What Am I Best At? Grade and Gender Differences in Children's Beliefs About Ability Improvement

CAROL FREEDMAN-DOAN
Eastern Michigan University

ALLAN WIGFIELD
University of Maryland

JACQUELYNNE S. ECCLES AND PHYLLIS BLUMENFELD
University of Michigan

AMY ARBRETON
Public/Private Ventures, Philadelphia, PA

RENA D. HAROLD
Michigan State University

The authors assessed age and gender variations in children's beliefs regarding the kinds of activities (academics, sports, music and arts) at which they thought they were best and worst. Children also reported the extent to which they thought they could improve their abilities in these different activities. The authors interviewed 865 first-, second-, and fourth-grade children individually. Children in all three grades were very optimistic that increased effort and better strategy use could improve their ability to perform different activities, particularly academic and sports activities. However, by fourth grade, an increasing number of children began to doubt whether they could improve enough to become best at their current worst activity. There were gender stereotypic differences in children's beliefs about their abilities. The implications of these findings for teachers and parents and for children's future activity choice are discussed.

Researchers have found that when individuals have confidence in their ability for particular tasks they choose more challenging activities, persist more in the face of

Direct all correspondence to: Carol Freedman-Doan, 531 Mark Jefferson Building, Eastern Michigan University, Ypsilanti, MI 48197 <psy_ketl@online.emich.edu>.

Journal of Applied Developmental Psychology 21(4): 379–402
ISSN: 0193-3973

difficulty, and perform better (e.g., Bandura, 1997; Eccles, Wigfield, & Schiefele, 1998; Stipek & Mac Iver, 1989). Different aspects of children's beliefs about their ability have been investigated. One important topic has been the degree to which children's ability beliefs change over time. Researchers using both questionnaire and interview methods have found that across the elementary school years, children's ability beliefs decrease (Benenson & Dweck, 1986; Eccles, Wigfield, Harold, & Blumenfeld, 1993; Wigfield et al., 1997).

Researchers have also investigated the stability and malleability of children's ability beliefs. Ruble and Flett (1988) assessed how constant children think their own and other children's abilities are. They found that older children saw other children's abilities as more constant than did younger children. However, there were no age-related effects for children's sense of the constancy of their own ability.

Nicholls and his colleagues asked children of different ages various questions about ability and effort and about how different levels of performance can occur when children exert similar effort (e.g., Nicholls, 1978; Nicholls & Miller, 1984). They found clear age differences in children's understanding of how effort and ability are related both to each other and to performance. Five- and 6-year olds viewed effort and ability as positively related (i.e., smarter people also work harder). In contrast, many of the 10- to 13-year-old children viewed ability and effort as inversely related such that higher effort was associated with lower ability. Thus, younger children seem more likely to believe that ability is changeable through effort. Older children are more likely to think of ability as "capacity," and to conclude that those who succeed with less effort are smarter (see also Pomerantz & Ruble, 1997).

Dweck and her colleagues (e.g., Cain & Dweck, 1995; Dweck & Elliott, 1983; Dweck & Leggett, 1988) proposed that children hold one of two views of intelligence: an *entity* view in which intelligence is seen as a stable trait and an *incremental* view in which intelligence can be modified through effort and learning. It may be expected that children increasingly adopt an entity view of intelligence as they become older. The available evidence, however, is somewhat equivocal. Bempechat and London (1991) found that older children had stronger entity views than did younger children regarding physical appearance, but not in other domains. However, their one-item assessment of entity versus incremental views perhaps is not a sufficient test. Stipek and Gralinski (1996) looked at age differences in third- through sixth-grade children's views of intelligence as entity based or incremental. The only age difference was that third graders had a stronger entity view than did fourth through sixth graders. Pomerantz and Ruble (1997) reported few differences across second through fifth grades in children's views regarding entity versus incremental views of intelligence.

Nicholls' (1984, 1990) work on children's concepts of ability and Dweck and her colleagues' (Dweck & Elliot, 1983; Dweck & Leggett, 1988) work on children's beliefs about intelligence are different. Nicholls examined children's beliefs about ability as capacity, and Dweck examined how much control children think they have over their intelligence (see Nicholls, 1990; Pomerantz & Ruble, 1997). However, both lines of work provide evidence that some children see ability and intelligence as more malleable and others see it as more stable. Further, both Nicholls

and Dweck and her colleagues discussed how children's conceptions of ability and intelligence have important motivational consequences. If children think their ability cannot be improved, they should infer they have little chance of ever doing well after failure. In contrast, believing effort can enhance ability and performance should motivate children to increase their efforts after failure.

