

Expectancy-Value Theory of Achievement Motivation: A Developmental Perspective

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I consider Eccles et al.'s (1983) expectancy-value model of achievement performance and choice from a developmental perspective, by examining how recent research on the development of young children's competence beliefs, expectancies for success, subjective task values, and achievement goals can be incorporated into the model. The kinds of change in children's achievement beliefs considered include change in the factor structure of children's competence beliefs and values; change across age in the mean level of those constructs; and change in children's conceptions of ability beliefs and subjective values. I also discuss how achievement goals are conceptualized in this model, and how goals are conceived by other current motivation researchers. Changes in the nature of relations among competence beliefs, subjective task values, achievement goals, and achievement behaviors also are considered.

KEY WORDS: achievement motivation; expectancies; competence beliefs.

INTRODUCTION

Expectancy-value theory has been one of the most important views on the nature of achievement motivation, beginning with Atkinson's (1957) seminal work and continuing through the work of Battle (1965; 1966), the Crandalls (e.g., Crandall, 1969; Crandall *et al.*, 1962) and more recently Feather (1982, 1988, 1992) and Eccles, Wigfield and their colleagues (e.g., Eccles, 1984a,b; Eccles *et al.*, 1983, 1984; Wigfield and Eccles, 1992). To characterize the theory very broadly, theorists adopting this perspective

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posit that individuals' expectancies for success and the value they have for succeeding are important determinants of their motivation to perform different achievement tasks. Atkinson (1957) originally defined expectancies as individuals' anticipations that their performance will be followed by either success or failure, and defined value as the relative attractiveness of succeeding or failing on a task. More recent researchers in the expectancy-value tradition (e.g., Eccles *et al.*, 1983; Feather, 1982, 1988, 1992; Wigfield and Eccles, 1992) have expanded these definitions, and further discussed how individuals' expectancies for success, subjective task values, and other achievement beliefs mediate their motivation and achievement in educational settings.

In a recent article, Wigfield and Eccles (1992) reviewed extant research on the nature of individuals' subjective task values, and described how researchers interested in this topic have extended Atkinson's (1957) original expectancy-value model. They discussed in detail the research on children's and adolescents' subjective values done by Eccles, Wigfield and their colleagues (see also Wigfield, in press), focusing on an expectancy-value model or achievement choice developed by Eccles *et al.* (1983). Much of the research they reviewed has been done with older elementary school children and adolescents. In this article, I examine the Eccles *et al.* model from a developmental perspective, by discussing recent empirical work on the early development (during the elementary school years) of children's subjective task values, competence beliefs, expectancies for success, and achievement goals. I began with a description of that model, and a definition of the constructs included in the model that I will discuss in this paper.

ECCLES *ET AL.*'S EXPECTANCY VALUE MODEL

Eccles *et al.* (1983) developed an expectancy-value model of achievement choice as a framework for understanding early adolescents' and adolescents' performance and choice in the mathematics achievement domain. Figure 1 presents the portion of the model dealing with children's achievement beliefs and values, and their relations to achievement behaviors. As shown in Fig. 1, Eccles *et al.* (1983) proposed that children's achievement performance, persistence, and choice of achievement tasks are most directly predicted by their expectancies for success on those tasks and the subjective value they attach to success on those tasks. Children's expectancies and values themselves are most directly determined by other achievement-related beliefs, including children's achievement goals and self-schemata, and their task-specific beliefs (defined as beliefs about ability or competence and task difficulty beliefs). Children's interpretations of their previous perform-

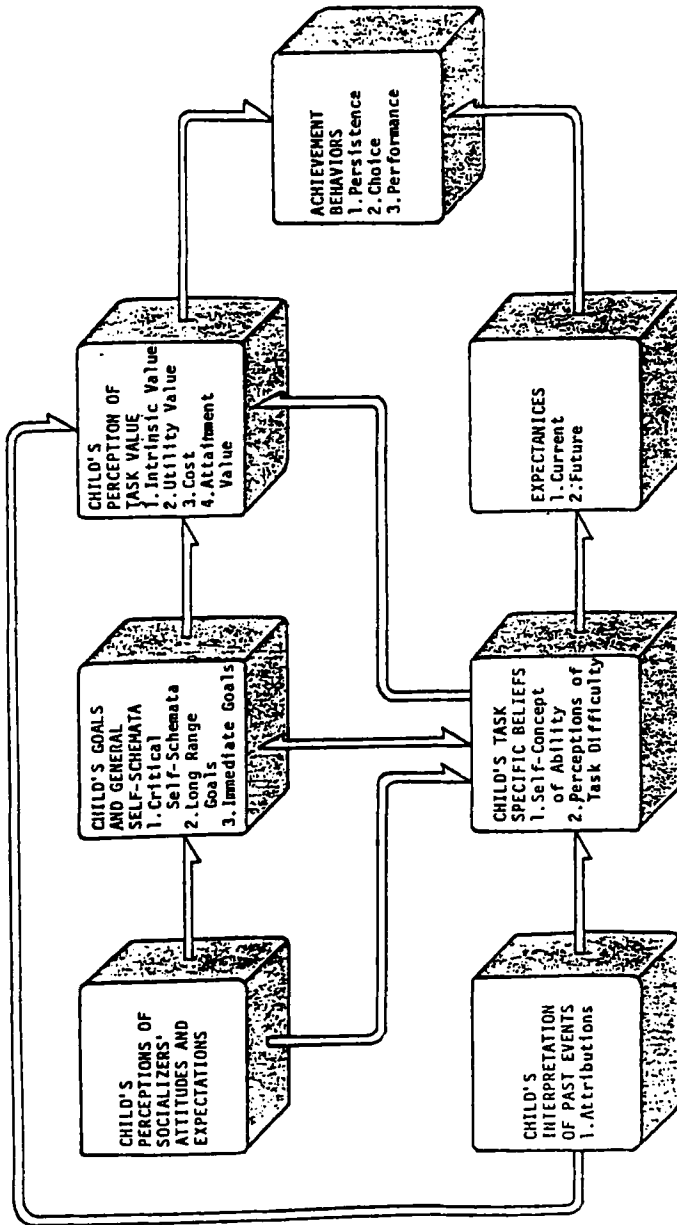


Fig. 1. Eccles' (1983) model of achievement performance and choice. From Spence, J. T. (1983). *Achievement and Achievement Motives*, W. H. Freeman, San Francisco. Adapted with permission.

ance, and their perceptions of socializers' attitudes and expectations influence their goals and task specific beliefs. Other influences not shown in this portion of the model are children's previous performance on different tasks, important socializers' beliefs, values, and behaviors, and the broader cultural milieu.

The major constructs from the model considered in this article include: (1) achievement behaviors such as children's achievement performance and choice (the last box in the model); and (2) the belief and value constructs in the two columns of boxes immediately preceding the box containing achievement behaviors. These constructs are children's subjective task values, expectancies for success, achievement goals, and beliefs about ability or competence.³ To begin, I will briefly define each of these constructs, and provide examples of how we have measured them.

