

Gender Differences in Sport Involvement: Applying the Eccles' Expectancy-Value Model

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With the growth of the field of sport psychology has come a growing interest and concern over gender differences in achievement and participation in various sports. Why do girls and boys differ from one another in their participation rates and participation patterns in sports? Over the past 10 years, Eccles and her colleagues have put together a theoretical model for analyzing the motivational factors underlying individuals' decisions regarding achievement-related choices. This paper describes this theoretical model and uses data from two studies, one focusing on adolescents, and one focusing on elementary school-aged children, to evaluate the utility of this model for understanding gender differences in sport participation. It reaches the following conclusions: (a) the Eccles et al. model holds for sport as well as, if not better than, it does for academic subjects; (b) gender differences in children's attitudes toward sport are quite strong and emerge at a very young age; and (c) these gender differences seem to be a consequence more of gender-role socialization than of "natural" aptitudinal differences.

With the growth of the field of sport psychology has come a growing interest and concern over gender differences in achievement and participation in various sports (e.g., Branta, Painter, & Kiger, 1987). Despite recent increases in female sport participation, boys and girls still do not participate equally in the same sport activities (Birrell, 1983; Csizma, Wittig, & Schurr, 1988; Lever, 1978; State Association Summary, 1989). For example, a recent survey of 712 high schools in a large midwestern state (State Association Summary, 1989) revealed a very different pattern of sport participation for boys and girls: Boys were most likely to play football (42,299), basketball (26,662), and baseball (19,368); in contrast,

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girls were most likely to play basketball (17,011), volleyball (16,306), and outdoor track and field (13,478). Thus, not only did these girls and boys prefer different sports, the girls also participated in substantially fewer numbers than boys even in their most preferred sports. Boys and girls may also differ in the nature of their sport-related play. For example, in one study boys were more likely than girls to engage in sport-related activities that involve teams, complex rule systems, and high levels of interdependency (Lever, 1978).

Why do girls and boys differ in their participation rates and participation patterns in sport? To answer this question, it is necessary first to ask the broader question of why children pick some activities and not others from the wide array of choices available to them. In this context gender is but one influence, and sport is only one of the possible domains they may consider. Over the past 10 years, Eccles and her colleagues have developed a theoretical framework for studying the motivational factors that underlie individuals' decisions regarding various activity and achievement-related choices (Eccles (Parsons), 1984; Eccles (Parsons) et al., 1983). Although most of the work validating this model has focused on school achievement patterns, it is likely that this model can be extended to a wide variety of activity choices, including how much time people choose to spend on sport activities. It can serve as a guide for the exploration of the origins of the social-psychological attitudes most closely related to these choices. The goals of this paper, then, are (a) to describe this theoretical model and summarize existing support, (b) to present data from two studies, one focusing on adolescents, and one focusing on elementary school-aged children, and (c) to use these data to explore the applicability of the model to the question of why there are gender differences in sport participation patterns.

A MODEL OF ACTIVITY CHOICE

The Eccles (Parsons) et al. (1983) model, as depicted in Figure 1, is based on expectancy-value models of choice.¹ The model links choice to performance expectations and to the importance, or value, individuals attach to the available options. It also specifies the relation of these constructs to cultural norms, the experiences one has growing up, aptitude, and a set of personal beliefs and attitudes associated with various activities (see Eccles (Parsons) et al., 1983). The model is built on the assumption that it is one's interpretation of reality rather than reality itself (i.e., past successes and failures) that most directly influences activity choices. The influence of reality on achievement-related beliefs, outcomes, and future goals is assumed to be mediated by interpretative systems, the input of

¹ Quite recently, Deeter (1989, 1990) has used this model and work by Vealey (1986) to analyze the association between expectancies, efficacy beliefs, values, and competence in physical activity.

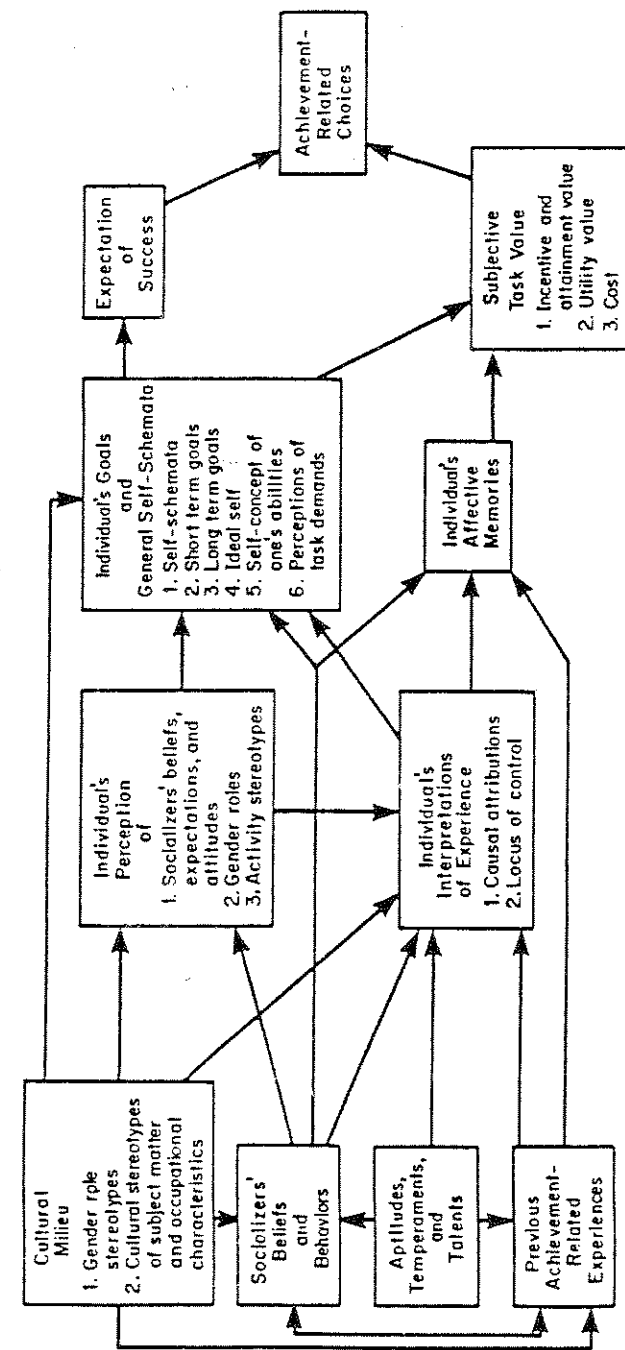


Figure 1. General model of achievement and activity choice.

primary socializers, one's needs and values, one's self-schema, and one's perception of the available options. Each of these factors is assumed to contribute both to the expectations one holds for future success at the available options and to the subjective value one attaches to these options. Expectations and subjective value, in turn, are assumed to influence the decision to engage in particular activities, the intensity of effort expended, and one's actual performance level.

