

**DUPLICATE**

DEVELOPMENTAL REVIEW 12, 000-000 (1992)

## The Development of Achievement Task Values: A Theoretical Analysis

ALLAN WIGFIELD

*Department of Human Development, University of Maryland*

AND

JACQUELYNNE S. ECCLES

*University of Colorado*

In this article we present a theoretical analysis of the nature and development of children's achievement task values. Our approach builds on traditional expectancy-value theory and also on a model of achievement choice developed by Eccles and her colleagues. We discuss different theoretical components of achievement values and present empirical evidence for these components. Existing work on how children's achievement values change across the elementary and secondary school years is reviewed, and hypotheses are provided for how the components of achievement values become differentiated across the school years. We discuss the work on achievement goals from the perspective of how children's achievement values could influence their goals. Suggestions are made for revising and expanding Eccles and her colleagues' expectancy-value model of achievement choice. © 1992 Academic Press, Inc.

Achievement motivation theorists attempt to explain people's choice of achievement tasks, persistence on those tasks, and vigor in carrying them out. Major theoretical models of achievement motivation processes posit that individuals' achievement-related beliefs are important determinants of these outcomes. These models, such as attribution theory (e.g., Weiner, 1979, 1985), expectancy-value theory (e.g., Atkinson, 1957, 1966; Eccles, Adler, Futterman, Goff, Kaczala, Meece, & Midgley, 1983; Feather, 1982a), and the self-efficacy approach (Bandura, 1977, 1986, 1989; Schunk, 1984) all have proposed that individuals' expectancies for success and perceptions of ability on different tasks play a prominent role in their motivation to perform these tasks. Expectancy-value theorists have argued that the incentive value of the task is another important determinant of task choice; individuals will tend to do tasks that they positively value and avoid tasks that they negatively value (Atkinson, 1957, 1966; Eccles et al., 1983; Feather, 1982a). Despite this acknowl-

Preparation of this article was supported in part by Grant HD17553 from the National Institute of Child Health and Human Development. Address reprint requests to Allan Wigfield, Department of Human Development, University of Maryland, College Park, MD 20742.

edged role of incentive values in expectancy-value theory, values have been relatively neglected in both theoretical and empirical work on achievement motivation. Work by Eccles and her colleagues (e.g., Eccles, 1984a,b; Eccles et al., 1983), the Crandalls (e.g., V. C. Crandall, 1969; V. J. Crandall, Katkovsky, & Preston, 1962), and Feather (e.g., 1982a,b, 1988) are the major recent exceptions.

In this article we discuss why achievement values have received less attention than other constructs in the various theories of achievement motivation. We present a theoretical conceptualization of children's achievement task values and how they develop, along with descriptions of empirical tests of this conceptualization. We relate this theoretical view of achievement task values to recent work on achievement goals (e.g., Ames & Archer, 1988; Dweck & Elliott, 1983; Dweck & Leggett, 1988; Maehr, 1984; Nicholls, 1984) from the perspective of how individuals' values may influence their goals in achievement settings.

#### ACHIEVEMENT VALUES IN EXPECTANCY-VALUE THEORY; ATKINSON'S MODEL

John Atkinson (1957, 1964, 1966) developed the first formal expectancy-value model to account for people's motivation in achievement situations. Atkinson's model was influenced by Lewin's (1938) notion of how the valence of an activity determines how important the activity is for that individual, Tolman's (1932) construct of expectancy for success, and Edwards' (1954) work on choice under conditions of risk and how individuals maximize expected utility in making those choices. Atkinson sought to explain different kinds of achievement-related behavior: striving for success, choice among achievement tasks, and persistence on those tasks. He believed that these behaviors were determined by individuals' achievement motives, expectancies for success, and incentive values. Atkinson defined the achievement motive ( $M_{as}$ ) as a relatively stable disposition to strive for success that is aroused when cues in the situation indicate that performance will be instrumental to achievement. He measured this motive using the Thematic Apperception Test, assuming that people's achievement imagery reflects their underlying unconscious achievement motivation (see also McClelland, 1985).

Expectancies for success and incentive values are the situational aspects of Atkinson's model in that they refer to the particular achievement task in which the individual is engaged. Expectancies or probabilities for success ( $P_s$ ) and failure ( $P_f$ ) are the cognitive anticipations that performance will be followed by a consequence, which in achievement settings is either success or failure. Atkinson defined  $P_s$  as the ratio of the number of successes the individual has had on a task over the number of times the task was attempted. Similarly,  $P_f$  is the number of failures over the num-

ber of attempts. These definitions mean that  $P_s$  and  $P_f$  are closely tied to the difficulty of the task. In experimental studies these definitions often were defined as the *population's* probability of success. However, Atkinson acknowledged the importance of defining the *subjective* probability of success for different individuals: "The most critical problem in contemporary work on achievement-related motivation is that of defining the strength of expectancy of success for particular individuals" (Atkinson, 1964, p. 266).

Atkinson broadly defined incentive value as the relative attractiveness of succeeding on a given achievement task and acknowledged that it had not received much attention: "The incentive variable has been relatively ignored or at best crudely defined in most research. It represents the relative attractiveness of a specific goal that is offered in a situation" (Atkinson, 1966, p. 12). Although he defined incentive value as a separate term in his model, through algebraic manipulation of the terms in his equation for resultant achievement motivation (see below), Atkinson defined  $I_s$  as equivalent to the inverse of  $P_s$ . Thus  $P_s$  took primary importance in the model, and a great deal of the empirical work assessing the model looked at individuals' achievement strivings under different probabilities for success (see Atkinson & Feather, 1966 for a review of this work).

Atkinson (1957, 1964, 1966) argued that resultant achievement motivation is a function of motives, expectancies, and values for both success and failure; hence he included approach and avoidance systems in his model. He expressed the tendency to approach success mathematically as follows:  $T_{as} = (M_{as} \times P_s \times I_s)$ . The multiplicative relations among the constructs of course imply that if any one of them is zero then  $T_{as}$  will be zero. The tendency to avoid failure, or fear of failure, was defined in terms of similar constructs and a similar algebraic equation:  $T_{af} = (M_{af} \times P_f \times I_f)$ , where  $T_{af}$  is the tendency to avoid failure,  $M_{af}$  is the motive to avoid failure,  $P_f$  is the probability of failing on a given task, and  $I_f$  is the incentive to avoid that failure. In his 1957 statement of this model Atkinson assumed that  $M_{af}$  actually can instigate achievement activity if the individual is in an achievement situation and must perform. In 1966, however, Atkinson argued that  $M_{af}$  inhibits achievement striving when the individual expects the activity to lead to failure. Hence the individual with a strong  $M_{af}$  will resist achievement-oriented activity, particularly in risky achievement situations. The tendency to avoid failure often has been equated with test anxiety (Atkinson, 1966; Hill, 1972), but it should be reiterated that Atkinson sees  $M_{af}$  as an inhibitory motive rather than generalized overarousal, as anxiety is sometimes defined.

Atkinson then combined these two forces into a single equation to show how both systems determine resultant achievement motivation ( $M_{ach}$ ):

$$M_{ach} = (M_{as} \times P_s \times I_s) - (M_{af} \times P_f \times I_f).$$

This equation implies that individuals with relatively stronger motives to approach success than avoid failure will have positive resultant  $M_{ach}$  and will be likely to approach achievement tasks. In contrast, individuals with relatively stronger motives to avoid failure than approach success will have negative resultant  $M_{ach}$  and thus seek to avoid achievement situations.

Atkinson made some critical assumptions about the relationships among the various terms in the model that allowed him to algebraically reduce the complexity of the model. First, he assumed that  $P_s + P_f = 1$ . Second, he defined  $I_s$  as  $1 - P_s$  and  $I_f$  as  $1 - P_f$ . As a result,  $T_{as}$  is highest if  $P_s = .5$ , and  $T_{af}$  is highest if  $P_f$  is  $.5$ . Thus for individuals with stronger tendencies to approach success than avoid failure,  $M_{ach}$  is predicted to be strongest for tasks of intermediate difficulty (e.g.,  $P_s = .50$ ). For instance, assume  $M_{as}$  equals 1. If both  $P_s$  and  $I_s$  equal  $.5$ , then  $T_a$  equals  $.25$ . No other combination of  $P_s$  and  $I_s$  produces any higher  $T_{as}$ ; hence Atkinson's point about  $M_{ach}$  being strongest with tasks of intermediate difficulty, when  $M_{as}$  is greater than  $M_{af}$ . Further, as  $M_{as}$  increases in strength this preference for tasks of intermediate risk becomes stronger (see Atkinson & Feather, 1966). By contrast, individuals with relatively stronger tendencies to avoid failure should be likely to avoid tasks of intermediate risk (when  $T_{af}$  will be at its maximum) and should prefer either very easy or very difficult tasks (when  $T_{af}$  is at its minimum). These two propositions are cornerstones of Atkinson's theory and have received empirical support in a number of studies with different-aged subjects, mostly using tasks such as ring-toss games (see Atkinson & Feather, 1966 for a review of this work). However, they are not always supported, in part because of the limited conceptualization of the incentive values construct (see Parsons & Goff, 1980, and further discussion below).

Second, Atkinson argued that success and failure influence both expectancies for success and incentive value, which in turn influence subsequent achievement choice. If the individual succeeds on a given task, the  $P_s$  for that task will increase. Continued success on that task will continue to raise the  $P_s$ . If this process continues and  $P_s$  continues to rise, the task will lose incentive value for the individual, since as just noted Atkinson assumed  $P_s$  and  $I_s$  are inversely related. This loss of incentive value for a given task will lead positively motivated individuals to attempt more difficult tasks.

If success-oriented individuals fail a task they thought they could do (e.g., a task with an initial  $P_s$  of  $.7$ ), they will lower their  $P_s$  for the task. Interestingly, Atkinson argued that this lowered  $P_s$  will increase their motivation to complete the task even if they keep failing the task, until the

$P_s$  falls below .5. They then should shift to a subjectively easier task. These examples show how Atkinson views positively motivated individuals' expectancies and values working in an inverse fashion to influence their task choices. The opposite patterns should hold for individuals with negative  $M_{ach}$ .

Atkinson's definition of  $I_s$  as the inverse of  $P_s$  has algebraic elegance and predicts certain achievement choices, but it provides a limited view of the nature of incentive values. In their seminal discussion of the possible reasons why task values have continued to be relatively neglected in studies of achievement, Parsons and Goff (1980) pointed out that defining  $I_s$  as the inverse of  $P_s$  effectively removed incentive value from Atkinson's mathematical model of achievement behavior. Since Atkinson's model was a primary theoretical force in the field of achievement motivation, it is likely that this definition is responsible, in large part, for the prominent role  $P_s$  has played in the field.

This definition also limits the kinds of factors that can influence achievement task values. Recall that Atkinson defined  $P_s$  in terms of the ratio of successes and failures on a task; hence  $P_s$  is tied closely to subjective task difficulty. If incentive value is the inverse of  $P_s$ , then it too primarily is determined by task difficulty; Atkinson did not discuss other potential influences on task value. Parsons and Goff (1980) argued that values may be determined by things besides the difficulty of the task, such as broader human values, affective experiences with the task, and sex roles. These other possible influences will be discussed later.

Defining  $I_s$  as the inverse of  $P_s$  further implies that success on very difficult tasks is seen as most valuable, whereas success on relatively easy tasks is less valued. Recently, researchers have demonstrated that values and expectancies may be positively related rather than inversely related (Eccles et al., 1983; Eccles & Wigfield, 1989). Furthermore, Eccles, Wigfield, Blumenfeld, and Harold (1984c), Eccles, Wigfield, Flanagan, Miller, Reuman, & Yee, (1989), and Harter (1985) argued that to maintain high self-esteem individuals may value most the tasks that they do well; this view assumes a positive relation between expectancies and values. In a slightly different vein Raynor (1981, 1982a) argued that when individuals are striving toward long term goals they do not want each step of the way to have a  $P_s$  of .5; rather, each step should be easier to attain so that the cumulative  $P_s$  is equal to about .5.

Finally, Parsons and Goff (1980) and other theorists (e.g., Maehr, 1974; Maehr & Nicholls, 1980) have argued that the contention that individuals with high  $M_{ach}$  will be most motivated when  $P_s$  is .50 assumes a risk-taking approach to motivation. They stated that there are many different kinds of achievement situations, many of which do not involve risk taking. In such situations individuals may be motivated when  $P_s$  is much

higher or even much lower than .50. Particularly in real-world achievement settings in which performance on a task has important implications for future achievement strivings, achievement situations values and expectancies may not be inversely related in the manner Atkinson suggested (see Raynor, 1982a).

More recently, Atkinson turned his attention to how expectancies and values influence individuals' choices among a set of ongoing activities (see Atkinson & Birch, 1970, 1978), calling this approach the dynamics of action. However, he did not greatly change his earlier definitions of  $P_s$  or  $I_s$ , and so these terms still are limited in the new model.

In summary, Atkinson developed the first formal achievement motivation model incorporating both expectancy and value constructs. However, his definition of each of those constructs is limited, and the premise that expectancies and values are inversely related is problematic. We will return to these issues when discussing more recent models of achievement values.

