Charting the Eccles’ Expectancy-Value Model from Mothers’ Beliefs in Childhood to Youths’ Activities in Adolescence

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The Eccles’ expectancy-value model posits that a cascade of mechanisms explain associations between parents’ beliefs and youths’ achievement-related behaviors. Specifically, parents’ beliefs predict parents’ behaviors; in turn, parents’ behaviors predict youths’ motivational beliefs, and youths’ motivational beliefs predict their behaviors. This investigation focused on testing this model with mothers in sports, music, math, and reading over a 12-year period. Data were drawn from mother, youth, and teacher questionnaires collected as part of Childhood and Beyond Study (92% European American; N = 723).

Mothers’ beliefs in sports, music, and math positively predicted their behaviors in these areas 1 year later, which predicted youths’ self-concepts of ability and values (i.e., their motivational beliefs) in these domains 1 year later. Adolescents’ motivational beliefs predicted time spent in organized sport activities, playing music, and reading after school measured 4 years later as well as the number of math courses taken in high school. Furthermore, except in reading, mothers’ behaviors mediated the relations between mothers’ and youths’ beliefs, and youths’ beliefs mediated the relations between mothers’ behaviors and youths’ behaviors. Although there were mean-level differences in several indicators based on child gender, in most cases the relations among these indicators did not significantly vary by child gender. This study highlights the processes by which mothers’ beliefs during their children’s childhood can predict children’s activities in adolescence.

Keywords: activities, motivation, parenting, self-concept, value

Why do children choose such different activities and have such different goals? Why do some children invest time and energy in developing their intellectual skills while other children, often with comparable intellectual abilities, invest their time and energy in developing physical or musical skills or no particular skills at all? In an effort to address these questions systematically, Eccles and her colleagues developed two theoretical models of achievement-related choices to guide research examining the motivational and parental predictors of adolescents’ achievement-related behaviors (Eccles, 1993).

On the basis of these theoretical frameworks, we tested a developmental model spanning 12 years describing the processes by which parents’ beliefs about their children during the elementary school years are associated with adolescents’ achievement-related behaviors. As shown in Figure 1, the Eccles’ expectancy-value model asserts that (a) parents’ beliefs about a domain shape parents’ behaviors geared toward promoting children’s engagement in that domain; (b) parents’ behaviors, in turn, influence youths’ self-concepts and task values (i.e., youths’ motivational beliefs); and (c) these motivational beliefs predict adolescents’ subsequent behaviors. Furthermore, parents’ behaviors mediate the relations between parents’ and youths’ beliefs, and youths’ motivational beliefs mediate the relations between parents’ and youths’ behaviors. The Eccles’ expectancy-value model also posits that each of these indicators as well as the relations between these indicators is influenced by child gender. Our goal in this article was to test these theoretical propositions among mothers in four achievement domains: sports, instrumental music, reading, and math.

These four domains were chosen because they address two theoretically important distinctions. First, these domains include two voluntary leisure activities (i.e., sports and instrumental mu-

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sic) and two mandatory academic domains (i.e., math and reading). Math and reading are two core, required subjects throughout grade school. Sports and instrumental music are particularly relevant leisure activities because they are similar to the academic domains in that they are skill-based activities that require instruction in order for youths to achieve. However, sports and instrumental music differ from academics because parents in the United States often need to play a substantial role in supporting children’s leisure as these activities often have only limited support in the public school system. Second, these four specific domains are distinct because of the pattern of gender stereotypes. Sports and math are traditionally “masculine-typed” activities, whereas reading and instrumental music are traditionally “feminine-typed” activities (for a review, see Wigfield, Eccles, Schiefele, Roeser, & Davis-Kean, 2006). Inclusion of these four specific domains allowed us to examine if the processes generalize across distinctions between mandatory academic and skill-based leisure domains as well as between traditionally masculine and feminine domains.

Although researchers have examined various indicators in the model, they have rarely examined multiple processes within one model. For instance, several researchers have examined the correspondence between mothers’ beliefs and youths’ motivational beliefs without testing the role of mothers’ behaviors (e.g., Fredricks & Eccles, 2002, 2005; Frome & Eccles, 1998; Kahn et al., 2008; Lynch, 2002; Shumow & Lomax, 2002; Tiedemann, 2000). Only two studies to our knowledge address the link between mothers’ child-specific beliefs and parenting behaviors. Jodl and her colleagues (Jodl, Michael, Malanchuk, Eccles, & Sameroff, 2001) found that mothers’ values of academics predicted adolescents’ values directly rather than indirectly through mothers’ behaviors. In another study, Bhanot and Jovanovic (2005) found that mothers’ perceptions of children’s ability in math and English predicted their involvement with their children’s work in math, but not in English. Although these studies provide support that mothers’ beliefs shape child development, they do not provide an integrated view of the sequential processes hypothesized to exist in the Eccles’ model.

Mothers’ Behaviors as Predictors of Youths’ Outcomes

According to the Eccles’ socialization model (Eccles, 1993), mothers influence their children’s beliefs through several mechanisms: (a) role modeling, (b) encouragement and reinforcement, (c) provision of activity-related experiences (e.g., activity-related materials), and (d) parent–child coactivity (e.g., parent–child participation in an activity together). Although the Eccles’ expectancy-value model posits that mothers’ behaviors influence youths’ behaviors by changing youths’ motivational beliefs, the existing literature addresses whether mothers’ behaviors predict youths’ motivational beliefs or youths’ behaviors. We review studies with both youth outcomes as they both provide support for the series of paths in the expectancy-value model.

Modeling

Mothers’ leisure pursuits, or their modeling of behaviors, have the potential to influence their children’s behaviors through processes associated with both observational learning and children’s desire to be like their mothers (Bandura, 1997; Eccles, 1993). Scholars have documented significant relations between mothers’ and children’s behaviors in sports (Kahn et al., 2008; Sallis,
Prochaska, Taylor, Hill, & Gerarci, 1999) and modest relations between parents’ and children’s reading (e.g., Neuman, 1986) as well as parents’ listening to music and children’s musical outcomes (Davidson, Howe, Moore, & Sloboda, 1996). However, several studies have noted null results for modeling in academics (e.g., Andre, Whigham, Hendrickson, & Chambers, 1999), sport motivation (e.g., Fredricks & Eccles, 2005; Welk, Woods, & Mors, 2003), and music (Freeman, 2000; Sloboda & Howe, 1991).