Another area of work relevant to the issue of malleability is children's views of others' dispositions (see Rholes, Newman, & Ruble, 1990 for a review). When children use trait-like explanations for behavior, it can be assumed that they view that behavior as stable. Rholes, Newman, and Ruble (1990) reviewed work showing that during the early and middle childhood years, children are increasingly likely to make trait-like judgments of others and to believe that others' behaviors, therefore, will be consistent across situations. For instance, Benenson and Dweck (1986) found that children used trait-based explanations of others' social behaviors as early as first grade in the social domain, but only beginning in fourth grade for the academic domain. Trait-based explanations of others' failures only occurred at fourth grade in the social domain. Children were unlikely to use trait-based explanations for their own outcomes. These results suggest that children see traits in others before they do in themselves and that there are domain differences in the extent to which children make trait judgments.

Domain differences in children's beliefs about the malleability of ability beliefs also have been assessed. Dweck and Leggett (1988) and Nicholls (1990) focused on children's beliefs about general academic intelligence and ability. However, Stipek and her colleagues (Droege & Stipek, 1993; Stipek & Gralinski, 1996) have focused on domain differences in children's beliefs about ability. Droege and Stipek (1993), in an interview study, examined children's beliefs about how much other classmates' abilities could change in the social and academic domains. All children believed that their classmates could improve somewhat in each domain, but sixth graders were less likely than third graders or kindergartners to believe they could greatly improve their own abilities. Stipek and Gralinski (1996), using a questionnaire measure, found that third through sixth grade children's beliefs about the stability of academic intelligence were not subject specific; items assessing children's conceptions of intelligence in social studies and math loaded on the same factor.

The purpose of this study was to build on the body of work that explores children's beliefs about the stability of intelligence by examining how malleable elementary school-aged children think ability is in a variety of domains. Our work extends the earlier work in several ways. First, we focused solely on children's beliefs about themselves; much of the earlier work in this area asks children what they think of other children's abilities (e.g., Droege & Stipek, 1993; Pomerantz & Ruble, 1997). Second, we explored grade differences in children's beliefs about the modifiability of their own abilities. We also examined grade differences in children's beliefs about which activities they do best to build on questionnaire-based studies of this issue (e.g., Eccles et al., 1993; Marsh, 1989). Third, we asked children about their abilities in different academic subject areas, sports, music, and arts activities, thus extending previous work to new domains. We thus could determine whether children believe that abilities are more changeable in some domains than in others.

We also assessed gender differences in children's beliefs about their ability in the various domains. A number of researchers have looked at gender differences

in levels of ability beliefs for different activities (see Eccles et al., 1998, for a review). For instance, Eccles et al.'s (1993) analyses of children's responses to questionnaires showed that children had sex-stereotypical competence beliefs: boys had more positive ability beliefs for sports and math, and girls had more positive beliefs for reading and music. Marsh (1989) also found sex-stereotypical differences in children's self-concepts in different domains, although the effect sizes for these differences were small.

We have expanded on these studies by examining boys' and girls' beliefs about numerous specific academic and nonacademic activities. Children were asked to compare their ability in math, reading, science, and spelling. We expected boys to have more positive competence beliefs about math and science, and girls about spelling and reading. In the sports domain, we focused on differences in boys' and girls' beliefs about both competitive and noncompetitive, team and individual sports. We expected boys' competence beliefs to be higher for competitive team sports, whereas we expected girls' competence beliefs would be higher for noncompetitive sports. In the music and arts domain, we asked children to compare their abilities on instrumental music, singing, dance, and art. We expected girls would have more positive competence beliefs than boys for these activities, particularly for dance and singing.