Values have both broad and more specific definition. Rokeach (1973, 1979) broadly construed values as beliefs about desired end states. He identified a set of values that he believed were fundamental to human experience; some of these values concerned achievement. In the achievement motivation literature subjective task values have been defined more specifically as how a task meets different needs of individuals (Eccles *et al.*, 1983; Wigfield and Eccles, 1992). One important aspect of the Eccles *et al.* (1983) model shown in Fig. 1 is that they proposed four major components of subjective values: attainment value or importance, intrinsic 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. Intrinsic value is the enjoyment one gains from doing the task; this component is similar in certain respects to notions of intrinsic motivation (see Deci and Ryan, 1985; Harter, 1981). 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. 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. Sample items measuring these constructs are shown in Table I.

Expectancies for success can be defined as children's beliefs about how well they will do on an upcoming task (see Table I for sample items). Other researchers also have included expectations for future outcomes as key aspects of their models of achievement behavior. For instance, in his discussion of self-efficacy and its influences on behavior, Bandura (1977)

³In tests of the model, children's task difficulty beliefs do not strongly predict either performance or choice, hence this task perception construct is not considered further in this article.

Table I. Sample Items Assessing Children's Competence Beliefs, Expectancies for Success, and Subjective Task Values^a

Competence beliefs	
1.	How good at math are you?
2.	If you were to order all the students in your math class from the worst to the best in math, where would you put yourself?
Expectancies for success	
3.	Compared to other students, how well do you expect to do in math this year?
4.	How well do you think you will do in your math course this year?
Subjective task values	
Intrinsic interest value	
5.	In general, I find working on math assignments (very boring, very interesting)
6.	How much do you like doing math?
Attainment value/importance	
7.	For me, being good in math is (not at all important, very important)
8.	Compared to your other activities, how important is it to you to be good at math?
Utility value/usefulness	
9.	In general, how useful is what you learn in math?
10.	Compared to your other activities, how useful is what you learn in math?
Achievement goals	
11.	How important is it for you to act like most boys (girls) do?
12.	Do you think being good at math is more important for boys than for girls?

^aMathematics items are used for illustrative purposes; similar items were asked for other achievement activities. Items were answered on 1-7 scales; some of the endpoints of the scales are shown in parentheses.

distinguished two kinds of expectancy beliefs. Outcome expectations are expectations that a given behavior can produce a certain outcome. Efficacy expectations are an *individual's* expectation that he or she can produce the outcome. In the expectancy-value model under consideration here, personal or efficacy expectations are the main expectancy beliefs included; outcome expectations have not been formally incorporated into the model. A more important difference between this model and Bandura's self-efficacy approach is that in the expectancy-value model theorists more systematically consider the influences of subjective values as well as expectancy beliefs on different aspects of achievement behavior. Bandura primarily has discussed (and measured) how efficacy beliefs influence achievement behavior, although he acknowledges that the value of a given task to individuals likely influences their involvement with the task as well. But individuals' valuing of achievement has not become a formal part of his model.

Beliefs about ability refer to children's evaluations of their competence in different areas. Ability beliefs have a prominent place in several theoretical models of achievement, including Covington's (1984) self-worth approach, Weiner's (1979) attribution theory, and the self-concept models of Harter and her colleagues (e.g., Harter, 1982, 1985) and Marsh and his

colleagues (e.g., Marsh, 1990; Marsh and Shavelson, 1985). In the expectancy-value model, ability beliefs are conceived of as broad beliefs about competence in a given domain, in contrast to one's expectancies for success on an upcoming task, which are seen as more specific beliefs. Table I presents sample items assessing this construct. When discussing my colleagues and my empirical work in this article I will use the term competence beliefs rather than ability beliefs, to be consistent with the terminology we have used in other recent articles.

Finally, in Eccles *et al.*'s model, achievement goals are the broad purposes children have for learning or doing different activities. Eccles *et al.* primarily discussed long-term goals such as career plans and goals like children's desires to act in accordance with certain behavior standards, such as gender role appropriate characteristics. Sample items assessing these beliefs are presented in Table I. Many researchers (e.g., Ames, 1992; Dweck and Leggett, 1988; Ford, 1992; Nicholls, 1979b; Nicholls, Cheung, Lauer, and Patashnick, 1989) interested in children's motivation have begun studying achievement goals. However, their focus has been more on children's goals for success in achievement settings rather than on the kinds of goals Eccles *et al.* discussed. I will provide a more detailed contrast of these different approaches to achievement goals later.

Most of the empirical studies testing aspects of this model have been done with children in fifth through twelfth grades. Researchers have addressed two major questions regarding children's and adolescents' achievement beliefs and values. The first is how do early adolescents' and adolescents' achievement beliefs and values change? Research addressing this question shows that early adolescents' beliefs and values tend to become more negative in different subject areas following the transition to middle school. During adolescence, beliefs about certain school subjects, especially math, continue to become more negative, whereas beliefs about other subjects (English) become more positive (see Eccles *et al.*, 1983; Wigfield and Eccles, 1992, for reviews). The second question concerns links between early adolescents' and adolescents' expectancies and values and achievement behaviors; more specifically, how do their beliefs and values predict their performance in math and choice of whether to continue taking math classes? Adolescents' beliefs about their math competence and expectancies for success in math most strongly predict their subsequent math grades, even when the effects of their previous grades are controlled for. Students' valuing of mathematics most strongly predicts their intentions to continue taking mathematics courses and their actual decisions to enroll in advanced math during high school (see Eccles, 1984a,b; Eccles *et al.*, 1983; Eccles, Adler, and Meece, 1984; Ethington, 1991; Meece, Wigfield, and Eccles, 1990; more details about some of this work are provided later). These findings emphasize the need to under-

stand the influence of *both* expectancies and values on individuals' achievement behaviors.⁴ In this article, I consider recent research with younger children that has dealt with each of these questions: How do young children's competence beliefs, expectancies for success, and subjective task values, change; and how do those beliefs and values predict children's achievement behaviors and choices?

DEVELOPMENT OF CHILDREN'S COMPETENCE BELIEFS, EXPECTANCIES FOR SUCCESS, AND SUBJECTIVE TASK VALUES

The first kind of change in children's competence beliefs, expectancies for success, and subjective task values I consider is change in the structure of these constructs, or the extent to which children's beliefs and values are differentiated or distinct in children's minds. The different beliefs and values shown in Fig. 1 (e.g., expectancies for success, subjective values, etc.) are all proposed to be distinct. When does that differentiation occur? Another aspect of this differentiation is whether individual constructs are comprised of different components. Eccles *et al.* (1983) proposed that children's subjective values consist of several components. When do these components become differentiated? A second kind of change considered is mean level change. Do children in the early elementary grades have more positive beliefs and values than those in the later elementary grades? The third kind of change considered is how different-aged children conceptualize the various achievement constructs such as ability. For example, do younger and older children define "ability" in the same way?

