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Age and Gender Differences in Children's Self- and Task Perceptions during Elementary School

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ECCLES, JACQUELYNNE; WIGFIELD, ALLAN; HAROLD, RENA D.; and BLUMENFELD, PHYLLIS. *Age and Gender Differences in Children's Self- and Task Perceptions during Elementary School.* CHILD DEVELOPMENT, 1993, **64**, 830–847. We examined the development of children's self- and task perceptions during the elementary school years. 865 first-, second,- and fourth-grade children (ages 7–10) completed questionnaires assessing their perceptions of competence in, and valuing of, activities in several activity domains (math, reading, sports, and instrumental music). Factor analyses showed that even the first graders had differentiated self-beliefs for the various activities. These analyses also indicated that children's competence beliefs and subjective task values formed distinct factors. Analyses assessing age and gender differences in children's beliefs showed that for all the activities except sports, younger children's (particularly the first graders) perceptions of competence and subjective task values were more positive than the beliefs of the older children. Boys had more positive competence beliefs and values than did girls for sport activities, and more positive competence beliefs for mathematics. Girls had more positive competence beliefs and values than did boys for reading and music activities.

Why do children with similar backgrounds choose different activities and have such different goals for themselves? Why do children with fairly similar grades in school, or fairly similar performance histories in other activity domains, have different opinions of their abilities? Finally, why do some children have high self-esteem despite limited abilities, while other children have low self-esteem despite a wealth of abilities? Questions such as these lie at the heart of self-schema and motivational theories. Eccles and her colleagues have proposed a model to study these types of questions (Eccles, 1984a, 1984b; Eccles et al., 1983). We are in the midst of a longitudinal study of elementary school age children and their families and schools designed to address these questions. Such a project has many components. But before addressing the more complex questions of interest, one has to create scales to measure the key constructs and do basic descriptive work with these scales.

The studies presented in this paper represent this first fundamental step on what we expect to be a long journey. In Study 1, we describe the development and validation of our measures of children's beliefs or perceptions of their own competencies, and the

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value they attach to competence, in three major childhood activity domains (school work [math and reading], sports, and instrumental music). In Study 2, basic descriptive differences in children's self- and task-related perceptions about these domains are presented. We begin with our theoretical perspective on the issues assessed.

Theories of Ability-related Self-Perceptions and Subjective Task Value, and Their Links to Behavioral Choice

Different views of achievement motivation, such as attribution theory, expectancy-value theory, self-efficacy theory, and self-worth theory propose that individuals' ability-related self-perceptions motivate their achievement behavior (e.g., Bandura, 1986, 1989; Covington, 1984; Crandall, 1969; Eccles et al., 1983; Feather, 1982, 1988; Nicholls, 1984; Schunk, 1984; Weiner, 1979). These theorists believe that individuals' interpretations of their achievement outcomes influence achievement behavior, persistence, and choice of achievement activities more than do individuals' objective performance histories. Researchers interested in understanding children's self- and task perceptions have begun to determine what the key ability-related self-perceptions are, how they relate to achievement behavior, and how they change over time. Children's beliefs about their own abilities or competence have received considerable research attention (see Blumenfeld, Pintrich, Meece, & Wessels, 1982; Covington, 1984; Dweck & Elliott, 1983; Eccles, Midgley, & Adler, 1984; Harter, 1982; Nicholls, 1984; and Stipek & Mac Iver, 1989 for detailed discussion of this work).

Other theorists, while acknowledging the central role of competence perceptions, have argued that children's subjective task values are also important predictors of children's activity choices (e.g., Eccles, 1984a, 1984b; Eccles et al., 1983, 1989; Eccles, Adler, & Meece, 1984; Eccles & Harold, 1991; Feather, 1982, 1988; Wigfield & Eccles, 1992). In their expectancy-value model of achievement-related activity choices, Eccles et al. (1983) defined four components of task value: (1) interest in, or enjoyment of, the activity (similar to what others refer to as intrinsic motivation), (2) perceived importance of being good at the activity or involved in the activity, (3) perceived usefulness of the activity for short- and long-range goals (similar to what others refer to as extrinsic motivation), and (4) the cost of engaging in any particular activity. Eccles and Wigfield (1991) showed that individuals do distinguish between these different components of task value by the time they are in the fifth grade. Eccles (1984a, 1984b), Eccles, Adler, and Meece (1984), and Meece, Wigfield, and Eccles (1990) all document that the value adolescents attach to various school subjects influences their course enrollment decisions (see also Feather, 1982, 1988). Additionally, gender differences in adolescents' valuing of both math and sports have been shown to mediate the gender difference in enrollment in advanced math courses and participation in sport activities (Eccles, Adler, & Meece, 1984; Eccles & Harold, 1991). Thus, subjective task values are important predictors of activity choice during the adolescent and adult years.

Relatively little work has been done documenting the nature of either of these belief systems among younger children. Harter and her colleagues and Marsh and his colleagues have demonstrated that one can measure competence beliefs during the elementary years (e.g., Harter, 1982; Harter & Pike, 1984; Marsh, Barnes, Cairns, & Tidman, 1984; Marsh, Craven, & Debus, 1991), but they have not explicitly linked these beliefs to children's activity choice. No one has developed measures of subjective task value for elementary school age children despite their apparent importance in activity choice, and despite suggestions by several psychologists that subjective task value may be a critical linking construct between competence beliefs and self-esteem (Eccles et al., 1983; Harter, 1990; James, 1890/1963).

The major theoretical purpose of the longitudinal project from which these studies are drawn is to extend the Eccles et al. (1983) expectancy-value framework to the elementary school years. In Study 1, we assessed whether elementary school children have clearly defined, and measurable, beliefs about their competence and subjective task values in a variety of activity domains. This was accomplished by examining the factor structure underlying children's competence beliefs and task values across activity domains and three age groups, and determining the internal consistency reliability of scales emerging from the factor analytic work. In Study 2, we examined whether the mean level of children's beliefs differ over the early elementary school years, and across the two sexes, to provide important descriptive information on these beliefs as well as helping determine the predictive validity of the scales.

Study 1: Developmental Changes in the Structure of Children's Competence Perceptions and Subjective Task Value Beliefs

One critical issue in work on children's self-perceptions and task value beliefs is how and when these beliefs and perceptions become distinct across the school years: When do children distinguish among different activity domains in their beliefs and perceptions, and among different components of their beliefs and perceptions, such as competence perceptions and subjective task values? In her discussion of the development of self-concept, Harter (1983) proposed that children's ability self-concepts are rather global initially, and gradually become more differentiated as they accumulate more experiences with various activities. Most research addressing this proposal has focused on the degree of differentiation in children's competence perceptions across age and activity domains. Earlier studies indicated that the competence self-perceptions of preschoolers and young elementary school children are rather global (Harter & Pike, 1984). In contrast, children in second grade and beyond clearly have a differentiated view of their competence across various activity domains (Harter, 1982; Marsh et al., 1984; Marsh & Hocevar, 1985). More recently, Marsh et al. (1991) showed that even kindergarten children have clearly differentiated competence self-concepts in different domains. No one has yet determined how the structure of children's subjective task values may differ during the elementary school years, a task undertaken in this study.