Encouragement

Children’s assimilation of motivational beliefs and activities is also presumed to be influenced by mothers’ verbal encouragement and positive reinforcement (Eccles, 1993; Grolnick, Ryan, & Deci, 1991). Talented adolescents and elite adult athletes and musicians report that parental encouragement was an important influence in their lives (Bloom, 1985; Csikszentmihalyi, Rathunde, & Whalen, 1993; Davidson et al., 1996; Sloboda & Howe, 1991). Mothers’ encouragement has been linked to children’s motivational beliefs in math (Ferry, Fouad, & Smith, 2000), time spent reading (Neuman, 1986), and sport interest and participation (Bauer, Nelson, Boutelle, & Neumark-Sztainer, 2008; Fredricks & Eccles, 2005; Sallis et al., 1999).

Provision of Materials

According to sociocultural theory, materials in the home expose children to particular experiences and value systems (Rogoff, 1990). Mothers’ provision of educational materials in the home, such as books or math-related materials, predicts children’s academic achievement and time spent reading (Bleeker & Jacob, 2004; Linver, Brooks-Gunn, & Kohen, 2002; Neuman, 1986). Having musical instruments in the home while growing up is common for people who go on to become accomplished musicians (Freeman, 2000). Much less research has addressed the link between provision of materials and children’s motivational beliefs, though there is some research in the sports domain. Indicators of logistic support, such as sports equipment and transportation, predict adolescents’ motivation and level of physical activity (see Pugliese & Tinsley, 2007, for a review).

Coactivity

Mothers and their children can engage in an activity together through daily interactions (e.g., reading a book or playing catch) and by attending events around that domain together (e.g., sports game or music concert). Mother–child coactivity provides a context for mothers to offer verbal encouragement, discussion, adequate structure and scaffolding, and role modeling (Grolnick et al., 1991; Rogoff, 1990). Researchers have found that mothers’ involvement in children’s sport and music activities predicts children’s motivational beliefs and participation (Bakkes & Weiss, 1999; Davidson et al., 1996; Fredricks & Eccles, 2005; Freeman, 2000; Zdzinski, 1996). Although there is less research on coactivity in academic domains, the existing research supports this connection. Family joint reading in the home predicts reading motivation in young children (Baker, Scher, & Mackler, 1997; Bus, 1994). Parent–child math coactivity predicts children’s math knowledge and fluency (e.g., LeFevre et al., 2009).

Youths’ Beliefs as Predictors of Their Behaviors

According to the Eccles’ expectancy-value model, contextual influences on adolescents’ behaviors are mediated by two distinct motivational beliefs: individuals’ self-concept of ability (operationalized in terms of children’s beliefs about their competence and how well they expect to perform the task in the future) and subjective task value (Eccles, 1993). Self-concept of ability and value are theoretically distinct constructs that are connected to different motivational theories. Competence-related beliefs are the cornerstone of several motivational theories focused on predicting performance and behaviors, including self-efficacy, self-worth, self-concept, and self-determination theories (e.g., Bandura, 1997; Covington, 1992; Marsh, Gerlach, Trautwein, Lüdtke, & Brettschneider, 2007; Ryan & Deci, 2000). In contrast, other motivational theories have focused on the value construct, including expectancy-value, intrinsic motivation, and interest theories (e.g., Deci & Ryan, 1985; Eccles (Parsons) et al., 1983; Feather, 1992; Schiefele, 1991). Because self-concept of ability and value are drawn from two motivational traditions and the focus of this article is on the validity of the parental influence portion of the Eccles et al. model, the most direct way to achieve this goal is to run separate models for children’s self-concept and value.

Empirical findings suggest that self-concept of ability and values are important predictors of participation, performance, and courses. Several studies have documented the link between self-concept of ability and sport participation (Fredricks & Eccles, 2005; Marsh et al., 2007; Sabiston & Crocker, 2008), music participation (Austin, 1990; Klinedinst, 1991), number of math courses (Simpkins, Davis-Kean, & Eccles, 2006), and amount of leisure time spent reading (Baker & Wigfield, 1999; Durik, Vida, & Eccles, 2006). Subjective task value includes two components: importance (i.e., utility value of task for future goals) and interest (i.e., enjoyment of the activity). Adolescents’ subjective task value is a strong predictor of the number of math and science courses adolescents take in high school (Simpkins, Davis-Kean, & Eccles, 2006; Updegraff, Eccles, Barber, & O’Brien, 1996), the number of high school English/literature courses (Durik et al., 2006), and their participation in sport activities (Eccles & Harold, 1991; Sabiston & Crocker, 2008; Vilhjalmsson & Thorlindsson, 1998). Interest in reading also predicts time spent reading for pleasure (Cox & Guthrie, 2001; Durik et al., 2006). To our knowledge, such relations have not been examined in instrumental music.

The Importance of Child Gender

Gender differences are a pervasive theme throughout the literatures on sports, music, reading, and math. Gender effects take two forms: (a) mean-level differences between females and males on key constructs and (b) variability in the relations among these constructs between females and males. The existing research has largely focused on mean-level gender differences. Consistent gender differences have been found in sports and math, with males scoring higher than females on competence and value beliefs (e.g., Bhanot & Jovanovic, 2005; Fredrick & Eccles, 2002, 2005; Jacobs, Davis-Kean, Bleeker, Eccles, & Malanchuk, 2005; Welk et
al., 2003). In contrast, males often score lower than females in reading and music (e.g., Baker & Wigfield, 1999; Bhanot & Jovanovic, 2005; Coles & Hall, 2002; Eccles, 1993; Evans, Schweingruber, & Stevenson, 2002; Jacobs, Vernon, & Eccles, 2005), but the research is limited for music and there are some null findings in reading (Anderson, Anderson, Lynch, & Shapiro, 2004; Hood, Conlon, & Andrews, 2008).

It is equally important to examine whether the associations among the indicators vary as a function of gender for three reasons. First, according to socialization and cognitive theories, youths are most likely to adopt the behaviors of models that are most similar to themselves and behaviors pertaining to gender-appropriate activities (Maccoby, 1998). According to these theories, daughters should be more strongly influenced by their mother than are sons and “will be motivated to adopt own-sex distinctive behavior” (Maccoby, 1998, p. 153). Second, the persistent mean-level differences in these traditional gender-typed domains beg the question of whether the relations between these indicators also vary. Third, testing for gender as a moderator has important implications for interventions. If the predictors of children’s motivation vary for males and females, then interventions should target different aspects of parent socialization or different youth motivational beliefs to produce change in these groups.

