likely to be based on personal significance (see Eccles, 1984).

Most of the research on situational interest has focused on the characteristics of academic tasks that create interest (e.g., Hidi, 2001; Schraw & Lehman, 2001). Among others, the following text features have been found to arouse situational interest: personal relevance, novelty, vividness, and comprehensibility (Chen, Darst, & Pangrazi, 2001; Schraw, 1997; Schraw, Bruning, & Svoboda, 1995; Schraw & Lehman, 2001; Silvia, 2006; Wade, Buxton, & Kelly, 1999). Durik and Harackiewicz (2007) argue that that some novel facets, such as surprising cartoons during a class only draw situational interest for students with initial low interest. Students with initial high interest lost interest based

**Table 1**

Sample items from measures of achievement values, goal orientation, and interest.

Construct	Sample items
Achievement values <i>Authors and subscale title</i> Eccles et al. (1993)	
Interest value	How much do you like doing math? In general, I find working on math assignments (very boring, very interesting)
Attainment value	For me, being good at math is (not at all important, very important) Compared to most of your activities how important is it for you to be good in math?
Utility value	In general, how useful is what you learn in math? Compared to most of your other activities, how useful is what you learn in math?
Cost	How much does the amount of time you spend on math keep you from doing other things you would like to?
Pekrun (2002)	
Intrinsic value	Math is my favorite subject I think the subject mathematics is very important
Extrinsic value	I think I cannot achieve anything in life without mathematics I find I can make use of the material in math later in life
Value of outcome	It is very important to me to get good grades in math I find it annoying to get poor grades in math
Pintrich et al. (1993)	
Intrinsic value	I like what I am learning in this class I think that what I am learning in this class is useful for me to know
Greene and Miller (1996)	
Intrinsic valuing	Learning this material is enjoyable The concepts and principles taught in this course are interesting
Extrinsic valuing	Learning this material is important because of its future value Mastering the concepts and principles taught in this class is of value because they will help me in the future
Marsh et al. (2005)	
Domain-specific interest value	It is important for me to be a good mathematician
Class specific interest value	I enjoy working on mathematical problems How important is it for you to learn a lot in mathematics classes? How much do you look forward to mathematics class?
Harter (1990)	
Importance	Some teenagers think it is important to be intelligent BUT other teenagers do not think it is important to be intelligent Some teenagers do not think that doing well in school is really that important BUT other teenagers think that doing well in school is important
Hulleman et al. (2008)	
Utility value	The topics in this class are important for my career In general material from this class is not useful to me
Intrinsic value	Lectures in this class are entertaining I enjoy coming to lecture
Achievement goals <i>Authors and subscale title</i> Nicholls et al. (1990)	
Task orientation	I solve a problem by working hard Something I learn makes me want to find out more
Ego orientation	I know more than others I get more answers right than my friends
Work avoidance	I do not have to work hard It is easy to get the answers right
Midgley et al. (1998)	
Task goal orientation	I like school work that I will learn from, even if I make a lot of mistakes I do my school work because I am interested in it
Ability-approach goal orientation	I would feel really good if I were the only one who could answer the teachers' questions in class I want to do better than other students in my classes

**Table 1** (continued)

Construct	Sample items
Ability-avoid goal orientation	It is very important to me that I do not look stupid in my classes One of my main goals is to avoid looking like I cannot do my work
Greene and Miller (1996)	
Learning goal	I do the work assigned in this class because I like to understand the material I study I do the work assigned in this class because I want to learn new things
Performance goal	I do the work assigned in this class because I do not want others to think I am not smart I do the work assigned in this class because I want to look smart to my friends
Elliot and Murayama (2008)	
Mastery approach goals	My aim is to completely understand the material presented in this class I am striving to understand the content of this course as thoroughly as possible
Mastery avoidance goals	My goal is to avoid learning less than it is possible to learn My aim is to avoid learning less than I possibly could
Performance approach goals	My aim is to perform well relative to other students I am striving to do well compared to other students
Performance avoidance goals	I am striving to avoid performing worse than others My aim is to avoid doing worse than other students
Harackiewicz et al. (2008)	
Mastery goal orientation	Mastering the material in introductory psychology is important to me The most important thing for me in this course is to understand the content as thoroughly as possible
Performance-approach orientation	It is important for me to do well compared to others in this class I want to do better than other students in this class
Performance-avoidance orientation	I just want to avoid doing poorly in this class I just want to avoid getting a low grade in this class
Work avoidance orientation	I want to do as little work as possible in this class I do not want to work hard in this class
Interest	
Author and subscale title	
Alexander et al. (2004)	
General interest in special education	How often have volunteered for programs aimed at individuals with special needs? How often have you read material related to special education or working with individuals with special needs?
Professional interest in special education	How often have you attended professional conferences/seminars/workshops related to individuals with special needs? How often have you participated on a research team concerned with individuals with special needs?
Ainley et al. (2002)	
Individual interest	How much I know about it? How important it is to me? e.g. of a topic: animals and Pets
Topic interest	How interesting do you expect each title to be? e.g. of a topic: Star Trek/X-Files
Depth of interest	Students indicated how much they would like certain activities Probing deeply into things Trying to figure out the meaning of unusual statements
Harackiewicz et al. (2008)	
Initial interest	I have always been fascinated by psychology I am really excited about taking this class
Catch-1 interest	I think the lectures are interesting I look forward to coming to this class
Catch- 2 Interest	I like my instructor I enjoy coming to lecture
Hold interest	Psychology fascinates me I think what we are learning about psychology is important

(continued on next page)

**Table 1** (continued)

Construct	Sample items
Schiefele (2009)	
Affective valences	Being involved with the subject matter of my major affects my mood positively
Value-related valences	It is of great personal importance to me to be able to study this particular subject
Intrinsic valences	I chose my major primarily because of the interesting subject matter involved

on such catch facets. Since studies of interest have been primarily with concerned with text, situational interest is almost synonymous with text-based interest (Schiefele, 2009). Furthermore, the same stimuli (i.e. novelty and relevance) that evoke situational interest will also bring about text-based interest (Schiefele, 2009). As discussed in more detail later, empirical evidence has provided strong support for the relation between situational interest and text comprehension and recall (see reviews by Hidi, 2001; Schiefele, 1996a, 1999, 2009; Wade, 1992).

### Measuring achievement values, goal orientations, and interest

There are a variety of questionnaire measures of each construct available in the literature. We discuss frequently used measures developed by researchers whose work we feature in this article. We focus on measures that have clear factor structures, high internal consistency reliabilities, and meaningful relations to other constructs. Sample items for these measures are presented in Table 1. We also examine whether there is overlap in the measures both within and across constructs.

#### *Measuring achievement task values*

Eccles and her colleagues (Eccles & Wigfield, 1995; Eccles, Wigfield, Harold, & Blumenfeld, 1993; Eccles et al., 1983; Wigfield et al., 1997) developed and validated measures of the interest, importance, and utility aspects of task value defined in their model, along with measures of expectancies for success and self-concept of ability. The measures are domain specific such that they ask children to indicate how much they value different academic subjects and non-academic activities like sports. There are three items for each aspect of values. Eccles et al. (1993) and Wigfield et al. (1997) present the full set of items. Eccles et al. (1983) measured cost of math and English with items asking how much doing these activities takes away time for other activities; these items have not been used as frequently.

Pintrich, McKeachie, and his colleagues (Pintrich & De Groot, 1990; Pintrich, Smith, Garcia, & McKeachie, 1993) developed the Motivated Strategies for Learning Questionnaire (MSLQ) to measure students' motivational beliefs and use of self-regulated learning strategies. The measure is designed to be domain specific in that instructions ask students to think about a particular class as they answer the questions, and the instrument has been used with respondents ranging in age from late elementary school through college. One set of items in this measure assesses achievement values; Pintrich et al. labeled this subscale Intrinsic Value, but the nine items contains items measuring students' perceptions of interest, usefulness, and importance of the class (see Pintrich and De Groot (1990) for the full set of items). Researchers using the MSLQ generally have used the set of items measuring value all together, rather than having separate subscales for the components of value defined by Eccles and colleagues. Greene, Miller, and their colleagues (Greene & Miller, 1996; Miller, Behrens, Greene, & Newman, 1993; Miller, DeBacker, & Greene, 1999) developed scales to measure intrinsic and extrinsic value, as part of their Approaches to Learning Survey that they have used primarily in studies with college students; Miller et al. (1999) present the full set of items for the value and goal orientation subscales of this measure. Their measures of intrinsic and extrinsic values scales include three items for each construct. These researchers also include in this measure a subscale measuring the perceived instrumentality of learning; items on this subscale assess how important learning the material in the class is for attaining future goals and for being the person they want to become, so the items appear to assess both goals and values (see Miller and Brickman (2004) and Wigfield and Cambria (in press) for discussion of relations of task value to perceived instrumentality).

