

Expectancy–Value Theory of Achievement Motivation

Allan Wigfield

University of Maryland

and

Jacquelynne S. Eccles

University of Michigan

We discuss the expectancy–value theory of motivation, focusing on an expectancy–value model developed and researched by Eccles, Wigfield, and their colleagues. Definitions of crucial constructs in the model, including ability beliefs, expectancies for success, and the components of subjective task values, are provided. These definitions are compared to those of related constructs, including self-efficacy, intrinsic and extrinsic motivation, and interest. Research is reviewed dealing with two issues: (1) change in children's and adolescents' ability beliefs, expectancies for success, and subjective values, and (2) relations of children's and adolescents' ability-expectancy beliefs and subjective task values to their performance and choice of activities. © 2000 Academic Press

Achievement motivation theorists attempt to explain people's choice of achievement tasks, persistence on those tasks, vigor in carrying them out, and performance on them (Eccles, Wigfield, & Schiefele, 1998; Pintrich & Schunk, 1996). As discussed by Murphy and Alexander (this issue), there are a variety of constructs posited by motivation theorists to explain how motivation influences choice, persistence, and performance. One long-standing perspective on motivation is expectancy–value theory. Theorists in this tradition argue that individuals' choice, persistence, and performance can be explained by their beliefs about how well they will do on the activity and the extent to which they value the activity (Atkinson, 1957; Eccles et al., 1983; Wigfield, 1994; Wigfield & Eccles, 1992). In this article we discuss the nature of the expectancy and value constructs, how they develop, and

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Address reprint requests to Dr. Allan Wigfield, Department of Human Development, University of Maryland, College of Education, College Park, MD 20742.



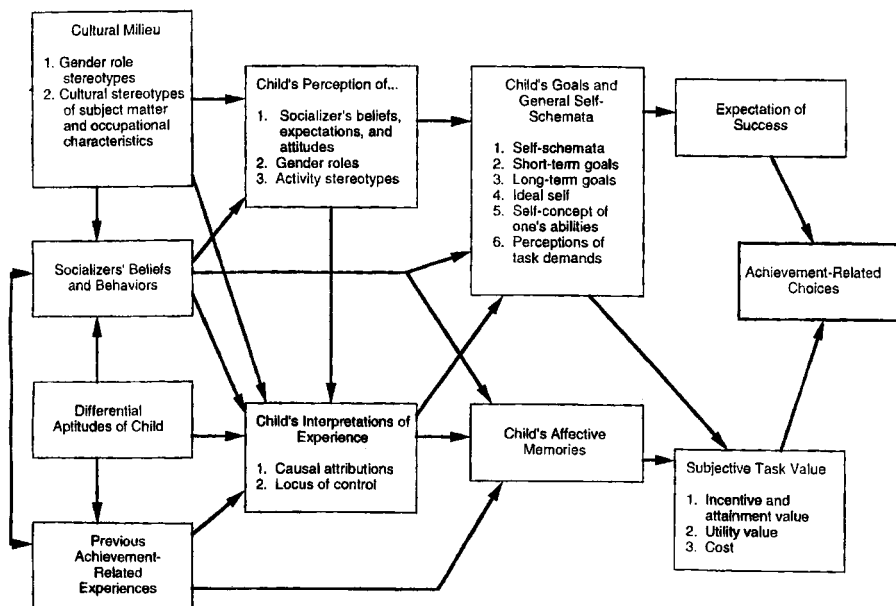


FIG. 1. Eccles, Wigfield, and colleagues' expectancy-value model of achievement motivation.

how they relate to children's and adolescents' performance and choice. We focus on the expectancy-value model developed and assessed by Eccles, Wigfield, and their colleagues (Eccles, 1984; Eccles et al., 1983; Wigfield, 1994; Wigfield & Eccles, 1992).