The existing research testing gender as a moderator is limited. Most research has shown that the relations between mothers’ behaviors and youths’ behaviors, and between youths’ beliefs and behaviors in a variety of activities are invariant across child gender (Fredricks, Simpkins & Eccles, 2005; Marsh et al., 2007; Sabiston & Crocker, 2008; Simpkins, Davis-Kean, & Eccles, 2005, 2006; Valente, DuBois, & Cooper, 2004). One exception to this is research by Bhanot and Jovanovic (2005) who found that the relations between mothers’ perceptions of their children’s ability and children’s self-concepts in math were positively correlated for males and females, but the correlations were stronger for males than females.

Goals of This Investigation

This study is based on the Childhood and Beyond study (CAB). Although there is research on particular components of the Eccles’ expectancy-value model utilizing this data set, this article extends previous work in the following critical regards. Published research with this data has focused on smaller portions of the model. Studies suggest that (a) parents’ beliefs predict children’s beliefs (Fredricks & Eccles, 2002, 2005), (b) parents’ behaviors predict children’s beliefs and participation (Fredricks & Eccles, 2005; Fredricks et al., 2005; Simpkins, Davis-Kean, & Eccles, 2005), and (c) youths’ beliefs predict their time-use and courses (Durik et al., 2006; Eccles & Harold, 1991; Simpkins, Davis-Kean, & Eccles, 2006; Simpkins, Fredricks, Davis-Kean, & Eccles, 2006). This investigation has several advantages over this previous work.

To begin with, this is the first study to take a developmental perspective and examine all the links between mothers’ beliefs and behaviors in elementary school and youths’ beliefs and behaviors in adolescence within the same model. The full model presented in Figure 1 has never been tested in any one domain. Furthermore, several relations noted in Figure 1 have never been tested in any of the four domains, such as the relation between mothers’ beliefs and mothers’ behaviors. Other relations have not been tested in all domains, such as the relation between mothers’ behaviors and youths’ motivational beliefs in music. Another substantial strength of this study is that it is the first study to examine these processes across sports, music, math, and reading, which can provide insight into the generalizability across domains that vary in gender stereotypes and their focus on academics versus leisure activities. Very little work exists in the domains of reading and music. Finally, this study provides a nuanced perspective on mediators and child gender as a moderator.

We hypothesized that mothers’ beliefs (i.e., task importance, perceptions of child abilities, and efficacy) would positively predict mothers’ behaviors in these domains (i.e., modeling, encouragement, provision of activity-related experiences, and parent–child coactivity). In turn, we expected mothers’ behaviors would positively predict adolescents’ self-concepts and values. Finally, we expected adolescent’s self-concepts and values would positively predict subsequent achievement-related behaviors. But even more important, we predicted a specific sequence of indirect effects across time: (a) mothers’ behavior would mediate relations between mothers’ and youths’ beliefs, and (b) youths’ beliefs would mediate relations between mothers’ behaviors and youths’ behaviors.

On the basis of prior research, we expected mean level differences by gender, with males being lower on indicators of music and reading, but higher on indicators of sports and math than females. Considering the tenets of social learning theory, we expected to find significant differences in the relations between mothers’ beliefs and behaviors and children’s beliefs for boys and girls. However, the limited research conducted to date in which gender has been tested as a moderator generally has failed to show differences for males and females. One goal of the current study was to lend evidence to help reconcile these opposing perspectives.

Method

Childhood and Beyond Study

The data were drawn from the Childhood and Beyond Study (CAB). This is a longitudinal study including nine waves of data from three cohorts composed largely of white middle-class two-parent families. Families fitting this demographic were chosen specifically for this study because it was the first large-scale study of its kind, and the principal investigators needed a sample of participants for whom poverty was not an issue for families in the provision of opportunities for their children. Selecting these families allowed the study of the focal processes in the expectancy-value model. Families were followed while children were in elementary, middle, and high school. All nine waves were spaced 1 year apart with two exceptions. First, due to a gap in funding, Wave 5 occurred 4 years after Wave 4. Second, Wave 8 occurred 2 years after Wave 7 so that data could be collected from the middle cohort when they were in 12th grade. For complete information on the study, including the timing of the data collection waves, please see the study website (www.rcgd.isr.umich.edu/cab/).

Participants

Youths were recruited from four small city school districts near Detroit. Seventy-five percent of the families contacted agreed to
participate. The youngest of the three CAB cohorts included 287 children who were in kindergarten at Wave 1. The middle cohort included 306 first graders at Wave 1. The oldest cohort included 394 third graders at Wave 1.

Of the 987 families,7 723 families had at least one parent who participated in the study. The 1990 yearly household incomes ranged from less than $10,000 to more than $80,000, with a median income of $50,000–$59,999. At Wave 3, children largely resided in households with two parents who were married (87%), and the majority was European American (93%). The sample of youths was 48% female. Most mothers had earned a high school degree (98%), and several had obtained a bachelor’s degree or higher (38% of mothers).

All participants were tracked and asked to participate at each wave. A combination of mailed surveys and telephone interviews (coupled with a variety of tracking strategies, including earlier parent or friend contacts, the state motor vehicle department records, Social Security numbers, and forwarding address information available from the post office) was used to minimize attrition. Of the 723 mothers, approximately 75% participated at Wave 2, and 68% participated at Wave 3 (1 year later). Of the youths, approximately 85% participated at Wave 4, 69% participated at Wave 5 (4 years later), and 49% participated at 12th grade (which was collected at Waves 7–9 for the three cohorts). As in all longitudinal studies, attrition often increases with the length of the study. The most common source of attrition was moving out of the data collection area.

We compared youths whose mothers had some data (n = 723) and youths whose mothers did not have data (n = 264) on all youth indicators, gender, and cohort. Of the 20 tests, seven were statistically significant. Youths who had parent data had a higher IQ (p < .001), higher math ability (p < .01), higher sports ability (p < .05), higher music ability (p < .001), and higher reading value at Wave 4 (p < .05), and took more math courses (p < .05) than youths whose mothers did not have data. In addition, in the oldest cohort, there were fewer youth than expected by chance who did not have mothers with data (p < .05).

Procedure

Data used in this investigation were collected from mothers, youths, and teachers at various waves. Parent data were collected at Waves 2 and 3. Self-administered parent questionnaires were mailed home with a stamped, return envelope in the spring of each wave. Youths completed questionnaires each spring in school classrooms supervised by project staff. The current study incorporated youth data collected during Waves 5–9. Teachers reported information on children during Waves 1–3. Teacher questionnaires were self-administered during the spring of each wave.

Data were also collected from 541 fathers. A set of analyses were completed with fathers’ data that parallel the models presented in the article for mothers. The findings were largely similar to the models for mothers. These results are available from the first author upon request.

