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Parents' Influence on Children's Achievement-Related Perceptions

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Two aspects of the relation between parents' perceptions of their children and children's self- and task perceptions in math and English were investigated: (a) the mediating role of parents' perceptions between grades and adolescents' self-perceptions and (b) the gendered nature of parents' perceptions. Data for this study are part of a longitudinal investigation (the Michigan Study of Adolescent Life Transitions). Data from 914 sixth-grade adolescents and their parents are used in this article. Results showed that parents' perceptions mediate the relation between children's grades and children's self- and task perceptions in both domains. Parents' perceptions had a stronger influence on children's perceptions than children's own grades. Significant but low correlations between gender and self- and task perceptions were found in both math and English.

It is commonly recognized that expectations for one's success are important determinants of achievement-related behavioral choices such as course enrollment and career choice (Eccles [Parsons], 1983, 1984; Eccles [Parsons], Adler, & Meece, 1984; Parsons, Adler, & Kaczala, 1982; see also Bandura, 1981, 1982; Weiner, 1994). For both math and English, plans for future course enrollment are related to self-concept of ability in the subject and subject task value (Eccles, 1984). Because expectations play such an important role in determining these types of behavioral choices, it is important to identify the factors that influence their development. Eccles and her colleagues have proposed a theoretical model that specifies several such influences (see Eccles [Parsons], 1983, 1984). This model has two basic components: a psychological component and a socialization component. According to the psychological component, expectations for success are most directly influenced by individuals' ability self-concepts and individuals' estimates of the difficulty of the task. In support of these predictions, Eccles ([Parsons], 1984) found that both self-concept of math ability and perceived difficulty of math are related to math course enrollment plans primarily through their significant association with expectations for success in math. According to the socialization component, parents' perceptions of their children's ability are a major determinant of all three of these self- and task beliefs (ability self-concepts, perceived task difficulty, and expectations for success).[1] In support of this prediction, Parsons et al. (1982) found that children's self- and task concepts were more strongly directly related to their parents' perceptions of their math abilities than to their grades.

We tested hypotheses associated with both of these components of the Eccles ([Parsons], 1983) model. The specific hypotheses we tested are illustrated in Figure 1, which represents a subset of associations outlined in the full Eccles ([Parsons], 1983) model. First and foremost, we tested the hypothesized role of parents as critical mediators of the association of performance level to early adolescents' self-perceptions, perceived task difficulty, and expectations for success in math and English. In addition, we assessed the hypothesized predictive role of ability self-concepts and task difficulty beliefs for expectation of success. We tested these hypotheses with early adolescents in the domains of math and English.

We also examined the roles of gender and of parents' perceptions of their children's academic ability in influencing early adolescent self-perceptions. It is especially important to study the role of gender in mathematics, because women continue to be underrepresented in advanced studies in applied math and related fields (e.g., physical science and engineering) and in careers in applied math, engineering, and technology (Eccles, 1993a). What is the reason for this underrepresentation? Decisions that adolescents make about which courses to take and which careers to seek out play a critical role (Eccles [Parsons],

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[1] Although not tested in this article, the model also predicts that teachers will influence students' self- and task beliefs. For example, Parsons, Kaczala, and Meece (1982) found that teacher praise for boys conveys information about teacher expectations and is related to boys' self-concept of ability but that for girls teacher praise did not covary with their expectations and was not related to girls' self-concept of ability. Parsons et al. also found that girls had lower expectancies in classrooms in which they were treated in a different manner than boys, especially in classrooms where among the students for whom the teacher had high expectations the boys were praised and the girls were not.

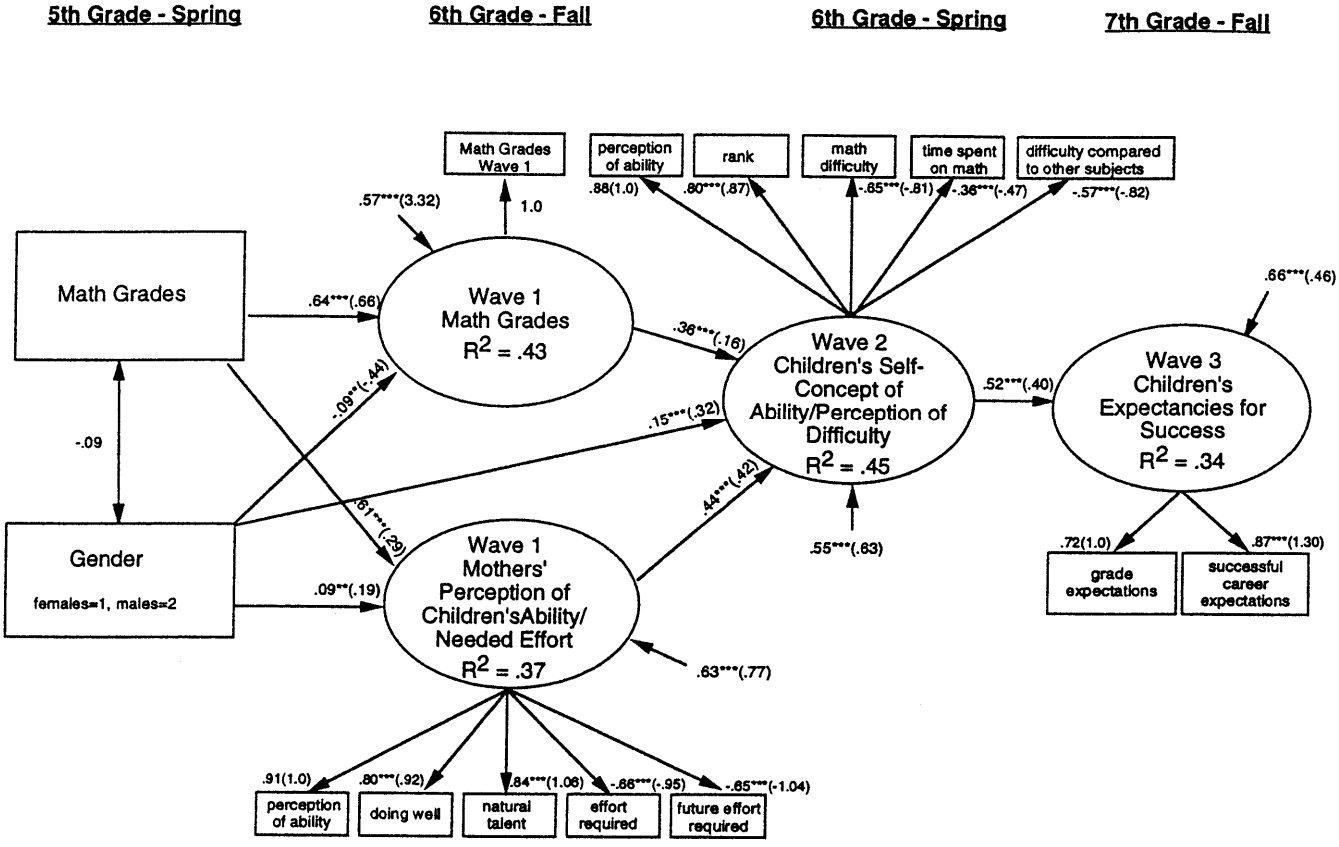

Figure 1. The standardized structural paths are represented here, with the unstandardized paths represented in parentheses. $^{**}p < .01$. $^{***}p < .001$. $\chi^2(81, N = 781) = 636.95$; goodness-of-fit index (GFI) = .91; normed fit index (NFI) = .89. (Because of the fact that no hypotheses were made regarding the direction of the relation between mother's perceptions and child's sixth-grade math grade, no path between them was included in the model; however, if these variables are allowed to correlate, the chi-square is reduced to 488.47, GFI = .92, and NFI = .92.)

1983, 1984; Meece, Eccles-Parsons, Kaczala, Goff, & Futterman, 1982). Eccles's expectancy-value model of achievement-related choices links these types of choices to the self- and task beliefs investigated in this article (Eccles [Parsons], 1983). Furthermore, Eccles [Parsons] et al. (1984) demonstrated that gender differences in these perceptions and expectations mediate the association of gender with enrollment in advanced high school math courses. Understanding the origins of gender differences in these self-perceptions may help us understand the course of female underrepresentation in the fields of math and physical science.