We also assessed whether children would make more subtle distinctions both within and between beliefs about competence and subjective task values. For example, would they distinguish between their ratings of their own ability and their expectations for success in a given domain? The few available studies suggest that early in elementary school children might not make these types of distinctions. Even less work has been done on young children's tendency to make distinctions between competence self-perceptions and subjective task value ratings. In one such study, Marsh et al. (1984) reported that items assessing ability beliefs and liking load on the same factor among elementary school aged children. But Marsh et al. (1984) used single-item indicators of liking, and thus their failure to show differentiation between these concepts may have resulted from their limited measurement of task value. Eccles et al. (1983) and Eccles and Wigfield (1991) have found consistent factorial evidence that upper elementary school aged children distinguish between competence and task value constructs within specific activity domains. Furthermore, Eccles and Wigfield (1991) have also demonstrated that three of the theoretical components of task values suggested by Eccles et al. (1983) (interest, importance, and usefulness) are differentiated by grade 5. To date, however, no study has looked at the developmental differentiation during the elementary school years of the full array of competence and task value beliefs proposed by Eccles and her colleagues, despite the theoretical and methodological importance of this task. This first study does this task. In addition, the reliability of a set of scales designed to look at these constructs across the activity domains of interest and for each of the three age groups is examined.

Method

Participants

The present study is part of a 4-year longitudinal project (the Michigan Childhood Development Study) investigating the early development and socialization of children's self- and task perceptions and activity choices. The data presented in this report come from the second year of data collection, which was the first year children completed questionnaires assessing their self- and task perceptions; 865 first-, second-, and fourth-grade children attending 10 elementary schools in four semi-urban school districts in southeastern Michigan participated. There were 284 first graders (142 girls and 142 boys), 320 second graders (169 girls and 151 boys), and 261 fourth graders (134 girls and 127 boys). The children are from families with lower-middle-class to middle-class backgrounds; over 95% are white (the remaining 5% are a mixture of African-American, Asian-American, and other ethnic and racial groups). Children, parents, and teachers were recruited through their school districts. Seventy-five percent of children solicited agreed to participate (i.e., agreed to participate and obtained parental permission to participate).

Measures

In the spring of 1988, the children completed questionnaires tapping their beliefs about academic subjects, instrumental music, and sports, as well as other constructs. Within each of these activity domains, children answered questions about specific ac-

tivities. In the academic area, children were asked about mathematics and reading, the music questions concentrated on instrumental music, and the sports questions focused on sports in general, and both tumbling and throwing and catching a ball, in particular, in order to include both a male and female sex-typed sport activity. These activity domains were chosen because they are common to most children's experience, because they all involve skill acquisition and activity choice, and because several of them have been included in earlier work with older children (e.g., Eccles et al., 1989; Wigfield, Eccles, Mac Iver, Reuman, & Midgley, 1991). Similar domains have been used by other researchers interested in similar issues (e.g., Harter, 1982, 1985, 1990; Marsh, 1989). Since we are particularly interested in predicting children's choice among various skill-related activities that are likely to be available in middle childhood, we selected domains likely to be available as choices for a reasonable number of our subjects. In addition, since we are also interested in gender-role socialization, we picked domains likely to be differentially selected by males and females.

In this report we focus on children's beliefs about their own competence in, and the value of, activities in each domain. There is currently much discussion in the literature about the best way to conceptualize beliefs about competence. Dweck and Elliott (1983), for example, have pointed out the need to distinguish whether the child is thinking about ability as a stable or an incremental characteristic. We have purposely left the terms vague in our questionnaire and asked about different aspects of competence without stressing either the stable or incremental interpretations of the word "good." One critical issue is whether one believes one can get better in the future. To capture this concept, we asked children how good they would be at learning new material in each domain. Thus, across the set of ability-related items in each domain we tap several constructs underlying various views of the term "good." Specifically, we have included items tapping children's perceptions of how good they are at each activity, their expectancies for success in each activity, how hard they think each activity is for them, and their sense of efficacy about learning new things in each domain. We use the term "competence belief" to refer to this set of beliefs, though it should be understood that our usage of this term is a broad one.

The items assessing children's subjective task values tapped the children's ratings of how interesting/fun each activity is, how important being good at the activity is to the child, and how useful the child thinks the activity is. The items were modified from earlier questionnaire items developed by Eccles and her colleagues to assess early adolescents' beliefs about mathematics, English, sports, and social activities. These items have excellent psychometric properties (see Eccles, 1984a, 1984b; Eccles, Adler, & Meece, 1984; Eccles et al., 1983; 1989; Parsons, Adler, & Kaczala, 1982). For this study, similar questions were developed to assess children's perceptions about instrumental music. However, due to time limitations, especially for the first and second graders, we used fewer indicators of each construct in the music domain. The items from each domain are presented in Table 1; since most of the items assessing beliefs about math, reading, and sports are identical, we only present the ones for math, along with the items assessing throwing ability and tumbling ability.

Because the children in the current study are younger than children in our previous studies, great care was taken to ensure that the children understood the constructs being assessed. The questions were piloted on 100 children in first and second grade in order to refine them for use with younger children. The 1–7 Likert-style answer scales (see Table 1) were illustrated with stars, bars, or other graphic representations of increasing quantity so that children would understand how to use them. For instance, when vertical bars were used, the smallest bar was put at one end point and bars of increasing size were placed over each of the other six numerical indicators. The end point and midpoint of each scale were also labeled with a verbal descriptor of the meaning of that scale point (e.g., the number 1 would be labeled with the words "not at all good," the number 4 would be labeled with the word "ok," and the number 7 would be labeled with the words "very good"). All questions were read aloud to the children, and they were carefully monitored as they filled in their answers.