In summary, then, the model is based on the assumption that activity choices are made in the context of a variety of choices. Furthermore, these choices, whether made consciously or nonconsciously, are assumed to be guided by one's expectations for success at the various options; by such core personal values as achievement needs, competency needs, personal goals, motivational orientation, and gender-role schemata; by more utilitarian values such as the importance of participating in various activities for one's future goals; and by the potential cost of investing time in one activity rather than another.

Expectancies as Mediators of Choices

Expectancies for success have long been recognized by decision and achievement theorists as important mediators of behavioral choice (e.g., Atkinson, 1964; Lewin, 1938). There have been numerous studies demonstrating the importance of performance expectations for a variety of behaviors including academic performance, task persistence, and task choice. For example, studies using measures of confidence in learning math have demonstrated a consistent link between expectations for one's future math performance and decisions regarding enrollment in mathematics courses (see Eccles (Parsons), 1984). In addition, gender differences are often found on expectancy measures particularly for gender-role stereotyped activities like sport (see Eccles, 1984; Lenney, 1977). It is likely that a similar effect holds for sport, and that gender differences in involvement in various sports are mediated by gender differences in expectancies for success in these sports. Existing evidence supports these predictions (Corbin & Nix, 1979; Corbin, Landers, Feltz, & Senior, 1983; Roberts, Kleiber, & Duda, 1981; Ryckman, Robbins, Thorton, & Cantrell, 1982). This paper reports on two studies designed to test this hypothesis in children and adolescents.

Given that performance expectancies play such a significant role in students' academic choices and that gender differences are often found for expectancies on male-typed tasks including several sport activities, it is important to identify the factors that influence expectancies. Eccles (Parsons) et al. (1983) suggested the following attitudes and beliefs as critical mediators of performance expectancies: (a) self-concept of ability; (b) estimates of task difficulty; (c) interpretations of previous experiences and performances; (d) identification with masculine and feminine gender roles; and (e) the beliefs and behaviors of significant socializers such as parents, peers, and other adults.

Self-Concept of Ability

The influence of self-concept of ability on achievement-related behaviors and activity choices has been discussed extensively (e.g., Calsyn & Kenny, 1977; Covington & Omelich, 1979; Deeter, 1989, 1990; Nicholls, 1976; Eccles (Parsons) et al., 1983; Weiss, 1987).² These authors believe that self-concepts of ability are critical predictors of performance and task choice. Although the evidence for this prediction is sometimes equivocal (see Calsyn & Kenny, 1977), several studies, especially intervention studies, support this hypothesis for both academic subjects and sport (de-Charms, 1976; Deeter, 1990; Dweck, 1975; Roberts & Duda, 1984). In addition, research specific to math achievement has yielded a consistent positive relation between perceptions of mathematical ability and plans to enroll in advanced mathematics courses (e.g., Eccles (Parsons) et al., 1983; Sherman & Fennema, 1977). Similar results hold for sport (e.g., Roberts et al., 1981; Weiss, 1987; Weiss, Bredemeir, & Shewchuk, 1986).

Perceived Task Difficulty

Intuitively, it seems that expectations for success should be inversely related to the perceived difficulty of the task. While little research has addressed this prediction directly, there is ample evidence indicating that task choice is related to perceived task difficulty (see Atkinson, 1964; Weiner, 1972). However, the relation between these two variables is not straightforward. Several investigators (Atkinson, 1964; Weiner, 1972) have suggested a curvilinear relationship between perceived task difficulty and task choice: They suggest that people prefer tasks that are moderately difficult to tasks that are seen as either too easy or very difficult. Maehr (1978) has suggested that this analysis applies only to a limited set of achievement circumstances; namely, those that might be labeled recreational. For inherently difficult tasks with important future implications, such as achievement in competitive sports, both Maehr (1978) and Eccles (Parsons) et al. (1983) predict that perceived task difficulty will be negatively related to participation plans. However, as Atkinson (1964) suggested, whether perceived task difficulty relates negatively or curvilinearly to task choice should depend on the individual's motivational orientation, goals, and the value the individual attaches to the activity.

Causal Attributions and Other Influences on the Interpretation of One's Performance

According to several theorists, it is not success or failure per se, but the interpretation one makes about these outcomes that influences future

² By achievement-related, we mean decisions to participate in any activity in which one's performance can be evaluated in terms of its competence. People may choose to participate in these activities for a variety of reasons, including reasons that have little to do with demonstrating skill or ability.

performance expectations (Heider, 1958; Weiner, 1972). The research in causal attributions provides the best example of this orientation. According to attribution theory, the impact of success and failure on self-perceptions, expectations for future success, and self-confidence in one's ability depends on the causal attribution made for the success or failure. Attributing successes to ability and/or effort is predicted to have better psychological consequences than attributing successes to luck, task ease, or external help. Similarly, attributing failures to task difficulty or insufficient effort is predicted to have better psychological consequences than attributing failures to lack of ability. Several studies have provided support for these general hypotheses (Dweck, 1975; Dweck & Elliott, 1984; Dweck & Reppucci, 1973; Roberts et al., 1981; Weiss, 1987). Furthermore, throughout the attribution literature, gender differences in response to success and failure are noted. Although these gender differences are neither very large nor very consistent across various tasks and attributional measures (see Bird & Williams, 1980; Eccles-Parsons, Meece, Adler, & Kaczala, 1982), to the extent that they are significant, girls are more likely to exhibit what has been labeled the low expectancy pattern (Bird & Williams, 1980; Crandall, 1969; Dweck & Elliott, 1984; Dweck & Reppucci, 1973; Nicholls, 1975). In particular, girls are more likely than boys to take personal responsibility for their achievement-related failures and, consequently, to lower their expectations when faced with failure (see Crandall, 1969; Dweck & Elliott 1984; Parsons, Ruble, Hodges, & Small, 1976). They are also less likely to attribute their successes to talent (Eccles-Parsons et al., 1982). To the extent that this is true for sports in general or to some sports in particular, gender differences in causal attributions may be an important mediator of gender differences in expectations for success.

But probably even more important than causal attributions is the view that males and females have of how they can increase their skill in various sports. If they think that individual differences in particular sport skills are primarily the result of natural talent, they should be more likely to give up if they do not do well at the sport during the initial learning period than if they think the individual differences are due primarily to individual differences in practice and training. In the latter situation, they should be more willing to persist through the initial learning period provided that they value increased competence in the particular sport under consideration. Existing evidence supports this hypothesis (Roberts et al., 1981; Weiss et al., 1986).