#### COGNITIVE MODELS OF ACHIEVEMENT MOTIVATION

Atkinson's work is not the only area in which constructs related to expectancies for success have taken theoretical precedence. Over the last 20 years cognitive models of achievement motivation (e.g., Bandura, 1977, 1986, 1989; Covington, 1984; Kukla, 1972; Nicholls, 1984; Schunk, 1984; Weiner, 1979; Weiner, Frieze, Kukla, Reed, Rest, & Rosenbaum, 1971) have become prominent in the achievement motivation field. In these models perceptions of competence and expectancies for success also have been emphasized in explaining achievement behavior, and these new models have extended and elaborated Atkinson's original expectancy notion. In this section we briefly review the most prominent cognitive motivation models to show how expectancies rather than values have taken theoretical precedence in these models as well.

##### *The Attribution Perspective*

Bernard Weiner's attribution perspective on achievement motivation (e.g., Weiner, 1979, 1985; Weiner et al., 1971) has had a tremendous impact on the field. As a student of Atkinson, Weiner based his approach in the expectancy-value tradition. However, he differed from Atkinson by emphasizing how interpretations of achievement outcomes, rather than motivational dispositions, determine subsequent achievement strivings. Weiner argued that the individual's causal attributions for achievement outcomes determined subsequent achievement strivings. He identified (conceptually and empirically) the most important achievement attributions (ability, effort, task difficulty, luck, interest, mood, others' influence) and developed his now familiar and classic model for classify-

ing these attributions into first two and then three different causal dimensions: stability, locus, and controllability (see Weiner et al., 1971; Weiner, 1979). For instance, Weiner classified ability as a stable, internal, uncontrollable cause and effort as an unstable, internal, controllable cause.

He argued that each of these different causal dimensions influences certain aspects of achievement strivings, as well as specific achievement beliefs such as expectancies, incentive values, and affective reactions to success and failure. For example, his research and that of others (see Weiner, 1979, 1985 for reviews) have shown that the stability dimension influences individuals' expectancies for success; attributing an outcome to a stable cause such as ability has a stronger influence on expectancies for success on subsequent tasks than does attributing an outcome to an unstable cause such as effort (see Weiner, 1979, 1985). Like Atkinson, (1957, 1966) Weiner argued that expectations for success greatly influence the individual's choice of subsequent achievement tasks.

Other cognitive motivational theorists also have focused on ability perceptions and expectancies to explain achievement strivings. Covington (1984) discussed how individuals maintain self-worth by attempting to maximize their sense of ability following success and minimize the role of lack of ability in explaining their failures. The implicit assumption in Covington's work is that perceptions of ability exert the strongest influence on achievement strivings. Nicholls (1978) and Nicholls and Miller (1984) also give ability perceptions a primary role in their conceptualization of children's achievement strivings, and so other achievement-related beliefs have received less attention.

Weiner (1985) also has assessed how incentives influence achievement strivings: "Motivation is believed to be determined by what one can get (incentive) as well as by the likelihood of getting it (expectancy)" (p. 559). However, rather than studying these incentives or values directly, Weiner instead has examined individuals' affective reactions to achievement outcomes, which follow from their causal attributions for those outcomes. He argued that the objective value of an attained object is not influenced by perceived causality, since objective value remains the same regardless of the reason one obtains something: "A dollar has the value of one dollar whether it is attained because of good fortune, hard work, or as a gift from another" (Weiner, 1985, p. 559). Thus Weiner defined incentives in rather objective terms, and so has not studied them extensively. He has focused instead on emotional or affective reactions to attaining or not attaining desired outcomes and has argued that attributions mediate the specific affective reactions individuals have to achievement outcomes.

Weiner (1985) posited the following sequence linking outcomes to affective reactions. When the individual experiences an achievement outcome, he or she first evaluates whether the outcome was positive or

negative and experiences an initial positive or negative emotional reaction to the outcome. The individual then attributes the outcome to a specific cause, which leads to a more distinct emotional reaction. These reactions then influence individuals' behavior in subsequent achievement situations. Weiner and his colleagues now have documented how the different attributional dimensions determine individuals' affective reactions to achievement outcomes (e.g., Weiner, Russell, & Lerman, 1979). For instance, the locus of the cause determines whether the individual experiences pride in accomplishment (see Weiner, 1985, for discussion of other affective consequences of the different attributional dimensions).

Thus Weiner has emphasized expectancies for success and affective reactions to success and failure as major determinants of subsequent achievement activity. Given the influence of Weiner's views, this emphasis on expectancies and affective reactions also could be a major reason why values have been neglected in the achievement motivation literature. We would argue that it may be equally important to understand why certain objects and actions are valued over others, and what different components of value there might be. It seems quite possible that individuals can value certain goal objects regardless of their affective reaction to attaining or not attaining that object. For instance, individuals might enroll in a science course because they are planning to be dentists (see Eccles, 1987; Eccles et al., 1983). While succeeding in the course would make them happy (depending on the attribution they make for that success!), the reason for selecting the course in the first place likely was influenced by the value the task had for the individuals' future career. This implies that the value an individual attaches to a certain goal object goes beyond his or her affective reaction to attaining it. Thus the incentive value of various tasks is a subjective psychological construct, rather than an objective property of the object or task.

#### *The Self-Efficacy Perspective*

Bandura (1977, 1986, 1989) and Schunk (1984) have proposed a model of motivated behavior that emphasizes the role of perceptions of efficacy in determining the individual's achievement striving. Efficacy perceptions are similar in many respects to expectancies for success; however, Bandura distinguished two kinds of efficacy perceptions. Outcome expectations are beliefs that certain behaviors will lead to certain outcomes. Efficacy expectations are beliefs that the individual can effectively do the behaviors necessary to produce the outcome. These beliefs must be distinguished because individuals can believe that a certain behavior will produce a certain outcome (outcome expectation), but may not believe they themselves can do that behavior (efficacy expectation). Bandura



proposed that individuals' efficacy expectations are a major determinant of activity choice, willingness to expend effort, and persistence.

The self-efficacy perspective has proven to be powerful in explaining individuals' achievement strivings. Further, changing children's efficacy beliefs is an effective way to improve their performance on achievement tasks. Schunk (1981, 1983, 1984) has shown that poor-performing children's mathematics performance can be improved by increasing their sense of efficacy toward mathematics, through a combination of skill training and training to make their efficacy beliefs about mathematics more positive.

To date, this work has focused almost entirely on delineating efficacy perceptions, and at how changing efficacy perceptions influences achievement strivings. Although Bandura (1986) acknowledged that individuals are more likely to strive on tasks they value and Schunk and his colleagues (e.g., Schunk, 1990; Schunk & Rice, 1987, 1989) have looked at how students' goal setting influences their perceptions of efficacy, studies in this tradition have not examined exactly how individuals' valuing of different tasks plays a role in their efficacy perceptions. This may be due in part to the fact that most of the work in this area has been done with school-related tasks presumed to be valued. We would argue that the value attached to different tasks also will influence activity choice; individuals may have positive efficacy expectations about certain tasks yet not engage in them because the task has little value for them. Further, students' achievement values could influence the effectiveness of efficacy training. For instance, students who value math but lack math skills may benefit greatly from efficacy training in that their skills and confidence about doing well in math would increase. Such training would help get those children's values and perceptions of efficacy or ability more in synchrony. Students who devalue math may benefit less, since they would not care about acquiring greater math skills. However, if the efficacy training leads them to value math more it also could increase math efficacy. Thus there may be interaction effects between perceptions of efficacy and valuing of different tasks on children's subsequent performance. These possible interaction effects should be assessed in future studies of efficacy by looking at both efficacy perceptions and students' valuing of different tasks before and after efficacy training is done.

#### RECENT PERSPECTIVES ON ACHIEVEMENT TASK VALUES

There have been two fundamentally different approaches to the study of values. One group of researchers, most of whom ascribe to expectancy-value theory, have discussed the nature of achievement task values and expanded on Atkinson's (1957, 1966) initial definition of incentive values. These researchers have conceptualized task value as how differ-

ent tasks meet different needs of individuals. For example, tasks can be valued because they provide enjoyment, allow the individual to achieve a short or long range goal, make the individual's parents happy, and so on. Utility value theorists (e.g., Edwards, 1954; Raynor, 1982a,b; Vroom, 1964) and attainment value theorists (e.g., Battle, 1965, 1966; V. C. Crandall, 1969; Rotter, 1982; Stein & Smithells, 1969) are two primary representatives of this approach. Other researchers, most notably Rokeach (1973, 1979, 1980), have discussed broader human values. These researchers have focused on values as broad-based, general psychological characteristics of the individual and have speculated how such personal values might affect behavioral choices. Rokeach (1980) and Feather (1982b, 1988) have elaborated theoretical systems that link these more generalized personal values or motives to the valence people attach to various behaviors.

Only a few researchers have tried to integrate these two perspectives to produce a more detailed theoretical analysis of how personal values and general attitudes might affect relative subjective task values (e.g., Eccles et al., 1983; Feather, 1988; Parsons & Goff, 1980). Most of this section is devoted to that work. But first Rokeach's work is described, since his perspective provides important theoretical grounding for Eccles' and Feather's work.

#### *The Nature of Broad Human Values*

Rokeach (1979) provided a general definition of human values: "Values are core conceptions of the desirable within every individual and society. They serve as standards or criteria to guide not only action but also judgment, choice, attitude, evaluation, argument, exhortation, rationalization, and one might add, attribution of causality" (p. 2). He distinguished between terminal values, which are the beliefs or conceptions about life's ultimate goals or desired end-states, and instrumental values, which are the desirable modes of behavior to reach the terminal values. Terminal values include such things as desiring a comfortable life, freedom, equality, and happiness. Instrumental values include courage, ambition, cleanliness, and independence. Rokeach developed a survey to assess terminal and instrumental values, and the values he included in the survey are presented in Table 1. As can be seen in the table, several of these values, such as ambition, competence, sense of accomplishment, and responsibility relate to achievement strivings.

Rokeach viewed these values as general guides or standards for behavior and believed they are universal; values differ across cultures only in the extent to which they are emphasized in the culture. Since he viewed values as central to the individual's belief system, he saw them as relatively stable and encompassing and thought they influenced behavior by

## ANALYSIS OF ACHIEVEMENT VALUES

11

TABLE 1  
 ROKEACH'S TERMINAL AND INSTRUMENTAL VALUES

Terminal Values	Instrumental Values
Wisdom	Intellectual
Freedom	Capable
Self-respect	Honest
Sense of accomplishment	Responsible
World at peace	Imaginative
Equality	Independent
World of beauty	Broadminded
Inner harmony	Logical
Family security	Ambitious
Social recognition	Helpful
Happiness	Courageous
An exciting life	Self-controlled
A comfortable life	Loving
True friendship	Forgiving
Mature love	Cheerful
National security	Polite
Pleasure	Clean
Salvation	Obedient

providing meaning to that behavior. Values serve to coalesce the individual's attitudes about particular topics. In fact, Rokeach posited that values, attitudes, and behaviors are organized hierarchically, with values at the top of the hierarchy, and hence the least susceptible to change.

Rokeach has criticized attitude theorists such as Ajzen and Fishbein (1977) for arguing that measures of specific attitudes and measures of specific behavior are needed in order to understand better how attitudes and behaviors relate to one another. Instead, Rokeach argued that his broader values best capture the attitude-behavior link, since those values provide the underlying framework guiding the individual's behavior. However, it may be that his notion of values as general belief systems relegates values to an uncertain role in the direction of behavior. For example, recent work in the self-concept area has shown that when the self-concept is conceptualized as a broad belief system, relations between the self-concept and different behaviors are modest at best (see Wylie, 1979). When the self-concept is characterized as an organized set of more specific beliefs, relations to behavior in those specific areas are much more apparent (see Harter, 1982, 1985; Marsh, 1989; Shavelson & Bolus, 1982). The same points may apply to the study of human values. Rokeach's belief that the same values apply across cultures is perhaps overly optimistic or even naive; it seems quite likely that different cultures not only vary in the degree to which they endorse a given value, but may have

quite different values as well. Despite these possible problems, Rokeach's work has been important for identifying the general role values have in motivating behavior.

#### *Achievement-Related Values*

Within expectancy-value approaches, researchers initially building on Atkinson's (1957, 1966) work have defined values somewhat more narrowly than Rokeach did, while still expanding on Atkinson's original definition of achievement value. In general, these researchers (e.g., Battle, 1965, 1966; V. C. Crandall, 1969; V. J. Crandall et al., 1962) have focused on one aspect of value, how important different tasks are to individuals, perhaps reflecting views first espoused by James (1892) that it is not just success or competence but success on important tasks that determines individuals' strivings. Battle (1965) coined the term attainment value to describe importance and defined it as follows: "Attainment value is the importance to the individual of achievement in a given task and should determine the length of his persistence in working at it" (p. 209); thus attainment value has implications for persistence. Battle distinguished two aspects of attainment value, importance of the activity per se (absolute attainment value) and importance of it relative to other activities (relative attainment value).

Battle (1965, 1966) examined how children's expectancies and values affected their persistence and achievement. Battle (1965) assessed seventh, eighth, and ninth grade children's expectancies for success, attainment values, and minimal grades with which they would be satisfied. Children then performed a mathematics task, and Battle measured how long they persisted on the task. She found that the group that persisted the most on the task had expectancies that were higher than their minimal acceptable grades, and also had high absolute attainment values for math. The group that persisted the least had minimal acceptable grades that equaled their expectancies. This study shows that both expectancies and values predict children's persistence in achievement settings.