It is equally important to study the role of gender in English. Most existing work on gender differences in academics has focused on math and science, but the broader literature on gender differences in expectations suggests that the differences across subject areas should mirror the gender typing of the fields (Eccles [Parsons] et al., 1984; Eccles, Wigfield, Harold, & Blumenfeld, 1993; Licht, Stader, & Swenson, 1989; Marsh, Smith, & Barnes, 1985; Stevenson & Newman, 1986). Alternatively, it could be that male adolescents are simply more self-confident than their female peers across all school subjects. Therefore, it is important to replicate the previous work in math in a more female-stereotyped subject area such as English to determine whether the gender differences in self- and task perceptions are linked to the gender stereotyping of the area or whether males are more self-confident across many different subject areas.

Furthermore, some research has found differences in the way that beliefs are linked to achievement-related decisions based on the subject. Feather (1988) found that although both self-concept of math ability and the value of math predicted enrollment in a college of science rather than a college of social sciences or humanities (with ability being the stronger predictor), only the value of English predicted college enrollment. This difference is consistent with Eccles's (1984) finding of differences in perceptions of math and English; English was rated as easier than math, and students were more confident of their English ability than their math ability. Math is a subject in which performance, compared with English performance, is viewed as being influenced relatively more strongly by ability (Eccles, 1984). Stodolsky, Salk, and Glaessner (1991) found a similar difference in examples that children gave of times that they liked math and social studies. Examples regarding math

focused on times when math was easy for them, whereas examples regarding social studies focused on times when the topic was interesting. Thus, we also tested the hypothesized role of parents as critical mediators of the association of gender to early adolescents' self-perceptions, perceived task difficulty, and expectations for success in math and English.

Parents as Expectancy Socializers

Consistent with social constructivist perspectives, Eccles ([Parsons], 1983) hypothesized that individual differences in self- and task perceptions and in success expectations come not from reality itself but from children's interpretation of reality and that parents, through their role as expectancy socializers, are one of the major forces in shaping this interpretive process. Several studies have found support for this hypothesis (e.g., Entwisle & Baker, 1983; Klebanov & Brooks-Gunn, 1992). For example, both Parsons et al. (1982) and Jacobs (1991) found that parents' perceptions of their children's math abilities and of the difficulty of math fully mediated the association between performance-based feedback such as grades and test scores and children's own math-related self-perceptions and expectations. In fact, the children's math self-perceptions were more directly related to their parents' perceptions than to their own past performance or their gender (see also Eccles, 1993b; Eccles & Jacobs, 1986). In Parsons et al.'s (1982) study, the children's perceptions of the difficulty of math were also significantly related to their parents' estimations of their child's ability in math. Similarly, Phillips (1987) found that parents' achievement perceptions for their children were strongly associated with the children's self-perceptions of competence. Furthermore, Phillips and Zimmerman (1990) found that high achieving children who underestimated their overall academic competence and whose estimation of their overall academic competence dropped over time were viewed by their mothers as less capable relative to their more confident but equally performing peers. Finally, in Stevenson and Newman's (1986) study, mothers' rating of their daughters' cognitive abilities in 5th grade predicted their daughters' attitudes toward reading several years later, when the daughters were in 10th grade.

Parents as Gender-Role Socializers

Parents have also been found to contribute to the emergence of stereotypical gender differences in children's self- and task perceptions and expectations (Eccles, 1993b; Parsons et al., 1982). Research has shown that parents act as gender role socializers of children's self- and task perceptions in several achievement areas through their actions and communications (Eccles & Jacobs, 1986; Eccles, Jacobs, et al., 1993; Huston, 1983; Jacobs & Eccles, 1992). For example, research has shown that parents' perceptions of both the difficulty and the value of math for their child are affected by their child's gender even after controlling for performance differences. In turn, these gender-stereotyped perceptions and beliefs account for the gender differences that emerge in adolescents' self-perceptions and course enrollment plans (Eccles & Jacobs, 1986). Other studies also have shown that mothers' stereotypes and perceptions of their children's ability influence children's self-perceptions (Eccles, 1993b; Jacobs, 1991; Jacobs & Eccles, 1992).

In this study we tested the mediational role of parents in terms of both general individual differences and gender differences in self-perceptions, expectations, and task beliefs. We tested these hypotheses using more sophisticated data analytic techniques than have been used in previous studies by using structural equation modeling techniques to test the hypothesized relations among the variables. In addition, we directly tested the mediating role of parents' perceptions using the method suggested by Baron and Kenny (1986). Furthermore, we used longitudinal rather than cross-sectional data. A major problem with most previous work in this area is the reliance on data collected at a single point in time, making causal interpretation problematic. The longitudinal data in this study enabled a more sensitive test of our specific causal directional hypotheses. Finally, most previous work has not controlled for earlier achievement levels. The present study includes children's grades from two time periods. By including grades from both time periods in the structural equation models, we were able to control for children's concurrent achievement levels in testing the association of parents' perceptions in children's self- and task perceptions as well as test for the influence of children's prior achievement levels on parents' beliefs. Thus, the use of longitudinal data in conjunction with structural equation modeling provided for a sensitive test of our hypotheses.

Summary

The main hypothesis tested in this article is that parents act as expectancy socializers, influencing their children's self- and task perceptions through their perceptions of their child's ability and their perceptions of the effort that their child needs to make in order to do well. This general hypothesis can be broken down into four specific hypotheses. Analysis 1 examined the first two: (a) parents' perceptions of their children's ability and effort will predict children's self- and task perceptions in math and English, and parents' perceptions will have a stronger relation to these perceptions than will children's own grades, and (b) parents' perceptions will mediate the relationship between children's grades and children's self- and task perceptions. Analysis 2 examined the second two hypotheses: (c) parents' perceptions of the child's ability and effort will vary depending on the child's gender, and (d) parents' gendered perceptions will mediate the relation between children's gender and children's self- and task perceptions.

Method

Study Overview

The data presented in this article were collected as part of a larger longitudinal investigation (the Michigan Study of Adolescent Life Transitions—MSALT) that assesses the impact of change in the classroom and family environments on adolescents' perceptions, values, motives, and behaviors in several activity domains. Adolescents and parents completed the questionnaires three times during the years from which the current data were collected. The analyses reported herein include data collected from the parents in the fall of the children's sixth-grade year (Fall 1983) and data collected from the children in the spring of their

sixth-grade year (Spring 1984) and the fall of their seventh-grade year (Fall 1984).

Sample

Twelve school districts located in low- to middle-income communities were recruited for this project. The districts were located within a 50-mile radius of a large midwestern city. All elementary school teachers in those districts who taught mathematics to sixth grade elementary school adolescents were recruited: 95% of the teachers, representing 143 classrooms, agreed to participate. Only adolescents whose mother and father both completed a questionnaire were included in this report. Of the 2,723 adolescents who filled out questionnaires, 35% (941) had data for both their mothers and their fathers.[2] Forty-seven percent of the sample is female; 97% is European American, and 1.4% is African American.

Adolescents' Questionnaire

The adolescents' questionnaires, which measured many theoretical constructs across multiple-activity domains, were administered by field staff to adolescents during the period in which they normally received mathematics instruction. The questionnaires were administered over 2 consecutive days. The questionnaires contain items assessing a broad range of adolescents' perceptions, values, and attitudes concerning mathematics, English, physical skills, and social activities, as well as many other constructs. Many of these items have been used in previous studies by Eccles and her colleagues (e.g., Eccles [Parsons], 1983; Eccles [Parsons] et al., 1984), and so their psychometric properties (e.g., reliability, face validity, predictive validity, and construct validity) are well established (see Eccles [Parsons], 1983; Eccles [Parsons] et al., 1984; and Parsons et al., 1982; for full details).

The adolescent constructs in the present article include (a) adolescent self-concept of math and English ability (math α = .84, English α = .80), (b) adolescent perception of difficulty of math and English (math α = .68, English α = .65), and (c) adolescent expectancies for success in math and English (math α = .76, English α = .82). See the Appendix for the exact wording of the questions that make up each construct. Each of the items was assessed with a 7-point Likert scale anchored at the extremes.