Investigators have looked at other factors that influence the interpretation individuals make of their success and failure experiences. Factors such as the individual's motivational and goal orientation for doing the task; the goal reward structure for the activity; the gender, perceived skill level, and actual performance levels of the other individuals engaged in the task; previous history of successes and failures at similar tasks, as well as the interpretations provided by others, have all been investigated and found to be important (e.g. Ames, 1984; Corbin, 1981; Corbin, Stewart,

& Blair, 1981; Deeter, 1990; Duda, 1989; Dweck & Elliott, 1984; Eccles, Jacobs, & Harold, in press; Nicholls, 1984; Petruzzello & Corbin, 1988; Weiss et al., 1986). The extent to which these factors are related to gender differences in sport involvement are just beginning to be explored.

Gender-Role Stereotypes

Cognitive-developmental theorists suggest that children's self-concepts are derived in part from their interpretations of the attitudes and behaviors of those around them. Gender-role structure and gender-role stereotypes are two particularly salient components of children's social world. Consequently, gender-role beliefs and stereotypes may influence the development of children's self-concepts, their perceptions of the value of various activities, and their performance expectations for success on various tasks (see Huston, 1983).

Unfortunately stereotypes, especially gender-role stereotypes, are not value-free. Extensive evidence indicates that women are stereotyped as less competent than men, especially in intellectual and athletic domains even when they perform equally well (Broverman, Vogel, Broverman, Clarkson, & Rosenkrantz, 1972; Deaux & Emswiller, 1974; Eccles, 1988; Eccles, Jacobs, Harold, Jayaratne, & Yee, 1989; Jacobs, 1987). If, as cognitive-developmentalists argue, stereotypes influence children's developing self-concepts, then incorporation of these biased cultural gender-role stereotypes could well result in girls having lower self concepts of their intellectual and athletic abilities than boys.

Beliefs and Behaviors of Significant Others

Neither gender-differentiated beliefs and self-perceptions, nor gender-role beliefs develop in a vacuum. Ample evidence documents the fact that peers, friends, siblings, parents, TV, coaches, and other adults such as school teachers, neighbors, and camp counselors all contribute to the shaping of these beliefs and self-perceptions over time (see Greendorfer, 1983; Huston, 1983; Eccles & Hoffman, 1984; Horn, 1987; Lewko & Ewing, 1980). The Eccles et al. model focuses attention on the role significant others play in shaping children's self-perceptions in two primary ways: (a) as interpreters of experience, and (b) as providers of experience. The people around children help them interpret their experience and, in so doing, influence the inferences children make about their successes and failures in the sport domain, just as they influence the inferences the children make about their successes and failures in other domains. To the degree that these people let the gender of the child influence their interpretations, they contribute to the emergence of gender differences in children's self-perceptions and expectations (Eccles et al., in press).

Similarly, by providing children with various experiences, the people in children's lives structure the opportunities the children have for forming ideas about their own competencies. To the extent that socializers provide boys and girls with different experiences, girls and boys will have different opportunities to discover their various talents and interests, and, thus,

are likely to form different self-perceptions and task values (see Eccles & Hoffman, 1984; Huston, 1983).

Summary

In sum, in the Eccles et al. (1983) model it is hypothesized that performance expectations are important mediators of behavioral choice. Self-concept of ability, perceived task difficulty, interpretations of one's performance, attributions for success and failure, gender-role stereotypes, and the beliefs and behaviors of significant socializers are assumed to be critical mediators of expectancies and activity choice.

Values as Mediators of Choices

Task value is the second major influence on task choice. In the Eccles et al. (1983) model, task value is assumed to be a quality of the task or activity that contributes to the increasing or declining probability that an individual will select it (Eccles (Parsons) et al., 1983). Eccles et al. have broken this construct down into four major components: (a) utility value, (b) perceived cost, (c) incentive value, and (d) attainment value, each of which is assumed to influence task involvement.

Utility Value and Perceived Cost

These are perhaps the easiest of the four value components to define. Basically, the question is, How useful will engaging in a particular task or activity be in helping the individual to fulfill immediate or long-range goals? Individuals are more likely to engage in activities if they feel participation will be of some use to them. Usefulness can be conceptualized in various ways. An activity can be useful because it furthers some goal the individual has, like learning to play tennis. Alternatively, an activity can be useful because it provides the individual with the opportunity to socialize with other people the individual likes, or because it gives the opportunity to impress a colleague or potential mentor. Recent work on goals in both the academic and sport domains has provided a rich source of additional possible influences on the perceived utility value of various activities (e.g., Deeter, 1990; Duda, 1989; Eccles, 1987; Scanlan, Stein & Ravizza, 1989).

Cost is the negative side of this question: What does one have to give up to participate in a particular activity? People have limited time and energy and cannot do everything they would like. They must choose among activities, and thus, the cost of any given activity choice can be conceptualized in terms of loss of time and energy for other choices. Perceived cost can also be influenced by the anticipated anxiety of engaging in a given activity; anticipated negative responses from peers, parents, colleagues, or neighbors; fear of failure; and the negative affective memories associated with past participation in similar activities. While the perception of high utility value draws an individual to an activity, the perception of high cost pushes her/him away from the activity.

Incentive and Attainment Values

Incentive value is best conceptualized as the immediate rewards, intrinsic or extrinsic, that participating in a given activity provides. For example, playing sports could be intrinsically rewarding because it makes the individual feel healthy, or extrinsically rewarding because s/he is paid, or receives adulation, for the performance.

Eccles et al. conceptualize attainment value in terms of the needs and personal values an activity fulfills for the individual. As they grow up, people develop images of whom they are and/or whom they would like to be. These images include conceptions of their personality and capabilities, long-range goals and plans, schema regarding the proper roles for men and women, self-schema, personal values, etc. Eccles (Parsons) et al. (1983) propose that people select activities that they believe are consistent with their self images and avoid activities that they believe are inconsistent with these images.

How does this affect task value? The link between self-schema and activity selection can be found in the set of characteristics that the person associates with an activity. If an individual sees an activity as requiring mastery or strength and if the individual wants to confirm his/her possession of these characteristics, then the attainment value of this activity is increased and the likelihood of choosing this activity is increased. For example, involvement in sport affords the opportunity to demonstrate physical competence, strength, and agility both to oneself and to others. If an individual holds these characteristics as a critical part of her/his self-schema, then participating in sports should have high attainment value and participation should be high. A recent study by Duda (1988) supports this prediction. In this study, individuals who rated personal mastery as an important reason to participate in sport practiced their sport more in their free time than individuals who participated in sports for other reasons.

As was true for perceived utility value, the recent work on goals in both the academic and sport domains also provides a rich source of other possible influences on the perceived attainment value of various activities (e.g., Deeter, 1990; Duda, 1989; Eccles, 1987; Scanlan et al., 1989; Vealey, 1986). However, one influence is particularly relevant for our understanding of gender differences in sport involvement: gender roles.