Mother Beliefs

Three indicators of mothers’ beliefs were measured at Wave 2 (when youths were in Grades 1, 2, and 4). Every belief was assessed in each of the four domains. In previous research, comparable scales have strong psychometric properties (αs = .86–.92) and strong face, discriminant, and predictive validity (see Eccles, Freedman-Doan, Fronc, Jacobs, & Yoon, 2000; Eccles, Harold, & Wigfield, 1993; Eccles-Parsons, Adler, & Kaczala, 1982; Fredricks & Eccles, 2005, for more information).

Perceptions of children’s ability. Three items were used to measure mothers’ perceptions of children’s ability: (a) “How good is this child at [sports/music/math/reading]?” (1 = not at all good, 7 = very good), (b) “Compared with other children, how much innate ability or talent does this child have in [sports/instrumental music/math/reading]?” (1 = much less than, 7 = much more than), and (c) “How well do you think this child will do in each of these areas next year [for sports/music/math/reading]?” (1 = not at all well, 7 = very well). The reliability of this three-item scale was acceptable across mothers and domains (α = .86–.95).

Perceptions of importance. Mothers’ belief about the importance of each domain was measured with the following item: “How important is it to you that this child does well in [sports/music/math/reading]?” (1 = not at all important, 7 = very important).

Efficacy. Mother efficacy was assessed with one item: “How confident do you feel about your ability to help in each of the following activities?” (1 = much less confident than other activities, 7 = much more confident than other activities).

Mother Behaviors

Mothers provided information on their behaviors in all four domains at Wave 3 (when youths were in second, third, and fifth grades). Five behaviors were included: modeling, provision of activity-related materials, encouragement, and two indicators of co-activity.

The first indicator of mothers’ behavior, modeling, was how much time mothers spent at home or after work during the previous week on “organized competitive sports,” “playing sports with friends,” “doing athletic activities alone [like running],” “playing a musical instrument,” “participating in math- and science-related activities,” and “reading for pleasure” (1 = 0 hr, 7 > 20 hr). The three indicators of mothers’ sport activities were averaged to create a scale of sport modeling.

The second, provision of activity-related materials, was measured by whether anyone in the family had bought or rented activity-related materials for their child in the past year (0 = no, 1 = yes). Sports items included “sports equipment” and “sports books or magazines.” Music items included “musical instruments” and “music or dance books, supplies, or clothing.” Math items included “math-related books, games, toys, or magazines.” Reading items included “general interest books” and “general interest magazines.” Within each domain, the items were summed to create an indicator of the family’s provision of materials (range in each domain = 0–2, except math, which ranged between 0–1).

The third, maternal encouragement, was indicated by the extent to which mothers generally encouraged their youth to participate in each domain (1 = strongly discourage, 7 = strongly encourage).

1 Siblings were included in the larger study. Because siblings were only included in a subset of families and require different analyses, they were not included in the current investigation.
The fourth, coactivity, was indicated by how often mothers generally participated in their child’s daily activities: “play sports with this child,” “play a musical instrument with this child,” “did math or science activities with this child,” “parent read to this child,” and “this child read to the parent” (1 = never, 7 = almost every day for a long while). The two reading items were averaged. A second component of coactivity was how often mothers took their child to an event in the community related to sports or music. Items measured how often mothers took youths to events in the community: “paid sporting events,” “rock concerts,” and “classical music concerts” (1 = never, 7 = almost every day for a long while). The two music items were averaged to create a subscale of attendance at music events.

Youth Beliefs

Self-concept of ability. Children’s self-concept of ability was measured with the same four items in each domain at Wave 4 (when youths were in third, fourth, and sixth grades). The scale included the following questions: “How good at [sports/playing a musical instrument/math/reading] are you?” (1 = not very good; 7 = very good), “If you were to list all of the students from best to worst in [sports/playing a musical instrument/math/reading], where are you?” (1 = one of the worst; 7 = one of the best), “How good would you be at learning something new in [sports/playing a musical instrument/math/reading]?” (1 = not very good; 7 = very good), and “Compared to other subjects, how good are you at [sports/playing a musical instrument/math/reading]?” (1 = a lot worse, 7 = a lot better). These scales have excellent face, convergent, and discriminant validity as well as strong psychometric properties (e.g., Jacobs, Lanza, Osgood, Eccles, & Wigfield, 2002). The scales had high reliability (α = .81–.89).

Task value. Youths’ perceptions of task value were measured at Wave 4 (when youths were in third, fourth, and sixth grades). Three items assessed importance: “For me, being good in [sports/playing a musical instrument/math/reading] is . . .” (1 = unimportant; 7 = important), “Compared with other activities, how useful is learning [sports/to play a musical instrument/math/reading]?” (1 = not as useful, 7 = a lot more useful), and “Compared with other activities, how important is it to be good at [sports/playing a musical instrument/math/reading]?” (1 = not as important as being good in other activities, 7 = a lot more important than being good in other activities). The two items measuring interest were “I find [playing sports/playing musical instrument/doing math/reading] . . .” (1 = very boring; 7 = very interesting), and “How much do you like [playing sports/playing a musical instrument/doing math/reading]?” (1 = a little; 7 = a lot). We created each scale by taking the average of the items. The scales had adequate reliability (α = .75–.91) and excellent convergent and discriminant validity (e.g., Jacobs et al., 2002).

Youth Participation

In all domains except math, youths reported on the amount of time they spent in an activity at Wave 5 (when youths were in seventh, eighth and 10th grades). Specifically, they reported time spent “taking part in organized sports,” “practicing a musical instrument,” and “reading for fun” (1 = none, 8 = 21 or more hours). Although children spend time after school in informal math activities, few adolescents participate in math activities after school beyond completing their homework (Simpkins, Davis-Kean, & Eccles, 2006). In high school, youths are able to select in or out of math pursuits through elective courses. In order to capture the courses, youths took throughout high school, we measured youths’ math courses when they were in 12th grade. Because youths were from three different cohorts, the data were drawn from one of three waves, namely Waves 7, 8, and 9, depending on when the youths in each particular cohort were in 12th grade. At each wave, participants reported whether they had taken various math courses at any point during their high school career including algebra, algebra II, geometry, precalculus, trigonometry, calculus, and advanced placement (AP) calculus/AP analysis. The total number of math courses was the sum of all math courses and ranged from 0–7.