Parents' Questionnaire

The parents' questionnaire was modeled after the one Parsons et al. (1982) used and was constructed to parallel the children's questionnaire as much as possible. In the permission letter given to the adolescents, parents were asked if they would be willing to participate in the study. Parents who agreed were sent questionnaires in the mail. Seven-point Likert scales were used to assess parents' attitudes and expectancies. See the Appendix for the exact wording of the questions that make up each construct. These scales have established reliability and validity (see Eccles [Parsons], 1983; Jacobs, 1991; Jacobs & Eccles, 1992).

The parent constructs in the present article include (a) perception of their child's math ability (mothers' α = .88, fathers' α = .88), (b) perceptions of the effort their child needed to exert to do well in math (mothers' α = .72, fathers' α = .63), (c) perception of their child's English ability (mothers' α = .88, fathers' α = .89), and (d) perceptions of the effort their child needed to exert to do well in English (mothers' α = .75, fathers' α = .69).

School Record Data

In addition to the questionnaires, some measures were taken directly from the children's school files. The grades used in these analyses were the average yearly math and English grades from the child's fifth- and sixth-grade years. Almost all schools used letter grades. For schools that reported quarter grades, grades from the four quarters were averaged to form the yearly grade. For schools that reported semester grades, grades from the two semesters were averaged to form the yearly grade. All grades were recorded to a single scale that ranged from 1 to 16, with 16 = A+, 15 = A, 14 = A−, and so on.

Results

Analysis 1

Correlation of Parents' Perceptions to Children's Self- and Task Perceptions Regarding Math and English

We computed correlations between parent and child perceptions to test whether parents' perceptions (from fall of sixth grade) were related to children's self- and task perceptions (from the spring of sixth grade and the fall of seventh grade). The zero-order correlations are summarized in Tables 1 and 2.

In math, the mothers' and fathers' perceptions were significantly and highly correlated with the children's perceptions (mothers' correlations ranged from .30 to .54, fathers' correlations ranged from .23 to .51; see Table 1). The children's perceptions were as highly correlated with their parents' perceptions as they were with their own grades (average correlation of children's perceptions to grades = .44, to mothers' perceptions = .43, and to fathers' perceptions = .38).

In English, the mothers' and fathers' perceptions were also significantly correlated with the children's perceptions (mothers' correlations ranged from .31 to .40, fathers' correlations ranged from .23 to .38; see Table 2). Again, the children's perceptions were as highly correlated to their parents' perceptions as to their own grades (average correlation of children's perceptions to grades = .34, to mothers' perceptions = .34, and to fathers' perceptions = .30). Correlations between mothers' and fathers' beliefs can be found in Table 3. The high correlation between mothers' and fathers' perceptions was expected because they reported on the same target (their child). The fact that their perceptions are highly correlated speaks to the validity of these measures.[3]

Mediation of the Effect of Math Grades on Children's Perceptions by Parents' Perceptions

Do parents' perceptions mediate the relation of children's grades to their self- and task perceptions? We tested partial and

[2] The typical reason given by parents for nonparticipation in the study was lack of time. As is typical of most studies that require participation of both parents, the subsample of students who participated in this study were more likely to come from intact families (2% from divorced families vs. 27% from divorced families in the overall sample), and the parents in the subsample were more likely to have more education than the parents in the overall sample. The students in the subsample had higher math and English grades, rated math and English as easier, and had a higher self-concept of math ability than did students in the overall sample. However, we have no reason to believe that these differences related to the relations tested in the study.

[3] The high correlation between teachers' perceptions and parents' perceptions of the same child also supports the validity of these measures (Jacobs & Eccles, 1992).

Table 1
Math: Zero-Order Correlations of Parent Perceptions, Child Perceptions, Child's Grades, and Child's Gender

Variable	Child's self-concept of math ability (6th grade, spring)	Child's perception of math difficulty (6th grade, spring)	Child's expectancies for success in math (7th grade, fall)	Child's grades in math (5th grade)	Child's grades in math (6th grade)	Child's gender
Mother's perception of child's math ability (6th grade, fall)						
Total	.54**	−.46**	.35**	.59**	.64**	−.01
Female	.48**	−.39**	.28**	.58**	.60**	
Male	.59**	−.52**	.42**	.61**	.68**	
Mother's perception of effort child needs to expend to do well in math (6th grade, fall)						
Total	−.49**	.43**	−.30**	−.46**	−.47**	−.08*
Female	−.43**	.37**	−.26**	−.43**	−.42**	
Male	−.54**	.48**	−.34**	−.50**	−.54**	
Father's perception of child's math ability (6th grade, fall)						
Total	.51**	−.45**	.32**	.57**	.65**	−.03
Female	.46**	−.40**	.23**	.55**	.61**	
Male	.56**	−.48**	.39**	.58**	.69**	
Father's perception of effort child needs to expend to do well in math (6th grade, fall)						
Total	−.39**	.35**	−.23**	−.43**	−.39**	−.05
Female	−.34**	.31**	−.18**	−.39**	−.37**	
Male	−.42**	.38**	−.28**	−.47**	−.43**	
Child's grades in math (5th grade)						
Total	.41**	−.37**	.33**	—	.65**	−.09*
Female	.36**	−.33**	.24**	—	.62**	
Male	.47**	−.42**	.42**	—	.66**	
Child's grade in math (6th grade)						
Total	.53**	−.43**	.37**	.65**	—	−.15**
Female	.47**	−.40**	.29**	.62**	—	
Male	.60**	−.47**	.46**	.66**	—	
Child's gender[a]	.07*	−.04	.06	−.09*	−.15**	—

Note. $N = 941$. Brackets indicate the males' and females' correlations that differ at $p < .05$.
[a] 1 = female; 2 = male.
* $p < .05$. ** $p < .01$.

complete mediation following the method suggested by Baron and Kenney (1986), in which mediation is said to have occurred if the addition of a variable into the model significantly reduces the relation between two other variables in the model. We computed three regression equations: (Equation 1) the dependent variable was regressed onto the independent variable, (Equation 2) the mediator was regressed onto the independent variable, and (Equation 3) the dependent variable was regressed onto the independent variable and the mediator. The following criteria were used to determine mediation. Partial mediation is inferred if the effect of the independent variable on the dependent variable from Equation 3 is significantly less than in Equation 1 but is still significant (more specifically, if the effect from Equation 3 falls outside the confidence interval of the effect from Equation 1; personal communication from Charles Judd to Jacquelynne Eccles, September 15, 1992). Complete mediation is inferred if the effect of the independent variable on the dependent variable is reduced to nonsignificance when the mediator is entered into the equation.

Math. Table 4 summarizes the results for the tests of mediation. Consistent support was found for the hypothesis that parents' perceptions mediate the relation between children's grades and their self- and task perceptions. Tests of mediation show that almost all of the relations between the children's grades and their self- and task perceptions regarding math were at least partially mediated by their parents' perceptions of them (see Table 4).

English. Support was also found for the hypothesis that parents' perceptions mediate the relation between children's grades and their self- and task perceptions. Two thirds of the relations between the children's grades and their perceptions regarding English were also at least partially mediated by their parents' perceptions of them (see Table 4).