Gender Roles and Task/Activity Value

Because gender-role socialization influences the development of self-schema, personal values, and stereotypes of the characteristics associated with various achievement activities, gender-role socialization should affect both the positive and negative values individuals attach to various activities. One way gender roles can affect task values is through their impact on the importance females and males attach to various personal characteristics. For example, the male gender role places more value on competitiveness, strength, and physical prowess than the female gender

role (Eccles, 1987). To the extent that some activities embody these masculine characteristics more than others, these activities should have different attainment values for men and women. More specifically, males should be more likely than females to engage in athletic activities precisely because they place more importance on demonstrating their athletic competence or on being competitive (Duda, 1988). Alternatively, if participating in sports is seen as a highly masculine activity, then females who want to be feminine should be less likely to participate in sports than in other more "feminine" activities, not because they do not like sports, but because they think that participating in sport would convey an image of themselves that is less congruent with their self-schema than participating in other activities.

Differential participation rates of boys and girls in various particular sports may be tied to a similar phenomenon. For example, if football is seen as requiring particularly masculine characteristics such as physical strength and aggressiveness, whereas gymnastics is seen as requiring more feminine characteristics such as gracefulness and agility, males and females with gender-role stereotypic self-schema should select each of these sports at different rates.

Adherence to one's gender role may be so central to an individual that merely knowing, even at a subconscious level, that a particular activity is stereotypically part of the opposite gender's role may be sufficient to prevent further consideration of engaging in that activity. Similarly, gender-role stereotypes about the appropriateness of various activities may limit the options even considered to be in the realm of possible choices.

Other Influences on Value

As was true for expectancies, a variety of other factors also influence the value people come to attach to various activities. The affective memories associated with various activities are obviously one important influence. People will value more highly those activities that they associate with positive memories than those activities that they associate with negative memories. In turn, the valence of an individual's memories will have been influenced by many of the same processes that influence self-perceptions and expectations: namely, prior success and failure experiences, and the interpretations made by both the self and others for those experiences; the goals and motivational orientation that were held at the time the person engaged in the activities; and the reactions of others to the individual's involvement in, and performance at, various activities.

Expectancies regarding likely success or failure should also affect the value attached to various activities. People should value more highly those activities they think they can succeed at with appropriate levels of effort.

Finally, of course, just as socializers affect the development of self-perceptions and expectations, so too they should affect the value that children come to attach to various activities (subjective task value). Socializers can affect children's developing subjective task values by directly communicating the value they attach to various activities. They can also

affect value by providing the child with opportunities to engage in various activities in either enjoyable or stressful contexts, and by the interpretations they provide children for the children's experiences, and for their successes and failures. Finally they can affect children's developing subjective task values through their power as role models. To the extent that any of these processes are gender-differentiated (and evidence suggests that many are; see Eccles & Hoffman, 1984; Greendorfer, 1983; Huston, 1983), they will contribute to gender differences in participation in sport.

Summary

The model depicted in Figure 1 builds on the theoretical base of expectancy-value models of task/activity choice. In addition, by elaborating on the construct of value, it provides a link between expectancy-value models and the literature on the self. As described above, activities can take on value to the extent that they map onto the view one has of one's current or future self, including the usefulness and importance of the activity in confirming one's self-definition. And this value, in turn, should influence the task choice.

The question follows: How do children develop their ideas about whom they would like to be, and about how specific activities fit with their self-schema? Certainly, the culture gives us information about how to define some activities. Life experiences can also affect how children define, or see, particular tasks. What is important, then, is to understand the meshing of children's views of the activity with their view of themselves, and the extent to which they see the task or activity as either being instrumental or counter-productive to reinforcing their self-views.

What are the influences that lead a person at a particular point in time to have a set of expectations and a set of values associated with a specific activity? As the model depicts, moving backwards from right to left, an individual's goals and general self-schemata, which are socialized and evolve over time, play an important role. In addition, the affective memories that people have are important: good or bad experiences may have occurred when particular activities were engaged in in the past. These affective memories will be stored both in a person's view of the self and in her/his view of the activity, and thus may affect the likelihood of engaging in similar activities in the present and future.

The next set of beliefs deals with the children's perception of their social system and of the people (i.e., parents, teachers, coaches, peers) who interact with them. These, of course, are directly related to the actual beliefs of these people—beliefs such as their estimates of the children's abilities, their view of the importance of excelling in, and/or participating in various activities, their causal explanations for the children's successes and failures, their beliefs about whether talent in various activity domains is learned or inherited, and their gender-role ideology (e.g., Eccles et al., in press; Greendorfer, 1983; Lever, 1978; Lewko & Ewing, 1980). The children's perceptions of these people are also directly tied to the behaviors of these individuals.

Of course, it is known that children have differential aptitudes. Furthermore, it appears that small biological differences may contribute to the early emergence of gender differences in upper body strength-related skills such as throwing (Morris, Williams, Atwater, & Wilmore, 1982; Nelson, Thomas, Nelson, & Abraham, 1986). These differences, however, are not necessarily a major influence on participation in an activity except at the extreme ends, e.g., who gets to play sports professionally, or who gets a Ph.D. in mathematics. It should have much less impact on the broad range of people who have sufficient ability to engage in an activity and do it with a reasonable degree of mastery. However, the model assumes that even the effect of extreme levels of aptitudinal differences are mediated through intervening variables. One parent may choose to devote a lot of time and energy to helping (or forcing) a child to develop his/her natural aptitude for sport or other activities (Bloom, 1985), while another parent may lack either the resources or the desire to do this and then the child's potential is unlikely to be realized.

EMPIRICAL FINDINGS

Two different populations are represented in the studies to be presented in this section. Study 1 is a 2-year longitudinal study that explores the transition from elementary to junior high school and examines children's ability self-perceptions, values, and activity choices before and after this transition. The second study is a 4-year longitudinal study that explores the ontogeny of children's self-perceptions and values during the elementary school years. Both studies consider the socialization effects of parents and teachers, and both employ data gathered from all three sources: the child, the parent, and the teacher.

Study 1: Method

The first study focuses on adolescents. Approximately 3,000 children in 12 different school districts were studied over four waves of data collection: the fall and spring of the children's sixth grade, and the fall and spring of their seventh grade school year. Children were recruited to participate in their classrooms. Approximately 90 percent of the children asked agreed to participate and got the necessary parental permission. The data reported here come from the two waves of data collection taken during the children's sixth grade year.

The sixth graders' self-perceptions and activity perceptions were assessed with a questionnaire administered at school in their classrooms. Items on the questionnaire used seven point Likert-type scales anchored at the extremes with descriptors. When available, multiple indicators of each construct were used. Single items were used in the remaining analyses. The reliability and validity of these scales and items are reported in Eccles (Parsons) et al., 1983, Eccles et al., 1984, and Eccles et al., 1989. Comparable items were used to assess the early adolescents' beliefs in each of three activity domains: math, language arts, and sport. Sample items are outlined below.

Self-Concept of Ability. The students were asked to rate their ability in math, English, and sports. For example, they were asked, "How good are you at sports?" (not at all good—very good), "How good are you at sports compared to other subjects?" (not at all good—very good), "How good are you at sports compared to other children?" (much worse than other children—much better than other children), and "How well do you expect to do in sports in the future?" (not at all well—very well). These items all factor together and are treated as a single scale. The alphas for these scales are quite high (greater than .70 in each case).