Battle (1966) looked at how expectancies, attainment value, minimal acceptable grades, and certainty of attaining the grade related to seventh through ninth grade children's math and English achievement. She found that for both math and English, expectancies for success and minimal acceptable grades were more highly correlated with performance than were attainment values, particularly relative attainment values. Absolute attainment values correlated moderately with performance in both math and English, whereas relative attainment value correlated only weakly with performance. Expectancies for success and attainment value were positively related, with the correlations stronger for absolute than relative attainment value. Thus in contrast to Atkinson's view that expectancies

and values are inversely related, Battle found that for mathematics and English performance children thought it important to do well in areas in which they expected to do well.

V. J. Crandall et al. (1962) also examined how attainment values and expectancies correlated with first, second, and third grade children's choice of intellectual activities and the intensity with which they did the activities in a free-play situation. They measured relative attainment value by presenting children with pairs of activities and asking them which activity they would most like to do well. They also assessed children's expectancies for success, their perceptions of control over outcomes, and their anxiety. For girls, the only predictor of choice of activities was attainment value. Boys' expectancies for success positively predicted their choices, and their anxiety was a negative predictor. Boys' achievement standards and perceptions of control over outcomes also were positive predictors of choice. Similar results occurred for degree of striving, leading Crandall et al. to conclude that girls engaged in "wishful" motivational thinking whereas boys were more action oriented. Crandall et al. also looked at how these variables predicted math and reading achievement and found that girls' achievement actually was negatively correlated with their expectancies and values. Boys' achievement was positively predicted by their control perceptions. Thus several sex differences in these predictors emerged, although the relatively small sample size (20 children per grade) means the results should be viewed cautiously. Nevertheless, they suggest that attainment values are an important predictor of choice and persistence, particularly for girls.

Feather (1975, 1979, 1982a,b, 1988) has attempted to integrate Rokeach's more general approach to values with the expectancy-value approach to  $M_{ach}$ . Like Rokeach, Feather sees values as a set of stable, general beliefs about what is desirable and postulates that these beliefs guide behavior. Values emerge from society's rules as well as the individual's psychological needs and are basic to the individual's sense of self. Feather argued that values are one class of motives that lead the individual to perform acts he or she thinks should be done. Individuals with different values will regard different goal objects as more or less attractive, and so their motivation to attain those goal objects will be based (at least in part) on their values. As an expectancy-value theorist, Feather also argued that the likelihood of attaining the goal also will influence behavior; a valued goal may not be approached if the expectancy for achieving that goal is very low.

In his empirical work, Feather (1982b) has looked at how Rokeach's terminal and instrumental values influence people's willingness to undertake certain activities related to those values, such as joining groups in order to accomplish certain social or political tasks. He has found that

people's values do influence their level of involvement in such groups. In the achievement domain, Feather (1988) found that certain instrumental values predicted college students' valuing of particular subject matter areas. In this study, students completed the instrumental component of Rokeach's (1979) Value Survey, estimated their ability to do math and English, and indicated how much they valued math and English. The task value measure came from Eccles and her colleagues' work on identifying components of achievement task value (see below). Feather attempted to predict students' choice of a college major from these variables. He found that the Restrictive Control scale derived from Rokeach's survey related to math value, and the Prosocial Concern scale related to English value. Math value and students' math ability perceptions predicted choice of science-related majors, with ability perceptions having a stronger predictive link than values. English values predicted strongly to students' choice to enroll in humanities courses. Finally, as in Battle's (1966) and V. J. Crandall et al.'s (1962) studies, Feather found that students' values and ability perceptions were positively rather than inversely related.

In reviewing the work on different aspects of values and valences, Feather (1982a) concluded that there is a compelling need for expectancy-value theorists to examine the determinants of different kinds of values, as well as to specify the dimensions of those values. He argued that values are determined (in part) by features of the goal object itself, the valence of success and failure to the individual, and the probability of succeeding on the task. He stated that we know little about why some things are relatively attractive and others aversive to different individuals.

#### *Components of Achievement-Related Values: Eccles and Colleagues' Work*

In the achievement domain, Eccles (Parsons) and her colleagues have begun to answer the questions Feather (1982a) proposed about the dimensionality of task value and its determinants. They have proposed the most elaborate model of achievement task values to date and have conducted several large-scale studies of the relations of both expectancies and values to achievement performance and choice (Eccles, 1984a,b, 1987; Eccles et al., 1983; Eccles, Adler, & Meece, 1984a; Eccles & Wigfield, 1989; Meece, Parsons, Kaczala, Goff, & Futterman, 1982; Meece, Wigfield, & Eccles, 1990; Parsons & Goff, 1980). Like Atkinson (1957, 1966), Eccles and her colleagues derive the expectancy and value constructs from the earlier theoretical work of Lewin (1938) and Tolman (1932), as well as from Atkinson's own work. However, in contrast to Atkinson, the model Eccles and her colleagues propose focuses on the social psychological reasons for people's choices in achievement settings; thus expectancy and value are defined as cognitive rather than purely motivational con-

structs. Eccles et al. (1983) argued that individuals' choices in achievement settings have both conscious and unconscious components, but they have focused primarily on the conscious aspects of achievement choices. Eccles views choice in terms of cost as well as positive valence; that is, one kind of choice means that other options are not available, and the relative value of various options must be looked at to understand choice. Much of her work has looked at children's decisions regarding whether or not to continue taking mathematics, and she and her colleagues have been particularly interested in sex differences in these achievement choices.

Eccles et al. (1983) presented the first formal statement of this model, which is presented in Fig. 1. As can be seen, children's expectancies and values are assumed to have the most direct effects on their performance, persistence, and choice of achievement tasks. Expectancies and values themselves are influenced by children's task-specific beliefs, which are perceptions of competence and perceptions of the difficulty of different tasks, and their goals. These variables are in turn influenced by children's perceptions of parents' and teachers' attitudes and expectations for themselves, and their interpretations of previous achievement outcomes. Socializers' behaviors and beliefs about their children influence children's perceptions as well as their interpretations of their past outcomes. The overall cultural milieu and unique historical events directly influence socializers' behaviors and beliefs, and children's own beliefs.

One of the most important aspects of this model is the broader definition of achievement task values that is provided. Building on earlier work on achievement values (e.g., Battle, 1965, 1966), research on intrinsic and extrinsic motivation (e.g., Deci, 1975; Deci & Ryan, 1985), and on Roke-

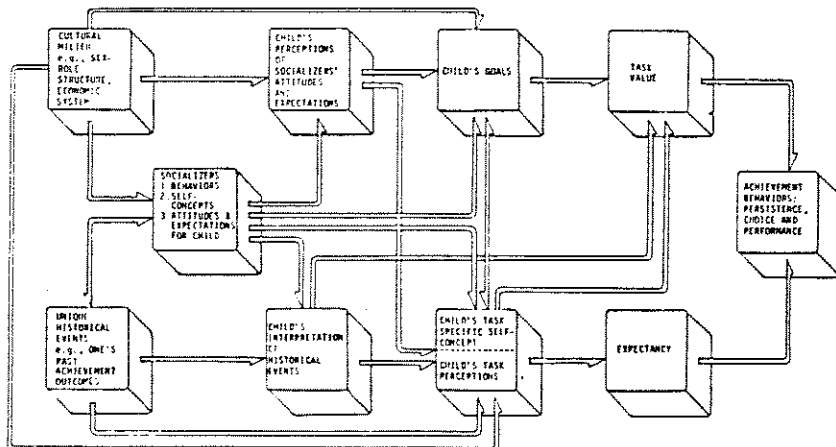


FIG. 1. Eccles' expectancy-value model of achievement motivation.

ach's (1973, 1979) view that values are shared beliefs about desired end-states, Eccles et al. (1983) defined four aspects of achievement task values that can influence achievement behavior: attainment value, intrinsic value, utility value, and cost. Like Battle (1965, 1966), Eccles et al. defined attainment value as the importance of doing well on the task. They also linked attainment value to the relevance of engaging in a task to confirm or disconfirm salient aspects of one's self-schema. That is, they argued that tasks provide the opportunity to demonstrate aspects of one's actual or ideal self-schema, such as masculinity, femininity, and/or competence in various domains. Tasks will have higher attainment value to the extent that they allow the individual to confirm salient aspects of these self-schemata. This component of the model relates most directly to the broader perspective on values espoused by Feather (1982b, 1988) and Rokeach (1973, 1979).

Intrinsic value is the enjoyment the individual gets from performing the activity, or the subjective interest the individual has in the subject. Eccles et al. (1983) argued that when a task has high interest value, the individual will be intrinsically motivated to do the task. Interest value is a construct similar to the construct of intrinsic motivation as defined by Deci and his colleagues (e.g., Deci, 1975; Deci & Ryan, 1980, 1985; Ryan, Connell, & Deci, 1985) and by Harter (1981a,b). As will be discussed below, when individuals do tasks that are intrinsically valued, there are important psychological consequences, most of which are quite positive.

Utility value is how the task relates to future goals, such as career goals. The individual may pursue some tasks because they are important for future goals, even if he or she is not that interested in that task for its own sake. For instance, students often take classes that they do not particularly enjoy but that they need to take to pursue their real interests, to please their parents, or to be with their friends. In one sense this component 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 (see Deci & Ryan, 1980; Harter, 1981a for further discussion of extrinsic motivation).

Finally, Eccles and her colleagues also have discussed the "cost" of engaging in different tasks (Eccles et al., 1983; Eccles, 1987). They conceptualized cost in terms of all the negative aspects of engaging in the task. These include anticipated emotional states (e.g., performance anxiety and fear of both failure and success) as well as the amount of effort that will be necessary to succeed at the task.

Other researchers have provided somewhat similar definitions of different components of task value. Raynor (1982b) identified five dimensions of task value. Like Eccles, Raynor defined intrinsic value and in-



strumental or attainment value. He also defined difficulty value, which is value determined by the subjective probability of success; in essence, this kind of value is identical to Atkinson's incentive value. Another category of value he defined is extrinsic value, which refers to expected outcomes like money, prizes, and so on. This construct is similar in some ways to Eccles' utility value construct. Last, Raynor defined cultural value, which is a broader construct more like one of the values defined by Rokeach and also is somewhat like the broader conception of attainment value in Eccles' model. It refers to moral judgments about an activity and deciding whether the activity is good or bad, which in the achievement domain means the belief that success is good and failure is bad. Raynor also made the interesting point that past, present, and future values should be considered. For instance, individuals could choose tasks in order to maintain their successes on tasks they have always valued (a past time sense) or choose tasks that they think will help them become the individual they want to become (a future time sense). This "future values" orientation is similar to Markus's analysis of "possible selves" (see Markus & Nurius, 1986), as well as to Eccles' future usefulness component of achievement task values, and attainment value in the sense that tasks help one to develop the skills seen as central to one's future possible selves.

Eccles and her colleagues have done extensive empirical tests of different aspects of this model. In studies of how expectancies and values relate to elementary through secondary school students' performance and choice, Eccles and her colleagues have shown that students' expectancies predict children's performance in mathematics and English, whereas their achievement task values predict both intentions and actual decisions to keep taking mathematics and English (Eccles, 1984a,b; Eccles et al., 1983; Eccles et al., 1984a; Meece et al., 1990). For instance, using path analysis Eccles (1984b) showed that 5th through 12th grade students' expectancies for success predicted subsequent performance in math more strongly than did their achievement values. Students' valuing of math predicted their intentions to keep taking math more strongly than did their expectancies for success. Eccles (1984a) and Eccles et al. (1984a) showed that 8th through 10th grade students' valuing of math strongly predicted their actual decisions to continue taking math later in their high school careers, whereas their self-concepts of ability in math did not predict enrollment decisions. Using structural equation modeling procedures, 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 performance

more strongly than did the importance of math. They also found that the predictive links among expectancies, values, performance, and intentions were similar for boys and girls.

Recently, Eccles and Wigfield (1989) examined whether the proposed importance, interest, and usefulness components of achievement value could be distinguished empirically. They used confirmatory factor analysis techniques to assess the factor structure of the responses of 750 5th through 12th grade students to items assessing their mathematics ability perceptions, expectancies for success, perceived performance in math, mathematics task value, and other constructs (see Eccles et al., 1983, for further discussion of these measures). In contrast to previous work showing that ability perceptions and expectancies are separate constructs, they found that children's ability perceptions, expectancies, and performance perceptions formed one factor. Three task value factors were distinguished clearly: perceptions of importance of the skills (attainment value), interest (intrinsic value), and usefulness of math (utility value), confirming the theoretical distinctions in the Eccles et al. model. Additional work is needed, however, to determine whether other values categories, such as those proposed by Raynor (1982b), should be included in this model.

Other research has shown that these components of task value have different predictive links to students' intentions to keep taking mathematics. Wigfield and Eccles (1989) assessed (using structural modeling procedures) how students' perceptions of the usefulness of math and their interest in math predicted junior and senior high school students' intentions to keep taking math. Junior high students' interest in math predicted their intentions to keep taking math. Both interest in math and its utility value predicted senior high school students' intentions to keep taking math. These findings further underscore the importance of distinguishing different components of task value, since those components have different predictive links to intentions in younger and older students.