Additional Indicators

Several additional family- and child-level indicators were included in our analyses as control variables based on theoretical importance. They included parents’ education, family income, child’s ability, child’s gender, and cohort. Inclusion of these indicators in our analyses was important so that we can understand what mothers contribute to children’s beliefs and behaviors while controlling for these other characteristics. For example, by controlling for aptitude, we were controlling for the possibility that children with high aptitude or skills are likely to have mothers who support children in these domains and that these children are likely to have high beliefs and participate in these domains.

Parent demographics. Parents indicated their highest level of educational attainment on a list of precoded responses (1 = grade school, 9 = Ph.D.). This variable was created from the highest level of educational attainment across parents’ surveys at Waves 1–3. The highest level of education within a parental pair was used to characterize parents’ education (Shumow & Lomax, 2002). Parents described their annual income on a scale listing income brackets in $10,000 increments (minimum = none, maximum = over $80,000). The average household income from Waves 1 through 4 was used.

Ability. Child ability was assessed through standardized aptitude assessments and teachers’ ratings of children’s abilities. The standardized assessments were completed when youths entered the study at Waves 1–3 and provided information on children’s intelligence, verbal skills, mathemetic skills, and physical aptitude. Children’s overall cognitive skills were measured with the Slosson Intelligence Test–Revised (Slosson, Nicholson, & Hiebschman, 1991). Children’s physical aptitude was assessed with the Bruininks–Oseretsky Test of Motor Proficiency (Bruininks & Bruininks, 1977). This test has been widely used to assess the proficiency of both gross and fine motor skills (Hattie & Edwards, 1987).

Teachers assessed children’s ability in each of the four domains with two items: “Compared with other children, how much innate ability or talent does this child have in each of the following?” (1 = very little, 7 = a lot), and “How well do you expect this child to do next year in the areas listed?” (1 = very poorly, 7 = exceptionally well). Teachers rated these items at Waves 1–3 (α = .78–.92). We averaged teachers’ ratings across the three waves to estimate children’s enduring ability in these areas. The correlations of the scales
across time were moderate to high (sports: .39–.46, music: .21–.37, math: .52–.62, and reading: .60–.69).

Plan of Analysis

Our analyses focused on testing the model presented in Figure 1 with structural equation modeling (SEM) in AMOS Version 19. Although 723 mothers participated, several of these participants were missing some data. Full information maximum likelihood was used to incorporate cases with missing data in the analyses (Schafer & Graham, 2002). Thus, all analyses were computed on 723 participants. Eight separate models were estimated to capture (a) each of the four domains and (b) children’s self-concept and value.

As depicted in Figure 1, mothers’ beliefs, mothers’ behaviors, and youths’ motivational beliefs were represented with latent variables. Mothers’ beliefs at Wave 2 were represented by three indicators: task importance, perceptions of child abilities, and efficacy. Mothers’ behaviors at Wave 3 included modeling, encouragement, provision of materials, daily coactivity, and coactivity at events. The latent variable for youths’ self-concept and value had multiple indicators. Youths’ self-concept was represented by the four self-concept items detailed in the Method section. Youths’ value included (a) three items on importance and (b) two items on interest. Because we expected the three importance items to be correlated (as they all measured this component of value), we correlated the error terms of the three importance items. Youths’ behaviors at Wave 5 (or at 12th grade for math) were measured variables.

Several additional family and child indicators were included in each model to account for their association with the parent and child beliefs and behaviors (e.g., Jacobs et al., 2002). These indicators included family socioeconomic status (i.e., a latent indicator of parent education and family income), teacher rating of child ability in each domain, child IQ, child gender (i.e., 1 = male, 0 = female), and cohort (i.e., two dummy codes for the youngest and middle cohorts with the oldest cohort as the reference group). In the models for sports, children’s physical aptitude was also included in addition to the other indicators. The models were originally estimated such that each of these family and child indicators predicted mother beliefs, mother behaviors, youth beliefs, and youth behaviors. We only retained paths that were statistically significant in the final models to increase parsimony. If one of these family or child indicators did not significantly predict any of the indicators in Figure 1, it was dropped from the model.

The models were fit to the full sample unless the multigroup analyses that are detailed later suggested that separate models for males and females significantly improved model fit. Several indicators of model fit were utilized. The comparative fit index and root-mean-square error of approximation were used in addition to the chi-square test to assess overall model fit (Hu & Bentler, 1999).

Mediation. We tested two mediation paths: (a) whether mothers’ behaviors mediated relations between mothers’ beliefs and youths’ beliefs, and (b) whether youths’ behaviors mediated relations between mothers’ behaviors and youths’ behaviors. To do this, we used the unstandardized estimates and standard errors in an online calculator to develop confidence intervals (Selig & Preacher, 2008). All confidence intervals (CIs) of the indirect effect presented were 95% CI. All CIs that do not include zero suggest there is mediation.

Child gender. In this investigation, we examined if child gender predicted mean-level differences in the study indicators and if it moderated the relations among these indicators. Mean-level gender differences in mothers’ beliefs, mothers’ behaviors, youths’ motivational beliefs, and youths’ behaviors were tested through regression analysis in SAS with multiple imputation (Schafer & Graham, 2002). Ten data sets were imputed. In these models, we included parent education, family income, teacher rating of ability, child IQ, child gender, and cohort as well as physical aptitude (in the sport models only) to examine if there were systematic gender differences above and beyond these indicators.

We tested whether child gender moderated the relations shown in Figure 1 through multigroup analyses in SEM. We examined the change in model chi-square between (a) a model in which the three paths between mothers’ beliefs, mothers’ behaviors, youths’ beliefs, and youths’ behaviors shown at the top of Figure 1 were free to vary across the two groups (all other paths and correlations were fixed to be equal across the two groups) and (b) a model in which all paths and correlations were fixed to be equal across the two groups. If the change in chi-square was not statistically significant, then one model was fit to the entire sample, and child gender was added as a predictor. If the change in chi-square was statistically significant, we examined the gender differences in each of the four paths separately to identify which path was significantly different.

Results

In this section, we review the findings of the SEMs. As shown in Table 1, the models fit the data well. The significant standardized path estimates from the family and child control variables to parent and child beliefs and behaviors are presented in the Appendix. All items significantly loaded on the latent variables in all models. The standardized loadings were as follows: mothers’ beliefs: from .18 to .97, ps < .01, mothers’ behaviors: from .11 to 1.00, ps < .05, and youths’ motivational beliefs: from .26 to .92, ps < .001. However, the error variance of mother reading coactive was negative, but not statistically significant. The error variance was set to .001, which is a positive, but nonsignificant, value.