METHODS

Participants

The data are from the first wave of an on-going longitudinal project (the Childhood and Beyond Study) investigating the early development and socialization of children's self and task beliefs and activity choices. The participants included 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), attending 10 elementary schools in four school districts in southeastern Michigan. The data were collected in the spring of 1987. The school districts offer children a variety of activities. All children attend art, music, and gym classes at least once weekly. In all three districts, formal instrumental music classes begin in fifth or sixth grade. At the time of this wave of data collection, all schools had computers either in each classroom or available to classes in a computer lab. Additionally, all districts offer a wide range of sports activities to the children. From the parent surveys given in this study, we found that both the boys and girls were involved in a wide range of sports, music, social, and religious activities. The children come from lower middle class to middle class backgrounds, and more than 95% are white. Children, parents, and teachers were recruited through their school districts. Approximately 75% of the children solicited agreed to participate (i.e., agreed to participate and obtained parental permission to participate).

Measures

Child Interview. Each child was interviewed individually during the spring of the first year of the project. (An excerpted version of the interview is presented in the Appendix; the complete interview can be obtained by contacting the first

author.) The children were asked about academic, sports, and instrumental music and other arts activities, as well as social activities. In the three domains (academic, sports, and music/arts), all children were asked to indicate at which of a set of activities they were best, and at which they were worst. A randomly selected subsample of children was asked a series of follow-up questions about activities in each domain. Subsets of children were interviewed because of the length of the interview. Two hundred ninety-one children were asked these follow-up questions for the *academic* activities, 286 were asked about the *sports* activities, and 279 children were asked about the *music/arts* activities. All children were then asked a set of across domain comparison questions in six activities: math, reading, computers, sports, music/arts, and making friends.

Procedures

Twenty-eight adult females (ages 20–55) interviewed the children in empty rooms at the school. All interviewers had considerable experience working with children and received extensive training and evaluation before interviewing the children participating in this study. The training manual is available from the first author.

The interviewer began by asking questions about academic activities (see Appendix for sample interview). She placed four cards depicting a same-sex child doing math, reading, spelling, and science in front of the child and asked the child to indicate at which activity he/she was best and not so good. Then, children were asked if they thought they could become better at the activity they identified as the one at which they were worst. If the child was included in the third of the sample asked the probe questions about academics, several additional questions were asked next: Could you be the best at this activity? What would you do to be one of the best at (worst activity)? If they responded "no" to the first question, they were then asked: Why couldn't you be the best at (worst activity) if you wanted to?

The interviewer then displayed 19 pictures of some common sports (both team and individual sports) and play activities. The pictures either showed a child performing the activity or showed something to represent the activity itself (e.g., a soccer ball). The child indicated whether he or she participated in the sport activity. The interviewer then asked the child to identify the sports activity they do at which they are best and worst. If the child was included in the third of the sample being probed about sports, the questions listed above were asked for this domain.

Next, children were shown four pictures of children singing, playing musical instruments, dancing, and drawing. They then were asked to indicate in which activities he or she participated. The child then indicated at which of the activities he or she was best and not so good. If the child was included in the third of the sample being probed about music/arts activities, then those questions were asked.

Finally, the interviewer asked the child to think about the many different kinds of activities he or she does. The interviewer laid out pictures of: a child doing math, a child reading, a child at a computer, a child with friends, and the sports or physical skills and the music/arts activities the child had said he or she did best. The interviewer then asked the child to select the picture of the activity at which

he or she is best. The child then selected his or her next best activity. This process continued until all six pictures had been ranked. Next, children were asked how they know they are best at that activity and if they could improve at their lowest-ranked activity. If they responded that they could not improve, they were asked why they could not become better. If they responded that they could improve, they were asked what they would do to become better.

Coding and Scoring

One set of codes was used to code two of the questions: Why couldn't you be the best at (worst activity)?, asked for subsample probe; and How do you know you are best at (best activity)?, asked in across domain set. The initial coding system for these questions was a low inference coding system that contained 225 specific codes. This was done to retain as much information as possible. Coders who could accurately code at least 90% of the responses on a precoded practice interview were then given three actual interviews to code, which were checked by project staff members to insure an interrater reliability of 90%. When a response could not be classified by the coder, a staff member reviewed the response and decided if a new code should be added or if it should be put into the Other or Uncodable categories. Approximately 50 new codes were added in this manner during the coding process. Therefore, *all* interviews were given a final check coding by a group of highly accurate coders. Table 1 provides samples of the codes.