The Differentiation of Children's Competence-Related Beliefs and Values

Developmental theorists such as Werner (1957) proposed that different characteristics change from a global to a more differentiated state (e.g., Werner, 1957). In her discussion of children's self-concept development,

⁴Another question that my colleagues and I have addressed is how do males' and females' achievement beliefs and values differ. We (and other researchers) have found that males' and females' beliefs differ in fairly sex stereotypic ways. Males' competence beliefs and expectancies for math are higher than those of females, whereas girls' competence beliefs and valuing of English are more positive than boys are. Interestingly, males and females differ little in their valuing of math, at least during elementary and middle school (Eccles *et al.*, 1983, 1989; Wigfield *et al.*, 1991; see Eccles. *et al.*, 1984a, Wigfield, in press; Wigfield and Eccles, 1992, for more complete reviews). Due to space limitations, sex differences are not discussed further in this article.

Harter (1983) discussed how children first have broad understandings that they are "smart" or "dumb," and later develop a more fine-grained sense of competence for specific activities. Various researchers have examined the structure of children's beliefs about competence, and some have examined children's subjective task values, to assess how the structure of these constructs becomes differentiated (e.g., Eccles and Wigfield, in press; Eccles, Wigfield, Harold, and Blumenfeld, 1993a; Harter, 1982; Harter and Pike, 1984; Marsh, Barnes, Cairns, and Tidman, 1984; Marsh, Craven, and Debus, 1991; Marsh and Hocevar, 1985; Wigfield *et al.*, 1992). In addressing this question, researchers have factor analyzed children's responses to various questionnaire measures of these constructs, to examine whether the factors that emerge reflect children's competence beliefs about several domains, or about single domains. One clear finding emerging from these studies is that even during the early elementary school years children distinguish different domains of competence. For instance, Harter (1982) developed a scale that assesses different aspects or domains of children's perceived competence, including academic, social, and physical competence. She gave this scale to third through ninth grade children, and performed factor analyses of their responses. She found that at all grade levels children's perceived competence in each area formed a separate factor.

Eccles *et al.* (1993a), Marsh *et al.* (1984), and Wigfield *et al.* (1992) assessed children's beliefs about their competence in many different domains. In the Eccles and Wigfield work the domains included math, reading, music, and sports activities. The youngest children included in the studies were in the first grade. Marsh *et al.* utilized the Self-Description Questionnaire (SDQ) he and his colleagues developed, which assesses children's competence beliefs in the areas of math, reading, general school, physical ability, physical appearance, peer relations, parent relations, and general self-concept. The youngest children included in their study were in second grade. In each study, the factor analyses done on children's responses to the questionnaires given showed that children's beliefs about competence in the different domains formed clear, distinct factors. Marsh *et al.* (1991) gave the SDQ to kindergarten children, and their factor analyses showed that even for this age group separate domains of competence were clearly identified. Thus even in the earliest elementary school grades children have distinct competence beliefs in different domains.

Some of these researchers (Eccles and Wigfield, in press; Eccles *et al.*, 1993a; Wigfield *et al.*, 1992) also have looked at whether children's competence beliefs and expectancies for success are distinct constructs, as is proposed in the Eccles' *et al.* (1983) model. In studies of first through fourth grade children, and also fifth through twelfth grade children, these researchers have given questionnaires to children that assess competence be-

liefs, expectancy beliefs, and perceived level of performance in the domains of math, reading, music, and sports (see Table I for sample items). Factor analyses of children's responses to these items *within* each activity domain showed that children's competence beliefs, expectancies for success, and perceived performance loaded on the same factor; hence these components were not empirically distinct. Therefore, two of the constructs proposed as separate in the model (competence beliefs, expectancies for success) are not empirically distinguishable within a given different activity domain, in children ranging in age from first through twelfth grades.

However, young children do seem to distinguish between their competence beliefs and subjective values. Eccles *et al.* (1993a) and Wigfield *et al.* (1992) also found that *within* the domains of math, reading, and sports, children's competence-expectancy beliefs and subjective values formed clearly distinct factors. In both studies the researchers compared confirmatory factor models including both competence beliefs and subjective values on one factor in each domain with models where competence belief and subjective values were posited to be separate factors. The two factor models in each domain had significantly better fit indices than did the one factor models, suggesting that the two constructs are distinct within each of the activity domains studied. This distinction was apparent even in the factor structure within each domain for the first graders. This finding is a crucial one for the expectancy-value model. Even during the very early elementary grades children appear to have distinct beliefs about what they are *good* at and what they *value* in the domains of math, reading, and sports. This finding suggests that two central constructs in the model appear quite early on, in different activity domains.

Thus even during the very early elementary school years children's competence beliefs and subjective values are distinct constructs. Can the different aspects of subjective values proposed by Eccles *et al.* (1983) be empirically identified? Eccles and Wigfield (in press) examined whether three of the components of subjective values (attainment value, interest, and utility value) proposed by Eccles *et al.* (1983) could be distinguished empirically in the mathematics domain. They used confirmatory factor analysis to assess fifth through twelfth grade students' responses to items assessing their mathematics competence beliefs, expectancies for success, perceived performance in math, mathematics task value, and other constructs. As mentioned above, one finding from this study was that children's competence beliefs and expectancies for success formed one factor. Three task values factors were distinguished clearly: perceived attainment value or importance, interest, and perceived utility value or usefulness, confirming the theoretical distinctions in the Eccles *et al.* model. Comparative tests of the factor structure of the younger (fifth through seventh) and older (eighth through twelfth) grade students showed no differences, indicating

that the distinctions were made by the youngest as well as the oldest students. Recently, Wigfield *et al.* (1992) found that during the early elementary school years children's subjective values are less differentiated, with two factors (interest, and utility-importance) emerging in the confirmatory factor analyses of children's responses to items in the math, reading, and sports domains.

In sum, even young children's competence beliefs are differentiated clearly across various activities, although their competence beliefs and expectancies for success are less clearly differentiated. Different components of subjective values also have been identified, especially in children in fifth grade and above. These results generally are consistent with the notion that children's beliefs become more differentiated as they get older (Harter, 1983), although some of this differentiation occurs very early on, perhaps earlier than once thought. The most important implication of the work just reviewed for the expectancy-value model (see Fig. 1) is that even early in the elementary school years many of the beliefs proposed in the model have been shown to be distinct (e.g., competence beliefs, subjective values). Thus these constructs can be listed as separate beliefs even for very young children. However, competence beliefs and expectancies for success are less distinct, and the different components of subjective values identified by Eccles *et al.* (1983) may not be readily identifiable during the early elementary school grades.