Graham and Taylor (e.g., Graham & Taylor, 2002; Graham, Taylor, & Hudley, 1998; Taylor & Graham, 2007) devised an innovative measure of task value that asks students to nominate other students whom they most admire, like, and want to be like as a way to get at students' achievement values indirectly. They also ask their participants to say who in their class tries hard and gets good grades, who does not try and gets poor grades, and who follows or does not follow school rules. Graham and Taylor posited that students' answers to these questions give a sense of what kinds of achievement-related behaviors they admire. These items correlate with a more traditional task value measure developed by Scott (1965), which Taylor and Graham (2007) say gives their measure construct validity.

Marsh et al. (2005) measured what they called students' class-specific and domain-specific interest in math, drawing on both expectancy value theory and interest theory in developing the measures. The items on these scale also assessed how much they looked forward to math, how important math is to them, and the importance of being a good mathematician, along with enjoyment of math. Harter's (1986) measure of importance (one of the task value components in the Eccles et al. model) asked children and adolescents to indicate how important each of the domains in her self-perception profile were to them; there were two items per domain. Finally, Hulleman et al. (2008) measured perceived value of a college class. Their three item utility value scale assessed relevance, importance, and usefulness of the material. Intrinsic value was measured by three items assessing perceptions that the lectures were enjoyable and entertaining.

#### *Measuring achievement goal orientations*

Nicholls, Patashnick, and Nolen (1985) developed one of the first measures of achievement goal orientations. He and his colleagues (Nicholls, Cobb, Wood et al., 1990; Nicholls, Cobb, Yackel et al., 1990) and Nolen (1988) used this measure in a number of studies of children and adolescents' goals and motivation. The questionnaire includes items assessing task orientation (measured as both effort and understanding and collaboration), ego orientation, and work avoidance. Correlations between the goal orientations vary some across different studies. In Nicholls and colleagues' (1990) studies, task and ego orientation relate negatively, as do task orientation and ego orientation, and ego orientation and work avoidance relate positively. In Nicholls et al. (1985) correlations are similar, except that task and ego orientation relate positively. Nolen (1988) reports small positive correlations of task and ego orientation scales. The two aspects of task orientation often are combined in Nicholls' work.

One of the most widely-used measures of students' goal orientations in the literature is contained in the Patterns of Adapted Learning Scale (PALS) developed by a team of researchers at the University of Michigan to assess students' motivation and perceptions of classroom goal structure, among other things. Midgley et al. (1998) report on the development and validation of the goal orientation measure scales in this instrument. They developed subscales measuring task goal orientation, ability-approach orientation, and ability-avoid orientation; there are six items in each subscale. This measure was one of the first to incorporate the approach-avoidance distinction into a measure. They report no correlation between task and ability-approach or ability avoids goals. Ability approach and avoid goals correlate at .56.

In their Approaches to Student Learning Questionnaire, Greene, Miller and colleagues (Greene & Miller, 1996; Miller et al., 1993, 1999) include a three item learning goals scale, and a five item performance goal scale. The performance goals scale includes both approach and avoidance goals in the same subscale.

Harackiewicz et al. (2008) assessed mastery goals (seven items), performance-approach and avoidance goals (four and two items, respectively), and work avoidance goals (two items), basing their measures on earlier scales Harackiewicz and her colleagues developed, and also the PALS. Mastery goals correlated negatively with performance-avoid and work avoidant goals; the two performance goal subscales and work avoidance correlated positively.

Elliot and McGregor (2001) developed a questionnaire called the Achievement Goal Questionnaire to assess mastery and performance approach and avoidance goals, and Elliot and Murayama (2008) presented a revised version of the measure. The 2008 article presents a thoughtful analysis of different goal measures and argued that questionnaires assessing goals should be careful to assess goals clearly and not to confound the measurement of goals by having other constructs included in the items. They

defined achievement goals as aims focused on competence (with performance and mastery aspects of competence being the primary types of competence), and further defined the valence of competence with respect to the individual's approach or avoidance tendencies. Their scale contains three items measuring each of the four goals, and the items use the phrases "My aim is", "I am striving to", and "My goal is" to frame each item as assessing goals. Elliot and Murayama also stated that goal measures should keep the goal or aim separate from the reason for the goal, have normative comparisons included in both approach and avoidance performance goals given the definition of performance goals, and not include affective reactions as part of items assessing goals. Mastery-approach and avoid goals correlated .51, performance-approach and avoid goals correlated .68, mastery approach correlated .16 and .13 with performance-approach and avoid goals, respectively, and mastery-avoid goals correlated .15 and .46 with performance-approach and avoid goals, respectively.

### *Measuring interest*

Alexander and her colleagues assessed individual interest along with strategic processing and relevant knowledge in studies of the Model of Domain Learning (Alexander, Kulikowich, & Jetton, 1994; Smith & Reio, 2006). Alexander, Sperl, Buehl, Fives, and Chiu (2004) created a 13 item interest measure that they used in a study of special education faculty members' interest in this topic. They found evidence for two kinds of interest, general interest in special education and interest in specific special education research profession (i.e. publishing and attending conferences).

Ainley, Hidi, and Berndorff (2002) assessed 8th and 9th grade students' individual, topic interest (which is proposed to be related to both situational and individual interest in this study), The individual interest assessment was constructed to reflect Renninger's (1992) definition that interest is comprised of knowledge and value for the domain. Two items were used to measure knowledge and importance in different domains. Topic interest was measured using students' ratings of how interesting four books were expected to be. Ainley et al. (2002) also used the depth-of-interest subscale of the Two-Factor Curiosity scale developed by Ainley (1986) to measure students' desire to understand, investigate, and evaluate puzzling or challenging books. Harackiewicz et al. (2008) also measured interest in the psychology course in which their study took place. They measured initial interest in the course (seven items), and both "catch" (measured twice with four and five items, respectively) and "hold" aspects of interest (nine items), following the distinctions noted earlier Initial interest correlated significantly but relatively weakly with both catch and hold interest. The two measures of catch interest correlated .62, and catch 1 and 2 interest correlated significantly with hold interest (.42 and .60).

Schiefele (2009) described the development of the 18 item Study Interest Questionnaire (SIQ) and how this measure is used to assess vocational and academic interests of college students. Affective, value, and intrinsic valence aspects of interest are measured in this scale. The affective valence consisted of items that evaluate how doing work for the major makes the participant feel, the value portion assessed beliefs about the importance of doing work for their major, and the intrinsic valence was concerned with the inherent enjoyment of doing work for the major. This measure was designed to be highly internally consistent and therefore these valences are conceptually distinct, but do not form separate factors. These assessments show the variety of topics and instruments that can be utilized to measure student interest. Although the majority of studies measure individual interest, there are also important measures that include situational interest (Ainley et al., 2002; Guthrie et al., 2006). Further empirical work on interest might consider measuring changes in the dimensions of interest (Schiefele, 2009) as individuals progress through the phases of interest (Hidi & Renninger, 2006).

In sum, there are a variety of well-validated measures of the values, goal orientation, and interest constructs in the literature, and so we suggest that researchers should strongly consider using these when studying these constructs, rather than continuing to develop new measures. However, there are some issues that need to be considered when using these measures. First, the scales measuring each construct have some overlap but each measures different aspects of the construct, as perusal of Table 1 indicates. This seems particularly the case for the task or mastery goals scales, which focus on a number of different possible aspects of mastery or improvement. Elliot and Murayama (2008) focus directly on aims and mastery in their mastery goals subscales, so in some respects are the clearest of these measures with respect to adherence to specific definitions of mastery goals.

Second, some of the measures seem to include constructs other than the specific construct they purport to measure, or the wording of the items deals with other issues. For instance, the MSLQ's value scale has items asking about learning from mistakes and choosing topics that require more work; these items may reflect the constructs of mastery goals and effort more than values per se. Marsh et al.'s (2005) measure of interest includes importance and Nicholls et al.'s (1985) task orientation scales have several items about working hard along with items asking about mastering material; it thus appears to measure effort along with mastery orientation. Midgley et al.'s (1998) PALS task orientation scale items ask about learning new things and wanting to improve, but also include items about enjoying the work and uses the words "like" or "enjoy" and "importance" in nearly every item, which means it overlaps with achievement values. In contrast, Elliot and Murayama (2008) worked to ensure that their measures of mastery and performance goal orientation measures focused very specifically on those constructs. With respect to interest, Harackiewicz et al.'s (2008) measure of catch interest contains an item that reads "I like my instructor." Students may like an instructor regardless of their interest in the topic.