The authors created a set of more general, higher-order categories, and children's responses were aggregated into these categories. These categories are presented in Table 1, along with examples. The categories were based on constructs in current motivation theory. Specifically, because we asked children to explain why they were good or not so good at an activity, we used categories from attribution theory (Weiner, 1985). These categories included ability, effort, task difficulty, and quality of instruction reasons for why one is good or not so good. The intrinsic and extrinsic value categories stem from the expectancy-value model underlying the broader study (Eccles et al., 1983; Wigfield & Eccles, 1992). These latter categories also are related to constructs in intrinsic motivation theory (Deci & Ryan, 1985). The frequencies with which children's responses fell into these broader categories are reported in the Results section.

Another set of codes was used for the question about how to become best at the child's current worst activity. This low-inference system contained 53 codes and was developed as described above. These codes were then aggregated into six general categories. These categories were based on research on motivation in children's self-regulation, strategy use, and help-seeking (e.g., Newman, 1994; Pintrich & De Groot, 1990; Zimmerman, 1994). The categories include: (a) *Practice* (e.g., I would do more of it/practice more, I would try to improve my batting); (b) *Approach the task differently* (e.g., I would pay attention more, I would write down my spelling words ten times before the test); (c) *Seek help from others* (e.g., I would ask my mom to help me study, I would have my coach practice with me); (d) *Personal characteristics/reactions* (e.g., I would try to like it more, I would do better if I didn't worry so much); (e) *Task characteristic responses* (e.g., I would do better if the teacher were clearer, I would do better if the coach didn't yell so much); and (f) *Other responses* (e.g., Don't know).

Table 1. Higher-Order Codes and Examples: Responses to the Probe Questions in Each Domain

Reasons	*Examples of kinds of responses*
Positive probe set: *Why are you best at _____ ?*	
Ability	I am good at it, I do well at it, I got an "A" on my report card, I hit a lot of home runs, I am a good singer, I am better than other kids in my class
Task Ease	It's easy, I do it fast, I have to work at it less than other kids
Positive Effort	I do it a lot, I work on it, I practice my lessons often, I pay attention, I try hard, I play on a team, I get help from my coach
Good Instruction	It's taught well, I have a good teacher/coach, I like the way it's taught
Positive Intrinsic	I like it, It's fun, It's more interesting than other things I do, I like to be on a team, I want to be good at it
Positive Extrinsic	It's an important skill to have, I get to wear a uniform, I can perform in front of others, I can do it with my dad, You can be with your friends, You can get a trophy/prize, I want to be a singer some day, It's good exercise
Positive Other	I don't know, Just because
Negative probe set: *Why are you not so good at _____ ?*	
Lack of Ability	I'm not good at it, I don't know it, I can't do it, I got a bad score/grade last time, I'm not very athletic/artistic, I don't score any points
Task Difficulty	It's hard, I do it slow, I have to work at it a lot, I can't reach the basket
Negative Effort	I don't do it a lot, I don't try, I don't take lessons, I don't practice, I don't pay attention, I don't want to do it, I don't have the time to do it
Poor Instruction	I have a bad teacher, I don't like the way it's taught, I don't like learning about fractions
Negative Intrinsic	It's boring, I don't like it, it's too easy, I get hurt too easily, I get embarrassed doing it
Negative Extrinsic	It's not useful, You can't be with your friends, It won't help me become a better dancer, ball player, etc., I haven't gotten any prizes/awards, You have to do it in front of people, My mom thinks I'm not good at it, I don't like when my coach tells me I messed up
Negative Other	Don't know, Just because

Results

Results for each domain are organized as follows. First, information about grade and gender differences in children's beliefs about which activity they think they are best and worst at is presented. Then, information is presented about whether children think they can improve their abilities, along with their explanations of how they can improve. Next are results pertaining to the children who believe they cannot improve. Finally, children's comparisons of their abilities across the different domains are considered.

Ability Beliefs in the Academic Domain

Table 2 presents the frequencies of children's responses to the questions regarding at which academic activity children think they are best and worst. Results of chi-square analyses that assessed gender and grade differences are also in Table 2. There were significant grade and gender effects.

Grade Differences. Interestingly, grade level differences occurred only on the question, "Which subject are you not so good at?" and only for math and reading.