Results

Exploratory Factor Analysis of Children's Self- and Task Perceptions

Children's responses to the questions were factor analyzed in order to assess the comparability of the dimensionality of their

TABLE 1

ITEMS USED IN THE FACTOR ANALYSES

	Math, Reading, and Sports Domain
MA.ABIL.1	How good in math are you? (not at all good, very good)
MA.ABIL.2	If you were to list all the students in your class from the worst to the best in math, where would you put yourself? (one of the worst, one of the best)
MA.ABIL.3	Some kinds are better in one subject than in another. For example, you might be better in math than in reading. Compared to most of your other school subjects, how good are you in math? (a lot worse in math than in other subjects, a lot better in math than in other subjects)
AM.EXPEC	How well do you expect to do in math this year? (not at all well, very well)
MA.NEW	How good would you be at learning something new in math? (not at all good, very good)
MA.DIF	In general, how hard is math for you? (not at all hard, very hard)
MA.USE	Some things that you learn in school help you do things better outside of class, that is, they are useful. For example, learning about plants might help you grow a garden. In general, how useful is what you learn in math? (not at all useful, very useful)
MA.IMP	For me, being good in math is (not at all important, very important)
MA.LIKE.1	In general, I find working on math assignments (very boring, very interesting [fun])
MA.LIKE.2	How much do you like doing math? (not at all, very much)
THRO.ABIL	How good are you at throwing and catching a ball? (not at all good, very good)
TUMB.ABIL	How good are you at tumbling or gymnastics? (not at all good, very good)
	Music Domain
MU.ABIL.1	How good are you at music? (not at all good, very good)
MU.ABIL.2	Compared to most of your other activities, how good would you be at playing a musical instrument? (a lot worse, a lot better)
MU.NEW	How good would you be at learning to play a new musical instrument? (not at all good, very good)
MU.DIF	In general, how hard would it be for you to learn to play a musical instrument? (not at all hard, very hard)
MU.IMP	For me, being good at playing a musical instrument is (not at all important, very important)
MU.LIKE.1	In general, I find playing a musical instrument (very boring, very interesting [fun])
MU.LIKE.2	How much do you like playing a musical instrument? (not at all, very much)

NOTE.—All items were answered on 1–7 scales, and the anchors are shown in parentheses. For the math, reading, and sports domains, all items were identical; the math items are used for illustrative purposes.

self- and task perceptions across grade levels and to create scales for further analyses. Two kinds of exploratory factor analyses (EFA) were done: First, to determine whether children's beliefs about the different domains formed separate factors, all the items assessing children's various beliefs across all the activity domains were included in a single analysis. Second, the sets of items assessing children's beliefs within each domain were analyzed separately in order to determine the dimensionality of children's beliefs within each activity area. We performed both kinds of analyses for the sample as a whole and separately for each of the grades. We used Cattell's (1966) scree test, which is based on the eigenvalues of the factors, to determine the number of factors that best describe the data. We then selected all items with factor loadings greater than .40 as the defining items for each factor. Since both the orthogonal and oblique solutions yielded comparable solutions in terms of the number of factors and the defining items for each factor, we present the orthogonal solution.

Across-Domain Exploratory Factor Analyses

In general, the factor structure of children's beliefs across activity domains is quite similar across the grades, particularly in terms of the number of factors, but also in terms of specific items defining each of the factors. For the whole sample and at each grade, the scree test indicated that the five-factor solution best described the data. In each of the analyses, children's beliefs about each domain (math, reading, music, and sports) form separate factors, indicating that these children (even the first graders) clearly distinguish the different activity domains. The fifth factor contains items tapping children's valuing of the two academic domains, math and reading. Thus at all grade levels

the children appear to distinguish some of the task value items from the competence belief items in the math and reading domains. Interestingly, children's valuing of these two domains loads on this single factor, while their beliefs about their own competence in each domain clearly load on two separate domain-specific factors. Within each domain, children's beliefs about their ability, their expectancies for their own success, and their perceptions of how good they would be at learning new material all load on the same factor. More details and specific factor solutions along with factor loadings can be obtained from the first author.

Within-Domain Exploratory Factor Analyses

The analyses done separately within each of the domains again show similarity across grade levels, both in terms of the number of factors and the items characterizing each factor. For both math and reading, the scree test indicated that the two-factor solution best described the data. In these domains, one of the two factors contains items assessing the children's competence perceptions: ratings of how good they are at the activity, how well they expect to do, how difficult the task is, and how good they would be at learning new material. The other factor in each domain contains the subjective task value items: how much they enjoy doing the task and how interesting it is, how important being good at the task is to them, and how useful they think doing this task is.

For the music domain, a one-factor solution containing both the values and the competence items emerged, though for the first graders beliefs about music appear to be differentiated into a competence cluster and a subjective task value cluster. In the sport domain, beliefs differentiate into two factors, though the competence and values items are somewhat less clearly distinguished in these analyses.

Confirmatory Factor Analyses

We used confirmatory factor analyses (CFA) to test whether models specifying that there are two factors (competence perceptions, subjective task values) in each domain best fit the data, and also, more explicitly, to test whether there are age differences in the factor structure of children's beliefs. CFA is a more powerful technique than EFA because it allows the researcher to test more precisely theoretically derived hypotheses about the structure of a set of variables (see Jöreskog & Sörbom, 1984; Long, 1983; for more thorough discussion). It also allows the researcher to compare the fit of the same model across various groups. Since comparing the factor structure of children's self- and task perceptions across grade levels is a central goal of this paper, this is an ideal technique to use.

There are a variety of goodness-of-fit indices used in CFA to assess how well a given model fits the data; unfortunately, there still is no one generally accepted index (see Marsh, Balla, & McDonald, 1988). We report four of the most commonly accepted: (1) chi-square; (2) chi-square divided by degrees of freedom, for which a score of 2.0 suggests a very good fit (Carmines & McIver, 1981); (3) Jöreskog and Sörbom's (1984) goodness-of-fit (GFI) index, for which a score greater than .9 suggests a very good fit; and (4) the Tucker-Lewis (1973) index (TLI), for which a score greater than .9 suggests a very good fit. (The TLI evaluates model fit by testing a theoretically derived model against a "null" model that postulates no relations in the observed variables [see Bentler & Bonett, 1980; Marsh et al., 1988]. Bentler and Bonett's Normed Fit Index is often used for this purpose; however, Marsh et al. [1988] have shown that this index is strongly influenced by sample size and recommend using the TLI for this kind of model comparison. Thus we used the TLI in our comparisons.)

Model testing.—For each domain (match, reading, music, and sports) the following three models were specified: (1) a null model that specified no relations among the observed measures; this model is used as a comparison to the target models (see Bentler & Bonett, 1980; Marsh et al., 1988); (2) a one-factor model in which the factor loading matrix contained all the items assessing competence perceptions and subjective task value beliefs loading on one factor; and (3) a two-factor model in which the factor loading matrix consisted of the competence perception items loading on one factor and the subjective task value belief items loading on a second factor.