#### *The Development of Achievement Task Values*

Relatively few studies of the development of children's achievement values have been conducted, whereas numerous developmental studies of children's expectancies for success have been done. To summarize the work on how children's expectancies change to provide a context for how children's achievement values might change, most studies show that young (4- and 5-year-old) children's expectancies for success are overly optimistic, so that they nearly always think they will do well on the next task. This optimism holds even if young children repeatedly fail a task, and so it appears that young children's expectancies are not grounded in the reality of their performance, but may reflect what outcome they hope

to achieve. As children proceed through elementary school, their expectancies begin to correspond more closely to their previous performance, so that following success their expectancies increase, and following failure their expectancies for future performance are less positive (see Parsons & Ruble, 1977; Stipek, 1984). Thus expectancies for success appear to become more accurate or realistic as children get older, in the sense of relating more closely to their actual performance on different tasks and being more responsive to success and failure experiences (see Eccles, Midgley, & Adler, 1984b, and Stipek, 1984, for reviews of this work).

In considering how children's achievement values develop, two kinds of change could be studied: change in the levels of children's valuing of different tasks and change in the structure of the components of children's task value. Although studies of both types of change exist, far more work has been done on the changes in the levels than on the changes in the structure of children's task value beliefs. In fact, so little work on changes in structure have been done that no strong developmental conclusions can be drawn at present: we present some hypotheses about changes in structure of values below. The picture is much clearer regarding changes in mean level.

*Age-related changes in the mean level of perceived task value.* Results of studies looking at changes in the mean level of children's values generally show that children value academic tasks less as they get older (see Eccles & Midgley, 1989; Eccles et al., 1984b). In studies of students' domain-specific achievement values, Eccles et al. (1983) and Wigfield (1984) examined how children's valuing of mathematics and English differed by age in a group of 5th through 12th grade students. Both studies showed that younger students valued math more highly than did older students. In contrast, students' valuing of English increased across age. Eccles et al. (1989) and Wigfield, Eccles, Mac Iver, Reuman, and Midgley (in press) looked at how the transition to junior high influenced children's valuing of different activities. They found that children's ratings of both the importance of math and English and their liking of these school subjects decreased across the transition from elementary to junior high school. In math, students' importance ratings continued to decline across 7th grade, whereas their ratings of the importance of English the beliefs rebounded somewhat.

In a study of the early development of children's achievement values, Wigfield et al. (1990) assessed children's valuing of different activities (math, reading, computers, music, and sports) in a sample of 850 first, second, and fourth grade children. Across age there were no differences in the value attached to math, although at all grades math was not valued very highly. Children's valuing of reading, music, and computer activities decreased across grade, whereas valuing of sports increased.

Studies of more general value constructs like intrinsic versus extrinsic motivation show that children become more extrinsically motivated as they get older. For example, in a cross-sectional study of children's intrinsic motivation (or interest value in the context of this paper) Harter (1981b) assessed different components of intrinsic motivation in third through ninth grade students. She found that older children's intrinsic motivation was much lower than younger children's on three of her intrinsic motivation subscales: preference for challenge, curiosity/interest, and independent mastery. Harter concluded that children's intrinsic motivation is stifled in important ways during the school years (see Eccles & Midgley, 1989; Eccles et al., 1984b for further discussion).

Taken together, these results paint a rather gloomy picture of children's valuing of academic activities, especially after students reach junior high and especially for mathematics. Results of the studies on children's values are similar to those on children's expectancies in many ways. In the early school years children have quite positive values for different activities, expressing interest in them and believing they are important. As they get older they begin to value certain academic activities less. It is particularly striking that Eccles et al. (1983) and Wigfield (1984) found that older high school students see math as being less useful than did the younger children, since the older students in the sample were those who continued to take college-preparatory mathematics courses. Even among this more select and reasonably high-performing group, math loses its value.

What explains these declines in children's valuing of certain school subjects? The changes may be explained in part by the changes in children's ability perceptions that Nicholls (1978, 1984), Dweck and Elliott (1983), and Parsons and Ruble (1977) discuss (see below). As children get older many of them begin to view ability as a rather stable entity that cannot be changed much. For those children doing relatively poorly in a subject such as math and believing their poor performance is due to a lack of this stable ability, one way to deflect the impact of that poor performance on overall self-esteem is to decide that math has little value. However, this analysis only would explain why children doing relatively poorly begin to devalue math. The changes in math value discussed earlier are more pervasive and seem to characterize children who are performing well along with those who are doing poorly.

Another more general factor that has a major influence on children's valuing of different tasks is the kind of school environments they encounter. Eccles et al. (1984b) and Eccles and Midgley (1989) argue that systematic changes in school environments may be responsible for the negative changes in many students' motivational orientation and in the value they attach to school subjects. The types of changes often associated with

the transition to junior high especially may have negative effects on many students' motivation for and valuing of school. These changes, such as the move to a larger, more bureaucratic, and controlling environment (see Eccles & Midgley, 1989) experienced by many students as they move into junior high and the shift to more stringent normative-based grading standards from criterion-based grading standards (Kavrell & Petersen, 1984) may have negative influences on their achievement motivation and values (see also Simmons & Blyth, 1987). A complete review of the literature on schooling's effects on motivation is beyond the scope of this paper; interested readers should consult Ames (1984), Covington (1984), Eccles et al. (1984b), Eccles and Midgley (1989), and Nicholls (1979, 1984) for discussion of how changes in the school environment may explain the negative changes in achievement motivation and values just discussed.

*Age-related changes in structure of task value beliefs.* Age-related changes in the structure of children's task value beliefs can be looked at two ways: (1) the extent to which children differentiate the value they attach to various domains (i.e., do they place relatively more value on some domains than other); and (2) the extent to which children differentiate between various subcomponents of task value within specific domains (i.e., do they distinguish between the interest value, attainment value, and utility value of a specific domain like math). Very little work has been done on either of these two aspects of structure.

With regard to the first type of structure (differentiation across domains), the assumption is typically made in the few developmental studies that assess task value that differentiation has occurred. Children are simply asked to report the value they attach to different school subjects (e.g., Eccles et al., 1983; Eccles et al., 1984a; Stein & Smithells, 1969; Wigfield et al., in press). The fact that different patterns emerge in the mean levels of these ratings suggests that even elementary school age children do distinguish between various school-based activities and subjects in the value they attach to these domains, although these kinds of findings do not provide a direct test of this claim.

From Harter's (1983) discussion of the development of the self-concept, it seems plausible that children's valuing of different school subjects likely is not very differentiated during the first 2 or 3 years of elementary school. They also may report valuing all school subjects highly, in the same way that they have high expectancies for success on those activities. This should be especially true for children's beliefs about the importance and interest value of different school subjects, since parents and teachers provide pervasive messages about the importance of schooling and since early elementary school aged children appear to be impervious to failure experiences.

In the study mentioned earlier, Wigfield, Eccles, Mac Iver, Reuman, &

Midgley (1990) assessed children's ability perceptions and valuing of mathematics, reading, computers, music, sports, and social activities and did factor analyses of these beliefs to determine how differentiated they were both across and within activity domains. Items assessing children's valuing of these activities tapped children's interest in the activity, its perceived importance, and perceived usefulness. Results of factor analyses showed that even first grade children have differentiated beliefs about various activities; children's beliefs about the different activities each formed a separate factor. Further, as mentioned above even at first grade the mean level of values differed across activity areas. However, there also was some evidence for more global beliefs. In the factor analyses a global task value factor emerged, (especially for academic activities) as did a factor containing all the items assessing worries about different activities. Thus for both of these constructs, children's beliefs in the early years of elementary school transcend the domains, providing some support to the notion that during early elementary school children's value beliefs are not completely differentiated.

Relatively little work has been done on the second aspect of the structure of task value beliefs, the differentiation of subcomponents within domains, especially for younger children. In their factor analyses Wigfield et al. (1990) found that within each activity area items assessing the different components of task value tended to load together; thus children in the early and middle elementary school years do not seem to distinguish among the different components of task value proposed by Eccles and her colleagues. With older children this differentiation appears to have occurred (Eccles & Wigfield, 1989). In this study Eccles and Wigfield (1989) also assessed whether there were age differences in the pattern of covariances among items assessing task values within one activity domain. They compared two age groups: early adolescents (5th through 7th grade) and middle adolescents (8th through 12th grade). Since the matrices were invariant across these two age groups, Eccles and Wigfield concluded that the basic structure of task value beliefs is stable across 5th through 12th grade. Thus, the mature structure seems to be in place by the time children reach early adolescence.

These two studies provide some indication of when children's task value beliefs become more differentiated. We would suggest that an understanding of how the components of task value differentiate might best be understood in the context of task choice. As discussed earlier, Eccles et al. (1983), in keeping with general expectancy-value models of behavioral choice, hypothesized that achievement-related choices such as the amount of effort to expend on a task and the initial decision to engage in a task would be related to the value the individual attached to the task. There likely are age-related differences in the extent to which this hy-

pothesis is true and age-related differences in the relative strength of this relationship for the different subcomponents of subjective task value. For example, at young ages the subjective value of a task may be heavily determined by the amount of pleasure the child gets from doing the task. If so, then young children's choice of different activities initially may center around their enjoyment of those activities. Their enjoyment may not relate closely to their performance level; children simply may do different activities that give them pleasure regardless of how well they are doing on those activities. In addition, given young children's relatively short attention spans, their interests and anticipated enjoyment may shift fairly rapidly, so that they may do many different activities for a short time before deciding which activities they enjoy the most.

As children get older, the importance that significant adults place on various activities may also begin to influence the subjective value the children place on these activities. But if it is true that the task value beliefs of these young elementary school age children are not yet fully differentiated, then it is likely that the perceived intrinsic and extrinsic values of various tasks will be highly correlated in most children's minds. Only as they begin to have experiences with tasks that are not equally important and interesting will they come to see the distinction between these two sources of task value. At this point, the extent to which more extrinsic sources of task value (such as parents' views) exert a greater influence on choice and involvement than the intrinsic interest value of the task will depend on the nature of the environment the child is in (i.e., how controlling the external social agents are in enforcing their activity choice). During the early and middle elementary school years we would hypothesize that children's sense of the usefulness of different activities, especially for future goals, likely is not very clear, and so this component may stabilize and become reliable later.

By the time children reach the late elementary school and middle school years children's achievement values are more differentiated (Eccles & Wigfield, 1989). At this time children may begin to make some decisions about which activities are more useful to them, although these decisions still would be quite tentative. Through the junior high and high school years and beyond how useful children think different activities are likely will play an increasingly important role in their decisions about which classes to take and how to best spend their time and energy (see Wigfield & Eccles, 1989). This proposed pattern of how children's values relate to their achievement choices should be studied further.

It is also likely that the relationship between children's achievement values and competence perceptions would change across the elementary and secondary school years and have an important influence on task choice. Initially the relations between these constructs should be weak, in

part because children's perceptions of competence are not clearly defined during the early school years, and also because children's interests may be only weakly related to their level of performance. Through the middle elementary school years there should be an increase in the strength of this relationship. In addition, it seems likely that based on the work of Battle (1966), Eccles et al. (1983), Eccles and Wigfield, (1989), and Feather (1988), this relationship will be positive when it emerges.

We do not yet know which of these constructs may take causal precedence in this relationship. Do children first develop a sense of competence for different activities and then decide which they value or do their values for different activities develop first? Most current views would hold that for school subjects competence perceptions may develop first because of the kinds of evaluative feedback students receive about their performance in school (e.g., Deci & Ryan, 1980; Harter, 1981a; Stipek & Mac Iver, 1989). As children become aware of their competence at different activities, they may adjust their initially high values for all school activities so that their values and competence perceptions are in synchrony with each other. Alternatively, thinking more broadly about achievement choices, it is equally likely that children's interest in certain activities would stimulate them to spend more time trying to master these activities, which would increase their actual competence at these activities. This increased competence, in turn, should foster higher expectations for one's success at these activities. These alternative causal relations can be tested only using longitudinal research; however, in either case, there should be a positive rather than inverse association between competence perceptions or expectancies and achievement values.

*Summary.* There are many issues concerning the development of achievement task values that need to be addressed, including those raised above about the stability of children's values and how they predict children's achievement performance and choices. We are beginning to get a sense for how children's valuing of different academic tasks changes across age. However, longitudinal work is needed in this area to chart the course of achievement values for different groups of children, as well as how those values relate to children's achievement in different subject areas and choices to continue taking those subjects (when those choices become available). Such longitudinal work also is needed to assess how the structure of children's task values changes over time, and which of these different possible components of task value are the most meaningful, in the sense of their discriminant validity and relation to other measures.

Along with establishing the developmental course of different components of task value and how they relate to perceptions of competence, we also should consider the interplay between the different components of



achievement values. How do children's perceptions of interest, importance, and usefulness work together to influence their task choices? We have seen that for senior high school students both usefulness and interest predict their intentions to keep taking math, whereas for junior high school students only interest predicts intentions (Wigfield & Eccles, 1989). What happens earlier on? Further, what happens when children's values are not in synchrony? Some children may find certain tasks important for different reasons, but not be at all interested in doing them, whereas other children may see those tasks as both important and interesting. Children whose values are in synchrony may be more positively motivated in their approach to different achievement tasks, whereas those out of synchrony may be more conflicted (see Harter, 1985). As appears to be the case with children's ability perceptions and task values, children holding congruent values also may have higher general self-esteem.