Table 2. Grade and Gender Differences: Responses to Academic Domain Questions

	Math	*Reading*	*Spelling*	*Science*
Best At				
Grade [χ^2 (6, N = 865) = 12.99, p = ns]				
Gender [χ^2 (3, N = 865) = 24.04, p < .001]				
Females				
(row %)	122 (27.4)	189 (42.5)	79 (17.8)	55 (12.3)
(expected)	(146.1)	(163.1)	(68.9)	(66.9)
Males				
(row %)	162 (38.6)	128 (30.5)	55 (13.1)	75 (17.9)
(expected)	(137.9)	(153.9)	(65.1)	(63.1)
Total Count (%)	284 (32.8)	317 (36.6)	134 (15.5)	130 (15.0)
Not So Good At				
Grade [χ^2 (6, N = 865) = 14.02, p < .05]				
1st				
(row %)	81 (28.2)	35 (12.2)	95 (33.1)	76 (26.5)
(expected)	(72.8)	(43.8)	(90.2)	(80.2)
2nd				
(row %)	81 (25.8)	40 (12.7)	100 (31.8)	93 (29.6)
(expected)	(79.7)	(47.9)	(98.7)	(87.7)
4th				
(row %)	55 (21.4)	56 (21.8)	75 (29.2)	71 (27.6)
(expected)	(65.2)	(39.2)	(80.8)	(71.8)
Gender [χ^2 (3, N = 865) = 23.21, p < .001]				
Females				
(row %)	126 (28.4)	45 (10.1)	134 (30.2)	139 (31.3)
(expected)	(112.7)	(67.7)	(139.6)	(124.1)
Males				
(row %)	92 (22.2)	86 (20.7)	136 (32.8)	101 (24.3)
(expected)	(105.3)	(63.3)	(130.4)	(115.9)
Total Count (%)	218 (25.4)	131 (15.3)	270 (31.4)	240 (27.9)

First-grade children selected reading less often than expected and math more often than expected. In contrast, fourth graders selected reading more often and math less often than expected.

Gender Differences. Significant gender differences occurred in children's answers to both questions about which activities they thought they were best and worst (see Table 2). As predicted, girls reported thinking they were best at math less often than expected, whereas boys reported thinking they were best at it more often than expected. Girls also reported being not so good at math more often than expected, whereas boys gave this response less often than expected (although 22% of the boys also believed they were least good at math).

By contrast, girls reported being best at reading more often than expected, whereas boys gave this response less often than expected. Further, boys reported being not so good at reading more often than expected, whereas girls gave reading

as a response less often than expected. Although this same pattern of gender differences was evident for spelling, neither boys nor girls viewed spelling very positively.

Beliefs About Improving Academic Abilities

All children were asked the question, Could you get better at *(subject at which you are not so good)*? Ninety-five percent of all children responded "yes," and there were no grade or gender differences in children's responses to this question.

A subset of the children ($N = 291$) were asked the probe questions in this domain. The first of these probe questions [Could you be the *best* at *(subject not so good at)?*] was asked of the 275 children who had said they could improve at this activity. Of these, 68% ($N = 186$) responded "yes." There were no grade or gender differences in children's responses to this question. These 186 children then were asked what they would do to become the best. Children could give up to three responses. Of the 210 responses given, 75% (157/210) related to practice and trying to improve some specific skill; 14% (29/210) related to paying more attention in class or trying some new learning strategy; 6% (13/210) related to getting help from others; 4% (9/210) related to changing some personal characteristic or how one feels about the subject; and 1% (2/210) were "do not know" responses. There were no grade, gender, or subject differences in these responses. Thus the vast majority of the responses reflected increased effort, attention, or both.

Ability Beliefs in the Sports Domain

For purposes of analysis, the 19 sport activities were collapsed into four categories: *team competitive* sports (T-ball, baseball, basketball, soccer, ice hockey, football, and kickball), *individual competitive* sports (tennis, gymnastics, bowling, and karate), *individual noncompetitive* sports (jogging, biking, climbing on outdoor equipment, jump roping, and roller skating) and other *individual ambiguous* sports and physical skills activities where competitiveness was unclear (swimming, ice skating, and skate boarding). We coded the sports activities in this way because we anticipated gender differences in sports ability beliefs depending on the competitive nature of the sport and the degree of organization (team versus individual) needed to play the sport. We begin with grade and gender differences in children's beliefs about their ability. The frequencies and chi-square results are presented in Table 3. Both grade and gender effects were significant. There was no interaction of grade and gender.