The Longitudinal Relations Among Indicators

As shown in Table 2, mothers’ beliefs when youths were in first, second, and fourth grades positively predicted their behaviors 1 year later in all domains except reading (path estimates ranged from .16 to .98, ps < .001). Mothers’ behaviors when youths were in second, third, and fifth grades predicted youths’ self-concept in sports and music, as well as youths’ value in sports, music, and math (path estimates ranged from .18 to .56, ps < .001). Mothers’ behaviors were not a significant predictor of youths’ reading beliefs or math self-concept. Youths’ self-concept and value predicted their activities 4 years later and their math courses throughout high school (path estimates ranged from .13 to .39, ps < .01), except in the case of males’ reading time.

Tests of Mediation

We tested whether mothers’ behaviors mediated the relations between mothers’ beliefs and youths’ beliefs, and whether youths’ beliefs mediated the relations between mothers’ behaviors and
youths’ behaviors. The CIs of these indirect effects are presented on the right side of Table 2. The findings suggest that both indirect effects were significant in the models with youths’ sport self-concept and value, music self-concept and value, and math value. Both indirect effects were not significant in the models with reading self-concept and value or with math self-concept. The mediational paths were likely nonsignificant in these three models because in each of these models, parents’ beliefs did not significantly predict their behaviors or mothers’ behaviors did not significantly predict youths’ beliefs.

Child Gender

Table 3 presents the means, standard deviations, and effect sizes for mother and youth indicators by gender. There were a few notable patterns concerning the mean-level gender differences. First, the largest number of gender differences across mothers and children emerged in the sport domain. Second, parental perceptions of their children’s ability and task value varied by child gender, but parent efficacy did not. Third, parent provision of materials and encouragement often varied by child gender, but modeling, coactivity, and attending events often did not. Fourth, children’s self-concept of ability and subjective task value varied by child gender, but adolescents’ behaviors did not significantly vary by child gender. In all cases, the gender differences were consistent with prior research and with gender-role stereotypes: Males were higher on sport and math indicators, but lower on music and reading indicators, than were females.

Three of the eight multigroup analyses testing gender as a moderator were statistically significant as shown in Table 1. Child gender moderated relations in the models predicting youths’ sport value and reading self-concept of ability and value. The follow-up multigroup analyses revealed that four paths significantly varied across males and females (see Table 2 for the standardized path estimates). In the sport models, the relations between mothers’

| Model Fit Indicators and Multigroup Tests of Gender Moderation |
|--------------------------------------|-----------------|-----------------|-----------------|
| Model                                | χ²              | CFI             | RMSEA           | Change in χ²   |
| Sports                               |                |                |                |                |
| Self-concept                         | (131) 403.38***| .91             | .05             | Δχ²(3) = 5.90  |
| Value                                | (324) 506.46***| .92             | .03             | Δχ²(3) = 10.35*|
| Music                                |                |                |                |                |
| Self-concept                         | (151) 508.01***| .88             | .05             | Δχ²(3) = 1.37  |
| Value                                | (163) 481.38***| .91             | .05             | Δχ²(3) = 1.46  |
| Reading                              |                |                |                |                |
| Self-concept                         | (223) 437.89***| .89             | .03             | Δχ²(3) = 9.10* |
| Value                                | (288) 404.82***| .92             | .02             | Δχ²(3) = 9.96* |
| Math                                 |                |                |                |                |
| Self-concept                         | (131) 312.74***| .91             | .04             | Δχ²(3) = 2.96  |
| Value                                | (133) 242.88***| .94             | .03             | Δχ²(3) = 7.78  |

Note. CFI = comparative fit index; RMSEA = root-mean-square error of approximation.
* p < .05. *** p < .001.

| Standardized Path Estimates and Confidence Intervals of the Mediated Paths |
|----------------------------------------|-------------------------------|-------------------------------|-------------------------------|
| Model                                  | Mother beliefs → mother behaviors | Mother behaviors → youth beliefs | Youth beliefs → youth behaviors | Mother beliefs → mother behaviors | Mother behaviors → youth behaviors | Test of mediation |
| Sports                                 |                                |                               |                               |                                |                               |                 |
| Self-concept                           | .64***                        | .39***                        | .38***                        | [.188, .640]                  | [.331, 1.019]                  |                 |
| Music                                  |                                |                               |                               |                                |                               |                 |
| Self-concept                           | .65***                        | .56***                        | .32***                        | [.480, 1.008]                 | [.352, .721]                   |                 |
| Value                                  | .72***                        | .36***                        | .29***                        | [.343, .841]                  | [.174, .447]                   |                 |
| Reading                                |                                |                               |                               |                                |                               |                 |
| Self-concept                           | .06                           | .05                           | .10M/.33***F                  | [−.024, .096]                 | [−.006, .023]M; [−.018, .059]F |                 |
| Value                                  | .06                           | .04                           | .11M/.35***F                  | [−.081, .174]                 | [−.011, .024]M; [−.034, .064]F |                 |
| Math                                   |                                |                               |                               |                                |                               |                 |
| Self-concept                           | .18*                          | .09                           | .23***                        | [−.046, .496]                 | [−.014, .149]                 |                 |
| Value                                  | .16†                          | .18†                          | .13**                         | [.027, .982]                  | [.006, .157]                   |                 |

Note. All confidence intervals are 95%. Confidence intervals that do not contain zero are statistically significant. M = males; F = females.
* p < .10. † p < .05. ** p < .01. *** p < .001.
beliefs and mothers’ behaviors, $\Delta \chi^2(1) = 4.67, p < .05$, and between youths’ beliefs and youths’ behaviors, $\Delta \chi^2(1) = 5.55, p < .05$, were stronger for males than for females. The relation between youths’ reading self-concept of ability and time spent reading was not statistically significant for males, but was significant and positive for females in both reading models, $\Delta \chi^2(1) = 6.92$ and $7.77, p < .01$. All other relations in these models did not vary by child gender, $\Delta \chi^2(1) = 0.00–2.12, ns$.

### Reading Compared With Other Domains

The evidence was consistent in all domains except reading. Specifically, mothers’ reading beliefs did not predict their behaviors and mothers’ reading behaviors did not predict youths’ reading self-concept of ability and subjective task value. We conducted some follow-up analyses to examine if mothers’ beliefs and behaviors were different for reading compared with their beliefs and behaviors for sports, music, and math. We tested the mean-level differences across domains (i.e., the within-subjects factor) with a repeated-measures analysis of variance. We examined all indicators of mothers’ beliefs and behaviors that were measured and had the same scale across all four domains. The findings suggested that mothers were consistently higher on all reading items compared with the other domains. The pairwise comparisons suggest that mothers’ perceptions of child ability and encouragement were higher in reading than in sports and math ($p < .001$). Ratings of importance, efficacy, modeling, and daily coactivity were higher in reading than in sports, music, and math ($p < .001$).