Perceived Task Value. The students were asked several questions to assess perceived task value. For example, they were asked, "How useful is it to you to be good at sports?" (not at all useful—very useful), "How much do you like playing sports?" (not at all—a lot), and "How important is it to you to be good at sports?" (not at all important—very important). Since these items did not factor together, they are used as single item indicators of the adolescents' perceived task value in each of the analyses reported here.

Free Time Involvement in Each Domain. Two items were used to assess activity involvement. First, the adolescents were asked to rate how much time outside of school they spend doing each the following: math, language arts activities like reading and writing, and sports on a four point scale with 1 = less than 15 minutes per day and 4 = one or more hours per day. The second item asked them to rate subjectively how much time they spent on each domain. This item used a seven point Likert scale anchored at the extreme ends with the following descriptors: 1 = very little/less than other children and 7 = a lot/more than other children. These two items were used as a scale ($\alpha > .60$ for each activity domain), and as single indicators.

Results

Gender differences in each domain are illustrated in Table 1. As found in previous studies, the boys rate themselves as more able than the girls in math, and the girls rate themselves as more able than the boys in English. In addition, the boys rate themselves as more able than the girls in sports. Furthermore, the magnitude of the sport difference is much larger than the magnitude of the gender differences for either math or English; gender accounts for 8% of the variance in the adolescents' ratings of their sports ability in comparison to less than 1% of the variance in each of the other two domains.

Gender differences are less marked for the perceived task value items in math. In contrast, the adolescents' rating of the value of English and sports are consistent with the gender-role stereotyping of these two domains. The girls rate English as more important, more useful, and more enjoyable than the boys. The boys rate sports as more important, more useful, and more enjoyable than the girls.

If the Eccles et al. (1983) model is correct, then these differences in the adolescents' beliefs and self-perceptions should lead girls and boys to be

Table 1
Sex differences in self perceptions and domain perceptions: Study 1

Construct	Domain						F variance accounted for	F variance accounted for	
	Sport		Math		English				
	Girls	Boys	Girls	Boys	Girls	Boys			
Self-concept of ability	4.9	5.7	5.0	5.2	5.2	5.0	26.24***	1%	
Importance to do well	4.9	5.5	6.2	6.1	6.2	6.1	10.12**	1%	
Enjoyment of activity	5.8	6.4	4.8	4.8	4.8	4.8	.21	75.27***	2%
Usefulness of activity	5.1	5.7	6.1	6.1	6.1	6.1	.54	41.51***	1%

Note. ** $p < .01$; *** $P < .001$. $df = 1$ and between 3,100-3,205 depending on extent of missing data for each item or scale. The variance accounted for is the r^2 for the gender effect associated with all significant F s.

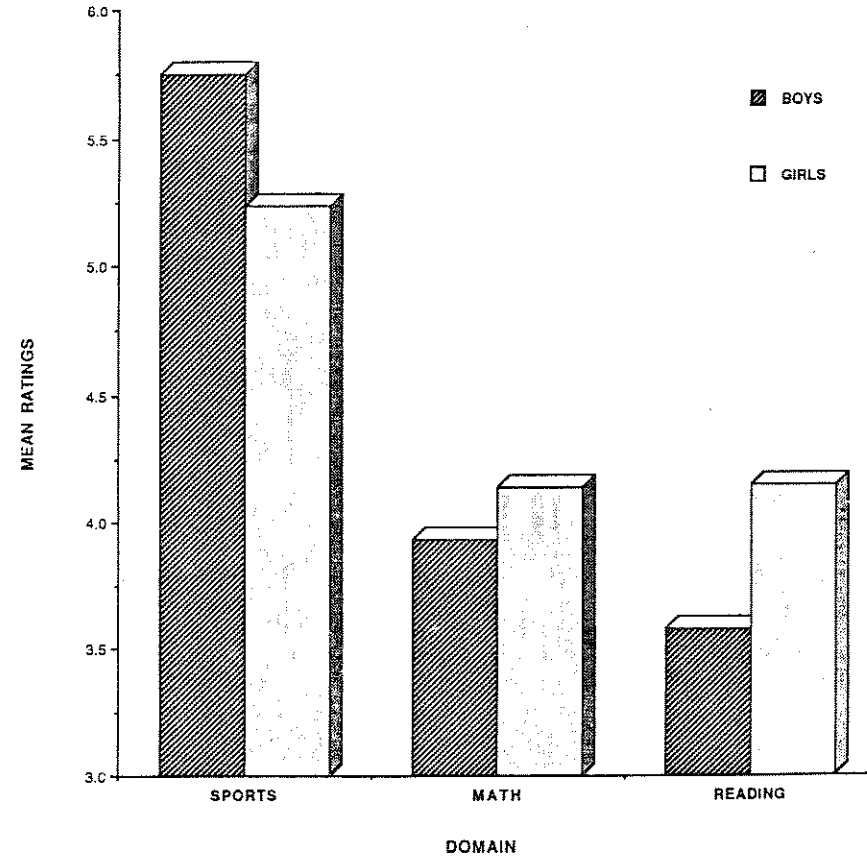
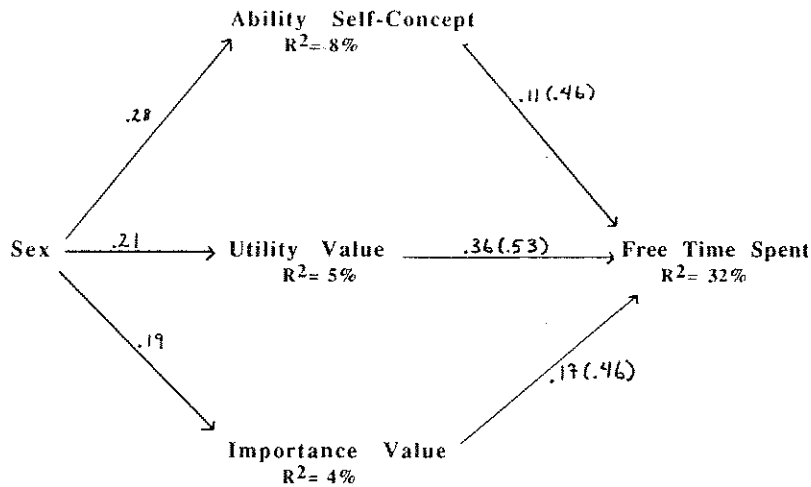


Figure 2. Sixth graders' free time use. Note. The scale used does not represent absolute hours; e.g., "6" does not refer to six hours, but rather to the top part of the scale that children used to report that they spent an hour or more a day on the particular activity.

differentially involved in activities in each of these three domains. As is evident in Figure 2, this is indeed the case. Figure 2 illustrates sixth graders' involvement in three different activity domains: sport, mathematics, and language arts. The boys report being significantly more involved in sports than the girls, $F(1, 3,150) = 63.72, p < .001$. In contrast, the girls report being slightly more involved than the boys in math-related activities, $F(1, 3,150) = 15.02, p < .001$, and in reading and writing activities, $F(1, 3,150) = 98.81, p < .001$. It should be noted, however, that both boys and girls of this age report participating more in sports than in either of the two more intellectual activities.