Structural Equation Modeling

In an attempt to both replicate the findings of Parsons et al. (1982) and confirm Eccles's expectancy-value model, we tested the hypothesized relationships between the variables using the LISREL VIII program (Jöreskog & Sörbom, 1993). LISREL

Table 2
English: Zero-Order Correlations of Parent Perceptions, Child Perceptions, Child's Grades, and Child's Gender

Variable	Child's self-concept of English ability (6th grade, spring)	Child's perception of English difficulty (6th grade, spring)	Child's expectancies for success in English (7th grade, fall)	Child's grades in English (5th grade)	Child's grades in English (6th grade)	Child's gender
Mother's perception of child's English ability (6th grade, fall)						
Total	.40	−.33	.35	.58	.61	−.25
Female	.39	−.31	.31	.52	.56	
Male	.39	−.32	.34	.58	.61	
Mother's perception of effort child needs to expend to do well in English (6th grade, fall)						
Total	−.35	.31	−.31	−.43	−.41	.15
Female	−.32	.28	−.28	−.35	−.35	
Male	−.35	.32	−.30	−.46	−.42	
Father's perception of child's English ability (6th grade, fall)						
Total	.38	−.32	.38	.58	.62	−.20
Female	.31	−.27	.33	.53	.59	
Male	.41	−.33	.39	.59	.61	
Father's perception of effort child needs to expend to do well in English (6th grade, fall)						
Total	−.28	.22	−.23	−.31	−.31	.13
Female	−.23	.22	−.19	−.26	−.24	
Male	−.30	.22	−.25	−.32	−.33	
Child's grades in English (5th grade)						
Total	.33	−.27	.33	—	.73	
Female	.28	−.25	.21	—	.70	
Male	.33	−.26	.39	—	.72	
Child's grades in English (6th grade)						
Total	.38	−.29	.35	.73	—	−.25
Female	.31	−.28	.21	.70	—	
Male	.39	−.27	.41	.72	—	
Child's gender[a]	−.14	.13	−.15	−.22	−.25	—

Note. $N = 941$. Brackets indicate the males' and females' correlations that differ at $p < .05$. All correlations are significant at $p < .01$.
[a] 1 = female; 2 = male.

provides two major component models: (a) a structural equation model that allows researchers to assess the fit of the data to specific causal predictions and (b) a measurement model that allows researchers to address measurement error issues (Biddle & Marlin, 1987). Specifically, the structural equation model component of LISREL allows for the test of conceptual connections among a set of latent factors (Alwin, 1988). The measurement model of LISREL allows investigators to test predicted relations of manifest variables with latent constructs (thus allowing the test for the reliability of the measures).

Because of the high correlation of the mothers' perception of their children's ability and the mothers' perception of the effort needed by their children to do well, we combined these variables into one latent variable: mothers' perception of children's ability/needed effort.[4] We also made this change in the fathers' models. Similarly, we combined the children's self-concept of ability and the children's perception of task difficulty into one latent variable: children's self-concept of ability/perception of difficulty. Thus, the final models included children's average grade in the subject from their fifth-grade year, children's gender, children's average grade in the subject from their sixth-grade year, mothers' (fathers') perception of child's ability/effort needed to do well in the subject from the first semester of sixth grade, children's self-concept of ability in the subject/perception of task difficulty from the second semester of sixth grade, and children's expectancies for success in the subject from the first semester of seventh grade. Although there has been some question of whether one's grades predict one's self-concept of ability or vice versa, some research has shown that grade point average predicts changes in self-concept of ability, and this is the causal order used in our models (Calsyn & Kenny, 1977).[5]

[4] An adequate goodness of fit could not be obtained in the structural equation models without combining these two constructs. This change fits with Eccles's expectancy-value model because the model hypothesizes that many different beliefs held by the socializer regarding both the child's abilities and the child's activities influence the child's beliefs. The only difference between this model and a model that separates the constructs is that this model gives a less detailed picture of how the different parent beliefs may differentially influence the child's beliefs.

[5] On the other hand, Marsh (1990) found that self-concept predicts grades. However, there seems to be a developmental phenomenon oc-

Table 3
Zero-Order Correlations of Mother's Beliefs and Father's Beliefs

Variable	Father's perception of child's math ability	Father's perception of effort child needs to expend to do well in math	Father's perception of child's English ability	Father's perception of effort child needs to expend to do well in English
Mother's perception of child's math ability	.80	−.54	.43	−.15
Mother's perception of effort child needs to expend to do well in math	−.61	.56	−.26	.14
Mother's perception of child's English ability	.42	−.26	.77	−.47
Mother's perception of effort child needs to expend to do well in English	−.26	.26	.−.57	.51

Note. All correlations are significant at $p < .001$.

There is a variety of goodness-of-fit indices used in LISREL to assess how well a given model fits the data. We report two commonly accepted indices: Jöreskog and Sörbom's (1989) goodness of fit index (GFI), for which a score greater than .9 suggests a very good fit, and Bentler and Bonett's (1980) normed fit index (NFI) for which a score greater than .9 suggests a very good fit (see also Loehlin, 1987; Marsh, Balla & McDonald, 1988).

Math. The fits of the LISREL models to the data (GFI = .91 and NFI = .89 for both math models) support the hypothesis that parents' perceptions predict children's self-concept of ability/perception of task difficulty (see Figures 1 and 2). Mothers', but not fathers', perceptions of their children predicted the children's self-concept of ability/perceptions of task difficulty more strongly than the children's grades (from the fall of sixth grade). The standardized direct effect of mothers' (fathers') perceptions on children's self-concept of ability/perceptions of task difficulty was .44 (.34), whereas the direct effect of the children's grades on these perceptions was .36 (.39). The indirect effect of grades (from the spring of fifth grade) on children's self-concept of ability/perceptions of task difficulty was .50 (.45). This effect goes through parents' perceptions and sixth-grade grades (and very slightly through gender). Parents' perceptions of their children did not directly affect their children's expectancies for success but rather affected them indirectly through their effect on the children's ability/task difficulty perceptions; indirect effect was .23 (.19).

English. The fits of the LISREL models to the data (GFI = .91 and NFI = .89 for both English models) support the hypothesis that parents' perceptions predict children's self-concept of ability/perception of task difficulty (see Figures 3 and 4). Parents' perceptions of their children predicted the children's self-concept of ability/perception of task difficulty more strongly than the children's grades (from the fall of sixth grade) did. The standardized direct effect of mothers' (fathers') perceptions on their children's self-concept of ability/perception of task difficulty was .38 (.31), whereas the standardized direct effect of the children's grades on these perceptions was .21 (.24). The indirect effect of grades (from the spring of fifth grade) on children's self-concept of ability/perception of task difficulty was .37 (.36). Parents' perception of their children both directly (.23 [.28]) and indirectly (.19 [.13]) affected their children's expectancies for success, but these effects were not as strong as the direct effect of the children's other self-concept of ability/perception of task difficulty.

Summary

These results support the hypotheses that (a) parents' perceptions are more strongly related to children's self- and task perceptions than are children's grades (in math for mothers only) and (b) parents' perceptions partially mediate the relation between children's grades and their self- and task perceptions. Thus, it seems that parents' perceptions do influence children's interpretation of how their grades represent their ability.

Analysis 2

Analysis 2 examined the relation between gender differences in children's actual ability and perceptions of children's ability by both the children and their parents. We hypothesized that (a) parents' perceptions of the child's ability and effort would vary

curring here. Marsh's sample was made up of students in their last years of high school. It has been found (Yoon, Wigfield, & Eccles, 1993) that children's perceptions of their math ability become more stable as they get older, thus the fact that grades do not predict self-concept of ability in older students may be due to the fact that their self-perceptions have stabilized at that point.