Eccles et al. (1983) proposed an expectancy-value model of achievement performance and choice and studied it initially in the mathematics achievement domain. The most recent statement of this model is presented in Fig. 1; the overall model is presented to provide a sense of its scope. We focus in this article on a portion of the model; specifically, the constructs contained in the expectancies and subjective task values boxes, along with some of the constructs in the box containing goals and self-schemata. As can be seen in the figure, expectancies and values are assumed to influence directly achievement choices. They also influence performance, effort, and persistence. Expectancies and values are assumed to be influenced by task-specific beliefs such as ability beliefs, the perceived difficulty of different tasks, and individuals' goals, self-schema, and affective memories. These social cognitive variables, in turn, are influenced by individuals' perceptions of their own previous experiences and a variety of socialization influences (see Eccles et al., 1983, Eccles et al., 1998, and Wigfield & Eccles 1992 for discussion of these influences).

TABLE 1
Items Used to Assess Children's Ability Beliefs and Subjective Task Values

Ability Beliefs Items

1. How good in math are you? (not at all good very good)
2. If you were to list all the students in your class from the worst to the best in math, where would you put yourself? (one of the worst one of the best)
3. Some kids are better in one subject than in another. For example, you might be better in math than in reading. Compared to most of your other school subjects, how good are you in math? (a lot worse in math than in other subjects a lot better in math than in other subjects)

Expectancy Items

4. How well do you expect to do in math this year? (not at all well very well)
5. How good would you be at learning something new in math? (not at all good very good)

Usefulness, Importance, and Interest Items

1. Some things that you learn in school help you do things better outside of class, that is, they are useful. For example, learning about plants might help you grow a garden. In general, how useful is what you learn in math? (not at all useful very useful)
 2. Compared to most of your other activities, how useful is what you learn in math? (not at all useful very useful)
 3. For me, being good in math is (not at all important very important)
 4. Compared to most of your other activities, how important is it for you to be good at math? (not at all important very important)
 5. In general, I find working on math assignments (very boring very interesting [fun])
 6. How much do you like doing math? (not at all very much)
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Defining the constructs in models of motivation is an important goal of this special issue. Eccles et al. (1983) defined and measured expectancies for success as children's beliefs about how well they will do on upcoming tasks, either in the immediate or longer term future. Ability beliefs are defined as the individual's perception of his or her current competence at a given activity. Ability beliefs thus are distinguished conceptually from expectancies for success, with ability beliefs focused on present ability and expectancies focused on the future. However, empirically these constructs are highly related (see Eccles & Wigfield, 1995; Eccles et al., 1993; this issue is discussed in more detail later). The items we use to measure these constructs appear in Table 1; items from the mathematics domain are used as examples. As can be seen we primarily have measured these two beliefs at the domain-specific level, although we occasionally have asked about specific activities within different domains.

These definitions can be compared to those of related constructs in the literature. Bandura (1997) included expectancies in his discussion of self-efficacy. He distinguished between efficacy expectations, or the individual's belief that he or she can accomplish a task, and outcome expectancies, or

the belief that a given action will lead to a given outcome (see also Pajares, 1996). He argued that expectancy-value theorists historically have focused on outcome expectations in their models, and stated further that efficacy expectations are more predictive of performance and choice than are outcome expectations. We would not argue with his claim that efficacy expectations are more strongly predictive of performance and choice. However, we would argue that in our work we have measured individuals' own expectations for success, rather than their outcome expectations. Thus our expectancy construct is more similar to Bandura's efficacy expectation construct than it is to the outcome expectancy construct.