The different goodness-of-fit indices for the one- and two-factor models are presented in Table 2. As can be seen in the table, the indices show that in general the one-factor models do not fit the data very well. The chi-square values are large, and very few of the GFIs exceed .90. In contrast, the two-factor models fit the data quite well.

Most of the chi-square to degrees of freedom ratios are around 2.0, and all of the GFIs and nearly all of the TLIs exceed .90, which indicates good model fit. In terms of the fit within the different domains, for the first and second graders the two-factor models for math and reading fit very well, whereas for the second graders the model for sports fits somewhat less well. For the fourth graders, the math model fits better than any of the other domains, though each of these other models fits reasonably well.

Age differences in factor structure.—Jöreskog and Sörbom (1984) and Marsh and Hocevar (1985) have discussed how group comparisons can be done using CFA. These comparative tests can be ordered from least to most restrictive, with the least restrictive test comparing whether the factor patterns are the same across groups, that is, whether the same number of factors emerge in each group. We specified that there should be two factors for each domain at each grade level. Next is a comparison of whether the actual factor loadings are invariant across the groups. The most restrictive test is whether the covariance matrices are invariant across groups. Each of these tests was performed by comparing pairs of groups to one another: First graders versus second graders, first graders versus fourth graders, and second versus fourth graders. As with tests of individual models, different fit statistics can be used to evaluate each of the tests. For these tests, we report the chi-square test and Jöreskog and Sörbom's GFI. Because the null model is not used in group comparisons, TLIs were not computed.

The various fit indices for the grade-by-grade comparisons in the different domains are presented in Table 3. Looking at the table, it appears that there is invariance of the factor patterns and the factor loadings across the groups. The chi-square values themselves are all significant; however, Marsh and Hocevar (1985) have discussed how significant chi-squares often do not mean poor fit of the model. Chi-square divided by their degrees of freedom for these tests produces values also indicating quite reasonable fit across groups. All the GFI values except one exceed .90.

The covariance matrices of the first and fourth graders in the math, reading, and

TABLE 2

GOODNESS-OF-FIT INDICES FOR THE ONE- AND TWO-FACTOR MODELS

	ONE FACTOR				TWO FACTOR			
DOMAIN	Chi-Sq	Chi-Sq/ *df*	GFI[a]	TLI[b]	Chi-Sq	Chi-Sq/ *df*	GFI	TLI
Math:								
First	157.07	4.49	.89	.62	73.31	2.16	.95	.87
Second	182.35	5.21	.88	.70	43.49	1.28	.97	.98
Fourth	205.26	5.86	.84	.75	73.45	2.16	.94	.94
Reading:								
First	123.48	3.53	.90	.68	36.40	1.07	.97	.99
Second	241.63	6.90	.84	.69	61.82	1.82	.96	.96
Fourth	273.37	7.82	.79	.73	121.05	3.56	.91	.90
Music:								
First	181.49	12.96	.86	.44	15.13	1.16	.98	.99
Second	132.60	9.47	.86	.78	21.10	1.64	.98	.98
Fourth	104.53	7.47	.88	.83	51.69	3.94	.94	.93
Sports:								
First	110.01	3.14	.91	.87	71.42	2.10	.94	.93
Second	247.06	7.06	.86	.76	131.54	3.87	.92	.89
Fourth	210.06	6.00	.86	.82	123.17	3.62	.90	.90

NOTE.—For math, reading, and sports, *df* = 35 for the one-factor models, 34 for the two-factor models. For music, *df* = 14 for the one-factor models, 13 for the two-factor models. The null models all had 45 *df*, except for music, 21 *df*. For math, chi-square values for the null models are: first grade, 446.35; second grade, 678.52; fourth grade, 93.59. For reading: first grade, 401.19; second grade, 888.72; fourth grade, 1175.75. For music, first grade, 467.80; second grade, 838.40; fourth grade, 808.75. For sports: first grade, 799.68; second grade, 1180.45; fourth grade, 1275.68.

[a] GFI = Jöreskog and Sörbom's goodness-of-fit index.

[b] TLI = Tucker-Lewis Index.

sports domains do not appear to be invariant. The GFI values are relatively low for these tests, and the chi-square values are large, particularly in comparison to those of the factor pattern and loading tests. It appears, however, that in all domains the matrices for the first and second graders are invariant, since those fit indices are better. Overall, these analyses provide strong support for the similarity of the factor structure across age groups, further indicating quite clearly that first graders have differentiated achievement self-perceptions, and that the structure of children's self-perceptions and task value beliefs does not differ very much across the early and middle elementary school years. The factor loadings for the two-factor model in each domain are presented in Table 4.

Scale Creation

Based on the results of the factor analyses, comparable scales for the three different grade levels were created. The scales are unit weighted and are the average of the items to which children responded. Table 5 presents the internal consistency reliabilities for these scales. The competence perception scales for all domains include the items tapping children's beliefs about their own ability, expectancies for success, and efficacy to learn new things in the domain. As can be seen in the table, these scales have high internal consistency reliabilities in each domain and at each grade level.

The subjective task value scale for each domain except music includes the items tapping perceived usefulness, perceived importance, intrinsic interest, and liking. For the music domain, the scale includes only the importance and interest items, since the item assessing perceived usefulness was not asked in this domain. Although the reliabilities for these scales are not always as high as those of the competence scales, they are acceptable, especially given the limited number of items.

Discussion

The results of this study support the view that children's activity-related self- and task perceptions are differentiated, even in first grade. Results also indicate that these beliefs can be measured reliably at all the grade levels assessed. These findings corroborate those of Harter (1982), Harter and Pike (1984), Marsh et al. (1984), and Marsh et al. (1991), who have shown that children's competence perceptions in different domains are clearly differentiated as early as kindergarten. We have extended this work on competence perceptions by showing how children's perceptions are differentiated

TABLE 3

Chi-Square and Goodness-of-Fit Indices for the Age Group Comparison Tests

	Pattern Invariance		Loading Invariance		Covariance Invariance	
Domain	Chi-Sq	GFI[a]	Chi-Sq	GFI	Chi-Sq	GFI
Math:						
1st vs. 2d	116.80	.97	131.30	.97	140.69	.95
1st vs. 4th	147.76	.94	154.45	.94	353.14	.76
2d vs. 4th	116.95	.94	129.75	.94	170.60	.90
Reading:						
1st vs. 2d	98.27	.96	101.93	.96	114.02	.96
1st vs. 4th	157.45	.91	161.83	.91	325.04	.82
2d vs. 4th	1182.93	.91	187.49	.91	165.63	.91
Music:						
1st vs. 2d	36.23	.98	46.06	.98	45.74	.98
1st vs. 4th	66.82	.94	76.91	.94	89.29	.94
2d vs. 4th	72.80	.94	75.43	.94	71.35	.95
Sports:						
1st vs. 2d	202.96	.92	220.60	.91	172.38	.94
1st vs. 4th	194.59	.90	217.81	.90	462.98	.72
2d vs. 4th	254.71	.90	271.15	.89	214.15	.88

Note.—For math, reading, sports, *df* for the covariance invariance tests are 55, for the pattern invariance tests 68, and the loading invariance tests 76. For music, *df* for the covariance invariance tests are 28, for the pattern invariance tests 26, and the loading invariance tests 31.