However, a real test of the Eccles et al. (1983) model requires a demonstration of the mediating role these beliefs and self-perceptions play in shaping the gender differences in participation. Path analysis is one tech-



Correlation: Sex - Time Spent = .14
 Partial Correlation: Sex - Time = .002
 (controlling mediating variables)

Figure 3. Path analysis illustrating that sex differences in adolescents' reports of time spent on sports is mediated by sex differences in three attitudinal variables.

nique that can be used to demonstrate such an effect. Figure 3 illustrates the results from the appropriate path analysis for the sport domain. The free time single item indicator for the participation variable was used in this analysis since this item is a more objective indicator of participation and thus should share less self-presentational bias with the psychological predictors than the subjective estimate of the individual's involvement in each activity.

This analysis is designed to assess whether the significant gender difference in reported free time devoted to sport is eliminated when the three attitudinal variables are entered as mediators into the analysis. First, the three attitudinal variables were regressed on gender to determine the strength of the association between these variables and gender. Each of these variables is significantly related to gender. The free time variable was then regressed on both the three attitudinal variables and gender to assess the strength of the associations between free time reports and the three attitudinal variables, and to assess whether the relationship between free time and gender remains significant when the three attitudinal variables are included in the analysis. As predicted, adolescents' reports of free time spent on sports are significantly related to the three attitudinal variables and to gender at the zero-order level ($r = .14, p < .01$). But most importantly, gender and free time are *not* significantly related to each other when the three attitudinal variables are included in the analysis.

Table 2
 Correlations of attitudinal predictors with reported free time involvement in Sport, Math, and English

Attitudinal predictors	Domain					
	Sport		Math		English	
	Girls	Boys	Girls	Boys	Girls	Boys
Self-concept of ability	.47	.44	.22	.28	.27	.32
Importance to do well	.46	.46	.20	.22	.37	.37
Enjoyment of activity	.47	.42	.29	.34	.45	.40
Usefulness of activity	.44	.38	.20	.26	.38	.34

Note. $N = 1,425-1,600$ depending on specific variable. All correlations are significant at $p < .001$ or better.

These results support our prediction that the gender difference in time spent on sport is mediated by gender differences in adolescents' ability self-concepts and in the value they attach to sport competence.

It is even more interesting to compare the extent to which these attitudinal variables predict free time involvement across the three domains. Table 2 shows the correlation of free time usage in each domain with self-concept of ability, perceived importance, perceived utility, and enjoyment for that domain. It appears that the correlations of both self-concept of ability and the importance of doing well with free time involvement are larger in the sport domain than in either of the two more academic domains. This discrepancy is particularly marked for the comparison between the sport domain and the math domain. For this comparison, all four of the predictor variables are more strongly related to free time involvement in the sport domain than in the math domain ($p < .05$). Interestingly, the correlations are about the same size for females and males in each domain.

These findings suggest two things: (a) The Eccles et al. model may hold even better for the sport domain than for the math domain. This makes sense given that the Eccles et al. model is a choice model, and adolescents may have more autonomy in deciding whether to participate in sport than they have in deciding whether to do their math work. (b) Since the attitudinal variables predict equally well for males and females but females have significantly lower scores than males on these variables, one way to increase female involvement in sport would be to design interventions aimed at raising females' perceptions of their sport ability, and of the value they attach to sport.

Study 2: Method

The second study is also a longitudinal research investigation. Having documented the effects of expectancies and values on behavioral choice with junior high students, this study focuses on elementary school students

and was designed to examine how and when these differences and relationships begin to emerge. Approximately 875 children in four school districts participated in the year the data being reported here were collected. This number represents over 80 percent of the children asked to participate. We began with approximately equal size cohorts of kindergartners, first, and third graders, and have administered measures to each cohort over the past three years. These students are currently in third, fourth, and sixth grades. In addition, we have gathered information from approximately two-thirds of the families, and individual ability assessments from all of the children's teachers. In the first year of the study, we administered the Bruininks-Oseretsky Test of Motor Proficiency (Bruininks, 1978) and a battery of basic cognitive measures to all children. Each of the following years, the children were given questionnaires similar to those described in the adolescent study. They were asked questions identical to those used in Study 1 to assess how good they thought they were in several domains, including math, reading, and sports; how important they thought it was to be good in each of these domains; how much they liked or enjoyed participating in each domain; and how useful they thought what they learned in each domain was. In addition, in the sport domain, the children were asked how good they were at sports, in general, and how good they were at throwing a ball and at tumbling, in an effort to get some information about specific sport skills that were either male or female gender-role stereotyped. In addition, they were asked how important they thought it was to their parents that they do well in each domain, and whether ability in each area was more important for boys, for girls, or equally important for both. All items were answered on seven point Likert scales anchored at the extremes and the midpoint with a verbal label and a pictorial representation of increasing quantity on the dimension being assessed. The data reported here are taken from the first and second years of data collection. The teacher data discussed below were also gathered with questionnaire measures that used seven point Likert-type scales.

Results

What gender differences were found? Do the differences found in the junior high sample appear as young as grade one? In sport, the answer is overwhelmingly yes and furthermore, the size of the gender differences is just as large in grade one as it is in grade four (i.e., virtually no gender by grade effects are significant). Collapsed across the three grades, then, Table 3 shows the boys' and girls' ratings of their ability in math, reading, sport, in general, as well as the specific sports skills of throwing, and tumbling; and their ratings of how important it is to do well in math, reading, and sport; how much they enjoy each of the three domains, and how useful they find what they learn in each of the three areas.