Changes in the Mean Level of Children's Achievement Beliefs and Values

A second kind of change to consider is how the actual level of children's achievement beliefs and values change across age. Several researchers have found that children's competence beliefs for different achievement tasks decline across the elementary school years and into junior high school or middle school (see Dweck and Elliott, 1983; Eccles and Midgley, 1989; Stipek and MacIver, 1989, for reviews). To illustrate, Nicholls (1979a) found that in first grade most children ranked themselves near the top of the class in their reading ability, and there was essentially no correlation between those ability ratings and children's performance. By age 12, children's ratings were more dispersed, and the correlations between ability ratings and school grades were in the .70 range. In their cross-sectional survey studies of children's competence beliefs in a variety of academic and non-academic domains, both Eccles *et al.* (1993a) and Marsh (1989) report linear decreases in children's competence beliefs across the elementary school years, particularly in the academic achievement domains. Recently, in the 3-year longitudinal follow-up to the Eccles *et al.* (1993a)

study, Wigfield *et al.* (1993) showed that children's competence beliefs for math, reading, instrumental music, and sports declined across the elementary school years. These declines often continue into junior high or middle school (Eccles *et al.*, 1989; Wigfield *et al.*, 1991).

Expectancies for success also decrease during the elementary school years. Most studies show that 4- and 5-year-old children's expectancies for success are quite optimistic. At these ages children generally believe they will do well on the next task, even if they have repeatedly failed the task. Stipek (1984) has argued that young children's expectancies may reflect the outcome they hope to achieve rather than the reality of their performance, though Dweck and Elliott (1983) made the interesting point that young children's skills do improve rapidly and so high expectancies for future success actually may be realistic. Across the elementary school years children's expectancies correspond more closely to their previous performance, so that following success their expectancies increase and following failure they decrease (see Parsons and Ruble, 1977; Stipek, 1984). Thus as children get older their expectancies for success become more sensitive to success and failure experiences. They also become more accurate or realistic, if we define accuracy as how children's expectancies related to their actual performance on different tasks (see Eccles, Midgley, and Adler, 1984, and Stipek, 1984, for thorough reviews of this work). One problem in this research that could explain some of these differences is the difficulty in using self-report measures with young children. Indeed, Heyman, Dweck, and Cain (1992) found that during the preschool years some children do react more negatively to failure than suggested by the work just reviewed. Similarly, Stipek, Recchia, and McClintic (1992) showed that preschool children indeed do react both behaviorally and emotionally to failure experiences. These findings are intriguing, and suggest that studies relying solely on children's self-reports may overestimate children's optimism about their abilities.

As with competence beliefs and expectancies for success, studies looking at changes in the mean level of children's values generally show that children value certain academic tasks less as they get older (see Eccles and Midgley, 1989; Wigfield and Eccles, 1992 for complete reviews). For instance, Eccles *et al.* (1993a) found that older elementary school-aged children valued reading and instrumental music less than younger children did. Interestingly, children's valuing of sports activities was higher among older elementary school aged children. In our longitudinal follow-up to this study (Wigfield *et al.*, 1993), we looked at changes in children's beliefs about the usefulness and importance of these activities and their interest in them. Children's beliefs about the usefulness and importance of math, reading, instrumental music, and sports activities decreased over the 3 years of the study. However, only children's interest in reading and instrumental music

decreased over time; their interest in math and sports did not. This finding shows the importance of examining the separate aspects of children's subjective valuing of different activities.

Eccles *et al.* (1983) and Wigfield (1984) found that in late elementary school children valued math more highly than did high school students. In contrast, the older students valued English more. Eccles *et al.* (1989) and Wigfield *et al.* (1991) found that across the transition to junior high school, children's ratings of both the importance of math and English and their liking of these school subjects decreased. In math, students' importance ratings continued to decline across seventh grade, whereas their importance ratings of English increased somewhat during seventh grade.

In summary, children's achievement beliefs become more negative in many ways as they get older, at least through the early adolescence time period. Children believe they are less competent in many activities, and often value those activities less. These differences are more pronounced in certain activity areas, notably math. The negative changes in children's achievement beliefs have been explained in two major (and complementary) ways. One explanation is that children become much better at understanding and interpreting the evaluative feedback they receive, and engage in more social comparison with their peers. As a result of these processes many children become more accurate or realistic in their self-assessments, so that their beliefs become relatively more negative (see Dweck and Elliott, 1983; Nicholls, 1984; Stipek and MacIver, 1989, for thorough discussion of how children's processing of evaluative information changes). A second explanation is that the school environment changes in ways that makes evaluation more salient and competition between students more likely, thus lowering some children's achievement beliefs (e.g., see Stipek and Daniels, 1988). The specific changes in the school environment and how they relate to children's achievement beliefs have been discussed extensively by Blumenfeld, Pintrich, Meece, and Wessels (1982), Eccles and Midgley (1989), Eccles, Wigfield, Midgley *et al.* (1993b), and Marshall and Weinstein (1984), among others. A complete discussion of these two explanations is beyond the scope of this paper. Interested readers should consult the references just cited for more detailed discussion.

Changes in Children's Conceptions of Achievement Beliefs and Values

The research on the structure of children's beliefs and mean level differences in those beliefs provides important information about the nature of developmental change in children's competence beliefs, expectancies for success, and subjective values. However, this research does not

directly assess children's conceptions of those beliefs, because the questionnaire methodology used in those studies requires that children respond to researcher-defined constructs rather than generate their own definitions of a given construct. Particularly when working with younger children, it is important to understand how they conceive different constructs. One reason for this is that if comparisons of different-aged children's beliefs are to be made, researchers first need to know whether younger and older children view the beliefs in the same ways. Several researchers have looked at how children's concepts of the different constructs change as they get older. Most of this work has focused on children's views about ability and intelligence. Because ability or competence beliefs are central in the Eccles *et al.* model, I review the work on children's conceptions of ability next.

Changes in Conceptions of Ability. John Nicholls and his colleagues have extensively examined children's notions of ability (e.g., Nicholls, 1978, 1984, 1990; Nicholls and Miller, 1984; Nicholls *et al.*, 1986). These researchers have asked children of different ages various questions about ability, intelligence, effort, and task difficulty, and how different levels of performance can occur when children exert similar effort. Focusing first on the work on ability and effort, their analyses of children's responses show four relatively distinct levels of reasoning about how ability and effort are differentiated (see Nicholls, 1990, for a more complete review of this work). At the first level (occurring in children aged 5 to 6) effort, ability, and performance are not clearly differentiated in terms of cause and effect. At the second level (dominant in children aged 7 to 9) effort is seen as the primary cause of performance outcomes; however, effort and ability are differentiated as causes. At level 3 (ages 9 to 12) children begin to differentiate ability and effort as causes of outcomes, but they do not always apply this distinction. Finally, at level 4, which emerges between the ages of 10 and 13, children clearly differentiate ability and effort, and understand the notion of ability as capacity. That is, children conceive that one's ability can limit the effects additional effort can have on performance, and that if success requires a great deal of effort it may mean the individual lacks ability.