### Discussion

Our study expands the prior literature on parenting, gender, and motivation by testing the links between mothers’ beliefs and adolescents’ behaviors as theorized by the Eccles expectancy-value model over a 12-year period (Eccles, 1993). One of the central contributions of this article to the literature is testing an inclusive model in two mandatory academic domains (i.e., math and reading) and two leisure domains (i.e., sports and music) that are traditionally gender stereotyped within one article. Prior to this study, researchers who wanted to compare processes across domains would have to compare findings from multiple studies that varied in terms of the participants, measures, and design. Thus, it was unclear if any inconsistencies emanated from a divergence in the methods or a divergence in processes. By including all four domains, we contribute indispensable information on the differences in processes across the four domains as well as fill important gaps in the literatures on each domain.

Our findings lend support for the Eccles’ expectancy-value model suggesting that mothers’ beliefs predict mothers’ behaviors. These parental behaviors, in turn, predict later adolescent motivational beliefs, which, in turn, predict adolescents’ subsequent behaviors. Furthermore, mothers’ behaviors mediated the relations between mothers’ and youths’ beliefs, and youths’ beliefs mediated the relations between mothers’ behaviors and youths’ behaviors. These findings largely replicated in three of the four domains, for daughters and sons, and for youths’ values and self-concepts of ability. The level of support for the Eccles’ expectancy-value model, however, did vary for the different portions of the model. The latter portion of the model (i.e., link between youths’ motivational beliefs and behaviors) largely characterized each domain. Thus, how adolescents allocated their time in reading, sports, and music and the number of math courses they took in high school were significantly and substantially predicted by previous self-concept of abilities and values. These results support previous research demonstrating the links between self-concept of abilities and values with adolescents’ behaviors and performance in sports, reading, and math (e.g., Baker & Wigfield, 1999; Cox & Guthrie, 2001; Marsh et al., 2007; Sabiston & Crocker, 2008; Updegraff, Eccles, Barber, & O’Brien, 1996; Vilhjalmsson & Thorlindsson, 1998). The findings on music are particularly unique as few studies have examined the instrumental music domain (for exceptions, see Austin, 1990; Klinedinst, 1991). The strength and consistency of these findings align with other research showing...
that children begin taking the lead on planning their activities after school at the end of elementary school (Savage & Gauvain, 1998). Our findings contribute to this literature by providing insight into earlier experiences in the home influence the ontogeny of these decisions.

The support for the portion of the model that focused on the link between mothers’ beliefs and behaviors and children’s motivation varied depending on the domain. We found stronger support in the leisure domains (i.e., sports and music) than in the academic domains (i.e., reading and math). There are several possible explanations for this finding. First, reading and math are part of the core curriculum at schools, whereas options to participate in activities designed to teach skills in sports and music are less likely to occur in schools in the United States. This difference in the availability of instruction in sports and instrumental music is likely to be increasing with the tightening of school budgets. Thus, the acquisition of youths’ skills and motivation in reading and math are likely subject to greater effects from the school. In contrast, sports and music are likely to be more influenced by experiences provided by the family. Second, there are more ways for families to differ in the extent to which they are involved in sports and music than in math and reading. In some families, parents go out of their way to sign their children up for their organized sports and music experiences; in other families, this is less true. Sports and music often require a larger family commitment as these activities often occur outside the regular school hours and require parents to purchase equipment or uniforms. They also can play a variety of roles in supporting continued involvement in these leisure domains such as being a coach or an instructor, a chauffeur, a financier, a spectator, and a cheerleader. Thus, it is likely that variations in parents’ values and goals will be both more extreme than in math and reading and more predictive of parents’ actual behaviors. It is also likely that parents’ values and goals will have greater influence on the ontogeny of their children’s ability self-concepts, subjective task values, and actual behavioral choices precisely because there is more variation across families in these values and behaviors.

There were also differences between the two academic domains in terms of the strength of the relations between mothers’ beliefs and behaviors and between mothers’ behaviors and children’s beliefs. Mothers’ beliefs and behaviors were not significant predictors in reading, but were significant predictors in math. This pattern has emerged in other research noting that mothers’ perceptions of children’s ability predicted their behavior in math but not in English (Bhanot & Jovanovic, 2005). One possibility is that reading behavior is determined earlier in children’s lives. Mothers often start reading to children before school begins (Hood et al., 2008). Thus, both the parents and the children’s beliefs and behaviors may be less variable after children’s entry into elementary school, making it more difficult to demonstrate effects using SEM techniques. Another possibility is that mothers’ beliefs and behaviors may not predict subsequent outcomes because of the fundamental importance of reading. Almost all jobs and careers require the ability to read. Even in elementary school, children use their reading skills to learn in other subjects such as science, math, and history. Our results indicate that mothers’ reading beliefs and behaviors were higher than the corresponding indicators in the three other domains. Mothers’ high endorsement of reading may limit its predictive power. Although very important, the salience of math skills in the home may be more variable and thus more amenable to demonstrating between family and between person variations.

In addition, this study contributes critical information on the correlates of mothers’ beliefs. The majority of previous studies have examined the correspondence between mothers’ beliefs and children’s beliefs and achievement-related behaviors (e.g., Bleeke & Jacobs, 2004; Fredricks & Eccles, 2002). Very few previous studies have considered how children learn or internalize mothers’ beliefs. Our findings suggest that mothers’ behaviors mediate the relations between mothers’ and youths’ beliefs in all of the domains except reading. This pattern aligns with the limited research on this subject (Bhanot & Jovanovic, 2005; Jodl et al., 2001).

The current findings also extend the literature on the role of mothers’ behaviors in promoting children’s motivation and achievement-related behaviors. In the extant literature, most researchers examined a quite limited set of parental beliefs and behaviors (for exceptions, see Davidson et al., 1996; LeFevre et al., 2009). We took a more inclusive look at mothers by including multiple indicators of mothers’ behaviors. The Eccles’ expectancy-value model posits that mothers can support and promote youths through multiple mechanisms (Eccles, 1993). We believe that such a holistic view is necessary to accurately capture family influence. For example, in the literature on talented youths and elite athletes and musicians, youths indicate that various parental behaviors were integral to their path in these careers and the pattern of these influences varied across youths—no single parental behavior emerged as critical to all of the youths (e.g., Bloom, 1985; Csikszentmihalyi et al., 1993; Sloboda & Howe, 1991). It will be important for research on fine-grained analyses of particular behaviors to be complemented with broader research, such as the current investigation.