These findings are interesting both within and across domains. Already, by grade one, girls feel significantly less able in both math and sport than do boys. Looking across domains, girls perceive themselves as least com-

Table 3
Sex differences in self perceptions and domain perceptions: Study 2

Construct	Domain						F variance accounted for			
	Sport			Math				Reading		
	Girls	Boys	F variance accounted for	Girls	Boys	F variance accounted for		Girls	Boys	F variance accounted for
Self-concept of ability	5.1	6.3	140.66*** 14%	5.4	5.8	14.64*** 2%	6.0	5.9	.05	
Throwing ability	5.5	6.1	33.42*** 4%							
Tumbling ability	5.7	4.5	78.06*** 8%							
Importance to do well	5.5	6.0	14.92*** 2%	6.4	6.0	10.02** 1%	6.4	6.1	9.38** 1%	
Enjoyment of activity	5.7	6.5	42.20*** 5%	5.0	4.9	.07	5.6	4.9	21.98*** 2%	
Usefulness of activity	5.3	5.7	8.05** 1%	5.6	5.7	.62	5.9	5.9	.02	

Note. ** $p < .01$; *** $p < .001$. $df = 1$ and between 850-860 depending on extent of missing data. The variance accounted for is the r^2 for the gender effect associated with all significant F s.

petent in the sport domain. Boys, in contrast, report feeling the most able in the sport domain. The gender difference found for general sport ability also holds for the children's ratings of their throwing ability. In fact, this item loads factorially with the children's views of their general sport ability indicating that throwing is seen as a fundamental part of their definition of sport. Interestingly, the opposite gender difference exists for the ability in tumbling item, with the girls reporting that they feel significantly more able than do the boys. However, the tumbling item does not correlate with any of the other sport beliefs and does not load factorially with the other general sport ability items. Instead it relates more strongly to the children's beliefs about the social domain and what it takes to be popular. Apparently these children see tumbling as something very different from the general sport domain.

How much importance do boys and girls attach to their ability in math, reading, and sport? Although both boys and girls report that doing well in the academic areas is more important than doing well in sport, gender differences emerge within each domain. Girls feel that doing well in both reading and math is more important than do boys. In contrast, boys feel that doing well in sports is much more important than do girls. Not surprisingly, both boys and girls report liking sports more than their academic subjects! But again, boys report that they enjoy sport activities more than girls do, while girls report that they like reading more than boys do. The differences in their enjoyment of math are not significant. Finally, with regard to the children's ratings of the usefulness of what they learn in each domain, sport was the only domain with a significant gender difference: boys rate the sport domain as more useful than girls. The girls, in fact, rate sport as the least useful domain.

Apparently gender differences emerge at a very early age. Why? Are there real aptitudinal differences between boys and girls within some domains, or are boys and girls already being socialized to have gender-role appropriate self-perceptions and values? Answering this question is not easy. Although aptitude is included as one variable to consider in the model described above, the notion of consistent aptitude differences based on gender is controversial, and must be carefully considered. These data are reported as a very rough indicator of possible aptitude differences in order to compare the magnitude of gender differences on these measures to the magnitude of the gender differences on the attitudinal measures.

The Bruininks-Oseretsky Test of Motor Proficiency was given to all the children to estimate their sport aptitude. The test was adapted somewhat to make it possible to administer in school hallways or classrooms. Table 4 describes the significant gender differences found using one-way ANOVA's. The boys outperform the girls on large motor skills such as running and broad jump; in contrast, the girls do better than the boys on the few fine motor skills such as tapping one's feet in time with a rhythm and drawing lines. As a consequence, the total score, which collapses across all of these separate activities, favors boys, because it is weighted towards activities in which boys do better. However, gender accounts for only 2%

Table 4
Significant sex differences on the Bruininks-Oseretsky Test of Motor Proficiency

Test	Girls	Boys	F	Variance accounted for
Running	5.5	7.2	35.87***	7%
Jump up and clap	2.0	2.2	5.22*	< 1%
Broad jump	41.9	47.9	70.84***	10%
Catch ball	2.0	2.4	20.71***	3%
Throw ball at target	1.3	1.5	7.46**	2%
Tapping feet	.6	.5	2.76*	< 1%
Drawing lines	3.7	3.6	3.85*	< 1%
Copying circles	1.6	1.5	3.83*	< 1%
Total score	45.2	48.0	10.95***	2%

Note. * $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$. $df = 1, 542$.

The variance accounted for is the r^2 for the gender effect associated with all significant F s.

of the variance on the total Bruininks score, whereas gender accounts for 14% of the variance on the children's ratings of their ability in sport. This discrepancy in the variances accounted for by aptitudes and attitudes suggests that even if aptitude accounts for some of the gender differences found in sport, something else is accounting for the other 12% of the variance.

One possible source of influence on children's views of their abilities is the school. The teachers' ratings of their children's abilities did not differ significantly for boys and girls in math or reading, but did for sport. Teachers were asked how much talent they thought each child had for sport; they rate boys as having more talent for sport than girls, $F(1, 542) = 8.97$, $p < .01$; means = 4.70 for boys and 4.33 for girls; r^2 for gender of child effect = .01. To the extent that these children know their teachers' opinion of their sport ability through either the grades their teachers give them for physical performance, or through more subtle messages such as who is chosen first for sports teams, the model predicts that this knowledge will influence the children's estimates of their own ability. Still, gender accounts for less than 2% of the variance in the teachers' ratings of the children's sport ability, far less than the percentage of variance that gender accounts for in the children's own ratings of their athletic ability. Consequently, other social factors must also play an important role.

Another obvious source of influence on children's perceptions of their ability might be their internalization of gender-role stereotypes. The children were asked to rate how important it is for a boy or a girl to have each particular ability. Their answers were given on a seven point scale that ranged from 1 = it's much more important for boys, to 4 = it's about the same importance for boys and girls, to 7 = it's much more important for girls. The sport domain is seen as more gender-role stereotyped than either of the other two domains. Both boys and girls think that it is more

important for boys than for girls to have ability in sports, with the boys endorsing this belief significantly more strongly than the girls, $F(1, 854) = 260.43, p < .001$; means = 1.90 for boys and 3.63 for girls; r^2 for gender effect = .23.

How does this gender-role stereotyping of sport relate to the children's own self-concept of ability in sport? According to the Eccles' model, there should be a relationship between the children's ratings of their own ability in sport and their beliefs regarding the gender-role stereotyping of sport. Such is the case. A positive correlation ($r = .26, p < .001$) was found between the girls' beliefs about the gender-role stereotyping of sports and their evaluation of their own sport ability, i.e., the more girls see sports as appropriate for girls in general, the higher are their estimates of their own ability in sports. The relationship for boys is also significant and negative as the model would predict ($r = -.22, p < .001$): To the extent that boys see sports as being male gender-role stereotyped, they also view themselves as having more ability in sports. Thus, even at this early age, children's gender-role stereotypes appear to be affecting their views of their own ability in the sport domain.

Parents are perhaps the most obvious other source of social influence on children's views of their own abilities. Therefore, it is not surprising to find that children's perceptions of how important it is to their parents that they *do well* in sports differ by gender: The boys think it is more important to their parents that they do well in sports than do the girls, $F(1, 852) = 13.95, p < .001$; means = 5.75 for boys and 5.27 for girls; $r^2 = .02$. Similarly, boys think that it is more important to their parents that they *participate* in sports than do the girls, $F(1, 852) = 30.14, p < .001$; means = 5.42 for boys and 4.62 for girls; $r^2 = .03$. Again, the Eccles et al. model predicts that children's views of the importance their parents attach to their involvement in sports should be related to their sense of their own athletic ability. This is true for both boys ($r = .31, p < .001$) and girls ($r = .26, p < .001$): To the extent that children think that their parents think it is important for them to do well in sports, they rate their own ability in sports as being higher.