#### *Antecedents of Achievement Task Values*

As part of their broader conceptualizations of achievement values, Eccles and her colleagues have discussed various antecedents of achievement values. Like Feather (1982a), Eccles et al. (1983) stated that task values are determined by characteristics of the task as well as broader needs and values of the individual. These broader needs and values serve as the primary antecedents of the value individuals have for specific tasks, and Eccles et al. proposed four major antecedents of children's achievement values for different activities: their self-schema and goals, the relative perceived cost or benefit of doing the activity compared to doing other activities, the previous affective experiences individuals have had with different activities, and the perceptions of the values of their parents, teachers, and peers.

*Self-schema and goals.* Eccles et al. (1983) hypothesized that self-schema and goals affect task value through their impact on the attainment and utility values of various activities and goals. They described gender-role identity as one example of how this process could operate. A child's gender-role identity could determine whether certain tasks are valued (see Eccles, 1987; Huston, 1983; Stein & Bailey, 1973). Individuals with strong gender-role identities should value tasks that are congruent with these identities. For instance, females tend to view careers in mathematics as unfeminine (Boswell, 1979). Females wishing to adhere to the stereotypic feminine role may decide to discontinue taking mathematics classes because they do not want to pursue unfeminine careers (see Eccles, 1987; Eccles et al., 1983, and Eccles & Hoffman, 1984, for further discussion).

Eccles (1987) also argued that males and females may define achievement activities in different ways (see also Stein & Bailey, 1973). For many males, achievement means success in a competitively oriented school or

career situation; hence achievement is defined in a fairly limited sense. For females, achievement may be expressed through other accomplishments, such as social activities, raising children, community involvement, and so on. As a result of these different kinds of achievement, females may have to choose one kind of achievement (child rearing) over another (career success). Eccles asserted that since competitive striving in school or career settings often is assumed to be "true" achievement, females often appear to lack achievement motivation. Like Stein and Bailey (1973) she discussed how it is more appropriate to define achievement in different ways, rather than viewing competitive achievement as the only kind of achievement (see also Maehr, 1974).

Finally, Eccles (1987) argued that males and females differ in both the number of goals and the hierarchy among the goals they are trying to achieve in their lives. For example, some evidence suggests that males may be more focused than females in their goals, placing much greater value on their dominant goal and much lower value on the array of other goals they would like to obtain. If this were true, then females would potentially experience more conflict between their various high priority goals leading to increased approach-avoidance anxieties associated with each of the goals. The socialization of gender-role stereotypic self-schema is likely to lead females and males to rank the relative importance of various goals differently; this process would lead females and males to attach different attainment value to these various goals and make different choices when they must choose between various high priority goals (see later discussion of the relative cost of various options). Comparable attainment value conflicts could arise due to the relative importance of other aspects of the self-schema.

In their empirical work Eccles and her colleagues have examined how sex differences in children's beliefs and attitudes about mathematics predict differential enrollment in advanced math courses in high school and college and participation in math-related careers. Eccles et al. (1983) and Wigfield (1984) reported that 5th through 12th grade boys have higher ability perceptions and expectancies for future success in math than do females, despite the fact that females in the samples actually were achieving higher grades. Females believe that it takes more effort to do well in math and that math is harder. Interestingly, the extent to which females and males differ in the value they attach to math varies across studies and age groups, with larger sex differences with older adolescents and higher achieving populations (see Eccles, 1984a,b; Eccles et al., 1984b). Eccles et al. (1983) discussed how these different achievement self-perceptions could mediate girls' choices to discontinue taking math; if math is viewed as difficult and requiring much effort, perhaps girls will decide it is no longer worth doing. However, the fact that in some studies girls value

math as much as boys do (Wigfield et al., in press) may make these decisions difficult for them. Eccles (1984a) and Eccles et al. (1983) have argued that it is the *relative* valuing of various activities that is critical to task choice. Even if the sexes do not differ in the absolute value they attach to mathematics, girls may value other activities more (like social activities, or other academic activities) and so still opt out of mathematics.

How early do these sex-differentiated values patterns emerge? Wigfield et al. (1990) found that first, second, and fourth grade boys valued sports more than girls did, whereas the girls valued reading and music more than did boys. There were no gender differences in children's valuing of math or computer activities, even though boys reported higher ability perceptions in these areas than did girls. In addition, there were very few sex by grade interactions in children's values, indicating that the pattern of gender differences was quite similar across the three grades assessed, and so that these differences already were established by the first grade.

It is interesting and perhaps surprising that the sex differences in achievement values emerge so early. As in much of the work in the achievement motivation field, most researchers looking at sex differences in achievement striving have focused on differences in ability perceptions or attributions for success and failure rather than on achievement values (e.g., Dweck, 1975; Dweck & Repucci, 1973; Nicholls, 1978). Because as just noted sex differences in children's achievement values are a critical mediator of the kinds of choices boys and girls make about different activities to pursue, we believe they deserve to be studied as extensively as children's perceptions of ability have been studied.

*Cost of success.* According to Eccles et al. (1983) and Eccles (1987) the fact that people have many goals and desired personal characteristics has implications for the value they attach to various activities. More specifically, Eccles and her colleagues suggested that people have a hierarchy of goals and of valued personal characteristics and self-schema. Consequently, they will be attracted to more than one activity and will be forced to prioritize these activities in terms of their hierarchies of goals and personal values. Eccles et al. (1983) and Eccles (1987) suggested that the perceived cost of the activity can be influenced by several factors, ranging from anticipated anxiety to the time lost for engaging in other activities. We focus here on this latter aspect of cost. Eccles et al. (1983) suggested the following: (1) choosing one activity necessarily limits the individuals' opportunities to do other activities that also are valued; (2) this limitation is perceived as a cost of engaging in the activity; (3) this cost will vary as a function of how high in the hierarchy of valued activities the target activity is; and (4) the greater subjective assessment of cost, the lower the net value of the activity to the individual. For example, while an individ-

ual may enjoy doing math, she also may enjoy spending time on social activities. With limited amounts of time available, individuals will have to choose between doing their math homework and calling friends. As they get older these choices between different activities become more numerous and complex. Thus the value of a given activity must be considered in the context of the other activities available to the individual.

*Affective experiences.* Eccles et al. (1983) also related values to the kinds of affective experiences individuals have had with different tasks. Like Weiner (1979, 1985), they posited that positive (or negative) achievement outcomes give rise to general positive or negative emotional reactions to the outcome. Thus children should come to value those activities they have succeeded on more than the activities on which they have failed. Individuals' affective reactions to tasks also are affected by their causal attributions for their success or failure at the task (Weiner, 1985; see above). These affective reactions should affect the value students have for the activity.

Another affective reaction that may be a particularly important influence on students' valuing of an activity is the degree of anxiety they experience about the activity; if students become anxious about certain activities they may try to devalue the activity to reduce their anxiety, since presumably the prospect of failure on an unimportant activity should produce less anxiety than the prospect of failure at a highly valued activity. Eccles (1984) and Meece et al. (1990) have found that students' mathematics achievement values and anxiety about math are negatively related.

*Perceived beliefs of significant others.* Eccles et al. (1983) suggest that the subjective value children attach to various tasks ought to be related to children's perceptions of the value their parents and teachers attach to these tasks. The early emergence of sex differences in the patterning of values attached to different subjects suggests that early socialization practices are having a strong impact on children's valuing of those subjects. In support of this suggestion, Eccles et al. found a significant positive association between the value children attach to math and their perceptions of their parents' aspirations for them and their parents' confidence in their math ability.

To date very little research has assessed the links between these proposed antecedents and the development of achievement values. In a test of how children's perceptions of their parents' beliefs relate to their achievement values, Eccles et al. (1983) found (using path analytic techniques) that 5th through 12th grade children's self-concepts of math ability and their perceptions of their parents' aspirations for them predicted children's valuing of mathematics. Eccles (1984a,b) found that the value children attached to both math and English was positively related to their

history of successful performance in each subject, supporting the view that children value those tasks on which they are successful. This relationship, however, was much weaker for females than for males. In a test of how children's self-schema relate to their achievement value, Eccles and Harold (1990) found that the extent to which children stereotype sports as appropriate for their own sex predicts the value they attach to sports for themselves. Future work needs to assess these proposed antecedents more completely, and how their influence may change over age.

#### *Socializing Children's Achievement Values*

Most studies of the socialization of achievement have been quite broad, looking at variables such as how parental aspirations for their children's education relate to children's own aspirations or how parents' behaviors relate to their children's general achievement motivation (see Parsons, 1981; Wigfield & Asher, 1984, for reviews). In the achievement motivation area, parents' expectancies for their children's success in different school subjects and their aspirations for their children's educational attainment (e.g., Alexander & Entwisle, 1988; Eccles et al. 1983; Parsons, Kaczala, & Meece, 1982) have been studied much more extensively than how children's values are socialized. Studies looking at parent socialization of achievement values have looked at broader categories such as valuing of education in general, rather than valuing of more specific activities. Two studies have looked at how parents' specific achievement-related beliefs relate to children's achievement self-perceptions. Parsons et al. (1982) found that parents' beliefs about their 5th through 11th grade children's competencies had a stronger influence on children's own beliefs than did either parents' role modeling of different activities or children's own grades in school. Results also showed that parents of sons think math is more important for their children than did parents of daughters. As just discussed in the previous section, Eccles et al. (1983) found that the influence of parents' beliefs on 5th through 12th grade students' beliefs was mediated through students' perceptions of those beliefs. For instance, parents' perceptions of the importance of math related to students' perceptions of their parents' aspirations for them, which in turn related to students' valuing of math. Eccles et al. also found that mothers' beliefs had a stronger impact on students' beliefs than did fathers' beliefs.

Deci and his colleagues' (Deci, 1975; Deci & Ryan, 1980, 1985; Ryan et al., 1985) work on intrinsic motivation could shed some light on the socialization of achievement values. They argued that when parents promote children's mastery attempts and foster a sense of self-determination in their children, those children are more likely to be intrinsically motivated. By contrast, when parents exert too much control over their children then children are more likely to remain extrinsically motivated. This

hypothesized pattern of socialization has not been empirically assessed; in the context of interest value it suggests, however, that parents may best foster children's interest in different activities by allowing them to determine those interests, rather than trying to force their own interests on children.

We have very little information about how parents differentially socialize achievement values for different activities (e.g., sports vs academics) or for different activities within the same domain (e.g., mathematics vs English). What kinds of messages do parents provide their children about the importance of different activities? How do the activities parents engage in influence children's participation in related activities? Following Parsons et al.'s (1982) results, how do parents' beliefs about their children's competences in different activities influence children's participation in those activities? Further, how might these various influences change over time? Perhaps most important, how do children's values become internalized? Eccles et al. (1984c), and their colleagues are assessing these issues in a 5-year longitudinal study of the development and socialization of achievement self-perceptions and activity choice across the elementary school years. Results of their study should help answer many of these questions.

Even less information is available concerning how teachers influence the values children attach to different school subjects, and how these patterns might change over time. Can an excellent teacher in a certain subject area pique a student's interest in that subject, so that he or she continues to study it later? Conversely, can a bad teacher destroy the interest a student has for a subject? In one study that provides some answers to these questions, Deci, Nezlek, and Sheinman (1981) examined how teachers' control orientation influenced elementary school-aged children's intrinsic motivation and perceptions of competence. They found that in classes in which teachers were oriented to developing children's autonomy, children had higher intrinsic motivation and perceptions of competence than did children in classrooms in which teachers were oriented toward maintaining control.

Though Deci et al.'s (1981) results are intriguing, Brophy (1985) has observed that teachers do not spend much time in classrooms discussing why the material they are teaching is important, so that they may not explicitly influence children's valuing of different subjects. However, the approaches they take to those subjects and their ways of interacting with students certainly should at least indirectly influence how students value different subject areas. Along with Deci et al.'s study, strong support for this hypothesis comes from the recent work focused on identifying the classroom characteristics that deter females and minorities from studying advanced math and physical science (e.g., Casserly, 1980; Eccles & Blu-

menfeld, 1985; Kahle, 1984; Wilkinson & Marrett, 1985). These studies clearly indicate that classroom practices such as the use of competitive, public motivational strategies, frequent use of public drill and practice, and insincere use of praise and criticism undermine the interest and value students attach to mathematics and science. In contrast, frequent use of hands-on learning opportunities, careful monitoring so that all children get to participate, and use of applied problems to teach basic concepts facilitate students' interest in mathematics and science. These influences need to be explored further.

#### ACHIEVEMENT TASK VALUES AND ACHIEVEMENT GOALS

Recently, there has been a great deal of interest among motivation researchers in delineating the goals individuals have in different achievement settings and determining how those goals relate to achievement behavior (e.g., Ames & Archer, 1988; Dweck & Leggett, 1988; Maehr, 1984; Maehr & Braskamp, 1986; Nicholls, 1979, 1984; Wentzel, 1989). Achievement goals refer to the purposes children have for learning different things. We will propose that achievement task values may influence achievement goals; however, the different views on the nature of achievement goals are presented first, followed by an exploration of how values and goals may be related.

Nicholls (1979, 1984) defined two major kinds of goal orientations that can influence individuals' performance, persistence, and choice in achievement situations, ego involvement and task involvement (see Dweck & Elliott, 1983, for a complementary analysis; in their terms ego involvement is called performance goals; and task involvement is called learning goals). An ego-involved orientation means that individuals attempt to obtain favorable evaluations of their competence and avoid negative judgments of competence. Questions like "Will I look smart?" and "Can I do this task?" reflect ego-involved goals. A task-involved goal orientation means that the individual focuses 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 involvement.