Grade Differences. The first graders said they were best at both individual and team competitive sports less often than expected by chance. In contrast, fourth graders (and for team competitive sports, second graders) said they were best at those activities more often than expected. For the individual noncompetitive sports, more first graders than expected said they were best at those activities, whereas fewer fourth graders than expected did so. More first graders than expected also identified an individual noncompetitive sport as the sport at which they were not so good.

Table 3. Grade and Gender Differences: Responses to Sports Domain Questions

	Team Competitive	*Individual Competitive*	*Individual Noncompetitive*	*Individual Ambiguous*
Best At				
Grade [χ^2 (6, N = 965) = 32.05, $p < .001$]				
1st				
(row %)	129 (44.6)	31 (10.7)	117 (40.5)	12 (4.2)
(expected)	(138.6)	(38.2)	(98.1)	(14.1)
2nd				
(row %)	156 (49.6)	40 (12.7)	105 (33.3)	14 (4.4)
(expected)	(151.1)	(41.6)	(106.9)	(15.3)
4th				
(row %)	129 (50.0)	43 (16.7)	71 (27.5)	15 (5.8)
(expected)	(123.8)	(34.1)	(87.6)	(12.6)
Gender [χ^2 (3, N = 965) = 123.92, $p < .001$]				
Females				
(row %)	134 (30.2)	68 (15.4)	217 (49.0)	24 (5.4)
(expected)	(212.5)	(58.5)	(150.4)	(21.6)
Males				
(row %)	280 (66.7)	46 (11.0)	76 (18.1)	18 (4.3)
(expected)	(201.5)	(55.5)	(142.6)	(20.4)
Total Count (%)	414 (48.0)	114 (13.2)	293 (34.0)	42 (4.9)
Not So Good At				
Gender [χ^2 (3, N = 965) = 1.97, p = ns]				
Grade [χ^2 (6, N = 965) = 14.28, $p < .05$]				
1st				
(row %)	104 (36.0)	52 (18.0)	77 (26.6)	56 (19.4)
(expected)	(100.5)	(55.9)	(60.9)	(71.7)
2nd				
(row %)	103 (32.7)	60 (19.1)	64 (20.3)	88 (27.9)
(expected)	(109.5)	(61.0)	(66.4)	(78.1)
4th				
(row %)	93 (35.9)	55 (21.2)	41 (15.8)	70 (27.1)
(expected)	(90.0)	(50.1)	(54.6)	(64.2)
Total Count (%)	355 (41.1)	199 (23.0)	182 (21.1)	128 (14.8)

Gender Differences. Boys reported participating in team competitive sports and individual competitive sports significantly more than did girls, and girls reported participating in significantly more individual noncompetitive sports than did boys. However, both boys and girls reported participating in a similar average number of sports activities overall (11.80 of 19 sports for girls and 11.97 of 19 sports for boys). Indeed, even in team competitive sports where differences were statistically significant, boys reported participating in an average of 5.13 sports (of a possible 8), whereas girls reported participating in 4.18 sports. Significant gender differences in sports occurred on the question, Which are you best at? (see Table 4). Many more boys than expected by chance said they are best at competitive team sports;

Table 4. Grade and Gender Differences: Responses to Music/Arts Domain Questions

	Singing	*Playing an Instrument*	*Dance*	*Drawing and Painting*
Best At				
Grade [χ^2 (6, N = 865) = 10.20, p = ns]				
Gender [χ^2 (3, N = 865) = 114.96, $p < .001$]				
Females				
(row %)	73 (16.5)	59 (13.3)	130 (29.4)	180 (40.7)
(expected)	(63.0)	(55.2)	(77.6)	(246.2)
Males				
(row %)	48 (11.8)	47 (11.5)	19 (4.7)	293 (72.0)
(expected)	(58.0)	(50.8)	(71.4)	(226.8)
Total Count (%)	121 (14.3)	106 (12.5)	149 (17.6)	473 (55.7)
Not So Good At				
Grade [χ^2 (6, N = 865) = 4.66, p = ns]				
Gender [χ^2 (3, N = 865) = 35.46, $p < .001$]				
Females				
(row %)	152 (35.0)	101 (23.3)	70 (16.1)	111 (25.6)
(expected)	(187.8)	(87.6)	(73.6)	(85.0)
Males				
(row %)	208 (52.3)	67 (16.8)	71 (17.8)	52 (13.1)
(expected)	(172.2)	(80.4)	(67.4)	(78.0)
Total Count (%)	360 (43.3)	168 (20.2)	141 (16.9)	163 (19.6)