[a] GFI = Jöreskog and Sörbom's goodness-of-fit index.

TABLE 4

FACTOR LOADINGS FOR THE TWO-FACTOR MODELS IN EACH DOMAIN

	MATH		READING		SPORT		MUSIC	
	1	2	1	2	1	2	1	2
ABIL.1	.77		.83		.87		.65	
ABIL.2	.72		.79		.78		.75	
ABIL.3	.51		.62		.77			
EXPEC	.69		.71		.55			
NEW	.52		.51		.61		.69	
DIFF	−.61		−.58		−.59		−.65	
USE		.23		.28		.43		
IMP		.36		.41		.51		.65
LIKE.1		.73		.73		.74		.84
LIKE.2		.79		.81		.75		.85

NOTE.—Standardized loadings from the analysis of the whole sample are presented. Missing factor loadings in the music domain resulted from the fact that fewer items were included for this domain on the questionnaires.

across an activity domain not previously studied (instrumental music), as well as across the mathematics, reading, and sports domains that have been studied by others. These findings have important implications for models of self-concept that argue that children's self-concepts are relatively undifferentiated early on and gradually become more differentiated (see Harter, 1983). Our results, and those of Marsh et al. (1991), suggest that this differentiation occurs quite early, even before children have had a lot of experience with the different activities in or out of school. In addition, our results indicate that within the school academic domain, children's math and reading ability self-concepts and subjective task value beliefs are differentiated from another by the end of the first grade.

Another major finding of this study is that children clearly distinguish between competence perceptions for different activities and their valuing of these same activities. In fact, this differentiation occurs earlier than we had anticipated; even the first graders in our sample distinguish between these two sets of beliefs. This distinction has not been examined in previous factor analytic work on children's activity-related self-perceptions and subjective task values. The fact that children do distinguish between items assessing competence perceptions and items assessing valuing of various activities (especially in math and reading) provides partial support for expectancy-value models of achievement behavior. These models assume the following: (1) expectancy-related beliefs (which are closely tied to compe-

TABLE 5

RELIABILITIES FOR THE SCALES ASSESSING CHILDREN'S BELIEFS ABOUT THE DIFFERENT ACTIVITIES

Scale	Whole Sample	First	Second	Fourth
Competence Beliefs:				
Math	.78	.71	.78	.82
Reading	.82	.73	.82	.76
Music	.73	.67	.76	.72
Sports	.78	.78	.78	.81
Subjective Task Values:				
Math	.61	.55	.62	.70
Reading	.65	.53	.69	.74
Music	.82	.76	.83	.86
Sports	.70	.65	.70	.77

tence perceptions) and subjective task values are differentiated constructs, and (2) these beliefs independently influence individuals' choice of activities and individuals' behavior in various activity settings (see Eccles, 1984a, 1984b; Eccles et al., 1983; Wigfield & Eccles, 1992). Our results clearly support the assumed differentiation of these two sets of beliefs even among children in the first grade.

Although elementary school aged children distinguish between competence perceptions and task values, we found no further differentiation within each of these constructs. Children's competence perceptions include items tapping their ratings of their ability, their expectations for success, their rating of task difficulty, and their rating of their own ability to learn new activities within the domain. These results are similar to those reported by Eccles et al. (1983) for adolescents. These findings have implications for views of achievement motivation that make fairly clear distinctions between perceptions of ability and expectancies for success (e.g., Weiner, 1979). Our results suggest that children do not make such fine distinctions for "real-world" achievement activities.

For the most part, the children's beliefs about an activity's value also load on a single factor. These results suggest, in contrast to findings with older children (Eccles & Wigfield, 1991), that young children do not make the distinctions among the different components of subjective task value hypothesized by Eccles et al. (1983). Thus, results from this study suggest that young children do not differentiate these subcomponents in their everyday ratings of task value. It is possible, however, that evidence of greater differentiation would emerge if more items were used to assess each of the subcomponent beliefs. Based on our other studies, we expect this differentiation to begin to emerge as the children move into grades 5 and 6.

Although the factor structures for the three grade levels are very similar, some differences did emerge. The covariance invariance tests indicated that the first and fourth graders' beliefs are organized somewhat differently. However, the simple hypothesis that younger children's beliefs would be less differentiated than those of older children is not confirmed by our findings. In fact, the factor structure was similar enough that identical scales measuring competence perceptions and subjective task values were created at each grade level. We explore descriptive differences in those scales in the next study.

Study 2: Grade and Gender Differences in the Mean Level of Children's Beliefs

Many researchers have been interested in developmental changes in children's self-perceptions. With a few exceptions (e.g., Harter, 1982), studies show that children's competence perceptions decrease as children get older, at least across the elementary school years (see Eccles, Midgley, & Adler, 1984, and Stipek & Mac Iver, 1989, for reviews). For instance, Nicholls (1979) found that 6- and 8-year-old children ranked their reading ability relative to others in their class as very high, but 10- and 12-year-olds' rankings were both lower on the average and more varied. Similarly, Parsons and Ruble (1977) found that 5–7-year-old children reported uniformly high expectations for their future achievements, while older children reported relatively more modest expectations, particularly after experiencing some failure at the task. More recently, Marsh (1989) reported linear decreases across the elementary school years in children's competence perceptions in several academic and nonacademic domains. The picture is more complex as the children get older. Eccles and her colleagues have found that the decreases in adolescents' academic achievement self-perceptions occur more in some subject areas than in others (Eccles et al., 1983, 1989; Wigfield et al., 1991). However, since this study focuses on elementary school aged children, we predict that the children's competence perceptions will decline across the grade levels studied.

Children's competence beliefs also seem to become more accurate as they get older, in the sense of relating more closely to teachers' assessments of their competencies and being more responsive to their success and failure experiences (Harter, 1982; Nicholls, 1979; Parsons & Ruble, 1977; Stipek & Hoffman, 1980). However, since this is not a focus of this report, we do not discuss this finding further.