Another major issue is overlap in measures that are said to measure different constructs. This issue is especially important when researchers are measuring the constructs together and (potentially) examining how each relates to outcome. The clearest example of this is in measures of interest and interest value, both of which ask individuals how much they like or enjoy doing different activities. Measures of personal or individual and situational interest also differ in their wording. Personal interest is conceptualized as having knowledge and value for the topic and therefore is often operationalized using words concerned with having a history of enjoyment or importance for a topic (Ainley et al., 2002; Mitchell, 1993) while situational interest measurements are more specific to a task (Mitchell, 1993). One potential issue is that measures of personal and situational interest both have used the word "enjoyment" (Harackiewicz et al., 2008; Mitchell, 1993) and common wording may lead to potential problems in discriminating between personal and situational interest. In these cases, researchers have tended to use personal interest as a broader interest in a subject while situational interest is more task specific (Ainley et al., 2002; Durik and Harackiewicz, 2007; Harackiewicz et al., 2008; Mitchell, 1993). However, it is important to note that in Harackiewicz and her colleagues' work the items designed to measure these different components of interest do form distinct factors.

As noted earlier, in the Task Goal Orientation scale on the PALS five of the six items have the word "like", "interest", or "enjoy" included in the item; e.g., "An important reason I do my school work is because I enjoy it". Thus these items seem to tap some combination of goal orientation, interest value, and interest. This overlap is less apparent in the Performance goal scales in this measure.

One way to deal with these issues, especially the overlap issue, would be to give several of these measures in one study, and use factor analysis and other methods to examine their empirical distinctiveness. Such a study would lead to a clearer understanding of the overlap in the measures of these constructs, and perhaps help lead to the development of measures that do not confound constructs. More broadly, for the field to move ahead it is essential for researchers to match carefully the definition of the construct they are assessing with the measure of it they choose to use (see also Elliot and Murayama (2008), Hidi and Harackiewicz (2000), and Murphy and Alexander (2000) for further discussion of this issue). We return to this issue in the final section.

## **Development of values, goals, and interest**

In this section we discuss how each of these constructs changes over time. A special focus of the section is on negative trajectories in children's values, goals, and interest, due to apathy and work avoidance.

### *Development of achievement task values*

Eccles, Wigfield, and their colleagues examined age-related changes in both the structure and mean levels of children's valuing of different activities. In Eccles et al. (1993) and Eccles and Wigfield (1995), children's competence-expectancy beliefs and subjective values *within* the domains of math, reading,

and sports formed distinct factors at all grade levels from first through twelfth. Thus, even during the very early elementary grades children appear to have distinct beliefs about what they are *good* at and what they *value*. The distinction between various sub-components of subjective task value appears to differentiate more gradually (Eccles & Wigfield, 1995; Eccles et al., 1993). Eccles, Wigfield, and colleagues' factor analytic work with the scales showed that children in early elementary school differentiate task value into two components: interest and utility/importance. In contrast, children in grades 5 through 12 differentiate task value into the three major subcomponents (attainment value/personal importance, interest, and utility value) outlined by Eccles et al. (1983). These results suggest that the interest component differentiates out first, followed later by the distinction between utility and attainment value.

Studies generally show age-related decline in children's valuing of certain academic tasks as well as their valuing of achievement and effort (e.g. see Eccles et al. (1998), Pekrun (1993), and Wigfield and Eccles (2002) for review). Jacobs, Lanza, Osgood, Eccles, and Wigfield (2002) found that children's valuing of the domains of math, language arts, and sports declined over the school years, with the downward trajectories varying some across different subject areas. Similar findings were reported by Fredricks and Eccles (2002) and Watt (2004). Children whose valuing of different academic activities declines sharply over the school years may become apathetic about learning; we return to this point below. One major explanation of these changes is that the increasing emphasis on evaluation leads children to de-value activities at which they do not do well. Evaluative pressure also can lessen the intrinsic value students have for learning (see Wigfield et al. (1998) for more detailed discussion).

#### *Development of children's goal orientations*

There still is not a large body of research on the development of children's goal orientations, although some work suggests that during elementary school children are more mastery-oriented, and as they go through school they become more performance-oriented (see Anderman et al. (2002) for review of extant work). Broadly, researchers have discussed two kinds of factors that can impact the development of goal orientations (see Elliot, 2005; Linnenbrink & Fredricks, 2007; Maehr & Zusho, 2009). One factor is a personal factor, specifically, beliefs about intelligence and ability; and the other is contextual: how different kinds of instructional contexts and activities can impact children's goal orientations in school. Two researchers were the pioneers in thinking about relations of ability-related beliefs and goals. Nicholls (1979, 1984) studied children's beliefs about ability and found (through interviews) that in the early school years children essentially equate ability and effort and believe that smarter children are those who try harder. Older children differentiate ability and effort, and many children come to believe that those children who have to try harder to do well are less smart (see Nicholls (1990) for discussion of the implications of these findings). As noted above, Nicholls also defined and developed measures for ego and task involved goal orientations. He stated that ego involvement should have stronger influences on children's achievement behaviors as they develop the more differentiated notion of ability (Nicholls, 1990). Interestingly, however, Nicholls (1990) found that that even among second graders task and ego goal factors could be identified through factor analyses of children's responses to the scales, suggesting that young children do distinguish these two kinds of goals. Further, they found that the level of one's perceived ability did not correlate with ego or task orientations; this finding implies that at different levels of perceived ability task, ego, or both goal orientations can be in play.

As mentioned earlier, Dweck and her colleagues (Dweck & Leggett, 1988) distinguished two main views of ability or intelligence, entity and incremental views (see Dweck and Master (2009) for review). Children holding an entity view believe that their ability is fixed, and children holding an incremental view think that they can improve their ability through their efforts. Thus children with incremental views of ability are more likely to have mastery goals, and children with entity beliefs performance goals. Further, Dweck and her colleagues looked at relations of children's beliefs about ability and their goal orientations, and found that performance goal oriented children only show mastery behavior when their perceived ability is high. By contrast, mastery-oriented children engage in mastery behavior irrespective of their perceived ability (Burhans & Dweck, 1995; Smiley & Dweck, 1994).

Maehr, Midgley, and their colleagues conducted a number of studies looking at how classroom instructional practices relate to children's goal orientations and how these relations may change over time. Anderman and Anderman (1999) reported that adolescents endorse performance goals more than mastery goals. A major reason for this is that schools increasingly emphasize performance goals as children get older. One clear example of this is how evaluations of different kinds proliferate, and have stronger consequences for adolescents' futures. Midgley and her colleagues' work (see Midgley, 2002) has shown two major things with respect to this point: (1) elementary school teachers focus on mastery-oriented goals to a greater extent than do middle school teachers and (2) middle school students perceive school as more performance-oriented than do elementary school students. Thus any observed changes in children's goal orientations seem very bound up in changes in the school goal culture.

Goal orientations often are studied at a relatively general level, but some researchers have looked at goal orientations towards particular school activities (e.g., Meece & Miller, 2001; Pintrich, Ryan, & Patrick, 1998; Wolters, Yu, & Pintrich, 1996). For instance, Meece and Miller (2001) studied the development during elementary of students' goal orientations in reading and writing, looking at performance goals, mastery goals, and work avoidant goals. The found that children's goal orientation were reasonably stable over a 1-year period; the lagged correlations were .44 for task mastery goals, .58 for performance goals, and .45 for work-avoidance goals. With respect to change over time, following prediction children's mastery goals decreased over time. Contrary to prediction, performance goals did as well. The pattern of change in work avoidant goals was less consistent.

As noted above both Pintrich (2000b) and Elliot and his colleagues (Elliot & McGregor, 2001; Elliot & Murayama, 2008) distinguished between mastery approach and avoid goals along with the well-established distinction between performance approach and avoid goals. Bong (2009) found that distinct factors for these four aspects of goal orientation could be identified as early as third grade; however, for the younger children the correlations of the two performance goal orientations were quite high indicating that they are not as distinct as they are for older children and adolescents.

### *Development of interest*

Eccles et al. (1998) summarized work on the early development of children's interests, which shows that children have general or universal interests at first, which become more specific relatively quickly (see also Todt, 1990). Todt (1990) argued that this early differentiation eventually leads to individual differences in interests in the social versus the natural sciences. Schiefele (2009) explained that differentiation is an evaluation of their perceived strengths and weaknesses by engaging in social comparison. He further notes that students are likely to become more interested in domains in which they have a higher self-concept of ability than others (cf. Denissen, Zarrett, & Eccles, 2007; Köller, Schnabel, & Baumert, 1998; Rottinghaus, Larson, & Borgen, 2003; Todt, 1990; Todt & Schreiber, 1998).