Dweck and her colleagues (e.g., Dweck and Bempechat, 1983; Dweck & Elliott, 1983; Dweck and Leggett, 1988) have discussed how some children view ability as unchangeable. In their view, children hold one of two views of intelligence or ability. Children holding an *entity* view of intelligence believe that intelligence is a stable trait. Children holding an *incremental* view of intelligence believe that intelligence is changeable, so that it can be increased through effort. It appears that the entity view of intelligence is similar to the view of "ability as capacity" that Nicholls discussed. However, Nicholls (1990) argued that Dweck and her colleagues equate "ability" and "intelligence" in their work, thus glossing over important dif-

ferences between the two constructs (see Nicholls, 1990; Nicholls *et al.*, 1986, for discussion of their work on children's conceptions of intelligence, and how ability and intelligence are different constructs).

Despite the differences in their approaches to defining and assessing the construct of intelligence, both Nicholls (1984, 1990) and Dweck and her colleagues (e.g., Dweck and Elliott, 1983; Dweck and Leggett, 1988) have discussed how children's conceptions of ability and intelligence can have important motivational consequences. A sense of ability as capacity means that failure is more debilitating. Some children holding this view will believe they have little chance of ever doing well, because their ability cannot be improved. "When ability is construed as capacity, perception of oneself as lacking a given ability would, presumably, be more aversive and make it seem more unlikely that we could perform well on tasks demanding this form of ability" (Nicholls, 1990, p. 25). In contrast, believing effort can improve performance in important ways should mean that children will continue to try even if they are not doing well on a given task (see Dweck and Leggett, 1988; Nicholls, 1984, 1990 for further discussion).

Changes in Conceptions of Subjective Task Values. Researchers have not yet addressed changes in the meaning of the components of task value identified by Eccles *et al.* (1983), although there likely are age-related differences in children's conceptions of what it means to value different tasks. Wigfield and Eccles (1992) suggested that during the early elementary school grades the subjective value of a task may be primarily characterized by children's interest in the task. If so, then young children's choice of different activities may come from their interest in those activities. Young children's interests may shift fairly rapidly, so that they may do many different activities for a short time before deciding which activities they enjoy the most.

Initially, young children's interest in a task may not relate closely to their performance level; children may engage in different achievement activities that interest them regardless of how well they are doing on those activities. However, recent research findings suggest that children's interest in a topic does begin to relate to their performance during the elementary school years. For instance, Asher, Hymel and Wigfield (1978) and Asher and Markell (1974) found that elementary school children better understood high- than low-interest material. Other researchers have found that children recalled more from interesting sentences (Anderson, Mason, and Shirey, 1984), and that they paid more attention (as measured by duration of reading time) to interesting than non-interesting materials (Anderson, 1982). Shirey (1992) discussed how children's better recall of the interesting sentences was not due to this attentional difference; when the relation between attention and recall was controlled the relation between interest and recall still remained. Renninger (1992) found in studies of fifth and sixth

graders that interest in the materials read enhanced comprehension, even of materials that were quite difficult for the children (although there were some gender differences in these patterns). Overall, these results indicate that students' interest in the material relates quite clearly to the use of effective learning strategies, their level of attention, and their comprehension of reading materials.

However, other recent work complicates this seemingly clear relation between interest and comprehension. Garner and her colleagues (see Garner, Brown, Sanders, and Menke, 1992 for a review) found that adding interesting bits of information to rather uninteresting text passages actually lowers comprehension of the important ideas in the text. Garner *et al.* called these interesting details "seductive details," and argued that they may distract readers' attention away from the central ideas in the text. Somewhat similarly, Wade (1992) reviewed work showing that there often is not good correspondence between the interesting material and the important material (i.e., the central ideas) in text passages. Wade and Schraw (1990) found that readers tend to remember better the high interest material in a text passage, even if it is not the most important material in the passage. One central implication of this work is that spicing up texts with interesting but not necessarily relevant information actually may decrease comprehension of the most important material. However, perhaps the most important implication is that the central ideas in a passage should be presented in an interesting way, so that comprehension is facilitated rather than decreased by the interest level of the passage. In terms of this article, this work shows in a rather specific way how children's valuing of an activity relates to their performance on that activity.

How might the other components of subjective values become differentiated from children's interest in different activities? Initially, children's perceived interest and the importance they attach to various tasks likely will be highly correlated for most children. Only as they have more experiences with tasks that are not equally important and interesting will they come to see the distinction between these two aspects of task value. During the early and middle elementary school grades children's sense of the usefulness of different activities, especially for future goals, probably is not very clear, and so this component may only be understood later. This suggested developmental pattern could be assessed using interview techniques such as those Nicholls and his colleagues have used in their studies of children's understanding of ability and intelligence.

To conclude this section, researchers examining children's conceptions of ability have found that those conceptions vary across age. Similar work should be done on how children's conceptions of children's subjective values may change. The ways these constructs may change in children's

minds have as yet not been incorporated into the expectancy-value model considered here, for two main reasons. First, the model initially was developed to explain adolescents' achievement choices. By adolescence the constructs included in the model likely are fully developed. Second, in tests of the model done to date researchers primarily have used questionnaires rather than interviews as measuring instruments. Interview techniques are needed to understand and probe children's actual *conceptions* of a given construct. The changes in children's conceptions of the different constructs likely influence the relations among them. Those relations are considered next.

RELATIONS AMONG COMPETENCE-RELATED BELIEFS AND SUBJECTIVE TASK VALUES

The research reviewed in this article on how children's competence beliefs, expectancies for success, and subjective values change has important implications for the nature of relations among the different belief constructs, and beliefs and behaviors. In their expectancy-value model (see Fig. 1), Eccles *et al.* (1983) proposed clear causal links between children's goals, competence beliefs, subjective values, and expectancies for success. The factor analytic work reviewed earlier indicates that children's competence beliefs and subjective values in different domains form distinct factors quite early. Similarly, children's goal beliefs also appear to be differentiated. Yet how do these different beliefs relate to one another in younger children? That question is the topic of this section.

Two main predictions about the nature of the relationship between competence beliefs and expectations for success can be made. First, competence beliefs and expectancies for success should be positively related; indeed, the correlations reported in Eccles and her colleagues' work show that these beliefs are positively (and highly) related (e.g., Eccles *et al.*, 1983; Eccles and Wigfield, in press; Wigfield, 1984). Thus the child who believes he or she is competent at a certain task believes that mastery of similar tasks in the future is quite possible; children having low beliefs of competence have lower expectations for success. From the factor-analytic research presented earlier, these beliefs may be nearly identical in practical terms. However, because competence beliefs seem to be more general or basic beliefs than one's expectancies for success on a task (see Wigfield and Eccles, 1992), competence beliefs may causally precede expectancies for success in the manner shown in the model. Indeed, in their longitudinal study of relations among mathematics achievement beliefs and behavior, Meece *et al.* (1990) found that adolescents' competence beliefs did predict

their subsequent expectancies for success in math. Second, these positive relations should increase across the elementary school years as children's competence beliefs become more related to their performance outcomes. In fact it is anticipated that these correlations will be the highest of any between any of the beliefs.