The few studies of developmental changes in task value beliefs have focused on older children and adolescents. At these ages the pattern of change depends on the domain, with the value of some activities like math and sports decreasing and the value of other activities like English re-

maining stable or increasing over time (Eccles et al. 1989; Wigfield et al., 1991). Thus we make no strong predictions for grade-related changes in children's subjective task values. But it seems likely given young children's optimistic orientation (Eccles, Midgley, & Adler, 1984; Stipek & Mac Iver, 1989) that they will place high value on academic competence early on and will lower this value as they get feedback about their actual competence levels. One efficient way to maintain high self-esteem in the face of information that one is not as competent as one would like to be at everything is to lower the value attached to being competent in those domains in which one is receiving relatively low performance feedback. If children adopt this strategy, then the average value attached to academic tasks should decline as some of the children are confronted with low performance feedback.

Several researchers report gender differences in children's self- and task perceptions, particularly in gender-role-stereotyped domains. When such differences emerge, they show that each sex reports greater perceived competence in gender-role congruent activities. The extent of this pattern varies by age and seems to become more marked as children get older. It also varies some across activity domain, with the earliest emergence occurring for perceptions of physical competence, favoring boys (Eccles et al., 1989; Harter, 1982; Huston, 1983; Marsh, 1989; Wigfield et al., 1991), though the patterns are not entirely consistent across studies. Few of these studies have looked at early elementary school children, and even fewer have looked at both competence and task value beliefs. Consequently, we do not know exactly when some of the gender differences begin to emerge, and we know very little about the ontogeny of gender differences in task value beliefs. However, we predict that stereotypic differences will be evident in our samples at all grade levels; in addition, we predict that the magnitude of these differences will increase as the grade level increases due to continued exposure to gender-role information from the culture at large.

Method

Participants, Measures, and Analysis

The participants and measures were the same as reported in Study 1. Children's responses to the scales tapping their competence beliefs and subjective task values were analyzed with 2 (sex) × 3 (grade) analyses of variance. Table 6 presents the grade-level and sex effects from these analyses. Effect size estimates are the squared beta coefficients for the independent variable with the effects of the other independent variable controlled. Significant grade-level effects were followed up with Tukey's (1953) HSD tests to assess the significance of the difference between each pair of means. The .01 level of significance was adopted for these paired comparisons. No sex × grade interactions were significant.

Grade Differences

Competence perceptions.—In general, as predicted, children's competence perceptions decrease across grade; Table 7 presents the means. The overall grade difference effects are significant for the domains of math, reading, and instrumental music; only the sport domain failed to yield a significant grade level effect (see Table 6). For each domain with a significant grade effect, the younger children have higher competence beliefs than do the older children. Results of these planned comparison tests are illustrated in Table 7 with superscripted letters ($p < .01$). Items within each row with the same superscript are not different from one another. The first graders' mean ratings are significantly higher than those of the fourth graders for math. For the reading and music competence self-concept scales, both the first and second graders' means are significantly higher than the fourth graders' means. The overall sports means are not different; however, for tumbling and throwing and catching a ball younger children's beliefs are more positive than those of the oldest children. Although somewhat speculative, it is interesting to note the differences in effect size across domains: the strongest grade differences occur for competence beliefs in the domains of reading and instrumental music.

Subjective task values.—Grade level differences in subjective task values are significant in the domains of reading, instrumental music, and sport (see Table 6). The means are presented in Table 8. In general, there is a grade-related decline in the value attached to the domains of reading and instrumental music and a grade-related increase in the value attached to sport. The planned grade-level comparison tests indicate the following results for each domain: reading—first graders' means are significantly higher than fourth graders' means; music—first and second graders' means are significantly higher than fourth graders'

TABLE 6

GRADE AND SEX DIFFERENCES IN CHILDREN'S BELIEFS ABOUT THE DIFFERENT ACTIVITIES

	MS	*df*	*F*	*p*	Effect Size
Grade differences:					
Competence beliefs:					
Math	6.74	2, 858	6.29	.001	.02
Reading	31.83	2, 858	28.30	.000	.06
Music	68.68	2, 859	28.49	.000	.06
Sports	1.35	2, 849	1.08	.341	. . .
Throwing	10.50	2, 841	4.21	.015	.01
Tumbling	25.01	2, 844	7.02	.000	.01
Subjective task values:					
Math	.009	2, 858	.005	.99	. . .
Reading	10.32	2, 857	5.65	.004	.01
Music	47.31	2, 849	13.72	.000	.03
Sports	6.12	2, 849	3.86	.022	.01
Sex differences:					
Competence beliefs:					
Math	17.79	1, 858	16.61	.000	.02
Reading	1.58	1, 858	1.40	.24	. . .
Music	123.07	1, 849	51.09	.000	.05
Sports	181.46	1, 849	144.54	.000	.14
Throwing	90.11	1, 841	36.08	.000	.04
Tumbling	279.61	1, 844	78.43	.000	.08
Subjective task values:					
Math	7.02	1, 858	3.66	.06	. . .
Reading	54.81	1, 857	30.13	.000	.03
Music	209.22	1, 849	60.69	.000	.06
Sports	61.76	1, 850	38.88	.000	.04

means; sports—fourth graders' means are significantly higher than first graders' means (see superscripts, $p < .01$ for all differences). One other finding to note regarding general subjective task value is that children value reading and math less than sports ($p < .01$).

Gender Differences

Competence perceptions.—As can be seen in Table 6, significant gender differences occur for math, instrumental music, and sports. Table 7 presents the means in each activity domain for boys and girls. Boys have higher competence perceptions than do girls for the math and general sport domains. For the specific sport activities, boys have significantly higher perceptions of their throwing ability than do girls, whereas girls have the higher self-perceptions for tumbling ability. Girls also have higher competence beliefs than do boys in the instrumental music domain. Again, although it is somewhat speculative, it is interesting to note that gender differences in sports competence beliefs yield a much higher effect size than in the other domains, suggesting that gender differences are more consistent across individuals in the sport domain than in the other domains.