The next phase of interest development – between 3 and 8 years of age – is characterized by the formation of gender-specific interests. According to Kohlberg (1966), the acquisition of gender identity leads to gender-specific behaviors, attitudes, and interests. Children strive to behave consistently with their gender identity, and, thus, evaluate activities or objects consistent with their gender identity more positively than other activities or objects. As a consequence, boys and girls develop gender role stereotyped interests (see Eccles, 1987; Ruble & Martin, 1998). At the next stage (ages 9–13) the emerging self-concept is assumed to be linked more directly to social group affiliation and cognitive ability, leading to occupational interests consistent with one's social class and ability self-concepts (see Cook & Church, 1996).

The final stage (occurring after age 13 or 14) is characterized by an orientation to the internal, unique self leading to more differentiated and individualized vocational interests, based on abstract concepts of self (e.g., of personality). Thus, the development of vocational interests is a process of continuous elimination of interests that do not fit the self-concepts of one's gender, social group affiliation, ability, and then personal identity (Todt, 1990). This process is assumed to depend mainly on the general cognitive development of the child or adolescent.

Hidi and Renninger (2006) proposed a four-phase model of interest development. This model is not tied to particular ages or activities, but instead describes how situational and individual interest can

relate and how situational interest may lead to individual interest. The first phase is triggered situational interest, which is sparked by a particular task, activity, or situation. One example is teachers who provide students with engaging lessons. The second phase of interest development is maintained situational interest, which involves continuing to experience engaging experiences with a task or tasks. This kind of interest is supported primarily by instructional conditions; thus it continues to be externally supported. The third phase, “emerging individual interest” occurs when the person begins to generate the interest and seeks to continue to do an activity or set of activities. This phase is characterized by growing knowledge about the activity, positive feelings for it, and positive valuing of it. Hidi and Renninger (2006) stated that this kind of interest tends to be self-generated, and can impact the kinds of goals students have. Finally, the fourth phase is well-developed individual interest. In this phase there are even stronger links between the task, affect, values, goals, and beliefs. The individual is most likely to generate the interest, but the environment can continue to support the person’s interest. Hidi and Renninger (2006) discuss that the development of goals parallel with that of interest. In the early development of interest, individuals have superficial goals to finish a task quickly and as interest develops, goals also become more elaborate.

When individuals have well-developed interests they seek to engage in the activity frequently, feel self-efficacious about it, value their engagement with the activity, and can regulate their engagement in effective ways. Hidi and Renninger state; “the student values the opportunity to reengage tasks for which he or she has a well-developed individual interest and will opt to pursue these if given a choice (p. 115).” Thus in this model individuals’ interest (particularly individual interests) drives their valuing of different activities and the goals they set for the activities.

Although Hidi and Renninger (2006) described this model as developmental, they stated that individual interests do not always develop after a situational interest is triggered or even maintained. Thus the model should not be viewed as providing a strong or automatic developmental progression. Despite this caveat, researchers have assessed factors that generate situational interest, and are beginning to understand processes involved in moving from situated to individual interest. For instance, Mitchell (1993) found that a variety of instructional factors generated situational interest in math, but students’ personal involvement with the tasks and their meaningfulness were necessary to maintain their interest (and thus generate individual interest in math). Guthrie et al. (2006) depicted the progression from situational to individual interest in third grade readers. They studied two groups of children in different classrooms. One group experienced a high number of activities designed to foster situational interest, and the second group received a significantly lower number of these tasks. Regression analyses indicated that students experiencing more stimulating tasks had higher reading comprehension and higher reading motivation than did the group experiencing fewer tasks. Further, the effects of the stimulating task on reading comprehension were mediated by students’ motivation.

Tsai, Kunter, Lüdtke, Trautwein, and Ryan (2008) examined predictors of 7th grade German students interest in different lessons in math, German, and foreign language. They looked at both situational factors (conceptualized and measured as students’ perceptions of teachers’ autonomy support, use of controlling behaviors, and support for students’ cognitions) and individual factors including students’ overall interest in the subject, gender, and grade in the class. Using HLM they found that there was significant within and between student variance in students’ interest in the lessons in the different subjects. Both situated and individual variables predicted students’ experience of interest in different lessons, with individual interest as an especially strong predictor. They also found some evidence that individual interest moderated the relationship of some of the situated variables with experienced interest. Students with higher individual interest were less affected by teachers’ controlling behaviors or by their autonomy support. These studies provide important support for Hidi and Renninger’s (2006) view that situated interest can translate to longer term interest and motivation, and have a positive impact on cognitive variables such as reading comprehension, and also that instructional conditions can have a strong impact on both situational and individual interest.

There also has been research on how children’s interest in different school activities changes over time. Consistent with studies of American children’s achievement values and interest (e.g., Eccles et al., 1993; Gottfried, Fleming, & Gottfried, 2001; Harter, 1981; Wigfield, Eccles, Mac Iver, Reuman, & Midgley, 1991), several European researchers have found that that interest in different subject areas school decline across the school years. This is especially true for the natural sciences and mathematics

(e.g., Hedelin & Sjöberg, 1989) and particularly during the early adolescent years. Further, Schiefele (2009) noted that the decrease in interest in school coincides with decreased attitudes toward school, task-value beliefs, and intrinsic motivation. However, this decreased interest in school subjects varies based on topic, instruction style, and gender. Pekrun (1993) found that intrinsic motivation stabilized after eighth grade, and Gottfried et al. (2001) reported surprisingly high stability coefficients for intrinsic motivation measured across a 1-year period for children ages 13 and above.

The decline in school-based interests may be due to the development of specific interest in other areas or instruction that is not specific to student interest and experiences. Baumert (1995) argued that the decline in school-related interests during adolescence reflects a more general developmental process in which the adolescents discover new fields of experience that lead to new interests and reduce the dominant influence of school (cf., Eder, 1992). A good example is the increasing interest in gender-typed academic domains during adolescence (McHale, Kim, Whiteman, & Crouter, 2004). McHale et al. (2004) investigated interest development from ages 10 to 12. They found that time spent with members of their own gender at age 10 was correlated with gender-typed interest in language arts for females and math for males at age 12.

In contrast, other researchers have suggested that changes in a number of instructional variables like clarity of presentation, monitoring of what happens in the classroom, supportive behavior, cognitively stimulating experiences, self-concept of the teacher (educator vs. scientist), and achievement pressure may contribute to declining interest in school mathematics and science (e.g., Eccles & Midgley, 1989). Schiefele (2009) highlighted the importance of bringing relevance of the natural sciences to students' experiences as this may heighten individual interest. For example, a study by Hoffmann, Lehrke, and Todt (1985) indicated that students have low interest in physics when there is an instructional emphasis on scientific laws and strong interest when it is related to their lives.

#### *Negative developmental trajectories in achievement values, goal orientations, and interest: student apathy and work avoidance*

As just discussed, there is a general pattern of decline in children's valuing of and interest in different academic activities across the school years. These declines can be particularly profound for some children. One possible outcome of such declines is students becoming apathetic about learning; apathy indicates a serious devaluing of school and lack of interest in it. A negative developmental trajectory with respect to children's goal orientation is the development of a work avoidant orientation (Nicholls et al., 1990). Apathy and work avoidance imply disengagement from school and poor achievement.

#### *Student apathy*

Children who are apathetic about learning or participating in other activities do not find much worthwhile or interesting to do in school or in other situations, and may even be so alienated from these activities that they actively resist attempts to get them involved. Brophy (2004) contended that apathy is the most serious motivational problem that teachers must contend with in their students, more serious than learned helplessness or anxiety. The apathy construct has some overlap with the construct of amotivation in self-determination theory, and is defined as a lack of motivation for learning or other activities (Vallerand et al., 1993).

There has not been a lot of research on the development of apathy, but different researchers have discussed possible reasons for it. These range from broad social and cultural explanations to more psychologically oriented ones. Ogbu's (1992, 2003) discussion of why some minority children do well in school and others do not is an example of a broad cultural approach to this issue. Children who believe their ethnic or racial group is excluded from meaningful participation in the economic structure of this country may find little reason to engage in the school activities said to be needed to obtain good occupations. Ogbu has argued that such children often become oppositional to participation in school activities, resisting attempts of teachers to engage them in learning activities.

A psychological perspective on apathy can be drawn from Markus and Nurius's (1986) work on possible selves. Markus and Nurius argued that possible selves provide an important motivational force for engagement in different activities such as school or sport activities. If children do not see

much of a future for themselves in these or other domains they likely will not see much reason to be involved in school or other activities designed to prepare them for the future, and so may be very apathetic about becoming involved in such activities.