CONCLUSIONS

What can be concluded from these findings? First, it is clear that the Eccles et al. model holds for sports as well as, if not better than, it does for academic subjects. Second, gender differences in children's attitudes toward sports are quite strong and emerge at a very young age. Finally, these gender differences seem to be a consequence more of gender-role socialization than of "natural" aptitudinal differences.

Validation of the Eccles et al. Model

The path analysis illustrated in Figure 3 supports the prediction that the gender difference in adolescents' participation in sports activities is related to the gender differences in adolescents' estimates of their sport ability and the value they attach to sport. The analysis also supports the

hypothesis that sport participation is related to individuals' perceptions of their sport ability and to the value that they attach to being good at sport.

The fact that the data support the model even more strongly in the sport domain than in the academic domain is not surprising. The Eccles et al. model is a choice model. It was designed to explain individual differences in choice behavior in the various activities. Decisions regarding participation in math and English are quite constrained until late in a student's academic career. The constraints are less obvious and less strong in the area of sport: To the extent that constraints exist (i.e., from the children's parents), they will be more idiosyncratic. As a consequence, there will be more variation in the participation rates, and this variation should be more highly tied to the types of individual differences in beliefs, self-perceptions, and social experiences outlined in the model.

Gender Differences

The results illustrated in Tables 1 and 3 document the existence of consistent and strong gender differences in children's ratings of their own ability in sport and of the importance they attach to the sport domain. Already by the first grade, girls have a more negative assessment of their general athletic ability than do boys. Girls also place less importance than boys on the sport domain. But even more importantly, girls see themselves as less able in sport than in other domains and see the sport domain as less important than the other domains. In contrast, boys see sport as equally or more important than the other domains and they feel more confident of their abilities in the sport domain than in the other domains. These patterns of self-perceptions and task values should be the critical mediators of the gender differences that are observed in sport participation. Children should put their efforts into those activities that they are most confident about and that they value the most. To the extent that these patterns differ across the genders, as they clearly do in these data sets, girls and boys should choose to put their efforts into different activities.

Origins of the Gender Differences

As noted earlier, identifying the origins of these gender differences is a difficult and controversial task. Too often, people adopt an either/or approach to this issue: either the gender differences are due to biological differences or they are due to socialization experiences. Such an approach is short-sighted because it fails to recognize the probable interaction between these two sources of influence. This paper has attempted to avoid such an approach. It has tried to get some indicators of aptitude in order to control for the possible impact of innate differences in aptitude on both the mediator variables and the participation variables. But individual differences on these indicators also include the influence of at least six years of social experience. What is interesting in the data is the fact that the gender differences on the self-perception, task value, and participation

indicators are much larger than the gender differences on the aptitudinal variables. This fact suggests that social experience variables, acting either independently or in interaction with earlier aptitudinal differences, contribute substantially to the gender differences observed in participation rates.

This paper has begun to explore which socialization experiences are important. Clearly the data presented here support the hypothesis that gender-role socialization is one key factor. The extent to which children see sport as appropriate for their own gender predicts their view of their own competence in this domain. Longitudinal analyses are necessary to determine the causal ordering of this relationship.

The data also suggest that parents play a key role. To the extent that children think that their parents value sport competence, they also rate their own sport competence higher. Again longitudinal analyses are necessary to determine the causal ordering of this relationship. In addition, analyses integrating the parental data with the children's data are necessary to actually demonstrate that the parents are a critical influence. Other analyses of these same data sets support the conclusion that parents' view of their children's sport competence and parents' view of the importance of sport competence for their children have significant longitudinal influence on the development of children's interest in sport and of their view of their own sport competence (Eccles et al., in press). These analyses indicate that parents rate their daughters' talent for sport substantially lower than their sons' even when their children are in kindergarten (Eccles et al., in press). Parents also provide sons with more opportunities to participate in sport activities than they provide daughters (Eccles et al., in press). Other studies in the field of sport psychology have also documented the power of both parents and coaches to affect children's interest in participating in sports (e.g., Coakley, 1987; Horn, 1987; Scanlon & Lewthwaite, 1984).

Future Directions

In order to understand both gender differences and individual differences within gender, it is going to be important to do within subject analyses in which children's relative perceptions of their abilities and task values across domains are assessed. This approach should be especially useful as activity choice is looked at across various domains. For example, some preliminary work has suggested a negative relationship between children's view of their ability in the sport and music domains: To the extent that children think they are good at music, they also tend to think they are less good at sport. These results suggest that children are already comparing their abilities across domains and judging their competence in each domain by their relative competencies across domains. It is likely that they will then make trade-offs across domains in the time they spend doing various activities.

More qualitative work is also needed. Most of the data presented here

were drawn from the aptitude and questionnaire measures used in the two studies reported here. However, during the second year of data collection, children in the second study (the elementary school study) were also interviewed and asked a series of questions about their activity preferences to assess their own explanations of why they liked certain activities. The children were shown an array of sports and asked which ones they did, which of these they liked the best and the least, and why this was so. For example, to the question, "Why do you like swimming the best?", one child replied, "You can pretend you're a mermaid and dive and do flips!" or another replied, "I can swim under water and when I get up, I get to make fish faces!" One domain was also compared against the other, and the children were asked to pick their *most* favorite activity. For one child, the question, based on her own nominations, was "Why do you like gymnastics better than computers?" to which she responded: "Computers don't let you exercise—they just expand your brain!" These responses will provide a better understanding of why the children think they are participating in various activities. There is a wide range of possible motivations for participating in any particular activity (see Duda, 1988; Scanlon et al., 1989; Weiss, 1987). It is clear from the preliminary examination of the children's answers that there are both interesting gender differences and more general individual differences in the reasons the children gave regarding their participation in sports. For example, the girls were more likely than the boys to give social reasons and less likely than the boys to give competitive reasons. For instance, one boy told us that he liked biking best because "I ride faster and better than my friends." Another boy said he liked baseball best because he could "beat his brother at scoring." Similarly, boys were more likely than girls to mention something about the roughness of the sport as what makes it appealing. For example one boy said that he liked ice hockey best because "it is fun when you get hurt." It will be interesting to test more systematically for age, gender, domain, and particular sport differences on these types of responses, and to relate these responses to the information we have obtained from the children's parents.

Suggestions for Intervention

Clearly, both the theoretical model and the empirical data presented in this paper suggest that gender differences in involvement in sport are due to modifiable social factors. Interventions are needed that raise females' confidence in their ability to do well in sport activities and that raise the value, and reduce the psychological cost, they attach to engaging in sport activities. Such interventions might include: (a) attributional retraining for the females and the adults who interact with the females around sport, (b) skill training in a positive affective environment that stresses cooperation and social interaction rather than competition, and (c) education regarding the value of sport for physical health and social interaction.

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