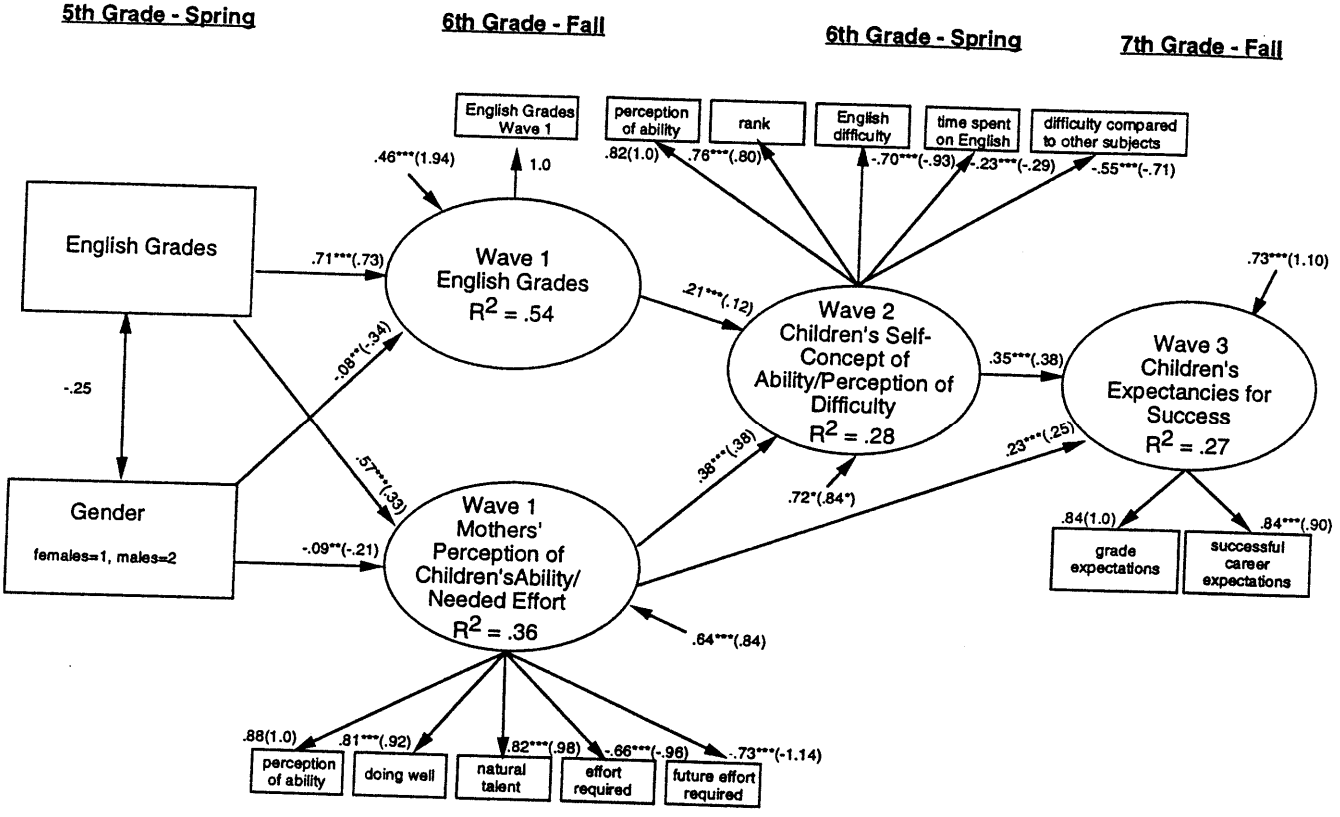

Figure 3. The standardized structural paths are represented here, with the unstandardized paths represented in parentheses. $*p < .05$. $**p < .01$. $***p < .001$. $\chi^2(81, N = 746) = 562.97$; goodness-of-fit index (GFI) = .91; normed fit index (NFI) = .89. (Because of the fact that no hypotheses were made regarding the direction of the relation between mother's perceptions and child's sixth-grade English grade, no path between them was included in the model; however, if these variables are allowed to correlate, the chi-square is reduced to 486.74, GFI = .92, and NFI = .91.)

value of the amount that they underestimated girls' ability). There were no significant differences in the residuals of fathers of daughters versus fathers of sons. Fathers were fairly relatively accurate in estimating their children's math ability.

The presence of a difference in over/underestimation between mothers of girls and mothers of boys and the lack of a difference between fathers of daughters and fathers of sons is also evident in the structural equation models (see Figures 1 and 2). When controlling for grades, for mothers there is a significant path between child's gender and mothers' perceptions of child's ability/needed effort; in contrast, for fathers there is not a significant path between these two variables.

Mothers of daughters also thought that their children needed to exert more effort to do well in math than did mothers of sons, $F(1, 939) = 6.33$, $p = .01$, $\eta^2 = .01$ (see Table 7). This difference could explain why mothers rated girls' abilities equal to boys' abilities despite girls' superior math performance. Mothers might think that their daughters' superior grades in math are due more to hard work than to innate ability. Support for this idea can be found in the path from gender of child to mothers' perception of children's needed ability/effort. Yee and Eccles (1988), using parents' causal attributions for their children's success in math, also found support for this hypothesis: Mothers of girls gave effort a higher importance rating and talent a lower importance rating than did mothers of boys.

English. As with math, if parents' perceptions and expectancies contribute to gender differences in children's perceptions regarding English, they must also show some differentiation based on children's gender (see Table 7). Compared to parents of sons, parents of daughters rated their children as having higher ability in English and needing less effort to do well in English. These perceptions are congruent with the fact that girls received higher grades in English than did boys. Thus, unlike in the math domain, parents' perceptions about children's English abilities seem to correspond to the children's actual grades. We explored this possibility by examining the residuals from the regression of the mothers' perception of their children's ability in English on the children's English grades. There was a significant, but small, difference in the residuals of mothers of daughters versus mothers of sons, showing that mothers of daughters slightly overestimated their children's English ability, whereas mothers of sons slightly underestimated their children's English ability (see Table 6). However, both mothers of girls and mothers of boys were equal in their relative accuracy of their estimates of their children's English ability (the absolute value of the amount that mothers overestimated girls' ability was equal

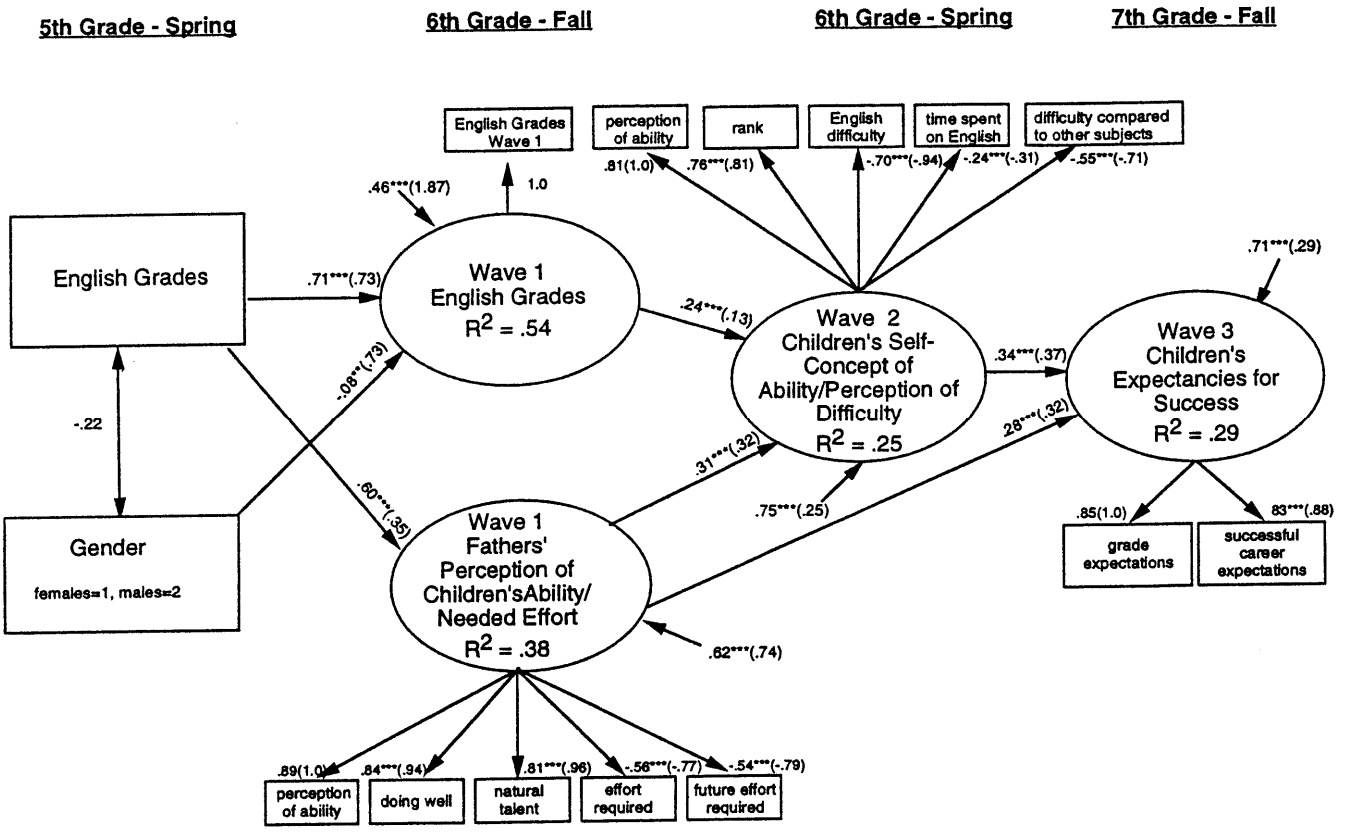

Figure 4. The standardized structural paths are represented here, with the unstandardized paths represented in parentheses. $*p < .05$. $**p < .01$. $***p < .001$. $\chi^2(81, N = 748) = 530.62$; goodness-of-fit index (GFI) = .91; normed fit index (NFI) = .89. (Because of the fact that no hypotheses were made regarding the direction of the relation between father's perceptions and child's sixth-grade English grade, no path between them was included in the model; however, if these variables are allowed to correlate, the chi-square is reduced to 450.11, GFI = .92, and NFI = .91.)