Turning to children's subjective task values, in several different studies researchers have found that children's competence and expectancy beliefs relate positively to their subjective values (e.g., Battle, 1966; Eccles and Wigfield, in press; see Wigfield and Eccles, 1992, for more detailed discussion). These findings contrast with Atkinson's (1957) assertion that the most valued tasks are the ones which are difficult for individuals to do (i.e., tasks on which individuals have low expectancies for success). The positive relations between competence beliefs and values should increase across the elementary school grades. In the early school years children's competence beliefs may not relate to their valuing of different activities; instead the two constructs could be relatively independent. This independence would mean that children might pursue some activities in which they are interested regardless of how good or bad they are at the activity. Particularly in the achievement domain many children may become more likely to value activities on which they do well; thus at that point the two kinds of beliefs would relate positively to one another. Also, those beliefs would then begin to mutually predict performance and choice of different activities.

How might children's competence beliefs relate to the different components of subjective values? During the early elementary school years, the strongest relations among the components of subjective values identified by Eccles *et al.* (1983) with children's beliefs about their competence may be between children's interest in different tasks and their competence beliefs. This is because children's conceptions of the importance of different tasks or their usefulness may not be very clear in the first several years of school. As children gain more experience with different tasks and begin to think about what they might do later, their beliefs about the importance and utility of different tasks should correlate more highly with their competence beliefs. Eccles and Wigfield (in press) found this pattern of relations among these constructs in fifth through twelfth grade children. During elementary school, these relations may still be only moderate, because children's ideas about what is useful change through most of the elementary and even into the secondary school grades. Children's beliefs about competence and interest in different subjects should continue to be positively related, although it is conceivable that in some subjects the relations may become weak. For instance, students may know that they are skilled in some subjects yet not be interested in them; examples might be courses students need to take as a prerequisite for a certain major or career. Con-

versely, they may be interested in some activities even if they are not particularly competent at those activities.

ACHIEVEMENT GOALS: CONTRASTING PERSPECTIVES

Achievement goals as defined by Eccles *et al.* (1983) are the broad purposes children have for learning or doing different activities. Eccles *et al.* discussed goals such as career plans and desires to act in accordance with certain behavior standards as important goals guiding achievement behavior. Thus achievement goals are rather broadly defined by Eccles *et al.* In fact, one important distinction between achievement goals and subjective values in this model is that values refer to more task-specific purposes for engaging in a task, whereas goals are broader influences first on values and then on achievement behavior.

In current research on achievement motivation researchers have been quite interested in children's achievement goals and how those goals relate to their achievement behavior (e.g., Ames, 1992; Blumenfeld, 1992; Dweck and Leggett, 1988; Ford, 1992; Nicholls, 1979b, 1984; Nicholls *et al.*, 1989; Nicholls, Cobb, Wood, Yackel, and Patashnick, 1990a; Nicholls, Cobb, Yackel, Wood, and Wheatley, 1990b). However, these researchers focus mostly on the specific goals children have in different achievement situations, particularly the goals children have for success in achievement situations, rather than the broader goals discussed by Eccles *et al.* (1983). In discussing specific goals for success, Nicholls and his colleagues (e.g., Nicholls, 1979b, 1984; Nicholls *et al.*, 1989) defined two major kinds of goals that children have: ego-involved goals and task-involved goals. Individuals who adopt ego-involved goals seek to maximize favorable evaluations of their competence and minimize negative evaluations of competence. Questions like "Will I look smart?" and "Can I outperform others?" reflect ego-involved goals. In contrast, with task-involved goals, individuals focus on mastering tasks and increasing competence at different tasks. Questions such as "How can I do this task?" and "What will I learn?" reflect task-involved goals. Dweck and Elliott (1983) and Dweck and Leggett (1988) provided a complementary analysis. They called ego-involved goals performance goals, and task-involved goals learning goals. Ames (1992) uses the terms performance and mastery goals. These researchers have discussed how these kinds of goals influence individuals' performance in achievement settings and choice of different tasks. With ego-involved goals, children try to outperform others, and are more likely to do tasks they know they can do. Task-involved children choose challenging tasks and are more concerned with their own progress than with outperforming others.

In terms of the differentiation of children's goals, Nicholls (1979b, 1984, 1990) suggested that the two goal patterns he defined exist across the school years; hence he assumed those goal patterns are differentiated early on. Nicholls and his colleagues developed questionnaire measures of task and ego goal patterns. Their factor analyses of these measures showed that the two kinds of goals formed distinct factors in second grade children (Nicholls *et al.*, 1990a,b), as well as in older elementary school-aged children (Nicholls and Thorkildsen, 1987) and high school students (Nicholls *et al.*, 1989). However, Nicholls also suggested that the ego goal orientation becomes more prominent for many children as they get older (see also Dweck and Bempechat, 1983; Dweck and Leggett, 1988).

Relations of Children's Competence Beliefs and Achievement Values to Their Achievement Goals

Researchers have made different predictions concerning relations between competence beliefs and achievement goals, in part because of the different conceptions of the nature of achievement goals. Dweck and Leggett (1988) argued that children's definitions of intelligence determine their goals in achievement situations; children holding the entity view that intelligence is fixed will be more likely to adopt performance goals in which obtaining positive evaluations of competence is most important. Children holding the incremental view that their abilities can be improved will be more likely to adopt learning goals, in which improvement of skills is most important. Thus as children's beliefs about ability change their goal orientation likely changes as well.

In contrast, Nicholls (1990) argued that children's goal orientations are *not* related to their beliefs about ability. They base this view on their empirical findings that children's goal orientation does not correlate with their perceived ability (e.g., Nichols *et al.*, 1990a; Nicholls & Thorkildsen, 1987). Further, as discussed earlier, children as young as second grade appear to distinguish task and ego goals, whereas their definitions of intelligence and ability change greatly across the childhood years. These contrasting views of the relations between ability beliefs and goals need to be tested further.

Dweck and Elliott (1983) discussed how learning and performance goals relate to children's subjective values. They argued that children's values are determined by the kind of achievement situation the child is in. With test-like, evaluative achievement situations the child learns to value performance goals, and those goals become prevalent. With a more mastery focus in achievement situations, children will value learning goals, particu-

larly if they see the skills as useful, are interested in acquiring those skills, and if skill increases are made salient.