**Child Gender**

Our findings are consistent with other studies of mean-level gender differences, with males having typically higher scores than females on sport- and math-related indicators and lower scores than females on music- and reading-related indicators (for a review, see Wigfield et al., 2006). The mean-level gender differences were stronger in the leisure domains than the academic domains. This finding may reflect the fact that leisure domains tend to be voluntary. Mastery of math and reading are necessary to graduate from high school and gain entry into college, which are important precursors to economic success in adulthood. Thus, mothers may promote and believe in the importance of math and reading for both their sons and daughters, given the centrality of these skills to academic success. Within the leisure domains, sports evidenced the most consistent and largest gender differences. Although previous literature consistently has shown gender differences in mothers’ sport-related behaviors (e.g., Fredricks & Eccles, 2005; Welk et al., 2003), instrumental music has been largely ignored. Playing music together and attending musical events in the community (e.g., a concert) may simply be less common in the United States than exhibiting similar behaviors in sports; thus, scores for instrumental music are low in both boys and girls. The gender differences may be larger for sports than music because gender stereotypes are stronger in sports than instrumental music. Most professional athletes are men, but professional musicians include well-known men and women.
Although there were several instances of mean-level gender differences, the relations between these indicators did not vary largely by child gender. The only consistent gender difference was that youths’ self-concept and value predicted the time spent reading for girls, but not for boys. Socialization theories, like social learning theory, posit that youths are more likely to adopt the behaviors of people who are like them (Maccoby, 1998). According to these theories, female offspring should be more likely to adopt the behaviors of their mothers than are male offspring. In general, our findings support this theory but suggest that the process is similar for boys and girls. If gender does not moderate the relations at hand, that would suggest that similar interventions or supports would promote girls’ and boys’ pursuit of these domains. However, replication studies are warranted given the small number of studies in which gender was examined as a moderator.

Limitations and Future Directions

Our results need to be interpreted in light of the following methodological limitations. The findings were based on a study that began in 1987 and involved a sample of middle-class European American families living in the United States. As stated earlier, this sample was specifically chosen so that the processes theorized in the expectancy-value model could be investigated within families for whom poverty would not be an issue in providing opportunities. That said, it will be important to replicate the current findings for families from different ethnic and socioeconomic groups within the United States as well as from different countries. Although we expect the basic model to hold with other groups, certain aspects of the model might be stronger in some populations than in others. For example, in cultures where traditional gender roles are highly valued, the differences between males and females are likely to be more pronounced. The associations between adolescents’ motivational beliefs and participation in organized activities may also be weakened in contexts that have limited opportunities for adolescents to engage in activities. In such circumstances, adolescents’ motivational beliefs should still be strong predictors of their engagement in informal, leisure activities. The differential role of parents in the different activity domains is also likely to vary depending on the availability of opportunities to participate in these different skill areas and the relative value placed on the different skill domains.

Not only does this study need to be replicated with diverse populations, future research should also include diverse measures to test the generalizability of the findings. All information on parenting behaviors and adolescents’ achievement-related behaviors were collected with self-report survey methods. Some potential concerns of self-report include the accuracy of mothers’ self-reports of behavior, the level of detail that can be measured, and the type of analysis that can be conducted. In future research, it will be important to supplement self-report measures with other methodological techniques to collect data on parental behavior. For example, observational data can allow for sequential analysis between parents’ behaviors and children’s reactions and the ability to measure a vast array of behaviors. Furthermore, the items in this study focused on the frequency of behaviors. Although this study was informative in several regards, it will be important for researchers to gather more nuanced indicators of both mothers’ and adolescents’ behaviors. For example, mothers can use a variety of strategies to teach skills and bolster children’s motivation during parent–child interactions (for examples, see LeFevre et al., 2009; Tenenbaum & Leaper, 2003). It will be critical to understand parent–child interactions during coactivity in order to document the specific mechanisms by which mothers influence children’s motivation. Variations in the emotional quality of these interactions should be key to understanding their influences on the ontogeny of the children’s beliefs and behavioral choices. The recent literature on children’s organized activities also suggests that it is not only important that children attend an activity but also that they are psychologically and emotionally engaged (Pearce & Larson, 2006).

Finally, this study focused on mothers as precursors of children’s beliefs and behaviors. Although our models include the core processes described in the family socialization component of the Eccles’ expectancy-value model, Eccles also theorized that many of these processes were reciprocal. Mothers’ beliefs are shaped by children’s abilities, performance, and behaviors. For example, parents will adjust their beliefs according to their children’s performance, preferences, and behaviors. Our models, while extensive, examine the processes from parent to child. They do not negate that mothers’ beliefs and behaviors were, in part, determined by children’s abilities and interests. However, prior research testing the cross-lagged relations between mothers’ and children’s beliefs using the CAB data provides support for our hypothesized model (Eccles, et al., 2000; Fredricks, 1999; Yoon, Wigfield, & Eccles, 1993). Mothers’ beliefs in the elementary school years were found to be highly stable, and the direction of influence was found to be stronger for mothers to children than vice versa. However, the strength of the reciprocal processes likely increases as the children mature and are allowed (or take) more autonomy in controlling their own behavioral choices. More studies are needed to chart these developmental pathways.

Conclusion

In sum, this study contributed to the literature by supporting the Eccles’ expectancy-value model in sports, music, math, and reading. One important conclusion of this article is that mothers may play a larger role in shaping youths’ motivation and behaviors in leisure pursuits than in academic pursuits. Furthermore, processes in certain fundamental subjects, such as reading, may function differently than in other academic subjects. Although the models were similar for boys and girls, there were persistent gender differences in people’s beliefs and behaviors.

Finally, this study suggests multiple intervention points where one can work with mothers to ultimately change their children’s beliefs and activity behaviors. For example, interventions should be directed at changing mothers’ child-specific beliefs (e.g., perceptions of children’s ability and the value of participating in different domains). Mothers also can play an important role in encouraging their children to pursue all four traditionally “gender-typed” domains regardless of their child’s gender. For example, interventions may be targeted at mothers of girls to help them to encourage their daughters to pursue math courses and math-related occupations and outline different ways mothers can provide opportunities in the home to support this involvement.

References


Appendix

Paths Including Family and Child Control Variables

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<th>Indicator</th>
<th>Sports</th>
<th>Music</th>
<th>Math</th>
<th>Reading</th>
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<td>Self-concept</td>
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<td>Note.</td>
<td>n/a = variable was not included in the model. *p &lt; .05. **p &lt; .01. ***p &lt; .001.</td>
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