The interplay of competence beliefs and values may play a crucial role in the development of apathy. Children doing poorly at school may begin to devalue school achievement, as a way to protect their self-esteem (see Covington, 1992). This devaluing could lead to apathy, again as a self-protective mechanism. Engaging in learning has risks, particularly for students not doing well, and one way to protect against those risks is to be apathetic about learning.

Finally, there likely are different developmental trajectories for the development of apathy. We noted two major possibilities to this point, children who perceive few opportunities for themselves or for their group and so come to devalue school, or children who do poorly in school almost from the start and so begin to devalue it as a way to protect their self-esteem. Another trajectory may occur for students doing well in school during the early school years and who come from backgrounds and cultural groups who generally have succeeded in our society, but who decide (for a variety of reasons) to no longer engage in school. These children may become alienated from school and therefore apathetic about participating in school activities (National Research Council, 2004). To date there is little developmental work on any of these trajectories, and that should be undertaken.

#### *Work avoidance*

As noted earlier, Nicholls and his colleagues (Nicholls, 1990; Nicholls et al., 1985; Nicholls, Cobb, Wood et al., 1990; Nicholls, Cobb, Yackel et al., 1990) identified work avoidance as one possible goal orientation, and they and other researchers have examined relations of work avoidant goal orientation to other variables. As noted above Nicholls and his colleagues' work shows that work avoidance is positively associated with ego orientation and negatively with task orientation. Children's work avoidance also related negatively to different kinds of knowledge about math. This work was foundational for understanding how work avoidance related to task and ego orientation and offered evidence on how this goal related to knowledge beliefs.

Other studies have shown that work avoidance relates positively to surface level strategy use and negatively to deep level processing, in both elementary and middle school students (Meece & Miller, 2001; Nolen, 1988). Nolen also found that work avoidance relates negatively to the value students attach to deep level processing. Further, both Baker and Wigfield (1999) and Wigfield and Guthrie (1997) found that elementary and middle school students' reading work avoidance related negatively to their valuing of and self-efficacy for reading, amount of reading they did, and achievement in reading. Baker and Wigfield (1999) also used *K*-means cluster analysis and found seven clusters, with two clusters scoring above the mean on reading work avoidance. The first of these two clusters was high on reading work avoidance and low on other motivation clusters. The second cluster was high on reading work avoidance and high on competition which suggests a profile of students who focus on demonstrating they are better than others in reading (performance orientation) but also prefer not to do work in reading. In their work with college students Harackiewicz et al. (2008) found that work avoidance is predicted negatively by mastery goals, and also is negative predictor of initial interest in a college course.

The work just reviewed shows how apathy and work avoidance relate in mostly negative ways to positive forms of motivation, strategy use and self-regulation, and achievement. Thus children who have the strong goal to avoid work and/or become apathetic about their schooling likely will not fare very well in school. We describe apathy and avoidance as undermining, in the sense that they reduce student engagement in learning. An interesting question for future research is how distinct these constructs are from values, interest, and goals, in terms of their psychological characteristics and influences on outcomes. The apathy construct will be used to illustrate this point. We noted above that apathy may be the outcome of students' devaluing of school. Children who do not value school ultimately may become apathetic about it; the question remaining is whether apathy is qualitatively different in some ways from low valuing of achievement. Is a student who does not value math (as indicated by a low score on a task values scale) apathetic about math, or does apathy imply a deeper and more entrenched negative reaction to mathematics that is not fully captured by current measures? Future research should address this issue.

## Relations of values, goals, and interest to achievement outcomes

### *Task values and outcomes*

There is clear evidence from a variety of studies in different domains such as math, science, reading, and sports that individuals' expectancies for success and achievement values predict their achievement outcomes, including their intentions, performance, persistence, and choices of which activities to do (e.g., Bong, 2001; Cole, Bergin, & Whittaker, 2008; DeBacker & Nelson, 1999; Denissen et al., 2007; Durik, Vida, & Eccles, 2006; Eccles, 1993; Eccles et al., 1983; Marsh et al., 2005; Meece et al., 1990; Pekrun, 1993, 2009; Simpkins, Davis-Kean, & Eccles, 2006; Xiang, McBride, & Bruene, 2004). Students' expectancies for success and beliefs about ability are among the strongest psychological predictors of performance. Students' subjective task values predict both intentions and actual decisions to persist at different activities, such as taking mathematics and English courses and engaging in sports activities. Thus individuals' valuing of activities appears to be especially important for their choices about whether to continue the activities, although some studies have found that values (especially utility values) predict performance (Cole et al., 2008; Hulleman et al., 2008).

The relations are evident in children as young as first grade, although they strengthen across age (Eccles, 1984; Eccles & Harold, 1991; Eccles et al., 1983; Meece et al., 1990; Wigfield, 1997). These relations have been shown to be reciprocal, as the Marsh et al. (2005) study discussed above documents (see also Pekrun, 2009). Children's achievement values have long term consequences; Durik et al. (2006) reported that the importance children gave to reading in fourth grade related significantly to the number of English classes they took in high school. Also, children's interest in reading measured in fourth grade indirectly predicted (through interest measured in 10th grade) high school leisure time reading, career aspirations, and course selections. In another longitudinal study looking at relations of performance, ability beliefs and values, and choice, Simpkins et al. (2006) found that children's participation in math and science activities in late elementary school related to their subsequent expectancies and values in these areas, which in turn predicted the number of math and science courses they took through high school.

Battle and Wigfield (2003), in one of the few studies to include the cost component of achievement values, found that attainment and utility value were positive predictors of college students' intentions to enter graduate school, but the perceived psychological cost of graduate school attendance was a negative predictor. Thus, when students value something they also report they are more likely to engage in the activity. When the activity is seen as having too great a cost, they will be less likely to engage in it.

### *Goal orientations and outcomes*

There is a growing body of research documenting the consequences of adopting one or the other of these goal orientations. Researchers have used a variety of methodologies in this work, including classroom observations (Ames & Archer, 1988), interviews (Dowson & McInerney, 2003), and questionnaire-based studies. Experimental manipulations of students' goal orientations also have been done, by introducing achievement tasks in a way that fosters either mastery or performance goals (e.g., Graham & Golan, 1991). The results concerning mastery-orientation are quite consistent and positive (see Anderman et al. (2002), Maehr and Zusho (2009), Pintrich (2000a, 2000c), and Urdan (1997) for review) When children are mastery-oriented they are more highly engaged in learning, use deeper cognitive strategies, and are intrinsically motivated to learn. Elliot and McGregor (2001) found that mastery-avoidance goals are associated with subsequent test anxiety and predicted mastery-approach goals, and performance-approach goals. Based on this and other work researchers have proposed that schools should work to foster mastery goal orientations (particularly mastery-approach) rather than performance goal orientations, and school reform efforts to do just that have been undertaken (e.g., Maehr & Midgley, 1996).

As noted above the research on performance goals is somewhat less consistent, in part because of the methodological confounding of performance-avoidance and approach goals. When these two

aspects of performance goals are unconfounded, researchers find that performance-avoid goals have negative relations with other aspects of students motivation and performance (e.g., Elliot & Harackiewicz, 1996; Elliot & McGregor, 2001; Elliot & Murayama, 2008; Harackiewicz et al., 2008; Middleton & Midgley, 1997; Skaalvik, 1997). Performance-approach goals relate positively to academic self-concept, task value, and performance (at least in college students), but not to intrinsic motivation to learn (Elliot & McGregor, 2001; Elliot & Murayama, 2008; Harackiewicz et al., 2008; Hulleman et al., 2008). Harackiewicz et al.'s (2008) study showed that performance-approach goals predicted both semester GPA and overall college GPA positively, and performance-avoid and work avoidance predicted overall college GPA negatively. This study thus provides important information about how the effects of goal orientations on grades persist over time.

### *Interest and outcomes*

Much of the research on individual interest has focused on its relation to the quality of learning (see Alexander et al., 1994; Denissen et al., 2007; Hidi, 2001; Renninger, Ewen, & Lasher, 2002; Schiefele, 1996a, 1996b, 1999, 2009). Hidi and Renninger (2006) discussed how interest influences individuals' attention, the kinds of goals they have, and their levels of learning. In general, there are significant but moderate relations between interest and text learning. More importantly, interest is more strongly related to indicators of deep-level learning (e.g., recall of main ideas, coherence of recall, responding to deeper comprehension questions, and representation of meaning) than to surface-level learning (e.g., responding to simple questions, verbatim representation of text; Schiefele, 1996b, 1999; Schiefele & Krapp, 1996). Findings by Ainley et al. (2002) and Hidi (2001) suggest that attentional processes, affect, and persistence mediate the effects of interest on text learning.