Beliefs about one's ability play a prominent role in different motivation theories. A complete review of these theories is outside the scope of this article (see Eccles et al., 1998 and Pintrich & Schunk, 1996, for reviews), but we briefly discuss definitions of the ability construct in various motivation and self-concept theories. In his attribution theory, Weiner (1985) proposed that individuals viewed ability as a relatively stable characteristic over which they had little control. He argued that attributions made to ability (and lack of ability) have important motivational consequences. Attributing success to ability has positive motivational consequences, whereas attributing failure to lack of ability has negative consequences. Covington (1992) also focused on individuals' ability beliefs in his self-worth model, arguing that individuals attempt to maintain a positive sense of ability in order to preserve their self-worth. Like Weiner, Covington focused on perceived ability as a relatively stable capacity. However, based on developmental work on children's understanding of the ability construct (e.g., Nicholls, 1978, 1990), he noted developmental differences in individuals' conceptions of ability. In their self-determination theory, Deci, Ryan, and their colleagues (e.g., Deci & Ryan, 1985; Ryan, 1992) included the need for competence as a basic need that individuals have and discussed how this need is a major reason why people seek out optimal stimulation and challenging activities. Finally, self-concept researchers often focus on beliefs about how good one is at different activities as a crucial aspect of self-concept. The measures these researchers developed include many items assessing individuals' beliefs about their ability in different areas (e.g., Harter, 1982, 1990; Marsh, 1989).

Researchers often measure ability-related beliefs in somewhat different ways. One crucial difference among measures is the level of specificity of measurement. Bandura (1997) argued that efficacy should be measured specifically because specific measures of beliefs relate more closely to behavior. Pajares (1996), in an article comparing self-efficacy with related constructs, noted that efficacy most often has been measured at the task-specific level. These measures typically ask individuals about how confident they are they can accomplish the task. However, at times Bandura has measured self-effi-

cacy rather generally. For instance, Bandura, Barbaranelli, Caprara, and Pastorelli (1996) measured individuals' efficacy for different academic subjects and then combined them into an overall measure of academic efficacy. As we noted above, our measures of ability beliefs and expectancies have tended to be domain rather than activity specific, and so our approach has been somewhat more general than much of Bandura's research and that of other researchers studying self-efficacy (e.g., Schunk, 1983).

Another crucial issue is how individuals are asked to judge their abilities. As seen in Table 1, we ask individuals to rate their individual abilities ('how good are you') and also ask them to compare their abilities across different subject areas and to other individuals. Self-concept researchers such as Harter (1990) and Marsh (1989) have not asked the comparative questions, focusing instead on questions about how good the individual thinks she is and how well or poorly she can do different activities. Self-efficacy researchers also tend to focus on individuals' beliefs about how confident they are they can complete different tasks rather than asking them to compare their efficacy to that of others (Bandura, 1997; Pajares, 1996).

In sum, ability and expectancy beliefs are crucial to the expectancy-value theory of motivation and are present in other major theories as well. The definition of these constructs varies some across theoretical perspectives. Measures of these beliefs also vary across theory, especially with respect to their specificity and exactly what aspects of ability are asked about. An important implication of these differences is that when researchers choose measures for future work on ability-related beliefs, they should carefully consider how specific they want their measures to be and which aspects of perceived ability they are most interested in measuring. An important task remaining for future research is to examine more closely how similar and different these various measures are.

Turning to the achievement values portion of the model, Eccles et al. (1983) defined different components of achievement values: attainment value or importance, intrinsic value, utility value or usefulness of the task, and cost (see Eccles et al., 1983, and Wigfield & 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. When individuals do tasks that are intrinsically valued, there are important psychological consequences for them, most of which are quite positive (see Deci & Ryan, 1985 for further discussion) 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 how the decision to engage in one activity (e.g., doing schoolwork) limits access to other activities (e.g., calling friends), assessments of how much effort will be taken to accomplish the activity, and its emotional cost. Most of our

empirical work has focused on the first three of these value constructs, so we limit our discussion to them.