fewer girls than expected did. Instead, far more girls (and fewer boys) than expected said they are best at an individual noncompetitive sport. Relatively more girls than expected and relatively fewer boys than expected said they are best at an individual competitive sport.

Beliefs About Improving Sports Abilities

The next set of analyses concerned children's beliefs about how much their abilities could improve. Ninety-five percent (N = 274) of the children asked this question stated that they could become better at their current worst sports activity. There were no gender or grade differences in response to this question. The 274 children who stated they could improve were asked if they could be the best at their worst sport. Approximately 60% (164 of 274) said "yes." In addition, more first graders than expected (71% observed vs. 60% expected) and fewer fourth graders than expected (52% observed vs. 60% expected; χ^2 = 7.26, $p < .05$) responded "yes" to this question. The 164 children who answered "yes" then were asked what they would do to become the best at this sport. Children could give up to three open-ended responses. Eighty-eight percent (150/172 responses given) reflected increased general practice or increased effort to improve on a specific skill associated with the sport. The remaining 22 responses reflected either doing the sport differently or trying new strategies. There were no grade or gender differences in these responses.

Ability Beliefs in the Music/Arts Domain

Children were asked questions about four music and arts activities: playing a musical instrument, singing, dancing, and drawing or painting. The frequencies of children's responses are presented in Table 4, along with the results of the chi-square analyses assessing gender and grade differences. There were no significant grade differences in children's responses. The gender effect was significant.

Gender Differences. Both boys and girls selected drawing and painting most often as the activity at which they were best. This was particularly true for boys (see Table 4). In contrast, more girls and far fewer boys than expected said they were either best at dance or at singing. Further, both boys and girls more often selected singing as their worst music and arts activity, but this was particularly true for boys. In addition, more girls but fewer boys than expected said they were either worst at drawing and painting or playing a musical instrument.

Beliefs About Improving Music/Arts Abilities

Similar to results in the previous domains, 84% of the children responded "yes" to the question, Could you get better at (worst activity)? However, more girls than expected (91% observed vs. 84% expected) and fewer boys than expected (77% observed vs. 84% expected) said "yes" in this domain ($\chi^2 = 28.38, p < .001$). There were no grade level differences in children's responses to this question.

Ninety-four percent ($N = 262$) of the children responded positively when asked if they could improve at their worst activity. These children then were asked if they could be best at this activity; 53% (140) said "yes." There were no grade or gender differences in response to this question. These 140 children next were asked what they would do to become the best and could give up to three responses. Approximately 83% of the responses (128/154) reflected doing the activity more, practicing more, and trying to improve some specific skill. The remaining 26 responses (26/154) related to doing the activity differently.

Children's Reasoning About Why Their Abilities Cannot Improve

The next set of analyses focused on children who thought they could not be the best at their current worst activity. The reasons children gave for this belief were examined in each domain. We examined age, gender, and activity differences in children's reasoning in response to this question across the three domains. Table 5 presents the frequency of responses to this question and indicates significant grade, gender, and activity choice differences for each reason given.[1]

Note first that the number of responses to this question is relatively small because few children thought they could not be best at their worst activity. As can be seen in the table, lack of ability was the most frequently mentioned reason in each domain. Lack of effort was the second most common reason given in the academic and music/arts domains. Difficulty of the work, followed closely by low intrinsic value of the task, were the next two most common reasons given in the academic domain. In the sports and music/arts domains, the third most frequent reason children gave was that they had little intrinsic value for doing the activity.