There is also ample evidence that subject matter interest is positively related to school achievement (cf. Schiefele, Krapp, & Winteler, 1992). Recent studies suggest that interest particularly predicts achievement when there is a context that allows for choice. Specifically, Köller, Baumert, and Schnabel (2001) found that interest in mathematics predicts achievement only at higher grade levels when students have a choice between more or less advanced courses. The "effect" of interest on achievement was partly mediated by choice of course level. However, there was also a direct path from interest to achievement even when controlling for prior achievement.

Harackiewicz et al.'s (2008) study of college students' goals, interest, and performance discussed above provides important information about these relations over time. They found that students' initial situational interest in the course (measured before students completed any assignments in the course) predicted their final course grade, and the number of psychology courses taken in college and whether they chose psychology as a major (although these effects were partially mediated by "hold" interest). "Hold" interest itself was a direct predictor of both number of psychology courses taken and choice of psychology as a major. There also were intriguing reciprocal relations of "interest and exam performance showing that students' performance on the first exam predicted subsequent interest (measured later in the semester).

### **Empirical relations of achievement values, goal orientations, and interest**

Researchers have examined relations among different groups of these constructs (see also Anderman & Wolters, 2006). We organize our review of this work in terms of the age groups included in the different studies, as well as chronologically with respect to when the work was done.

#### *Studies of children and adolescents*

Several researchers examined relations of children and adolescents' task values, achievement goals, self-efficacy beliefs, and self-regulation, with the different studies measuring some or all of these constructs. One set of studies (Pintrich & De Groot, 1990; Pintrich et al., 1993, 1998; Wolters et al., 1996) used the Motivated Strategies for Learning Questionnaire and PALS to measure the different constructs in the different groups. Another set of studies (Anderman et al., 2001; DeBacker & Nelson, 1999;

Wigfield, Anderman, & Eccles, 2000; Xiang et al., 2004) used either the Eccles and Wigfield measures of task values or the measure developed by Miller et al. (1999), and a variety of different goals measures, including the Nicholls et al. (1985) scales and scales developed by Greene and Miller (Greene & Miller, 1996; Miller et al., 1993, 1999). Some of the major findings from these studies are: (1) factor analyses of students' task values, ability beliefs, and goal orientations show that they are empirically distinct (DeBacker & Nelson, 1999; Miller et al., 1999; Wigfield et al., 2000); (2) students' task values and self-efficacy related positively to their reported self-regulation and cognitive strategy use and negatively to anxiety (Pintrich & De Groot, 1990; Pintrich et al., 1998; Wolters et al., 1996). In addition, students' expectancies for success were stronger predictors of their performance than were their achievement values, a finding similar to the findings reported by Eccles, Wigfield and their colleagues that were reviewed earlier (Pintrich & De Groot, 1990); (3) students' mastery goals and task values relate positively to one another in different academic and sports domains (DeBacker & Nelson, 1999; Miller et al., 1999); (4) students' performance goals relate negatively to their intrinsic and extrinsic values (Miller et al., 1999; Pintrich et al., 1993; Xiang et al., 2004).

Pintrich et al. (1998) and Wolters et al. (1996) also looked at longitudinal relations of these constructs, focusing on how students' goal orientations related over time to the other beliefs and values. In both studies students' mastery goals were the strongest positive predictor of their values, self-efficacy, and self-regulation, with relatively ability goals also predicting these variables positively. Extrinsic goals predicted these variables negatively (and overall, not as strongly), and test anxiety positively. Learning goals also were the strongest motivational predictor of students' grades, but previous grades were the stronger predictor. Pintrich et al. also found that students' task values and mastery goals were reciprocally related (particularly for females). Students' values predicted self-efficacy, cognitive strategy use, and self-regulation, and mastery goals also predicted cognitive strategy use and self-regulation (but only in females for this latter variable). In their longitudinal analyses Anderman et al. (2001) found (using HLM) that students' ability beliefs in math and reading predicted positive change in students' valuing of math and reading (change was measured as the difference between the students' current and previous year's valuing of math and reading). At the classroom level students who experienced a higher degree of performance-oriented instructional practices decreased in their valuing of math and reading. Mastery-oriented instructional practices were not related to changes in students' values.

### *Studies focused on college students*

Harackiewicz and her colleagues (e.g., Harackiewicz et al., 2002, 2008; Hulleman et al., 2008) conducted studies looking at relations over time of high school and college students' achievement goal orientations to their interest, task values, and academic and sports performance. The results (summarized across the studies) show that students' mastery goals predict their interest and course enjoyment, performance-approach goals positively predict course grades, and performance-avoid goals predict grades negatively. Interest and mastery goals predicted students' intrinsic and utility value for academic courses and sports activities. In the Hulleman et al. study, students' intrinsic and utility value mediated the effects of mastery approach goals on both subsequent interest in the course and final grade; values did not mediate the effects of performance-approach goals on final grades. As mentioned earlier, Harackiewicz et al. looked at long-term (over 8 semesters) relations of these variables. They found that students' interest and background knowledge predicted total number of psychology credits taken, and also choice to major in psychology. Performance-approach goals predicted overall psychology GPA, but this relationship was not significant after accounting for students' final grade in their introductory psychology course. These two studies provide a wealth of important information about the relations among these constructs and their links to performance.

Elliot and Murayama (2008) looked at motivational antecedents and consequences of the mastery and performance-approach and avoidance achievement goal orientations. They found that students' need for achievement predicted all but performance-avoidance goals, and fear of failure predicted all but mastery-approach goals. Mastery approach predicted intrinsic motivation for the psychology class (measured by asking students how interested they were in the class) positively and performance-avoid goals did so negatively. Performance-approach goals positively predicted class exam performance, and performance-avoid goals did so negatively. Taken together, Harackiewicz and

colleagues and Elliot and colleagues' work shows that during college there are clear relations of students' mastery goals, intrinsic motivation, interest and values, performance-approach goals and performance outcomes; and negative relations of performance and work avoidant goals to other motivational variables and performance. A particularly important aspect of Harackiewicz and colleagues' work is that they have looked at these relations over several semesters of college.

Taking a different analytic approach, Shell and Husman (2008) used canonical correlation to examine relations of a set of motivation-related beliefs including students' control beliefs, self-efficacy, and goal orientations and a set of self-regulatory strategies students report they use. At the higher end of the first canonical dimension, high efficacy beliefs and mastery goal orientations were associated with higher self-regulation; at the lower end and lower beliefs and goals relates to weaker self-regulation and also to work avoidance. At the high end of the second dimension there was a pattern of high knowledge building and lower self-regulation associated with higher control beliefs; Shell and Husman characterized these students as intrinsically motivated and autonomous. The lower end of this dimension was characterized by lower efficacy beliefs, lower master goals, along with lower knowledge building and a less regulation.

Some researchers have begun to use person rather than variable centered approaches in looking at the interrelations of these motivational attributes (see earlier discussion of Baker and Wigfield's (1999) cluster analytic study of reading motivation). Bråten and Olaussen (2005) used cluster analysis to examine motivational subgroups in 99 nursing and 105 business administration college students in Norway; the motivational variables included interest, goal orientation, task value, and self-efficacy. They were interested in which clusters may form, if they are different across academic contexts, and how cluster membership may change over the course of 1 year. In the first year, Bråten and Olaussen found that both samples had three-cluster solutions: high, moderate, and low on interest, mastery goal orientation, task value, and self-efficacy. In the second year, the nursing students formed a three-cluster solution again. There were four clusters in the business student sample; the moderate motivation cluster separated into moderate with high or low efficacy, with significantly more women in the low efficacy group. Given that groups were generally consistently high, moderate or low on each of these constructs, it appears that that these levels of motivation are likely to occur together in students.

The following conclusions can be drawn from this research looking at relations among these constructs. First, based on the factor analytic work it appears that values, goals, and interest are empirically distinct. Second, however, it also is clear that children's values, goals, and interests relate to each other in predictable ways. Children's valuing of achievement, interest, and mastery goals relate positively to one another; the only negative relations occurred between extrinsic and work avoidant goal orientation and the other variables. Third, these motivational variables related to different outcomes as well. Students' values and mastery goal orientations related positively to their self-reported self regulation and cognitive strategy use. Relations to performance indicators were obtained in some studies (Harackiewicz's work with undergraduates) but not in others (Wolters and Pintrich's work). We are beginning to have a sense for how these variables predict one another over time. In several of the studies (Harackiewicz and colleagues' work, Pintrich's work; Wolters et al.'s work), achievement goals were the exogenous variables in the analyses reported, and so the researchers assumed that goals drive the other motivational variables (although it is important to note that in their work, Harackiewicz and her colleagues included subjects' initial interest as a control variable in their analyses). This assumption finds its justification in goal theory (Maehr & Zusho, 2009) and in expectancy-value theory (Wigfield & Eccles, 2000), where as discussed earlier goals are seen as predicting individuals' expectancies and values. These results are often complex and moderated by other variables, so it is important to continue to look at these longitudinal relations; we elaborate this point in the next section.