Nicholls (1979, 1984) posited that these two kinds of goal orientations will produce different patterns of task choice. In task involvement, all individuals will choose tasks that are moderately difficult with respect to their own internal standards. In ego involvement capable people will choose tasks that are moderately difficult from a social comparative, normative perspective. Less competent people will choose either easy or hard tasks. Note the similarity of these latter predictions to Atkinson's (1957, 1966) original model of the task choices of people with high or low achievement motivation; in fact, Nicholls argued that the Atkinson model

only applies to competitive, ego-oriented achievement situations (see also Maehr, 1974 for a similar argument), not to the more task-focused situation.

Nicholls (1979, 1984) related these goal orientations to children's conceptions of ability. He distinguished two major conceptions of ability that children can have (see also Dweck & Bempechat, 1983). Some children define ability in learning and mastery terms. With this definition children judge their abilities in relation to their previous performance and believe that additional effort actually can increase their ability; hence children view ability and effort as complementary. This conception of ability fosters a task-involved goal orientation; that is, a focus on mastery and improvement. Other children define ability as relatively stable and judge it in comparison to others and so have the notion of "ability as capacity." In this view children see ability and effort as inversely related, so they base their assessments of ability on how much effort the individual has to expend. The more effort expended, the less ability one has. Because of this division of ability and effort, Nicholls argued that this is a more differentiated view of ability. He also stated that this view can foster the ego-involved goal orientation, since viewing ability as capacity leads to an emphasis on demonstrating that one has more ability than others do.

Nicholls (1984) also discussed how children's beliefs about ability and goal orientations change across childhood. He argued that most young children have a mastery or learning view of ability, believing that increased effort can improve their abilities. Thus young children are more likely to have a task-involved goal orientation. By the late elementary school years children can understand how effort and ability can be differentiated and are inversely related (see Nicholls, 1978), and that if success requires a great deal of effort it may mean the individual lacks stable ability. One outcome of this developmental progression is that some children become more ego involved in different achievement situations once they understand how effort and ability can be inversely related. This outcome is not a necessary outcome of the new understanding of ability; however, some children continue to maintain the task-involved goal orientation.

Nicholls (1979) argued further (see also Dweck & Elliott, 1983) that ego involvement will have debilitating motivational consequences for most children; only those who do very well relative to peers can thrive under ego involvement. Learning situations that produce ego involvement include those situations that heighten social comparison between students, increase competition, cause excessive concern over evaluation, and promote self-awareness of performance. Under these conditions task performance becomes less important than looking able relative to others. Nicholls stated that since many schools promote ego involvement (espe-



cially from the late elementary school years on), many children's motivation for school activities will suffer as they proceed through school. To reduce ego involvement and increase task involvement, Nicholls suggested that students should be given tasks that are moderately challenging and that the salience of task-extrinsic incentives (such as grades and/or how well one is doing relative to others) should be reduced.

Dweck and Elliott (1983) discussed how these achievement goals relate to other achievement-related beliefs, such as expectancies and values. They argued that children's cognitions about learning along with situational cues influence the salience of these different broad achievement goals as well as the expectancies and values for different achievement outcomes that are attached to those goals. With respect to achievement values, Dweck and Elliott (1983) argued that the values themselves 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, particularly if the learner sees the skill as useful, is interested in acquiring those skills, and when skill increase is made salient.

Taking a somewhat broader perspective on achievement goals, Maehr (1984) and Maehr and Braskamp (1986) discussed achievement goals in their theory of personal investment, a theory which attempts to explain individuals' choices of different tasks and persistence in achievement settings. They postulated that the individual's thoughts, perceptions, and beliefs determine motivation and focused on two major sets of beliefs, the individual's sense of self and personal incentives, as determining which achievement tasks had meaning for the individual. Sense of self includes three main beliefs: self-reliance, which refers to the degree or control the individual perceives he/she has over the environment; goal directedness, or the extent of future orientation; and self-esteem, which in Maehr and Braskamp's terms refers to individuals' estimates of their competence.

Personal incentives refer to what the individual expects to receive from different achievement situations. Maehr (1984) defined four such incentives, ranging from extrinsic incentives to intrinsic incentives. At the far extrinsic end are money and social recognition and then social goals such as social approval. Next are ego goals, which include social comparison and competition. At the most intrinsic end of the continuum are mastery goals, such as concern for excellence and task mastery goals.

By examining the individuals' self-beliefs and personal incentives Maehr and Braskamp (1986) argued that they can predict the ways in which the individual will invest time and energy into different activities. In their empirical work Maehr and Braskamp have examined how these different self-beliefs and personal incentives relate to individuals' career

choices. They have found that individuals in different careers (e.g., business occupations versus college faculty) have quite different patterns of goals (see also Wigfield & Braskamp, 1985). Thus achievement goals can have important influences on achievement behavior, particularly choice.

Future research should determine whether there are additional important achievement goals. While task (learning) and ego (performance) goals are powerful achievement goals, it seems unlikely that these are the only two kinds of goals (see Ames & Archer, 1988; Wentzel, 1989). In their discussion of career choice Maehr and Braskamp (1986) added two other kinds of goals to this list, social approval and purely extrinsic goals such as money. Eccles (1987) discussed gender-role-related values that involve the compatibility of the activity with nonachievement goals and with more process-oriented values that focus on the means of achieving certain goals as well as on the goal itself. These kinds of goals also may be applicable to the school achievement situation. Finally, Schunk (1990) discussed proximal and distant goals and argued that for children proximal goals (e.g., completing the immediate task at hand) work better than more distant goals (finish all the work you have been given, study now so you can attend college later). Schunk also noted that more specific goals appear to engage children in the task more than do general goals such as "work hard."

Along with considering additional goals and the generality or specificity of the goals, it may be more appropriate to see goals as existing along a continuum as Maehr and Braskamp (1986) have done, rather than characterizing them in "either or" terms as Nicholls (1979, 1984) and Dweck and Elliott (1983) have done. Alternatively, it is likely that different goals can coexist. For example, it seems unlikely that most students have either performance goals or learning goals; rather, they may have more than one kind of goal guiding their achievement behavior in different achievement situations (see Wentzel, 1989). There has been little theoretical or empirical work on how different levels or patterns of these goals influence children's achievement behaviors.

As just noted, Dweck and Elliott (1983), Eccles et al. (1983), and Nicholls (1984) discussed some possible relations between attainment values and achievement goals. Other more complex relations could be explored in which the different components of task value are posited to influence children's goals. Let us first look at "simple" examples where students value a subject (mathematics, for illustrative purposes) in one specific way. If students value math primarily because they think it will be useful to their future careers (e.g., they plan to be engineers, scientists, etc.) and realize they have to get good grades in math to have access to those careers, then ego-involved goals might be most prominent for them. They could choose math courses in which they think they have a good

chance of receiving good grades and perhaps will avoid those courses where they might have difficulty. Students with high math attainment value (i.e., who believe math ability is important to them) also may have more ego-oriented goals, since demonstrating competence may be the key aspect of math achievement for them. Alternatively, for students who take math primarily because they are interested in it, perhaps more task-involved goals would predominate. These students would take those courses that fit their interests and be more concerned about understanding the material presented than getting the best grades and/or outperforming others. Their choices of different courses might not be systematic, but would follow their particular interests. Moreover, choosing courses based on interest could have other positive consequences, as discussed by Deci and Ryan (1980), Harter (1981a), and Ryan et al. (1985). These researchers have shown that when individuals are interested in tasks they will strive more, have higher perceptions of competence for the task, and have more positive affective reactions to the task. Thus there appear to be many advantages for choosing tasks in which one is interested.

Of course, most students likely value math in more than one way, and these different values each may influence their mathematics choices (see Eccles, 1987; Eccles et al., 1983; Wigfield & Eccles, 1989). Some students might find math both interesting and useful, whereas others may know that math will be useful to them but are not particularly interested in math. These students should have different goals in math classes. The first group will have both ego- and task-involved goals and may be more likely to continue taking mathematics even when they no longer have to. The second group should be most focused on ego goals and try to get math "out of the way" as soon as they can. Similar scenarios could be devised for children who think math is important and interesting versus those who believe it is important but not interesting.

From this perspective, the achievement values students have influence their goals in achievement situations, which would in turn influence their achievement behavior. The achievement behaviors that may be most influenced by values and goals would be choice of different math activities or courses to fit the goals and persistence in attaining those goals. For instance, a student for whom math is a useful prerequisite for a certain kind of career but who does not particularly like math may choose a particular math course but then drop it if he or she is not doing well in the course in order to avoid having a bad grade on the transcript. A student interested in math may persist longer if he or she is having difficulty because learning goals will be more important than performance goals. By looking at how students' values and goals work together to influence their choice and persistence at math (or other subjects) we may have a more complete picture of how students' decisions are formed. Future research

should assess both values and goals in different achievement situations to see whether the proposed patterns indeed do hold.

### ISSUES FOR FUTURE RESEARCH

#### *Measuring Achievement Task Values*

Few measures of achievement task values exist in the literature. As discussed earlier, Eccles et al. (1983) developed scales for assessing students' ratings of the interest, importance, and usefulness of different academic subjects. These scales have been shown to be reliable, have discriminant validity, and also predict children's achievement choices. They also can be administered to children of many different ages, from the early elementary school years through high school. Measures of other different components of task value, such as the ones proposed by Raynor (1982b), have not yet been developed.

Along with questionnaire measures of children's values, various kinds of rating scales and behavioral ratings should be developed to assess possible outcomes (besides activity choice) of children's values. Eccles et al. (1984c) have developed measures to be used by teachers and parents to rate children's interest, involvement, enthusiasm, and investment in different school subjects and other activities. These rating scales can be done broadly for different school subjects or specifically for certain activities within a given subject. These researchers also have developed behavioral ratings for teachers and parents. Teachers rate how much time children spend at different activities. Parents rate how children spend their free time outside of school. These behavioral indices are important because as noted earlier children's task values relate to the choices they make about participating in different activities. Researchers could use these measures in conjunction with the self-report measures of children's values to determine which aspects of children's values predict the different outcomes.

#### *The Relationship between Expectancies and Values*

The theoretical issue of how expectancies and values are related needs further examination. In summarizing early work on the expectancy-value model, Atkinson and Feather (1966) stated that motives, expectancies, and values may be related in more complex ways than Atkinson (1957, 1966) anticipated in his original statements of expectancy-value theory. In this article studies have been reviewed showing that expectancies and values are positively related rather than inversely related. Most of Atkinson's work in this area was done with laboratory-type studies that do not have strong consequences for individuals' future achievement strivings in areas that are important to them. Studies showing positive relations be-

tween expectancies and values have been done in real-world settings and concern achievement values and expectancies for academic subjects such as mathematics and English (e.g., Battle, 1966; Eccles et al., 1983; Eccles & Wigfield, 1989; Feather, 1988). In addition, studies of intrinsic motivation and competence perceptions show that those two constructs are positively rather than inversely related (see Harter, 1981b; Ryan et al., 1985). Researchers should test the relations between expectancies and values on other kinds of tasks so that we can get a more complete picture of how the two constructs are related.

Based on the work reviewed here, we would predict that in most achievement situations expectancies and values will be positively related, so that the individual will value those tasks that he or she does well. This proposed congruence between expectancies and values also could have important implications for individuals' more general self-esteem, as Eccles, Wigfield, Blumenfeld, and Harold (1984), Eccles et al. (1989), Harter (1985), and James (1892) have proposed. When ability perceptions and values are in synchrony, individuals may have more positive general self-esteem because they are doing well on tasks that are important to them. Conversely, self-esteem may suffer when individuals do poorly on valued tasks. Doing poorly on tasks with little value to the individual, or doing well on such tasks, probably will not influence self-esteem as much. These predictions have been partially assessed (e.g., Eccles et al., 1989), but more complete tests are needed.

#### *The Nature of Decision Making*

Expectancy-value models have been particularly influential in explaining people's choices of different activities and persistence at those activities. In many respects these models emphasize the rational processes involved in making decisions. Based on their experiences individuals judge how well they expect to do on a task and how much they value success on the task, which determines whether or not they will continue to engage in the task. Recently, some theorists interested in decision making have begun to question how rational and conscious people's decision-making processes really are. For instance, Kahneman and Tversky (1984) and Tversky and Kahneman (1981) have shown that framing the same problem in different ways results in shifts in decisions made about the problem, so that people make quite opposite choices depending upon how the problem is presented, or how the potential outcomes of an action are presented. One problem they present to individuals is how to deal with the outbreak of a disease that may kill 600 people. Two programs to combat the disease are available. In one "framing" of these programs, people are told that if one program is adopted, 200 people will be saved. If the other program is adopted, there is a 1/3 probability that 600 will be

saved and a 2/3 probability that no one will be saved. With this framing, most people opt for saving 200 people. The second framing of the problem is as follows: if the first program is adopted, 400 people will die. If the second program is adopted, there is a 1/3 chance no one will die and a 2/3 chance that 600 people will die. With this framing most people opt for the second program. Note that the outcomes in both framings are identical; the only thing that changes is how the problem is introduced. Such results call into question the notion of rational choice based on a complete assessment of the available information (see also Nisbett & Wilson, 1977). Kahneman and Tversky argued further that individuals often are unaware of how alternate frames influence their decision about a particular problem. They discussed how rational theories of choice rely on a "coherence principle"; for example, that carefully answering the question "What do I want?" should lead to a coherent set of preferences. Their work calls such principles into question, since the way a problem is stated markedly influences preferences.