Another way to examine gender differences is to look at the ordering of boys' and girls' competence beliefs across the domains. Girls and boys may differ not only in the mean level of their ratings of each domain but also may differ in the ordering they show among the domains. Eccles et al. (1983) suggested that the relative ordering of one's sense of competence across a set of activities would be a better predictor of activity choice and persistence than one's absolute sense of competence; that is, to the extent that one's sense of competence affects task choice, it is likely that children will select those tasks at which they feel relatively more competent. Eccles (1987) also suggested that one of the major consequences of gender-role socialization may be gender differences in the ordering of one's competence perceptions across activity domains. Paired *t* test results ($p < .01$) comparing pairs of means within sex are illustrated with superscripts in Table 7; means with similar superscripts do not differ. Clearly, the pat-

TABLE 7

MEAN LEVEL OF COMPETENCE BELIEFS FOR THE DIFFERENT ACTIVITIES BY GRADE LEVEL AND SEX

	GRADE LEVEL								
	First			Second			Fourth		
	N	*M*	SD	*N*	*M*	SD	*N*	*M*	SD
Math	284	5.69^{A}	1.04	320	5.49^{AB}	1.08	260	5.38^{B}	1.00
Reading	284	6.04^{A}	1.00	320	5.85^{A}	1.06	260	5.38^{B}	1.12
Music	280	5.26^{A}	1.54	317	4.78^{A}	1.66	258	4.26^{B}	1.57
Sports	280	5.74	1.25	317	5.59	1.21	258	5.68	1.16
Tumbling	278	5.30^{A}	1.92	314	5.26^{A}	1.63	258	4.70^{B}	2.65
Throwing	278	5.67^{A}	1.78	314	5.76^{A}	1.63	258	6.05^{B}	1.42

	SEX					
	Girls			Boys		
	N	*M*	SD	*N*	*M*	SD
Math	444	5.38^{2}	1.05	420	5.67^{2}	1.04
Reading	444	5.81^{1}	1.06	420	5.73^{2}	1.13
Music	440	5.15^{2}	1.43	415	4.41^{3}	1.76
Sports	440	5.22^{2}	1.20	415	6.14^{1}	1.03
Tumbling	436	5.68^{1}	1.21	414	4.58^{3}	1.60
Throwing	436	5.67^{1}	1.78	414	6.14^{1}	1.46

NOTE.—Similar alphabetic superscripts within each row indicate that the means in that row are not different from one another. Similar numeric superscripts within each column indicate that the means in that column are not different from one another.

terns vary by gender. For boys, competence perceptions are highest in the sport domain and throwing, followed fairly closely by reading and math, and then by tumbling and instrumental music. In contrast, girls' competence self-perceptions fall into two clusters: They are highest in the reading domain and the two specific sports activities, and followed by the domains of math, sport, and instrumental music. The pattern of mean differences also suggests that boys as a population differentiate more consistently, and more extremely, among their competence beliefs across activity domains than do girls.

Subjective task value.—Gender differences in subjective task values are significant in the domains of reading, instrumental music, and sport (see Table 6). Means for girls' and boys' valuing of the different activities are presented in Table 8. Girls value reading and music more than do boys. In contrast, the boys value sports activities more than the girls do. Again, comparing the effect sizes suggests that gender differences in subjective task value are more consistent across individuals for the nonacademic domains than for the academic domains.

Boys and girls also differ in the ordering of the value they attach to each activity domain (see superscripts). Boys value sport activities the most, followed by math and reading, and then by instrumental music. Each of the pairs of means is significantly different, except for math and reading. Girls value reading activities the most, followed by sports, instrumental music, and then by math. Only two pairs of means are significantly different for girls: reading versus math and reading versus music. Interestingly, though girls and boys do not differ in their overall valuing of math, for girls math is the least valued activity, whereas boys rate it near the top of their value hierarchy.

DISCUSSION

Grade Differences in the Level of Children's Self- and Task Perceptions

Consistent with the results in other studies (e.g., Nicholls, 1979; Parsons & Ruble, 1977; Stipek & Mac Iver, 1989), the younger children in this study, particularly the first graders, reported higher estimates of their competence than the fourth graders in several domains. Parsons and Ruble

TABLE 8

MEAN SUBJECTIVE TASK VALUE FOR THE DIFFERENT ACTIVITIES BY GRADE LEVEL AND SEX

	GRADE LEVEL								
	First			Second			Fourth		
	N	*M*	SD	*N*	*M*	SD	*N*	*M*	SD
Math	284	5.42^{A}	1.49	320	5.44^{A}	1.41	260	5.42^{A}	1.26
Reading	283	5.76^{A}	1.36	320	5.62^{AB}	1.45	260	5.38^{B}	1.30
Music	280	5.51^{A}	1.81	317	5.16^{A}	2.02	258	4.68^{B}	1.90
Sports	280	5.76^{A}	1.42	317	5.98^{AB}	1.27	259	6.02^{B}	1.14

	SEX					
	Girls			Boys		
	N	*M*	SD	*N*	*M*	SD
Math	444	5.52^{2}	1.28	420	5.34^{1}	1.49
Reading	443	5.84^{1}	1.22	420	5.34^{1}	1.48
Music	440	$5.61^{2,3}$	1.67	415	4.62	2.08
Sports	440	$5.66^{1,2}$	1.37	416	6.19	1.14

NOTE.—Similar alphabetic superscripts within each row indicate that the means in that row are not different from one another. Similar numeric superscripts within each column indicate that the means in that column are not different from one another.

(1977) suggested that grade differences in children's self-perceptions in competence could reflect increasing pessimism with age; that is, the mean level differences across grade level could reflect a general lowering of the children's estimates of their own competence that is characteristic of most of the children in the population (see also Stipek & Mac Iver, 1989). In contrast, based on the finding that the correlations between children's assessments of their reading ability and their performance in reading also increase across the elementary school years, Nicholls (1978, 1979) has suggested that the age difference in children's ratings of their own competence reflect two processes: (1) an optimistic bias in younger children, and (2) increases in the accuracy of children's self-perceptions as they grow older. If these two processes were the primary causes of the grade differences found in this study, then we would expect greater variance in the scores of the fourth graders than in the scores of the first graders for the following reasons. If the scores of younger children reflect age-related optimism while the lower mean scores of the older children reflect greater realism, the scores of the younger children should be clustered at the high end of the scale while the scores of the older children should be spread more broadly across the scale reflecting the dispersion of their actual competencies. If this were true, then the variance in the younger children should be lower than the variance in the older children due to ceiling effects in the younger population. But we found no evidence of systematic grade-related differences in the variance of the children's competence self-perceptions (see Table 7). Although this evidence does not rule out a role for increasing realism with age, it does suggest that increasing realism, coupled with an optimistic bias among younger children, is not the only process underlying the grade differences found in this study. In future studies, we will investigate other possible explanations for these grade-related differences in competence self-perceptions.

Children's valuing of the different activities shows fewer and smaller differences across grade levels, particularly for math. And although the dominant pattern across all domains is for younger children to report greater valuing of the activities than older children, the oldest children report valuing sports more than did the youngest children. The fact that there are fewer differences across grade in subjective value is intriguing. On the one hand, this pattern may seem inconsistent with the suggestion made earlier that children should come to devalue those activities in which they believe they

lack competence as a way to maintain self-esteem. On the other hand, the differences in the two patterns of change across competence perceptions and task values may reflect a delay in the time it takes children to adjust their task values to changes in their estimates of their own competence in various activities. In the future, we will use the longitudinal data from this study to look at the relations between these two belief systems over time. We will also test whether children who continue to place high value on competence in a particular domain despite their view that they lack competence in the domain are at risk for declines in self-esteem (see Harter, 1985).