## **Next steps in theory and research on achievement values, goal orientations, and interest**

### *Similarities and differences among the constructs*

From the information presented so far we can glean important differences and similarities among the values, goals, and interest constructs and how they are measured. With respect to conceptual

differences among them, they are clearly distinguished theoretically in the literature. As noted earlier Pintrich (2003) stated that each of these constructs is from a different family of motivation constructs. In addition, each also comes from a separate theoretical tradition or model: expectancy-value theory, goal orientation theory, and interest theory, with different intellectual roots, emphases, and predictions.

The specific definitions of each construct also are different. Achievement task values are defined as beliefs about the relative worth of different activities to the individual. Judgments of the value of activities thus should influence individuals' willingness to become involved in them. Goal orientations concern individuals' approach to learning and competence. As Elliot and Murayama (2008) note such orientations concern individuals aims and purposes for engaging in different activities. Because of this concern for aims goals are precursors to action, but also likely influence students once they are engaged in the activity. Interest refers to affective and cognitive systems that are involved in individuals' engagement in different activities or events. Hidi and Renninger (2006) point out that interest therefore is a mediator of cognition and affect and part and parcel of engagement in activities. By contrast, they posit that values and goals (as belief systems) impact affect, knowledge, and choice as outcomes, rather than mediating engagement in them.

The clarity of these definitions becomes somewhat obscured both by further distinctions within each construct and the ways in which they are measured. This is best illustrated when comparing values and interest. Interest value is one of the components of task value and is often measured by items asking how much the individual enjoys or likes a certain task or activity. Very similar items are used to measure interest (at least situational interest). Personal or individual interest may be more conceptually distinct from interest and attainment value because such interests are enduring and often originate from the individual, rather than a judgment of the worth of an activity. However, over time as values for different tasks become established more strongly they likely begin to resemble individual interests more closely (see also Hidi & Renninger, 2006). As can be seen in Table 1, words like "importance" often are used in items assessing personal interest. Indeed, Hidi and Renninger suggest that the value of different tasks may facilitate the transition from situational to individual interest, and so the two are tied quite closely (see also Hulleman et al., 2008).

Theoretically goal orientations are clearly distinguishable from values and interest, in a number of ways. They are focused directly on individuals' aims or purposes, and so clearly are cognitive constructs rather than the cognitive and affective mixture that defines interest. Because they are defined as aims they precede activity and (potentially) guide it, rather than being inherent in the activity as interest is. By definition they do not include notions of worth, and so can be distinguished from values in this specific sense. However, Austin and Vancouver (1996) stated that goals can be distinguished with respect to their relative importance to the individual, which ties goals and their value more clearly together. Once again measurement issues can cloud these theoretical and definitional distinctions, particularly if value and interest-related terms such as "like" and "enjoy" are included in items assessing goals.

As research on these constructs continues we need to attend carefully to the definition of each construct, and how measures of each focus clearly on the most important aspects of these definitions (see also Hidi & Harackiewicz, 2000; Murphy & Alexander, 2000; Pintrich, 2003). Measures that confound the definitions by including other constructs make it difficult to maintain the conceptual distinctions among the constructs. As noted earlier, it would be useful for researcher to investigate further empirical similarities and differences in these constructs by including several measures in one study, factor analyzing responses to them, and looking carefully at their interrelations using a variety of statistical techniques.

#### *Theoretical predictions concerning relations among these constructs*

Another important next step in our understanding of differences and similarities in these constructs is to test theoretical predictions of relations among them. Theorists working within each of the traditions from which the constructs come have made such predictions. Pintrich and Schrauben (1992) proposed a model of how motivational and cognitive variables influence students' involvement in learning and their achievement. Two of the motivational components in the model are goals and

values. Pintrich and Schrauben stated that goals provide general direction and purpose of behaviors, and values may create the strength or intensity of different achievement behaviors. In their expectancy-value model Eccles and her colleagues (Eccles, 2005; Eccles et al., 1983; Wigfield & Eccles, 1992) propose that individuals' short and long term goals are one of the important determinants of the values they attach to different kinds of tasks. Eccles (2005) discussed this specifically with respect to goal orientations. Individuals with performance goals should place greater importance on competitive tasks and/or tasks that allow them to demonstrate their abilities to a greater extent than do individuals who are mastery-oriented. By contrast, mastery-oriented individuals will think more important tasks that help them improve their skills, and may avoid tasks that emphasize competition. More generally, Eccles stated that tasks which help fulfill one's short and long term goals of different kinds will have higher attainment and utility value. Thus for both Pintrich and Schrauben and Eccles, goals appear to be determining individuals' valuing of different activities.

Maehr and Zusho (2009) present as a major premise of goal theory that goals create motivational systems such as patterns of motivation-related beliefs, styles of self-regulation, and affective outcomes. Thus Maehr and Zusho agree with Eccles (2005) that goals may be causally prior to other motivational beliefs and values (see also Ford & Smith, 2007). It therefore would be informative for longitudinal studies of the relations of these constructs to examine these predictions over several time points in order to begin to obtain an overall picture of their development. The research reviewed earlier provides some support for these predictions. In the future researchers should examine these predictions specifically, and also test alternatives to them. This could be done in studies measuring each of these and other constructs at several time points, and modeling relations among them over time, as in Harackiewicz et al. (2008).

With respect to interest, Hidi and Renninger (2006) discussed relations of interest and values, and one of their central points is that the value of different tasks relates more strongly to individual interest than to situational interest. As individuals develop interest in an activity or activities they wish to reengage in it and will choose the activity when it is available to them. As discussed earlier, individual interests are relatively stable and are "characterized by positive feelings, stored knowledge, and stored value" (Hidi & Renninger, 2006, p. 114). Situational interest, because it is ephemeral and stimulated by certain environmental events rather than coming from the person, will not have the same associations with stored values and feelings. The two predictions from this model are first, that individual interest can make different tasks more or less valuable, and second, that situational interest is not as strongly related to value. These predictions are easily testable. As noted earlier, Hidi and Renninger also discussed how well-developed personal interests can influence the goals individuals have.

Theorists also are beginning to integrate across these theoretical boundaries. Hidi and Harackiewicz (2000) discussed possible relations of interest and achievement goals, noting that at the time they were writing their article there was not much discussion of these relations in the literature. At the broadest level they proposed that the relations of these two constructs likely are bidirectional. They further proposed that individual interest may facilitate the development of mastery goals, whereas situational interest may be a consequence of mastery goals. Relations of performance goals and interest are potentially more complex. Hidi and Harackiewicz noted that some researchers argue that performance goals may undermine interest (and its extension, intrinsic motivation) because of their focus on evaluation. However, based on a series of studies by Harackiewicz and her colleagues with college students they stated that performance-approach goals can enhance interest because such goals focus the individuals on attaining competence (see also Harackiewicz & Sansone, 1991). They also suggested that interest may be most strongly enhanced when both performance and mastery goals are in play.

Building on this work, Hulleman et al. (2008) proposed the following with respect to relations of values, goal orientation, and interest. They suggested that students who find class activities valuable for either intrinsic or utilitarian reasons could develop a deeper personal interest in the class (e.g., a relevant reading in a history class could lead to a deeper interest in history). It is important to note that in this analysis Hulleman et al. consider task value to be situation specific and individual interest more general. With respect to goals, they built on previous work on how there are different pathways to optimum motivation (e.g., Pintrich, 2000a), and stated that mastery and performance goals both might influence achievement through their impact on task values. As noted earlier they found that task values did mediate the effects of mastery goals on both subsequent interest and final grades in

a psychology course. They also noted (and demonstrated empirically) that initial interest predicted both mastery–approach goals and subsequent interest. Testing these theoretically derived predictions, particularly those concerning the interrelations among the constructs, is a major priority for future research.

#### *Developmental differences in relations of these constructs*

There are two fundamental questions with respect to the development of these constructs and how they relate to one another. First, are some of the constructs (or aspects of them) more prominent at different developmental phases? Beginning with task values, both Wigfield (1994) and Wigfield and Eccles (1992) suggested that the interest component of task value may be especially salient during the early elementary school grades with young children's activity preferences and choices being most directly related to their interests rather than to an activity's utility, or overall importance. The utility and importance aspects likely emerge later in development as children have a better understanding of themselves, what they plan to do, and the relations of different activities to these plans (e.g., doing well in math to get into medical school). Wigfield (1994) also suggested that early in development children's interests likely shift relatively quickly, and so it is likely they will try many different activities for a short time each before developing a more stable opinion regarding which activities they enjoy the most.