to the absolute value of the amount that they underestimated boys' ability). There were no significant differences in the residuals of fathers of daughters versus fathers of sons. Fathers were fairly accurate in estimating their children's English ability. So, it seems that mothers' perceptions in English were influenced by something in addition to actual grades; in contrast, fathers' perceptions seemed to be influenced by grades only.

The presence of a difference in over/underestimation between mothers of girls and mothers of boys and the lack of a difference between fathers of daughters and fathers of sons is also evident in the structural equation models (see Figures 3 & 4). When controlling for grades, for mothers there is a significant path between child's gender and mothers' perceptions of child's ability/needed effort; however, for fathers' there is not a significant path between these two variables.

Mediation by Parent Perceptions of the Effect of Gender on Child Self-Perceptions

Math. Parents' perceptions did not mediate the effect of gender on the child's self- and task perceptions (see Table 8). The low correlation ($r = .07$, $p < .05$) between gender and self-concept of ability in math could indicate that at this stage in the child's development, gender differentiation of self-concept of ability in math is just beginning (Eccles, 1984; Eccles & Bryan, 1994; Hill & Lynch, 1983). In support of this idea, neither the children's perception of the difficulty of math nor the children's expectancies for success in math were significantly correlated with the children's gender.

The LISREL models confirm the findings from the mediation test. In both the mother and father models, there was no significant indirect effect of gender on children's self-concept of ability/perception of task difficulty (mother model, standardized indirect effect = .01, $t = 0.29$; father model, standardized indirect effect = $-.02$, $t = -1.23$). Thus, it seems that at this age gender is not influencing children's beliefs indirectly through its influence on parents' beliefs.

English. The mediation tests that used regression suggest that there was partial mediation of the effect of gender on children's beliefs by parents' beliefs (see Table 8). Thus, there is support for the hypothesis that the gender difference in children's perceptions in English is due in part to the fact that parents hold gender-differentiated perceptions in this area. However, the low correlation of gender with children's self-concept

Table 5
Mean Ratings of Children's Self- and Task Perceptions

Variable	Girls		Boys			
	M	*SD*	*M*	*SD*	*F*	*dfs*
Self-concept of ability in math (spring, 6th grade)	5.13	1.09	5.29	1.18	4.47*	1, 926
Perception of math difficulty (spring, 6th grade)	3.31	1.10	3.21	1.14	1.67	1, 922
Expectancies for success in math (fall, 7th grade)	5.53	1.10	5.66	1.08	3.29†	1, 868
Self-concept of ability in English (spring, 6th grade)	5.27	1.11	4.95	1.26	17.03***	1, 917
Perception of English difficulty (spring, 6th grade)	3.31	1.11	3.60	1.14	14.83***	1, 905
Expectancies for success in English (fall, 7th grade)	5.46	1.22	5.08	1.31	19.19***	1, 863

† $p < .10$ (marginally significant). * $p \leq .05$. *** $p \leq .001$.

of ability ($r = -.14$, $p < .01$) and with children's perception of task difficulty ($r = .13$, $p < .01$) suggest that, as in math, at this stage in the child's development gender differentiation of self-concept of ability in English is just beginning (Eccles, 1984; Eccles & Bryan, 1994; Hill & Lynch, 1983). Thus, the effect that is being mediated is a small one.

In both the mothers' and fathers' LISREL models, there were significant indirect effects of gender on children's perceptions (for mother model, standardized indirect effects = $-.05$, $t = -3.49$, $p < .01$; for father model, standardized indirect effects = $-.03$, $t = -2.44$, $p < .05$).

Discussion

There were four main goals of this study: (a) to examine whether parents' perceptions of their children's ability and effort predict children's self- and task perceptions in math and English and whether parents' perceptions have a stronger relation to children's self- and task perceptions than children's own grades, (b) to examine whether parents' perceptions mediate the relation between children's grades and children's self- and task perceptions, (c) to examine whether parents' perceptions of children's ability and effort vary depending on the child's gender, and (d) to examine whether parents' gendered perceptions mediate the relation between children's gender and children's self- and task perceptions.

Table 6
Residuals Representing Children's and Parents' Underestimation and Overestimation of Ability

Residual	Girls		Boys			
	M	*SD*	*M*	*SD*	*F*	*dfs*
Regression of children's self-concept of ability on their grades						
Math	−.15	.99	.13	.99	15.88***	1, 822
English	.05	.95	−.05	1.04	2.00	1, 818
Regression of mothers' perceptions of children's ability on their grades						
Math	−.08	.97	.07	1.02	4.56*	1, 827
English	.13	.96	−.11	1.02	12.35***	1, 830
Regression of fathers' perceptions of children's ability on their grades						
Math	−.04	.99	.04	1.01	1.44	1, 827
English	.06	.95	−.05	1.04	2.39	1, 827

Note. Self-concept of ability is from the spring of 6th grade. Grades are from the spring of 5th grade.
* $p \leq .05$. *** $p \leq .001$.

Relation Between Parents' and Children's Perceptions and the Mediating Role of Parents' Perceptions

Support was found for the hypothesis that parents' perceptions of their children's ability and effort predict children's self- and task perceptions in math and English and that parents' perceptions have a stronger relation to children's self- and task perceptions than children's own grades. Results from this study confirm similar previous findings that children's self-perceptions in math relate significantly to their parents' perceptions about them (Eccles, 1993b; Eccles & Jacobs, 1986; Jacobs, 1991; Jacobs & Eccles, 1992; Parsons et al., 1982; Phillips, 1987). In fact, for both math and English, the mothers' perceptions of their children's ability and effort, and for English, the fathers' perceptions of their children's ability and effort, were stronger predictors of the children's self- and task perceptions than were the children's past performance. In addition, parents' perceptions partially mediated the link between grades and children's self- and task perceptions for both math and English.

These findings support Eccles's ([Parsons], 1983) hypotheses that parents act as expectancy socializers for their children and that children's self-perceptions reflect children's and parents' interpretation of reality in addition to reality itself. First of all, these findings support the idea that parents have a strong influence on how children interpret reality (Entwisle & Baker, 1983; Klebanov & Brooks-Gunn, 1992; Parsons et al., 1982). Second, the current evidence is quite consistent with the prediction that parents' perceptions influence children's self-concepts

Table 7
Mean Ratings of Parents' Perceptions of Their Children's Ability and Children's Effort Needed to Do Well

	Mothers						Fathers					
	Daughters		Sons				Daughters		Sons			
Variable	*M*	*SD*	*M*	*SD*	*F*	*dfs*	*M*	*SD*	*M*	*SD*	*F*	*dfs*
Perception of child's math ability	5.38	1.13	5.35	1.25	0.19	1, 939	5.33	1.07	5.27	1.13	0.67	1, 939
Perception of effort needed to do well in math	4.00	1.41	3.75	1.54	6.33**	1, 939	4.22	1.23	4.10	1.29	2.16	1, 939
Perception of child's English ability	5.54	1.09	4.95	1.25	60.53***	1, 939	5.46	1.03	5.02	1.20	37.02***	1, 936
Perception of effort needed to do well in English	3.67	1.53	4.13	1.50	21.57***	1, 939	3.92	1.34	4.26	1.33	14.73***	1, 936

Note. $N = 941$. All variables are from the fall of 6th grade.
** $p \leq .01$. *** $p \leq .001$.

of ability and perceptions of task difficulty. One way that parents may contribute to the differences in math and English expectancies is through the messages they provide to their children regarding their perceptions about their children's ability and effort. Parents can communicate these messages through the causal attributions that they make concerning their children's performance or by encouraging or discouraging particular activities (Eccles, 1993b).