Other motivation researchers have assessed constructs related to the intrinsic and utility value constructs. Interest value is a construct similar to the construct of intrinsic motivation as defined by Deci and his colleagues (Deci & Ryan, 1985; Deci, Vallerand, Pelletier, & Ryan, 1991) and by Harter (1981) because it concerns doing a task out of interest and enjoyment. This construct also bears some relation to the construct of interest as discussed by researchers such as Alexander, Kulikowich, and Jetton (1994), Renninger, Hidi, and Krapp (1992), and Schiefele (1996). Utility value captures more "extrinsic" reasons for engaging in a task, such as doing a task not for its own sake but to reach some desired end state. This construct thus can be tied to the construct of extrinsic motivation (see Deci & Ryan, 1985; Harter, 1981 for further discussion of extrinsic motivation). Although there potentially is some overlap in these constructs, it is important to point out that the values constructs and constructs of intrinsic and extrinsic value and interest come from distinct theoretical perspectives and so have different intellectual roots.

STUDIES TESTING ASPECTS OF THE EXPECTANCY-VALUE MODEL

We now have done a number of studies of the development of children's and adolescents' ability beliefs, expectancies for success, and subjective values. In this section we discuss our findings regarding (1) how children's expectancies for success, ability beliefs, and subjective values change across the school years; and (2) how these beliefs and values relate to children's performance and activity choice.

We have addressed these issues in three major longitudinal studies. The first was a longitudinal study focused on gender differences in achievement beliefs and values about mathematics and English.¹ The sample consisted of 5th through 12th graders who completed questionnaires once each year over a 2-year period (see Eccles et al., 1983; Eccles & Wigfield, 1995; Meece, Wigfield, & Eccles, 1990). The second was a study of how the transition from elementary to junior high school influenced children's beliefs and values about different academic subjects, sports, and social activities (see Eccles et al., 1989; Wigfield et al., 1991). The sample consisted of children in 6th

¹ Gender differences in children's and adolescents' achievement beliefs and values have been a central focus of our work. Space limitations preclude detailed discussion of these differences. In general, our results show that boys and girls' beliefs and values differ in gender stereotypic ways, beginning as early as 1st grade. Interested readers can see Eccles et al. (1993), Eccles et al. (1989), Wigfield et al. (1991), and Wigfield et al. (1997) for discussion of gender differences in children's ability-related beliefs and values.

grade in elementary school who subsequently made a transition to junior high school in 7th grade. The third is a 10-year longitudinal study of how children's achievement beliefs and values change through the elementary and secondary school years (see Eccles et al., 1993; Wigfield et al., 1997). This study began with a group of children in 1st, 2nd, and 4th grades and followed them until they graduated from high school. In each study children completed questionnaires assessing their ability beliefs, expectancies for success, and subjective valuing of different activities, along with a variety of other constructs. Most of the children participating in the studies were European-American, and they came from lower middle class to middle class backgrounds.

How Children's Expectancies for Success, Ability Beliefs, and Subjective Values Change across the School Years

We focus in this article on findings regarding two kinds of change: (1) change in the structure of children's ability-related beliefs and values; and (2) mean level change in the level of children's and adolescents' ability-related beliefs and values. In the model expectancies for success, ability beliefs, and the different aspects of task values are proposed to be separate constructs. When studying young children, however, it is reasonable to ask if these constructs indeed are distinct in children's minds. It is important to establish these distinctions before examining mean-level change.

The structure of children's ability-related beliefs and achievement values. In her discussion of children's self-concept development, 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. Our work on this issue has focused on the differentiation of children's competence and expectancy beliefs and subjective task values. To address this issue we analyzed data from the first and third study, using confirmatory factor analyses. Confirmatory factor analysis (CFA) allows the researcher to test theoretically derived hypotheses about the structure of a set of variables and allows for the explicit comparison of different alternative models.

Several major findings have emerged from this work. First, across childhood and adolescence children's and adolescents' ability beliefs and expectancies for success consistently loaded together in our CFAs (see Eccles et al., 1993; Eccles & Wigfield, 1995). These theoretically distinct constructs do not appear to be empirically distinguishable, at least as we have measured them. However, children's and adolescents' ability-expectancy beliefs are domain specific. For example, Eccles et al. (1993) assessed children's ability beliefs and expectancies for success in the domains of math, reading, music, and sports. The CFAs indicated that children's beliefs in each domain formed distinct factors and that each of these factors was char-

acterized by the items measuring ability beliefs and expectancies for success in the domain. This domain differentiation occurred even for the 1st-grade children in the study. Marsh, Craven, and Debus (1991) also found that young children's ability self-concepts were distinct for different achievement domains.