In an explicit critique of the subjective expected utility (SEU) decision-making model (which is analogous to expectancy-value theory), Fischhoff, Goitein, and Shapira (1982) also argued that the logical, rational decision-making processes of determining expectancies and valences outlined in the SEU model are not always used when people make decisions. They discussed how people often use simpler decision-making strategies than those implied in the SEU model. They also noted that people make many errors in judging probabilities, particularly the error that success is more attainable than it really is, and that decision making often can be based on fallacious reasoning rather than rational processes. Regarding valences, they argued that those can and do shift fairly rapidly, particularly in areas that are relatively unfamiliar to the individual.

These authors have raised some serious challenges to expectancy-value approaches. In replying to Fischhoff et al.'s (1982) concerns, Feather (1982a) wrote that expectancy-value models do posit that individual's judgments are subjective, and so there is room for error in those judgments. The subjective nature of both expectancies and values also means that the model does not overemphasize rational, logical, objective decision-making processes. Feather also argued that expectancy-value models may predict certain kinds of decisions better than others, particularly decisions that require planning and foresight. Impulsive decisions, decisions that must be made without having much information available, and habitual decisions may be kinds of decisions not well predicted by expectancy-value theory.

In support of expectancy-value theory, we have reviewed evidence showing that decisions concerning academic performance and choice can be predicted rather well on the basis of expectancies and values. Still, the

critique that expectancy-value models are overly rational and conscious, like similar critiques of attribution theory (see Langer, 1978), deserves serious attention. One important way to address these problems is to determine which kinds of decisions are most influenced by expectancies and values. Similarly, determining when people's values and expectancies are based on experiences with certain tasks or determining which tasks can be better judged in terms of expectancies for success or their value would give a better sense of when expectancy-value models may be powerful in predicting people's choices and when they may not be.

These critiques may be particularly important when considering the development of achievement values, since young children's choices about which activities they can succeed on and which they value may be less rational and/or conscious than the choices of adolescents or adults. Younger children's values and expectancies also may be less stable than those of adults, and so have less predictive validity. Because of these kinds of concerns, expectancy-value models may have to be modified to account for children's decisions and choice, and other factors may have to be included in those models. Suggestions for how to modify Eccles' expectancy-value model in light of these concerns and recent research findings are provided next.

#### *Extending Eccles' Expectancy-Value Model*

Eccles et al.'s (1983) expectancy-value model has been influential in guiding research on how children's expectancies and values relate to their achievement performance and choices. Several studies (Eccles, 1984a,b; Eccles et al., 1983; Eccles, Adler, & Meece, 1984a; Meece et al., 1990) now have looked at different aspects of the model. To guide future research efforts we will indicate which aspects of the model have been supported and which need to be expanded or revised. Along with guiding research efforts, this process should help refine and clarify values-related constructs and so aid theoretical development in this area.

One of the clearest findings coming from several different studies is that children's expectancies for success relate more strongly to their subsequent performance on different tasks, whereas their achievement values relate more strongly to their intentions and choices of achievement activities (e.g., Eccles, 1984a,b; Eccles et al., 1983; Meece et al., 1990). Referring back to Fig. 1, it can be seen that in the original model direct paths were drawn from expectancies and values to both performance and persistence; it now may be necessary to drop the path from expectancies to persistence and choice, and from values to performance, since the empirical studies have not found evidence for those paths.

Trimming other paths may be possible as well; for instance, given that students do not seem to distinguish clearly between ability perceptions

and expectancies (see Eccles & Wigfield, 1989), perhaps those two constructs can be merged. However, since some theorists have argued that ability perceptions may causally precede expectancies (e.g., Weiner, 1979, 1985), more longitudinal tests of the links between perceptions of ability and expectancies for success should be conducted to see if over time general ability perceptions may predict both expectancies and values, as suggested in the model.

In the original model predictions about the relations between expectancies and values were not made. With the increasing evidence that those constructs are positively related, the bidirectional noncausal path between the constructs should be inserted into the model and tested in different samples. Other paths that should be assessed more fully are those from the separable components of achievement values to persistence and choice. In the original model the general task value construct was linked to persistence and choice; it now appears that the separate components may differentially predict persistence and choice and these relations may differ across age (see Wigfield & Eccles, 1989). However, it should be noted that the relatively high correlations among these components makes it somewhat difficult to estimate their independent contributions to persistence and choice. Further bidirectional noncausal relations between the value components also may need to be included in the model to determine more clearly how each relates to one another.

The relation of goals and values specified in the model needs to be assessed more closely. Currently goals are seen as predicting children's values; however, as discussed earlier it may be that children who value tasks in different ways may have different goals for those tasks. Testing alternative formulations of the relations between these constructs would be very illuminating. Another possibility is that we may need to distinguish between different levels or dimensions of task goals. Some goals may be very broad (such as the goal to achieve a good education), whereas others may be more specific (ego goals or task mastery goals in a particular setting). Broader goals may predict achievement values, and these values may in turn predict the more specific achievement goals. Looking at relations between these different categories of goals (using measures like those developed by Wentzel, 1989) to assess specific goals and developing measures of broader goals and the components of achievement values would provide a test of these possible links.

As mentioned earlier, few tests of the proposed antecedents of achievement task values have been done; this remains an important task for future research. In studies with 5th through 12th grade children, Eccles et al. (1983) and Parsons et al. (1982) have shown that children's perceptions of their parents' beliefs are important antecedents of their own beliefs. These links should be assessed in children of different ages in order to see



if the relative strength of these and other antecedents changes across age. Parents' beliefs may be an even stronger influence on younger children's achievement-related beliefs. Conversely, children's previous performance may not be a strong antecedent during the early elementary school years (since as discussed earlier children's performance and beliefs about their performance are not strongly related during the early elementary school years), but by the end of elementary school and beyond children's own beliefs and their performance histories may become the strongest antecedents of their current beliefs. Specific aspects of the cultural milieu may prove to be critical antecedents, and their influence may change over time as well. For instance, peer influences may be a major antecedent of children's task values, and the strength of peer influences may increase as children get older, peaking during the junior high school years. Last, the ways in which children's achievement values become internalized have not been assessed. That topic is perhaps the most important priority for future research in this area.

#### REFERENCES

- Alexander, K., & Entwisle, D. (1988). Achievement in the first two years of school: Patterns and processes. *Monographs of the Society for Research in Child Development*, 53, (2, Serial No. 218).
- Ajzen, I., & Fishbein, J. (1977). Attitude-behavior relations: A theoretical analysis and review of empirical research. *Psychological Bulletin*, 84, 888-918.
- Ames, C. (1984). Competitive, cooperative, and individualistic goal structures: A motivational analysis. In R. Ames & C. Ames (Eds.), *Research on motivation in education* (Vol. 1, pp. 177-207). New York: Academic Press.
- Ames, C., & Archer, J. (1988). Achievement goals in the classroom: Students' learning strategies and motivational processes. *Journal of Educational Psychology*, 80, 260-267.
- Atkinson, J. W. (1957). Motivational determinants of risk taking behavior. *Psychological Review*, 64, 359-372.
- Atkinson, J. W. (1964). *An introduction to motivation*. Princeton, NJ: Van Nostrand.
- Atkinson, J. W. (1966). Motivational determinants of risk taking behavior. In J. W. Atkinson & N. T. Feather (1966), *A theory of achievement motivation* (pp. 11-31). New York: Wiley.
- Atkinson, J. W., & Birch, D. (1970). *A dynamic theory of action*. New York: Wiley.
- Atkinson, J. W., & Birch, D. (1978). *An introduction to motivation* (2nd ed.). New York: Van Nostrand.
- Atkinson, J. W., & Feather, N. T. (1966). Review and appraisal. In J. W. Atkinson & N. T. Feather (Eds.), *A theory of achievement motivation* (pp. 327-370). New York: Wiley.
- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, 84, 191-215.
- Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice-Hall.
- Bandura, A. (1989). Human agency in social cognitive theory. *American Psychologist*, 44, 1175-1184.
- Battle, E. (1965). Motivational determinants of academic task persistence. *Journal of Personality and Social Psychology*, 2, 209-218.

- Battle, E. (1966). Motivational determinants of academic competence. *Journal of Personality and Social Psychology*, 4, 534-642.
- Boswell, S. (1979). *Nice girls don't study mathematics: The perspective from elementary school*. Paper presented at the meeting of the American Educational Research Association, San Francisco.
- Brophy, J. (1985). Socializing student motivation to learn. In M. L. Maehr & D. Kleiber (Eds.), *Advances in motivation and achievement* (Vol. 5). Greenwich, CT: JAI Press.
- Casserly, P. (1980). An assessment of factors affecting female participation in advanced placement programs in mathematics, chemistry, and physics. In L. Fox, I. Brody, & D. Tobin (Eds.), *Women and the mathematical mystique* (pp. 138-163). Baltimore: Johns Hopkins Univ. Press.
- Covington, M. V. (1984). The motive for self-worth. In R. Ames and C. Ames (Eds.), *Research on motivation in education* (Vol. 1, pp. 77-113). New York: Academic Press.
- Crandall, V. C. (1969). Sex differences in expectancy of intellectual and academic reinforcement. In C. P. Smith (Ed.), *Achievement-related motives in children* (pp. 11-45). New York: Russell Sage Foundation.
- Crandall, V. J., Katkovsky, W., & Preston, A. (1962). Motivational and ability determinants of young children's intellectual achievement behavior. *Child Development*, 33, 643-661.
- Deci, E. L. (1975). *Intrinsic motivation*. New York: Plenum.
- Deci, E. L., Nezelek, J., & Sheinman, L. (1981). Characteristics of the rewarder and intrinsic motivation of the rewardee. *Journal of Personality and Social Psychology*, 18, 105-115.
- Deci, E. L., & Ryan, R. M. (1980). The empirical exploration of intrinsic motivation processes. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 13, pp. 39-80). New York: Academic Press.
- Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behavior*. New York: Plenum.
- Dweck, C. S. (1975). The role of expectations and attributions in the alleviation of learned helplessness. *Journal of Personality and Social Psychology*, 31, 674-685.
- Dweck, C. S., & Bempechat, J. (1983). Children's theories of intelligence. In S. Paris, G. Olsen, & H. W. Stevenson (Eds.), *Learning and motivation in the classroom* (pp. 239-256). Hillsdale, NJ: Erlbaum.
- Dweck, C. S., & Elliott, E. S. (1983). Achievement motivation. In P. H. Mussen (Ed.), *Handbook of child psychology* (Vol. IV, 3rd. ed., pp. 643-691). New York: Wiley.
- Dweck, C. S., & Leggett, E. L. (1989). A social-cognitive approach to motivation and personality. *Psychological Review*, 95, 256-273.
- Dweck, C. S., & Repucci, N. D. (1973). Learned helplessness and reinforcement responsibility in children. *Journal of Personality and Social Psychology*, 25, 109-116.
- Eccles, J. S. (1984a). Sex differences in achievement patterns. In T. Sonderegger (Ed.), *Nebraska Symposium on Motivation* (Vol. 32, pp. 97-132). Lincoln, NE: Univ. of Nebraska Press.
- Eccles (Parsons), J. S. (1984b). Sex differences in mathematics participation. In M. Steinkamp & M. Maehr (Eds.), *Advances in motivation and achievement* (Vol. 2, pp. 93-137). Greenwich, CT: JAI Press.
- Eccles, J. S. (1987). Gender roles and women's achievement-related decisions. *Psychology of Women Quarterly*, 11, 135-172.
- Eccles (Parsons), J., Adler, T. F., Futterman, R., Goff, S. B., Kaczala, C. M., Meece, J. L., & Midgley, C. (1983). Expectancies, values, and academic behaviors. In J. T. Spence (Ed.), *Achievement and achievement motivation* (pp. 75-146). San Francisco, CA: Freeman.
- Eccles, J. S., Adler, T. F., & Meece, J. L. (1984a). Sex differences in achievement: A test of alternate theories. *Journal of Personality and Social Psychology*, 46, 26-43.