Results also confirmed Eccles's (Parsons, 1983) expectancy-value model wherein children's self-concept of ability and perceptions of task difficulty mediate the relation of grades to expectancies for success. This model posits that it is not reality itself (e.g., grades) that determines children's expectancies for success, but rather their interpretation of that reality (Eccles [Parsons], 1983). Thus, grades would not directly determine expectancies of success but rather would influence future expectations through their influence on students' inferences regarding their abilities and the difficulty of certain tasks for them.

Development and Perceived Gender Differences in Academics

Before discussing the final two hypotheses, it is important to discuss development and its relation to perceived gender differences in academic ability and effort. In this study there were only small differences between boys and girls and self- and task perceptions in math and English. The relation between gender and self- and task perceptions in these academic areas may just be emerging. We expect that as the children move into and through adolescence, these differences will become larger. Eccles (1984) found that gender differences in perceptions of ability and task difficulty in math and English increased between early and mid-adolescence.

Researchers have suggested that early adolescence is a time when gender role stereotypes and expectations are likely to become more influential (Eccles & Bryan, 1994; Hill & Lynch, 1983; Wigfield, Eccles, & Pintrich, 1996). Hill and Lynch (1983) labeled this phenomenon *gender-role intensification.* In support of this hypothesis, Hill and Lynch noted that stronger gender differences can be found in adolescence than in childhood for several academic achievement-related constructs. Similarly, in a model of gender role development, Parsons and Bryan (1978) proposed that early adolescence (ages 12–14) is a transition phase that is characterized by a rigidification of gender role stereotypes and an increase in the pressure to conform to these stereotypes (see also Eccles & Bryan, 1994). Pressures toward gender role intensification are likely to come from parents and teachers. For example, parents may encourage less independence and more femininity in their daughters when they reach adolescence as a means of protection and preparation for adult roles (Hill & Lynch, 1983). This pressure can also come from peers, particularly because in adolescence one's self-esteem may become more reliant on acceptance by the opposite sex (Eccles & Bryan, 1994). Because there is a link between social acceptance and gender roles, young adolescents, particularly those who value acceptance by the opposite sex, may feel pressured to engage in increasingly gender stereotyped behavior. This role of peers has yet to be tested.

Specific to achievement, these models suggest that early adolescents will apply gender-appropriate standards for achievement to themselves more stringently than they did during middle childhood. Because high school math tends to be thought of as a stereotypically male domain, and English tends to be thought of as a stereotypically female domain (Meece et al., 1982), gender role intensification theory suggests that the two genders should begin to diverge at this age in both self-perceptions and actual achievement in these two subjects. Furthermore, if gender

Table 8
Tests of Mother's and Father's Beliefs as Mediators of the Relation Between Child's Gender and Child's Beliefs

Predictors and mediators	Child beliefs: Step 1 B	Step 1 CI	Step 2 B	Step 1 B	Step 1 CI	Step 2 B	Step 1 B	Step 1 CI	Step 2 B
	Self-concept of math ability			Perception of difficulty to math			Expectancies for success in math		
Child's sex (IV)	.16*	.10 to .31	.18**	−.10	−.23 to .05	−.12	.13	−.01 to .28	.15*
Mother's perception of ability (MV)			.54***			−.43***			.33***
Child's sex (IV)	.16*	.01 to .31	.06	−.10	−.23 to .05	−.02	.13	−.01 to .28	.08
Mother's perception of effort (MV)			−.38**			.32***			−.22***
Child's sex (IV)	.16*	.01 to .31	.19**	−.10	−.24 to .05	−.13*	.13	−.01 to .28	.11
Father's perception of ability (MV)			.56***			−.45***			−.20***
Child's sex (IV)	.16*	.01 to .31	.12	−.10	−.24 to .05	−.07	.13	.01 to .28	.15*
Father's perception of effort (MV)			−.35***			.31***			.32***
	Self-concept of English ability			Perception of difficulty of English			Expectancies for success in English		
Child's sex (IV)	**−.32*** **	**−.48 to −.17**	**−.09**	**.29*** **	**.14 to .44**	**.11**	−.38***	−.55 to −.21	−.27***
Mother's perception of ability (MV)			**.39*** **			**−.30*** **			−.24***
Child's sex (IV)	−.32***	−.48 to −.17	−.20**	.29***	.14 to .44	.19**	**−.38*** **	**−.55 to −.21**	**−.17***
Mother's perception of effort (MV)			−.26***			.22***			**.35*** **
Child's sex (IV)	**−.32*** **	**−.48 to −.17**	**−.15***	.28***	.14 to .43	.16**	**−.38*** **	**−.55 to −.21**	**−.20****
Father's perception of ability (MV)			**.39*** **			−.31***			**.41*** **
Child's sex (IV)	−.32***	−.48 to −.17	−.25***	.28***	.14 to .43	.23**	−.38***	−.55 to −.21	−.31***
Father's perception of effort (MV)			−.24***			.19***			−.21***

Note. Values in the chart are unstandardized regression coefficients. Significant mediated relations are indicated with bold type. Parent's perceptions of ability and effort are from the fall of 6th grade. Child's self-concepts of ability and perceptions of difficulty are from the spring of 6th grade; child's expectancies for success are from the fall of 7th grade. The first step in each column is the regression of the child belief on the independent variable (IV). The second step in each column is the regression of the child belief on the IV and the mediating variable (MV). CI = confidence interval; B = unstandardized path coefficient.
* $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$.

role intensification is reflected in adults' changing of their expectations for boys and girls at this age, gender role intensification theory predicts that adults should begin to have more gender-differentiated expectations for their children at this age despite their child's performance history during the middle childhood years. For example, gender bias has been found to influence teachers' perceptions of sixth grade math students' levels of talent and effort (Jussim & Eccles, 1992). Because the students in our sample were in the sixth and seventh grades, we are likely to be seeing just the beginning of these influences. In fact, Eccles (1984), with another sample and using similar measures, found that the gender differences in self-perception of both math and English were much larger among students in Grades 9–12 than among those in Grades 6–8.

Influence of Child's Gender on Parents' Perceptions

Consistent with the gender intensification hypothesis, despite the fact that parents and children were fairly accurate in estimating children's ability in math and English, there were significant and gender-stereotypic differences in the direction of the distortion in their perceptions. Both groups had already begun to over/underestimate children's ability in a manner consistent with gender stereotypes regarding ability.

In addition, in the mothers' math structural equation model (see Figures 1 and 2), there is a significant path between child's gender and mothers' perceptions of child's ability/needed effort. The finding (that mothers of daughters thought that their children needed to exert more effort to do well in math than did mothers of sons) provides one explanation both for the lack of gender-of-child differences in mothers' ratings of girls' math ability despite girls' superior math performance and the over- versus underestimation effects.

In contrast, we found no such effect in the fathers' data. In fact, we found little evidence of gender-role-stereotypic views in the fathers' data in general. This lack of gender-role-stereotypic effects for the fathers is consistent with other studies. For example, Yee and Eccles (1988) found that mothers, but not fathers, made stereotypical causal attributions for their daughters' and sons' successes in math. Also, Jacobs and Eccles (1985) found that mothers responded to media reports that reinforced the gender stereotype regarding math by shifting to an even more gender-stereotyped viewpoint of their children's math ability; in

contrast, fathers responded to these reports by becoming more egalitarian in their perceptions of their sons and daughters (see also Jacobs, 1991).