In a similar vein, it would appear from Hidi and Renninger's (2006) analysis of interest that young children's interest is most likely characterized primarily by situational interest, and their longer-term individual interests develop over time after they have experienced a variety of situational interests. The more general implication of these points with respect to interest and values is that children's interests likely are changeable and (potentially) short lived early in development, and gradually develop into more stable individual interests. These more stable individual interests likely have a role in determining which activities children find most useful and important to them.

To our knowledge goal orientation theorists have not made specific predictions about whether there is a strong developmental sequence with respect to mastery and performance goal orientations. Nicholls et al.'s (1990) work indicated that task, ego and work avoidant goals can be identified relatively early in elementary school, but several authors have discussed the growing prevalence of ego or performance goals as children go through school (see Anderman et al., 2002; Maehr & Zusho, 2009). This occurs because of the increased evaluative pressure students face as they go through school, with grades, tests, and other measurable outcomes of schooling becoming increasingly important.

The second question is how relations among the constructs may change across age. One possibility is that the different constructs are relatively distinct at first and become more closely related as children get older; Wigfield et al. (1997) provide evidence for this with respect to relations between competence beliefs and values. Further, the analysis of which aspect of the constructs are prevalent at different ages also has implications for how they relate. Relations among mastery goals, interest value, and situational interest may emerge first, with relations to individual interest, utility value, and attainment value coming later in development as these aspects become established more clearly. The Hulleman et al. (2008) study reviewed earlier provides very important information about relations of values, goals, and interest during college. Similar studies need to be done with children and adolescents in elementary and secondary school to see how these relations unfold and whether they are similar to the patterns that Hulleman et al. (2008).

#### *Relations of achievement values, goal orientations, and interest to achievement outcomes*

Another very important direction for future research is to examine the interplay of goals, values, and interests in predicting different kinds of achievement and other outcomes. We reviewed evidence above concerning how each variable and combinations of them relate to different outcomes such as performance, activity choice, and self-regulation (e.g., DeBacker & Nelson, 1999; Durik et al., 2006; Harackiewicz et al., 2008; Hulleman et al., 2008; Pintrich et al., 1998; Wolters et al., 1996). We need studies building on this work that look at the combined influences of the values, goal orientation, and

interest variables on these and other outcomes at different age levels, to provide us with a richer and more complete understanding of how motivation and major outcome variables relate. For example, we noted earlier that a fundamental finding from research on children's expectancies and values is that expectancies predict children's future performance, and values predict choice, with each having indirect effects on the other outcome variable. It would be very interesting to look at how the kinds of goals children have may moderate these findings. One reason why this is particularly important to do is that knowing the complex interplay of these variables on achievement outcomes may help with the design of interventions designed to enhance students' motivation and achievement (see Wentzel & Wigfield, 2007).

#### *Further methodological issues*

We examined many of the most popular measures of achievement values, goal orientations, and interest in an earlier section. An important methodological issue in this area is that most of the measures used in this literature are student self-report measures that ask directly about the construct (e.g., How much do you like math?). There are many reasons why student self-report is a good way to measure motivation; if one is interested in measuring individuals' beliefs then self-report needs to be used. These measures often are plagued by social desirability, however. It can be difficult for children to state on a questionnaire that school is not important to them. Further, self-report measures can be problematic in developmental studies with young children. Researchers have made strides in developing appropriate measures for young children and ways of administering them to help children answer them well (e.g., Eccles et al., 1993; Marsh, Ellis, & Craven, 2002), but care still must be taken in their use.

Another problem is the shared method variance in response to self-report measures when researchers rely solely on them; this problem can result in inflated correlations among the variables. We urge researchers to include other kinds of measures along with participant self-report measures, to get a more complete picture of students' values, goal orientations, and interest, their interrelations, and relations to outcomes. Recently, Fulmer and Frijters (2009) reviewed self-report and alternative approaches to assessing motivation. These alternatives include other approaches to self report including phenomenological or qualitative protocols such as interviews (e.g., Shedivy, 2004), as well as neuropsychological and physiological methodologies such as fMRI scans (e.g. Elliott, Newman, Longe, & Deakin, 2003), eye tracking procedures (e.g., Washburn & Putney, 2001), and measuring changes in cardiovascular activity (Brehm & Self, 1989) that measure physiological and behavioral indicators of motivation. Fulmer and Frijters (2009) also discussed behavioral observations as an additional method of assessing motivation. Examples of this are time taken to make a choice (Reeve & Nix, 1997) and motor responsiveness to a valued object or stimuli (Elliott et al., 2003).

A logical next step would be to use multiple methods of motivation measurement; however, Fulmer and Frijters (2009) warned the reader against this practice because many measures cannot be adequately integrated, have inconsistent correlations, and the notion that different methodologies may be assessing different parts of motivation. Instead, they suggest an *input/output approach* to measuring motivation in which the findings from one assessment can inform the next methodology. For example, students that have low motivation on a self-report instrument may be interviewed about the reasons for such low motivation or changes in self-reported motivation means might be examined after success or failure on a behaviorally assessed task.

Yet another way of assessing motivation is to use others' ratings, such as parents or teachers' ratings of student motivation. For instance, the Reading Engagement Index (Guthrie et al., 2004; Wigfield et al., 2008) has been used to measure teachers' perceptions of their students' motivation in addition to student self-report data. This measure (and others like it) relates to students' self-reports of motivation and also to student achievement. Using multiple raters of motivation provides a more complete picture of student motivation from multiple perspectives. An interesting developmental question with respect to such measures is how relations across them change over time. We hypothesize that student and teacher ratings of motivation become more highly correlated as children get older.

A third issue concerns the kinds of statistical analyses to use when doing studies that include multiple related measures of motivation, performance, and other outcome variables. Many of the studies

reviewed earlier used traditional variable-centered approaches such as hierarchical regression analyses or multivariate repeated measures ANOVAs to look at predictive relations among variables over time, factor analyses to look at the dimensionality of different constructs, and correlational analyses to look at relations among them. Recently, as discussed above researchers doing studies that include multiple related measures have used analytic techniques and approaches that may prove to be especially beneficial for this kind of work, such as canonical correlation and HLM (Shell & Husman, 2008; Tsai et al., 2008). A different kind of data analytic approach that can be useful in studies of multiple related constructs are pattern or person-centered approaches, such as cluster or profile analyses (see Peck, Roeser, Zarrett, & Eccles, 2008; Roeser & Peck, 2003 for discussion of these kinds of approaches). The Baker and Wigfield (1999) and Bråten and Olaussen (2005) studies reviewed above are good example of this kind of approach. Other studies have used cluster analysis in adults to examine values, interest, and goals such as Bembenny (1999) in college students and Jansen (2009) in teachers.

Finally, as we have discussed there are longitudinal studies that look at relations among these constructs (e.g., Harackiewicz et al., 2008; Hulleman et al., 2008; Pintrich et al., 1998; Wolters et al., 1996), but many studies are cross-sectional. If we are to understand clearly developmental trajectories of these constructs, the relations of these trajectories, and the relations of the motivational variables to outcomes, longitudinal studies must be done.

#### *Relations to competence and efficacy beliefs*

We close by connecting the work on achievement values, goal orientations, and interest back to research on the development of competence and efficacy. As noted in our introduction work on these latter constructs dominated the field for many years. Researchers need to do more work on the interrelations of all these constructs, for several reasons. First, as discussed above competence related beliefs and values have been shown to predict different kinds of outcomes (performance and choice); this work should be extended to include goals and interest along with values to see the more complex pattern of predictions of various outcome variables, and if the inclusion of the other variables moderates any relationships obtained. Second, it is important to include competence belief variables in longitudinal work to obtain a clearer understanding of the relations of the two sets of variables over time. Jacobs et al. (2002), in a pioneering study on this issue, found that change over time in children's valuing of different subject areas was predicted in large part by change in their competence beliefs. Marsh et al. (2005) also report stronger relations over time between self-concept of ability and interest than between interest and self-concept of ability, providing further support for the notion that competence beliefs may drive students' interest and valuing in at least achievement-related activities. Given the prominent causal role given achievement goals in some of the theoretical models and in research reviewed earlier it would be quite interesting to do similar work with goals, values, interest, and competence beliefs all measured in the same study.

To conclude, we have learned much about the nature of children's achievement task values, goal orientations, and interest and how they change over time. We are beginning to learn more about how these motivation-related variables interrelate and predict different achievement outcomes, but much more work is needed on the development of these relations. We are excited about the work attempting to integrate these constructs theoretically, and believe that testing the predictions emanating from this work is a very important priority for future research. More work also is needed to examine carefully the different measures of these constructs and connect them clearly to how they are defined in the literature. Careful specifications of this kind will enhance the field's ability to continue to make progress.

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