The direction of these predictions is different than that proposed by Eccles *et al.* (1983). As shown in Fig. 1, Eccles *et al.* stated that goals determine subjective values, rather than the reverse. One reason for the different predictions is that Eccles *et al.* discussed different kinds of goals than did Dweck and her colleagues. Eccles *et al.* focused more on broader life goals such as career plans, whereas Dweck and Elliott (1983) and Dweck and Leggett (1988) focused on more specific learning and performance goals in different achievement situations. One way to integrate these perspectives is to suggest that the broader goals discussed by Eccles *et al.* are causally prior to expectancies and values, with expectancies and values then determining the more specific goals in a given achievement situation. Integrating these two kinds of goals into the expectancy-value model remains an important issue for researchers to address in the future.

Nicholls' (1990) view on the relations between goals and subjective values seems more similar in causal sequence to Eccles *et al.*'s (1983) view. Nicholls proposed that children's goals for success influence their motivational orientation and valuing of school. Ego-involved goals are associated with valuing superior ability and beating others as essentials for school success. Students having task-involved goals value interest, effort, and cooperation with others as ways to achieve school success. Task-involved goals also relate to students' satisfaction with school, whereas ego goals do not. In terms of the expectancy-value model one suggestion is that children's ego goals might be associated most highly with their sense of the usefulness of a given task, whereas their task-involved goals should be associated more with their intrinsic valuing of the task. These proposed relations could be tested by giving Nicholls' questionnaire on goal types and our questionnaire measures of subjective values to groups of different-aged children and looking at the correlations across them.

RELATIONS OF CHILDREN'S ACHIEVEMENT BELIEFS AND SUBJECTIVE TASK VALUES TO THEIR ACHIEVEMENT BEHAVIORS

An issue of fundamental importance regarding these competence-related beliefs, subjective task values, and goals is how their relations to children's performance and activity choice change across age. Several researchers have found that relations between children's competence and expectancy beliefs and their performance are stronger as children get older (Nicholls, 1979a; Parsons and Ruble, 1977; Stipek, 1984). Researchers test-

ing aspects of the expectancy-value model also have found that competence-related beliefs relate to performance. Eccles and her colleagues have conducted two large-scale longitudinal studies of how children's achievement beliefs relate to their performance in elementary, junior high, and high school math classes, and their choices of whether to continue taking math courses. They measured adolescents' competence beliefs, expectancies for success, valuing of math and English, and intentions to take more math or English, and obtained students' grades and course enrollment decisions from school records. Using path analysis and structural equation modeling, Eccles and her colleagues have shown that students' competence-related beliefs predict children's subsequent grades in mathematics and English beyond that predicted by their previous grades. Children's subjective task values are the strongest predictor of both intentions and actual decisions to keep taking mathematics and English (Eccles, 1984a,b; Eccles *et al.*, 1983; Eccles, Adler, and Meece, 1984; Meece *et al.*, 1990; see also Ethington, 1991). For instance, Eccles (1984b) showed that fifth through twelfth grade students' expectancies for success predicted subsequent grades in math more strongly than did their subjective values. Students' valuing of math predicted their intentions to keep taking math more strongly than did their expectancies for success. Eccles (1984a) and Eccles, Adler, and Meece (1984a) showed that eighth through tenth grade students' valuing of math strongly predicted their decisions to enroll in advanced high school math courses. Meece *et al.* (1990) found that the importance junior-high school students attach to math competence predicted their intentions to continue taking math more strongly than did their expectancies for success in math. Students' expectancies for success predicted subsequent math grades more strongly than did the importance of math. Meece *et al.* also found that the predictive links between expectancies, values, grades, and intentions were similar for boys and girls. Finally, Wigfield (1992) reported that children's competence beliefs measured in fifth grade predicted their grades in math as many as 8 years later.

How might younger children's competence beliefs and values relate to their performance and activity choices? From Nicholls' (1979a) research, it seems likely that relations between competence/expectancy beliefs and achievement performance would become stronger across the early school grades. In addition, from the work on conceptions of ability and intelligence described earlier it is likely that children's changing conceptions of ability should change the nature of the relationship between competence beliefs/expectancies for success and achievement performance shown in Fig. 1. For children viewing ability as capacity, that relation should be stronger. Children believing they have more ability likely will perform better, and those believing they lack ability will perform more poorly. By contrast, for

children believing that increased effort improves their ability, the relation between competence beliefs and performance may be weaker. Instead, beliefs such as effort and their valuing of different tasks may relate more strongly to performance than do their competence beliefs (see Dweck and Leggett, 1988, for further discussion of how children's views of ability relate to their performance on and choice of different tasks).

From the developmental sequence of subjective values described earlier, it could be suggested that young children's interest would relate to their choice of different activities, whereas their views about importance and utility of the activities would not. During the middle-elementary school grades and into junior high school the other two components may become more predictive of choice, and by the high school years utility value often may be the strongest predictor. For older children this differential prediction does occur. Wigfield and Eccles (1989) found that for junior-high school students interest in math was the strongest predictor of intentions to keep taking math. For high-school students both interest and perceived usefulness of math predicted intentions.

Summary: Implications for the Eccles *et al.*'s Expectancy-Value Model

One implication of the work on the structure of children's competence beliefs and subjective values is that even children in the early elementary school grades distinguish clearly among these different constructs. Thus the general form of the model should be similar for children in, say, second grade and children in sixth grade. However, other beliefs such as competence beliefs and expectancies for success appear to be less clearly distinguished. Although competence beliefs and values appear to be distinct from one another even during the early elementary-school years, it does not appear that all the components of subjective values proposed by Eccles *et al.* (1983) are empirically distinct in the first few years of elementary school. Thus although young children's broad valuing of a task may predict their engagement with the task, for these children the various components of values would not differentially predict that engagement.

Second, the causal links in the model will increase in strength as children get older. To date this has been empirically demonstrated primarily with relations between children's competence beliefs and their performance, but it is likely that this pattern occurs for other beliefs as well. Therefore, it would seem that as children get older individual differences in children's beliefs also have more of an impact on children's performance and choice of different activities. For instance, children's competence beliefs will become more strongly predictive of good performance if children

maintain positive competence beliefs, or of poor performance if children's competence beliefs become more negative. Similarly, children's valuing of different activities will increasingly predict their choice either to continue certain activities or discontinue them, when those choices become available during the secondary school years.

Third, because the model is a linear one, Eccles *et al.* (1983) assumed a certain causal ordering in the directions of relations among the constructs in the model. Children's competence beliefs and goals influence their expectancies for success and subjective values, which in turn influence different aspects of performance. Although this causal sequence is proposed, it is important to acknowledge that the sequence likely becomes quite complex. Further, once into the sequence, children's beliefs will begin to influence one another in reciprocal fashion. For instance, children's competence beliefs may influence children's interest in a task; that greater interest could lead to higher competence beliefs, which may further increase interest, and so on. Harter and Connell (1984) likened relations among young children's beliefs to a chain, and those of older children to an integrated set. The same point no doubt applies to this model. Researchers trying to untangle the causal sequence in the early development of these beliefs will need to conduct longitudinal studies of the relations among achievement beliefs, values, goals, and achievement behaviors.