It also is important to note that particularly at fourth grade children value sports activities much more than academic activities, suggesting that many children are losing interest in school by the mid-elementary school years. If this pattern continues (which previous research suggests it will), it could have serious consequences for children's continued involvement with academic activities as they move into higher grades.

Gender Differences in Children's Self- and Task Perceptions

The gender differences in both the mean levels and the across-domain patterning of children's competence beliefs mirror this culture's stereotypes regarding gender differences in competence across these activity domains. Clearly the gender differences in achievement beliefs found by Eccles and her colleagues in their previous work (e.g., Eccles, 1984a, 1984b; Eccles et al, 1983, 1989; Wigfield et al., 1991) with early and middle adolescents also exist among early elementary school age children. As predicted, boys' competence self-perceptions are higher than girls' in the domains of math and sport; in contrast, girls' competence self-perceptions are higher than boys' in the domain of instrumental music. And although girls think they are less able in sports in general, they rate their tumbling competence much higher than do the boys. This result illustrates the importance of looking at self- and task perceptions for specific activities within a domain rather than for domains in general. The same point is illustrated by the different pattern of gender differences for math and reading (both academic activities).

There were also gender-role stereotypic differences in the valuing of the various activity domains. Boys value sports activities more than girls do, whereas girls value reading and music more than do boys. It is quite interesting that girls value sports just as much as the three other activities, despite the fact that they rate themselves relatively less competent at sports than at reading, tumbling, and throwing and catching a ball.

Boys and girls also differed in the number of significantly different means in the set of analyses comparing the rank ordering of both their competence beliefs and their task values within each sex: More of these differences were significant among the boys than among the girls. Although a comparison between the number of significant differences in the means among two groups of individuals is very speculative, we were quite intrigued by this difference, particularly since a consistent pattern emerged for both the competence and the task value ratings. This difference in magnitude of within-sex, across-domain means could result if the boys' hierarchies for both their competence self-perceptions and task values were more differentiated in a stereotypic manner (i.e., a shared pattern of differentiation) across domains at this age than the girls'; that is, if there were greater consistency in these across domain hierarchies among the males than among the females. Such a result would be consistent with other findings in the area of gender role socialization suggesting that boys are under greater pressure to adhere to the stereotypic male role than girls are under to adhere to the stereotypic female role (e.g., Huston, 1983). One consequence of this differential pressure would be greater interindividual consensus among boys in the valuing of various gender-role-related activities.

It is also worth noting the differences in the effect size of gender across the activity domains. Gender effect sizes are largest in the nonacademic domains. Although the sport domain differences are consistent with gender-role stereotypes, the magnitude of this effect for competence self-perceptions is startling. We have measured the actual physical abilities of these children using the Bruininks-Oseretsky Test of Motor Proficiency (Bruininks, 1977). Although there were some significant sex differences on specific subtests, the effect size of child sex on the total score was only .02 (accounting for 2% of the variance) (Eccles & Harold, 1991). We also had the children's teacher rate each child's athletic ability; again, although there was a significant sex-of-child effect, the effect size was only .02 (Eccles & Harold, 1991). Clearly, these children are

acquiring a more extreme sex-differentiated self-belief system in the sport domain than is warranted by whatever real differences might exist. Why? Evidence with older children suggests that parents' gender-role stereotypes may be one important influence (Eccles, Jacobs, & Harold, 1991). Tracing the influences on the emergence of these gender differences in competence perceptions and subjective task value and on the consequences of these gender-role stereotyped beliefs on the children's activity choices is one of our next goals.

We were surprised by the gender differences in the instrumental music domain. This is the only instance we know about in which the gender-role differentiated beliefs and self-perceptions in childhood are opposite to the gender differences in participation one observes in the adult world. The majority of instrumental musicians in both orchestras and rock bands are male. Perhaps children this young have not had an opportunity to observe these differences and are basing their beliefs on the prevalence of female music teachers and on the messages they are getting from the parents and teachers. The teachers of these children also rated the female children as more talented in music than the male children (Harold et al., 1989). Why? Informal discussions with some of the parents and teachers in this study suggest that adults believe that patience, discipline, and responsibility are the key characteristics a child needs to do well in instrumental music at this age; that is, these may be the characteristics necessary if a child is to practice with sufficient regularity to improve. The teachers in this study do rate the girls as more responsible than the boys (Harold et al., 1989), and this rating is significantly correlated with their rating of each child's music talent (Harold et al., 1989). Future research is needed to test this hypothesis.

The findings for instrumental music are interesting for another reason. Very few of the children in this sample have actually had very much experience with instrumental music. Formal instrumental music instruction does not begin in the schools until the fourth grade, and few parents have arranged for their children to get formal instruction outside of school. Nonetheless, the children appear to have just as reliable and differentiated self-concepts and task values for this domain as for domains with which they have had considerably more experience. In addition, the age and gender differences for this domain are just as reliable as the differences in the other activity domains. These findings suggest that experience is not essential for forming ability self-concepts and deciding how valuable and enjoyable a particular activity might be. Whether these self-concepts and task values will change as the children get more experience with instrumental music will be tested as the subsequent longitudinal data become available.

Summary and Future Directions

Results from the factor analyses and reliability analyses presented in Study 1 indicate that children do hold differentiated self- and task perceptions in the skill-linked activity domains studied herein, even at the first grade, and that these beliefs can be reliably measured. Evidence from the factor analyses presented in Study 1 and the ANOVAs presented in Study 2 indicate that the measures reported herein have both discriminant and predictive validity. Discriminant validity is evident in the existence of consistent, interpretable factors that reflect discriminations across activity domains and between constructs within domains. Predictive validity is evidenced by the consistency of our grade and gender differences with theoretical predictions and previous empirical findings drawn from studies with older children. In the future, we will determine the relations of these beliefs to individual differences in self-esteem, activity choice, persistence, and performance. We will also investigate the following questions: (1) Do the cross-sectional, mean-level differences found here also characterize longitudinal change? (2) What aspects of the home and school environment are associated longitudinally with changes in these beliefs and behavioral outcomes? (3) What is the nature of individual differences in the developmental trajectories associated with these constructs? (4) What social experiences at home and at school are related to the ontogeny of the gender differences reported in this paper? (5) To what extent do the gender differences in these beliefs mediate gender differences in skill acquisition and activity preference?

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