Further, young children also seem to distinguish between their ability-related beliefs and subjective task values. Eccles et al. (1993) found that *within* the domains of math, reading, music, and sports, children's ability-expectancy beliefs and subjective values formed clearly distinct factors. This distinction was apparent even in the factor structure within each domain for the 1st 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 different achievement domains.

Can the different aspects of subjective values proposed by Eccles et al. (1983) be empirically identified? Eccles and Wigfield (1995), analyzing data from the first study which included early adolescents and adolescents, examined the attainment, interest, and utility value aspects proposed by Eccles et al. (1983) that could be distinguished empirically in the mathematics domain. The CFAs showed that the three task values factors were distinguished clearly, confirming the theoretical distinctions in the Eccles et al. model. Comparative tests of the factor structure of the younger (5th through 7th) and older (8th through 12) grade students showed no differences, indicating that the distinctions were made by the youngest as well as by the oldest students. 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 CFAs of children's responses to items in the math, reading, and sports domains.

In sum, even young children's ability-related beliefs are differentiated clearly across various activities, although within a given activity ability beliefs and expectancies for success factor together. Different components of subjective values also have been empirically identified, especially in children in 5th grade and above. The most important implication of the work just reviewed for the expectancy-value model (see Fig. 1) is that early in the elementary school years certain of the constructs proposed in the model have been shown to be distinct (e.g., ability-related beliefs, subjective values). However, the ability beliefs and expectancy constructs, while theoretically distinct, are highly related empirically.

Mean-level change in children's achievement beliefs and subjective values. Various researchers have found in cross-sectional studies that younger children have more positive achievement-related beliefs than do older children (see Stipek & Mac Iver, 1989, for review). We have looked at this question longitudinally and across different school transitions.

We first consider ability-related beliefs. In cross-sectional analyses of the Study 3 data, Eccles et al. (1993) reported linear decreases in children's ability-related beliefs across the elementary school years, particularly in the academic achievement domains. Recently, in a 3-year longitudinal follow-up to the Eccles et al. (1993) study, Wigfield et al. (1997) showed that children's ability-related beliefs for math, reading, instrumental music, and sports declined across the elementary school years. Analyses of the data from Study 2, the junior high transition study, showed that these declines often continue into junior high or middle school and that the largest changes occurred immediately after the junior high transition (Eccles et al., 1989; Wigfield et al., 1991). Recent work with the 10-year longitudinal data from Study 3 show that these declines continue across the high school years (Jacobs, Hyatt, Eccles, Osgood, & Wigfield, 1999).

It is interesting to compare these findings to work on the development of self-efficacy. Shell, Colvin, and Bruning (1995) reported that children's self-efficacy for reading and writing was higher among 7th- and 10th-grade students than among 4th-grade students. They measured self-efficacy by asking students how sure they were that they could do reading and writing tasks of increasing difficulty. Such efficacy beliefs could increase, even if children's sense of how able they were compared to other students their age decreased, as we have found in our work.

Children's subjective values also decline, although these declines vary across domain. Eccles et al. (1993), analyzing Study 3 data, found that older elementary school-aged children valued math, 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 a longitudinal follow-up to these cross-sectional analyses, Wigfield et al. (1997) 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. (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 7th grade, whereas their importance ratings of English increased somewhat during 7th grade. During high school, however, adolescents' valuing of some activities becomes more positive. Eccles et al. (1983) and Wigfield (1984), analyzing Study 1 data, found that in late elementary school children valued math more

highly than did high school students. In contrast, the older students valued English more.