- Eccles, J. S., & Blumenfeld, P. B. (1985). Classroom experiences and student gender: Are there differences and do they matter? In L. Wilkinson & C. Marrett (Eds.), *Gender influences in classroom interaction*. Hillsdale, NJ: Erlbaum.
- Eccles, J. S., & Harold, R. (1990). *Gender differences in sport participation: Applying the Eccles et al. model*. Unpublished manuscript, University of Michigan.
- Eccles, J. S., & Hoffman, L. W. (1984). Sex roles, socialization, and occupational behavior. In H. W. Stevenson & A. E. Siegel (Eds.), *Research in child development and social policy* (Vol. 1, pp. 367-420). Chicago: Univ. of Chicago Press.
- Eccles, J. S., & Midgley, C. (1989). Stage/environment fit: Developmentally appropriate classrooms for early adolescents. In R. Ames & C. Ames (Eds.), *Research on motivation in education* (Vol. 3, pp. 139-181). New York: Academic Press.
- Eccles, J. S., Midgley, C., & Adler, T. (1984b). Grade-related changes in the school environment: Effects on achievement motivation. In J. G. Nicholls (Ed.), *The development of achievement motivation* (Vol. 3, pp. 283-331). Greenwich, CT: JAI.
- Eccles, J., Wigfield, A., Blumenfeld, P., & Harold, R. (1984c). *Psychological predictors of competence development*. Grant Proposal to the National Institute for Child Health and Human Development.
- Eccles, J. S., & Wigfield, A. (1989). *In the mind of the achiever: The structure of adolescents' academic achievement-related beliefs and self-perceptions*. Manuscript submitted for publication.
- Eccles, J. S., Wigfield, A., Flanagan, C., Miller, C., Reuman, D., & Yee, D. (1989). Self-concepts, domain values, and self-esteem: Relations and changes at early adolescence. *Journal of Personality*, 57, 283-310.
- Edwards, W. (1954). The theory of decision making. *Psychological Bulletin*, 51, 380-417.
- Feather, N. T. (1975). *Values in education and society*. New York: Free Press.
- Feather, N. T. (1979). Values, expectancy, and action. *Australian Psychologist*, 14, 243-260.
- Feather, N. T. (1982a). Expectancy-value approaches: Present status and future directions. In N. T. Feather (Ed.), *Expectations and actions: Expectancy-value models in psychology* (pp. 395-420). Hillsdale, NJ: Erlbaum.
- Feather, N. T. (1982b). Human values and the prediction of action: An expectancy-value analysis. In N. T. Feather (Ed.), *Expectations and actions: Expectancy-value models in psychology* (pp. 263-289). Hillsdale, NJ: Erlbaum.
- Feather, N. T. (1988). Values, valences, and course enrollment: Testing the role of personal values within an expectancy-value framework. *Journal of Educational Psychology*, 80, 381-391.
- Fischhoff, B., Goitein, B., & Shapira, Z. (1982). The experienced utility of expected utility approaches. In N. T. Feather (Ed.), *Expectations and actions: Expectancy-value models in psychology* (pp. 315-339). Hillsdale, NJ: Erlbaum.
- Harter, S. (1981a). A model of mastery motivation in children: Individual differences and developmental change. In W. A. Collins (Ed.), *Minnesota symposium on child psychology* (Vol. 14, pp. 215-255). Hillsdale, NJ: Erlbaum.
- Harter, S. (1981b). A new self-report scale of intrinsic versus extrinsic orientation in the classroom: Motivational and informational components. *Developmental Psychology*, 17, 300-312.
- Harter, S. (1982). The Perceived Competence Scale for Children. *Child Development*, 53, 87-97.
- Harter, S. (1983). Developmental perspectives on the self-system. In P. H. Mussen (Ed.), *Handbook of child psychology* (Vol. 4, pp. 275-385). New York: Wiley.
- Harter, S. (1985). Competence as a dimension of self-evaluation: Toward a comprehensive

- model of self-worth. In R. L. Leahy (Ed.), *The development of the self* (pp. 55-121). New York: Academic Press.
- Hill, K. T. (1972). Anxiety in the evaluative context. In W. W. Hartup (Ed.), *The young child* (pp. 225-263). Washington, DC: National Association for the Education of Young Children.
- Huston, A. (1983). Sex-typing. In P. H. Mussen (Ed.), *Handbook of child psychology* (Vol. 4, pp. 387-467). New York: Wiley.
- James, W. (1892). *Psychology*. New York: Fawcett.
- Kaczala, C. (1983). *Sex role identity and its effect on achievement attitudes and behaviors*. Unpublished doctoral dissertation. University of Michigan.
- Kahle, J. (1984). *Girl-friendly science*. Paper presented at the meeting of the American Association for the Advancement of the Sciences, New York.
- Kahneman, D., & Tversky, A. (1984). Choices, values, and frames. *American Psychologist*, 39, 341-350.
- Kavrell, S. M., & Petersen, A. C. (1984). Patterns of achievement in early adolescence. In M. L. Maehr (Ed.), *Advances in motivation and achievement* (pp. 1-35). Greenwich, CT: JAI Press.
- Kukla, A. (1972). Foundations of an attributional theory of performance. *Psychological Review*, 79, 454-470.
- Langer, E. J. (1978). Rethinking the role of thought in social interaction. In J. H. Harvey, W. Ickes, & R. F. Kidd (Eds.), *New directions in attribution research* (Vol. 2, pp. 35-58). Hillsdale, NJ: Erlbaum.
- Lewin, K. (1938). *The conceptual representation and the measurement of psychological forces*. Durham, NC: Duke Univ. Press.
- Maehr, M. L. (1974). Culture and achievement motivation. *American Psychologist*, 29, 887-896.
- Maehr, M. L. (1984). Meaning and motivation. In R. Ames & C. Ames (Eds.), *Research on motivation in education* (Vol. 1, pp. 115-144). New York: Academic Press.
- Maehr, M. L., & Braskamp, L. (1986). *The motivation factor: Toward a theory of personal investment*. Lexington, MA: Lexington Books.
- Maehr, M. L., & Nicholls, J. G. (1980). Culture and achievement motivation: A second look. In N. Warren (Ed.), *Studies in cross cultural psychology* (Vol. 3, pp. 221-267). New York: Academic Press.
- Markus, H., & Nurius, P. (1986). Possible selves. *American Psychologist*, 41, 954-969.
- Marsh, H. W. (1989). Age and sex effects in multiple dimensions of self-concept: Preadolescence to early adulthood. *Journal of Educational Psychology*, 81, 417-430.
- McClelland, D. C. (1985). How motives, skills, and values determine what people do. *American Psychologist*, 40, 812-825.
- Meece, J. L., Parsons, J. E., Kaczala, C., Goff, S. B., & Futterman, R. (1982). Sex differences in math achievement: Toward a model of academic choice. *Psychological Bulletin*, 91, 324-348.
- Meece, J. L., Wigfield, A., & Eccles, J. S. (1990). Predictors of math anxiety and its consequences for young adolescents' course enrollment intentions and performances in mathematics. *Journal of Educational Psychology*, 82, 60-70.
- Nicholls, J. G. (1978). The development of the concepts of effort and ability, perceptions of academic attainment, and the understanding that difficult tasks require more ability. *Child Development*, 49, 800-814.
- Nicholls, J. G. (1979). Quality and equality in intellectual development: The role of motivation in education. *American Psychologist*, 34, 1071-1084.
- Nicholls, J. G. (1984). Achievement motivation: Conceptions of ability, subjective experience, task choice, and performance. *Psychological Review*, 91, 328-346.

- Nicholls, J. G., & Miller, A. T. (1984). Development and its discontents: The differentiation of the concept of ability. In J. G. Nicholls (Ed.), *The development of achievement motivation*. Greenwich, CT: JAI Press.
- Nisbett, R. W., & Wilson, T. W. (1977). Telling more than we can know: Verbal reports on mental processes. *Psychological Bulletin*, 84, 231-259.
- Parsons, J. E. (1981). *The development of achievement motivation*. Report No. 117, Developmental Psychology Program, University of Michigan.
- Parsons, J. E., & Goff, S. B. (1980). Achievement motivation and values: An alternative perspective. In L. J. Fyans (Ed.), *Achievement motivation* (pp. 349-373). New York: Plenum.
- Parsons, J. E., Kaczala, C., & Meece, J. L. (1982). Socialization of achievement attitudes and beliefs: Classroom influences. *Child Development*, 53, 322-339.
- Parsons, J. E., & Ruble, D. N. (1977). The development of achievement-related expectancies. *Child Development*, 48, 1075-1079.
- Raynor, J. O. (1982a). A theory of personality functioning and change. In J. O. Raynor & E. E. Entin (Eds.), *Motivational career striving and aging*. New York: Hemisphere.
- Raynor, J. O. (1982b). Future orientation, self-evaluation, and achievement motivation: Use of an expectancy  $\times$  value theory of personality functioning and change. In N. T. Feather (Ed.), *Expectations and actions: Expectancy-value models in psychology* (pp. 97-124). Hillsdale, NJ: Erlbaum.
- Rokeach, M. (1973). *The nature of human values*. New York: Free Press.
- Rokeach, M. (1979). From individual to institutional values with special reference to the values of science. In M. Rokeach (Ed.), *Understanding human values* (pp. 47-70). New York: Free Press.
- Rokeach, M. (1980). Some unresolved issues in theories of beliefs, attitudes, and values. In M. M. Page (Ed.), *Nebraska symposium on motivation* (Vol. 20, pp. 261-304). Lincoln, NE: Univ. of Nebraska Press.
- Rotter, J. B. (1982). Social learning theory. In N. T. Feather (Ed.), *Expectations and actions: Expectancy-value models in psychology* (pp. 241-260). Hillsdale, NJ: Erlbaum.
- Ryan, R. M., Connell, J. P., & Deci, E. L. (1985). A motivational analysis of self-determination and self-regulation in education. In C. Ames & R. Ames (Eds.), *Research on motivation in education* (Vol. 2, pp. 13-51). New York: Academic Press.
- Schunk, D. H. (1981). Modeling and attributional effects of children's achievement: A self-efficacy analysis. *Journal of Educational Psychology*, 73, 93-105.
- Schunk, D. H. (1983). Ability versus effort attributional feedback: Differential effects on self-efficacy and achievement. *Journal of Educational Psychology*, 75, 848-856.
- Schunk, D. H. (1984). Self-efficacy perspective on achievement behavior. *Educational Psychologist*, 19, 48-58.
- Schunk, D. H. (1990). Goal setting and self-efficacy during self-regulated learning. *Educational Psychologist*, 25, 71-86.
- Schunk, D. H., & Rice, J. M. (1987). Enhancing comprehension skills and self-efficacy with strategy value information. *Journal of Reading Behavior*, 19, 285-302.
- Schunk, D. H., & Rice, J. M. (1989). Learning goals and children's reading comprehension. *Journal of Reading Behavior*, 21, 279-293.
- Shavelson, R. J., & Bolus, R. (1982). Self-concept: The interplay of theory and methods. *Journal of Educational Psychology*, 74, 3-17.
- Simmons, R. G., & Blyth, D. A. (1987). *Moving into adolescence: The impact of pubertal change and school context*. Hawthorn, NY: Aldine de Gruyler.
- Stein, A. H., & Bailey, M. M. (1973). The socialization of achievement orientation in females. *Psychological Bulletin*, 80, 345-366.

- Stein, A. H., & Smithells, T. (1969). Age and sex differences in children's sex-role standards about achievement. *Developmental Psychology*, 1, 252-259.
- Stipek, D. (1984). The development of achievement motivation. In R. Ames & C. Ames (Eds.), *Research on motivation in education* (Vol. 1, pp. 145-174). New York: Academic Press.
- Stipek, D., & Mac Iver, D. (1989). Developmental change in children's assessment of intellectual competence. *Child Development*, 60, 521-538.
- Tolman, E. C. (1932). *Purposive behavior in animals and men*. New York: Appleton-Century-Crofts.
- Tversky, A., & Kahneman, D. (1981). The framing of decisions and the psychology of choice. *Science*, 211, 453-458.
- Vroom, V. H. (1964). *Work and motivation*. New York: Wiley.
- Weiner, B. (1979). A theory of motivation for some classroom experiences. *Journal of Educational Psychology*, 71, 3-25.
- Weiner, B. (1985). An attributional theory of achievement motivation and emotion. *Psychological Review*, 92, 548-573.
- Weiner, B., Frieze, I., Kukla, A., Reed, L., Rest, S., & Rosenbaum, R. M. (1971). *Perceiving the causes of success and failure*. Morristown, NJ: General Learning Press.
- Weiner, B., Russell, D., & Lerman, D. (1979). The cognition-emotion process in achievement-related contexts. *Journal of Personality and Social Psychology*, 37, 1211-1220.
- Wentzel, K. (1989). Adolescent classroom grades, standards for performance, and academic achievement: An interactionist perspective. *Journal of Educational Psychology*, 81, 131-142.
- Wigfield, A. (1984, April). *Relationships between ability perceptions, other achievement-related beliefs, and school performance*. Paper presented at the meeting of the American Educational Research Association, New Orleans.
- Wigfield, A., & Asher, S. R. (1984). Social and motivational influences on reading. In P. D. Pearson (Ed.), *Handbook of reading research* (pp. 423-452). New York: Longman.
- Wigfield, A., & Braskamp, L. A. (1985). Age and personal investment in work. In D. Kleiber (Ed.), *Advances in motivation and achievement* (Vol. 4, pp. 297-331). Greenwich, CT: JAI Press.
- Wigfield, A., & Eccles, J. S. (1989, March). *Relations of expectancies and values to students' math grades and intentions*. Paper presented at the meeting of the American Educational Research Association, San Francisco.
- Wigfield, A., Eccles, J., Mac Iver, D., Reuman, D., & Midgley, C. (in press). Transitions at early adolescence: Changes in children's domain-specific self-perceptions and general self-esteem across the transition to junior high school. *Developmental Psychology*.
- Wigfield, A., Harold, R., Eccles, J., Aberbach, A., Freedman-Doan, K., & Yoon, K. S. (1990, April). *Children's ability perceptions and values during the elementary school years*. Paper presented at the meeting of the American Educational Research Association, Boston.
- Wilkinson, L. C., & Marrett, C. (Eds.) (1985). *Gender influences in classroom interaction*. Hillsdale, NJ: Erlbaum.
- Wylie, R. C. (1979). *The self-concept* (Vol. 2). Lincoln, NE: Univ. of Nebraska Press.

RECEIVED: June 11, 1990; REVISED: November 20, 1990.