DIRECTIONS FOR FUTURE RESEARCH

As we have seen, recent work on change in the structure of young children's achievement related self-beliefs and children's conceptions of those belief constructs has important implications for the expectancy-value model of achievement performance and choice proposed by Eccles *et al.* (1983). More specifically, based on this work it can be suggested that the form or structure of the model, the nature of the relations among the constructs proposed in the model, and the strength of those relations all will differ for younger and older children. During the last decade we have learned much about the nature and development of young children's achievement-related self-beliefs, yet much remains to be done in this area. To conclude this paper, some important directions for future research will be highlighted. I discuss both theoretical and methodological issues.

Two interesting theoretical questions needing further attention are when exactly do children's achievement beliefs become differentiated, and what factors contribute to that differentiation? Researchers (e.g., Eccles *et al.*, 1993b; Marsh *et al.*, 1991) now have shown that children as young as kindergartners have distinct competence beliefs in different domains, which

means that this differentiation occurs very early, before children have had extensive experience in school. Assessing preschool children's competence beliefs, values, and goals with questionnaire type-measures is difficult; other methodologies may have to be developed to examine how children's beliefs become differentiated. Heyman *et al.* (1992) and Stipek *et al.* (1992) have done some important work on how very young children react to success and failure experiences. Doing similar kinds of studies with achievement tasks in other domains, and perhaps interviewing children about that performance, may provide important evidence about how children's achievement beliefs become differentiated so early.

In the last decade we have learned much about children's competence beliefs and achievement goals. We still know less about children's subjective values, although researchers have begun to assess that construct more fully as well. It now may be time for researchers to compare more systematically the similarities and differences across different definitions of achievement goals, and between the goals and values constructs. I contrasted Eccles *et al.*'s (1983) definitions of achievement goals with those of other researchers studying goals, and discussed how goals for success and subjective values may be related. To take this analysis one step further, it now might be interesting to more explicitly compare the goals for success and subjective value constructs. Nicholls and his colleagues (e.g., Nicholls *et al.*, 1989, 1990b) developed scales to measure task and ego goals. Items on the task goals scale include "I work hard all the time" and "I find a new way to solve a problem." Items on the ego orientation scale include "I finish before my friends" and "I know more than the others." It would be interesting for researchers to administer these scales along with the Eccles and Wigfield (in press) subjective values scales (see Table I for sample items) to groups of children, to determine how similar or different these constructs are. Factor analyses could be done on the complete set of items, and relations among the constructs could be assessed. These sorts of analyses would provide an empirical indication of similarities and differences across these constructs; for instance, do certain of the goals and values items form single factors, or are the constructs very distinct? Including measures of the kinds of broader goals Eccles *et al.* (1983) discussed would allow for the assessment of links between broader and more specific goals, and their relations to subjective values. Such work would provide greater theoretical clarity, and perhaps theoretical integration, in this area.

Another important direction for researchers interested in children's achievement beliefs and values is to assess more completely links between motivational constructs like expectancies and values and children's cognition and performance. Researchers, notably Pintrich and his colleagues, have begun to assess how junior high school and college students' expect-

tancies and values relate to their use of cognitive strategies and self-regulation (see Pintrich, 1989; Pintrich and DeGroot, 1990). In their studies, students complete a questionnaire measure of their perceived self-efficacy, subjective values, cognitive strategy use, self-regulation of their learning, and test anxiety. The values measure is a composite that includes items assessing the interest, importance, and usefulness dimensions of task values that Eccles *et al.* (1983) defined. Pintrich and his colleagues have found that students' perceived self-efficacy and values relate positively to their use of cognitive strategies and self-regulation. The relations between subjective values, strategy use, and self-regulation are stronger than those between self-efficacy, strategy use, and self-regulation. As in our work, they find that expectancies relate more strongly to performance than do subjective values. However, they have found that the cognitive strategy and self-regulation scales more directly predict performance; the effects of self-efficacy and values on performance are mediated through the other constructs. These results provide fascinating evidence for the ways motivation and cognition can work together to facilitate (or impede) performance on different school tasks. From the perspective of this article, it would be interesting to assess these links developmentally, to see how they become established over the elementary school years.

Finally, there are important methodological issues that require more research. Most researchers assessing the constructs reviewed in this paper continue to do cross-sectional work. To understand actual change in these important constructs more longitudinal studies are needed. For example, in their important review of the literature on children's beliefs about intellectual competence, Stipek and MacIver (1989) concluded that children's beliefs decrease across the elementary school years. Yet most of the research they based this conclusion on was cross-sectional. More studies of actual change in children's beliefs and values like the Wigfield *et al.* (1993) study are needed to really substantiate this conclusion. Longitudinal work also is needed to allow researchers to test more adequately models like the one in Fig. 1 in which causal orderings of constructs are proposed. As with studies of mean level differences in children's beliefs, many researchers who test proposed causal relations in theoretical models do so utilizing one panel of data. When theorists propose causal sequences in beliefs (as is the case of the model in Fig. 1), cross-sectional tests are inadequate to understand fully the proposed causal sequence. Although longitudinal work is expensive, takes a long time to complete, and is often called for but seldom done, it very much is an important next step in this area. Such studies should examine both within-year change in children's beliefs and values, and across-year change, to help gauge what happens as children move into new classrooms (see Wigfield *et al.*, 1991, for an example of such a design).

Last, researchers need to continue to improve their measures of children's self-beliefs. Great strides were made during the 1980s in developing more adequate measures of children's competence beliefs, subjective task values, and other self-related beliefs, because researchers such as Harter, Marsh, Nicholls, and ourselves who developed these measures utilized theory to guide their development, and then conducted extensive psychometric work on those measures (see Wylie, 1989 for a review of some of these more recent measures). Yet problems still exist, particularly when the self-beliefs of young children are assessed. We need more work on the kinds of wording of questionnaires, answer scales to use, and ways of administering questionnaires that maximize the accuracy of young children's responses. One especially important methodological issue is whether questionnaires given to children of different ages should contain the same wording of items, or different wordings. Those developing questionnaire measures have not dealt much with the thorny issue of constructs such as "ability" seeming to mean different things for children of different ages. One way to deal with this problem is to vary item wording for questionnaire measures given to different age children (see Harter and Pike, 1984, for an example of such an approach). However, that kind of change might make it difficult to compare different-aged children's responses. Researchers need to think through the implications of giving the same or differently worded questionnaires to different-aged children. Another way to improve our measures would be to do more systematic comparisons of different kinds of self-concept scales (for a good example of one such study, see Marsh and Holmes, 1990). Such work would improve our methodology in this area, and likely lead to greater theoretical clarity as well, by helping us decide how similar or different various constructs are.

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