Examination of the mothers' and fathers' residuals (see Table 6) is also consistent with this line of argument. Recall that fathers' estimations of their children's math ability corresponded more closely to their children's math grades than did the mothers' estimations. This finding suggests that fathers rely less on gender stereotypes and more on grades in estimating their child's math ability than mothers do. Perhaps mothers have incorporated the stereotypical idea into their own self-concepts that girls' achievements in math are due to hard work rather than to natural ability. If so, when making attributions about their daughters, they may generalize this belief to their perceptions of their daughters. Fathers, on the other hand, would not have incorporated the belief that their own successes in math are due to effort rather than to natural ability and thus might not be as likely to apply this explanation to their daughters (Yee & Eccles, 1988). Consistent with this suggestion, all the analyses in this article support the idea that mothers incorporate gender stereotypes into their ability and effort perceptions of their children. In contrast, almost none of the findings for fathers reflect the possible influence of gender stereotypes on their perceptions. These findings are interesting in light of the hypothesis that fathers are an important influence in the development of women who are successful in stereotypically masculine fields (Putnam & Hansen, 1972). The present results, along with those of Jacobs and Eccles (1985), suggest that mothers are more influential than fathers in the degree to which girls develop gender-stereotypic views of their academic abilities. However, the fathers in this study seem to be key to girls having a realistic view of their academic abilities. So the results of the present study are consistent with the findings regarding fathers' influence on girls who end up in stereotypically masculine fields. It is the mothers who engender underestimations of perceptions of math ability, whereas the fathers support realistic estimates. This support of realistic estimates of ability is critical for girls considering male-typed occupations.

Nonetheless, fathers, like mothers, did not rate daughters' math ability higher than sons' math ability, despite the fact that the daughters earned higher grades. Apparently, gender roles are affecting the fathers' ratings of their children's math ability but not by means of the mechanism evaluated in this study.

It is interesting to note that both children and parents held more gender-differentiated perceptions for English than for math. However, it is important to remember that, if grades are interpreted accurately, parents and children should hold gender-differentiated perceptions favoring girls in both math and English. Thus, the presence of gender-differentiated beliefs in English could represent an accurate interpretation of English grades, because this view matches actual gender differences in English grades. However, the residuals show that mothers tended to overestimate girls' English ability and underestimate boys' English ability to an even greater extent than they distorted their view of their children's math ability and, just as was true for math, these mothers had gender-stereotypic views of the amount of effort their children were exerting in English. It should be noted that stereotypes regarding English emerge earlier in elementary school than do those regarding math (Stein & Smithells, 1969). This difference could explain the subject effect.

Mediation of the Relations Between Children's Gender and Their Self- and Task Perceptions by Parents' Perceptions

In the case of math, parents' perceptions did not mediate the relation between children's gender and their self- and task perceptions, but gender was directly related to both children's and parents' perceptions (for the parents this was evident only for mothers in the LISREL model, but it was evident for both mothers and fathers in the ANOVA). Thus, although gender is having an influence on children's perceptions of their math ability, this influence is not, at this age, due to the influence that parents have on their children's perceptions. Because both mothers and children underestimate girls' math ability and overestimate boys' math ability, it is likely that a third variable, such as societal gender stereotypes regarding ability, distorts the perceptions of both mothers and children. For example, one way that mothers may receive knowledge included in gender stereotypes regarding math ability is through the media (Jacobs & Eccles, 1985). Jacobs and Eccles (1985) found that exposure to news reports that proclaimed that males have higher natural math ability than females was linked to mothers' stereotypic perceptions of their daughters' math ability.

In contrast, for English the finding did support the hypothesized mediating role of parents' perceptions in explaining the association between gender and children's self-perceptions. This mediation was evident in the LISREL model in the significant indirect effect of gender on children's self-concept of ability/perception of task difficulty.

Regarding the difference between math and English, children distort their perceptions of their math ability in the direction of gender-role stereotypes to a much greater extent than they distort their perceptions of their English ability. Thus, it seems possible that stereotypes about math are strong enough to flip the direction of children's perception of their ability measured according to gender, whereas stereotypes about English have only a small influence on children's perceptions of their ability measured according to gender (the actual effects of stereotypes were not included in this study). Regarding math, Spencer, Steele & Quinn (1997) found that when participants were led to expect gender differences favoring men on an advanced math exam, women underperformed men on the exam. However, when participants were led to expect no gender differences in performance, women and men performed equally.

These findings are surprising in light of previous findings that gender stereotypes for English are stronger than those for math, although reading was seen as a predominantly feminine area and arithmetic was seen as a predominantly masculine area (Stein & Smithells, 1969). However, these differences might be due to age. For example, research has shown that parents of early elementary school aged children hold gender-stereotypic beliefs for English, but not for math, whereas parents of sixth graders hold gender stereotypic beliefs in math and English (Eccles, Wigfield, et al., 1993).

In summary, the results of this study demonstrate the consequences of parents' influence on the development of their chil-

dren's academic self-concepts. This influence likely extends beyond academic self-concepts, because these self-concepts in turn influence later important educational–occupational choices (Eccles [Parsons], 1983). Future research should investigate the possibility that as children get older, their parents' views of their abilities and efforts will be increasingly influenced by gender-role stereotypes, which in turn should lead the adolescents to view themselves increasingly in a gender-role–stereotyped manner.

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Appendix

Child and Parent Constructs

Child Math Constructs

Self-Concept of Ability

- How good at math are you? (1) *not at all good,* (7) *very good*
- If you were to rank all the students in your math class from the worst to the best in math, where would you put yourself? (1) *the worst,* (7) *the best*
- Compared to most of your other school subjects, how good are you at math? (1) *much worse,* (7) *much better*

Expectancies for Success in Math

- How well do you think you will do in math this year? (1) *not at all well,* (7) *very well*
- How successful do you think you'd be in a career that required mathematical ability? (1) *not very successful,* (7) *very successful*

Math Task Difficulty

- In general, how hard is math for you? (1) *very easy,* (7) *very hard*
- Compared to other students your age, how much time do you have to spend working on your math assignments? (1) *much less time,* (7) *much more time*
- Compared to most other school subjects you have taken or are taking, how hard is math for you? (1) *my easiest course,* (7) *my hardest course*

Child English Constructs

Self-Concept of Ability in English

- How good at English are you? (1) *not at all good,* (7) *very good*
- If you were to rank all the students in your English class from the worst to the best in English, where would you put yourself? (1) *the worst,* (7) *the best*

Expectancies for Success in English

- How well do you think you will do in English this year? (1) *not at all well,* (7) *very well*
- How successful do you think you'd be in a career that required English ability? (1) *not very successful,* (7) *very successful*

English Task Difficulty

- In general, how hard is English for you? (1) *very easy,* (7) *very hard*
- Compared to other students your age, how much time do you have to spend working on your English assignments? (1) *much less time,* (7) *much more time*
- Compared to most other school subjects you have taken or are taking, how hard is math for you? (1) *my easiest course,* (7) *my hardest course*

Parent Math Constructs

Ability

- In general, I believe that my child is (1) *not at all good,* (7) *very good in math*
- How well is your child doing in math this year? (1) *not at all well,* (7) *very well*
- How much natural talent does your child have in math? (1) *a little,* (7) *a lot*

Effort

- My child finds math (1) *very easy,* (7) *very hard*
- To do well in math, my child has to try (1) *a little,* (7) *a lot*
- How much will your child have to try in order to do well in future math courses? (1) *a little,* (7) *a lot*

Current Expectancies

- How well is your child doing in math this year? (1) *not at all well,* (7) *very well*
- What grade in math do you expect your child to get this term?

Parent English Constructs

Ability

- In general, I believe that my child is (1) *not at all good,* (7) *very good in English*
- How well is your child doing in English this year? (1) *not at all well,* (7) *very well*
- How much natural talent does your child have in English? (1) *a little,* (7) *a lot*

Effort

- My child finds English (1) *very easy,* (7) *very hard*
- To do well in English, my child has to try (1) *a little,* (7) *a lot*

Current Expectancies

- How well is your child doing in English this year? (1) *not at all well,* (7) *very well*
- What grade in English do you expect your child to get this term?

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