In summary, children's ability-related beliefs and values become more negative in many ways as they get older, at least through early adolescence.² Children believe they are less competent in many activities and often value those activities less. These differences are more pronounced in certain activity areas. The negative changes in children's achievement-related beliefs and value have been explained in two major 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 Stipek & Mac Iver, 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, 1996; Wigfield, Eccles, & Pintrich, 1996, for detailed discussion of these explanations).

How Children's and Adolescents' Ability-Related Beliefs and Subjective Task Values Predict Performance and Choice

This issue has been addressed in analyses of the data from Studies 1 and 3. In the first study, two fundamental findings emerged from our analyses looking at relations between children's competence beliefs and values and their performance and choice. First, even when previous performance is controlled, children's beliefs about their ability and expectancies for success are the strongest predictors of subsequent grades in math, predicting those outcomes more strongly than either previous grades or achievement values. Second, children's subjective task values are the strongest predictors of children's intentions to keep taking math and actual decisions to do so.

To illustrate these findings, in Study I we assessed how 7th through 9th graders' competence beliefs and performance in math Year 1 predicted their achievement beliefs and performance Year 2 (see Meece et al., 1990, for full details). The Year 2 achievement beliefs included in this model were expectancies for success, perceived importance of math, math anxiety, and intentions to continue taking more math. Meece et al. found (using structural equation modeling techniques) that Year 1 ability beliefs directly and posi-

² The general pattern is for children to have optimistic beliefs and values in the early grades, which decline across the school years. It is important to point out that some children doubt their abilities quite early on (see Burhans & Dweck, 1995; Heyman, Dweck, & Cain, 1992 for research documenting this point).

tively predicted Year 2 expectancies for success and importance attached to math and negatively predicted math anxiety. Year 2 importance ratings predicted the students' intentions to continue taking math more strongly than did their expectancies for success in math. Students' expectancies for success predicted subsequent math performance more strongly than did the importance of math. The only direct link of Year 1 performance was to Year 2 performance; however, that path coefficient was not as strong as the one from Year 2 expectancies for success and Year 2 performance. Thus the effects of previous performance on current performance are mediated through children's ability and expectancy beliefs.

Recently we have been examining how these relations emerge during the elementary school years. Wigfield (1997) and Wigfield, Eccles, and Roeser (1998) examined relations of children's ability beliefs and interest value to their performance in the different domains. The structural equation modeling analyses were done separately for three cohorts of children: 2nd and 3rd graders; 3rd and 4th graders; and 5th and 6th graders. We describe the results for the models done in the math domain. In each cohort Year 1 achievement grades significantly predicted children's Year 1 ability beliefs. Year 1 grades significantly predicted Year 2 grades in Cohorts 1 and 3. In each cohort Year 1 ability beliefs strongly predicted Year 2 ability beliefs, and Year 1 interest predicted Year 2 interest. Year 2 ability beliefs predicted Year 2 grades in all three cohorts. Interest did not predict Year 2 grades. Thus as in the earlier Meece et al. (1990) study, children's ability-related beliefs relate to their performance, but their achievement values do not.

Additional modeling analyses done in the sport domain also show how these relations become established in that domain (see also Eccles & Harold, 1991). These results provide support for some of the proposed links in the Eccles et al. (1983) model of achievement choice; in particular, the links between previous performance and subsequent ability beliefs and ability beliefs and subsequent performance. Moreover, the links begin to appear even in 2nd- and 3rd-grade children. We currently are assessing longitudinal relations between children's ability-related beliefs and values to address the causal order in the relations among these belief and value constructs.

To conclude, we discussed some of our research on the nature of children's expectancies for success, beliefs about ability, and subjective task values; work deriving from an expectancy-value model of motivation. We compared our definitions of these constructs to definitions of related constructs in the motivation field. An important issue for future research is to do validation studies to test further similarities and differences in these constructs, particularly the ability-related constructs. We are continuing to assess how children's ability-related beliefs and subjective values develop across the school years and relate to performance and choice.

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