Table 5. Frequencies of Reasons Given in the Three Domains for Why They Couldn't Be Best

	Academic Domain		*Sports Domain*		*Music/Arts Domain*	
	Count	*(%)*	*Count*	*(%)*	*Count*	*(%)*
Why Couldn't You Be Best?						
Lack of Ability	55	(62.5)	71	(64.5)	50	(56.8)
Difficult Work	11[a]	(12.5)	32	(29.1)	0	(–)
Lack of Effort	16	(18.2)	2	(1.8)	19	(21.6)
Poor Instruction	1	(1.1)	0	(–)	0	(–)
Negative Intrinsic	10	(11.4)	9	(8.2)	12[a,b]	(13.6)
Negative Extrinsic	0	(–)	1	(.9)	2	(2.3)
Other	0	(–)	0	(–)	6	(6.8)
No. Children Responding	88		110		88	

Notes: % represents percentage of children who gave that reason at least once given the number of children who were asked the question. Percentages do not add up to 100% because children can be represented in more than one category. Children could give up to 3 possible responses.

[a] Significant ($p < .05$) gender differences in chi-square analyses.

[b] Significant ($p < .05$) grade level differences in chi-square analyses.

One significant grade difference occurred in the music/arts domain. First graders said they could not be the best because they found little intrinsic value in the task more often than expected by chance. Second graders mentioned this reason less often than expected, and the fourth graders gave this reason as often as expected [$\chi^2(2, N = 11) = 5.52, p < .05$]. There were two significant gender differences: (a) girls more often than expected said they could not be the best at their worst academic subject because it was too difficult, whereas boys gave this response less often than expected [$\chi^2(1, N = 10) = 6.24, p < .05$], and (b) boys gave negative intrinsic reasons more often (and girls less often) than expected for why they could not be the best at their worst music/arts activity [$\chi^2(1, N = 11) = 5.02, p < .05$].

Across Domain Comparisons of Children's Ability Beliefs

The next set of results concerns children's responses to questions asked about activities across different domains. Children were asked to indicate which of six different activities they were best at, next best at, and so forth, until all six activities were ranked. The activities were: math, reading, computers, social activities, and both the sport and music/arts activity they had selected as their best in the earlier part of the interview. They then were asked follow-up questions about their choices.

Table 6 presents the frequency of the rankings for all six activities. Sports was ranked most frequently as the activity children thought they did best (396 of 858 children [46%] ranked it the highest), followed by music/arts (15% of the children), computers (12%), social activities (11%), math (8%), and reading (7%). Table 6 also presents the mean level ranking for each activity by gender and grade level. Two-way analyses of variance (ANOVAs) were calculated on these mean level rankings to examine gender and grade differences. Separate two-way ANOVAs

Table 6. Frequency of Rankings and Mean Level Rankings of Children's Perceptions of What They Are Best at, Across Six Activities

Ranking	*Math*	*Reading*	*Computers*	*Social*	*Sports*	*Music/Arts*
1	68	63	101	98	396	132
2	117	108	105	113	206	212
3	148	151	148	132	114	169
4	136	183	143	152	70	177
5	174	195	173	175	46	99
6	222	165	194	194	25	61
Mean Level Ranking[a]						
Grade 1	4.22	3.83	3.62	4.06	2.19	3.07
Grade 2	4.03	3.88	3.76	4.01	2.08	3.26
Grade 4	3.85	4.19	4.38	3.62	2.03	2.93
Girls	4.22	3.61	4.23	3.71	2.43	2.82
Boys	3.88	4.32	3.56	4.12	1.76	3.39
Whole Sample	4.04	3.96	3.90	3.91	2.10	3.10

Note: [a] All mean level differences are significant at $p < .05$ or better except grade level differences for sports ranking. 1 = highest ranking; 6 = lowest ranking.

were performed for each activity because the activity rankings are nonindependent. There were main effects of grade and gender, but no interactions. Grade level differences occurred on all activities except sports. Children in fourth grade reported higher rankings in their abilities for music/arts [$F(2, 838) = 3.78$; $p < .05$], social [$F(2, 838) = 5.39$; $p < .01$], and math [$F(2, 838) = 3.74$; $p < .05$] activities than did first and second graders, but lower rankings in their abilities for computers [$F(2, 838) = 16.16$; $p < .001$] and reading [$F(2, 838) = 5.05$; $p < .01$].

Although both boys and girls ranked a sport activity highest, this ranking was significantly higher for boys than for girls [$F(1, 838) = 54.62$; $p < .001$]. Similarly, although the music/arts activity received the second highest mean level ranking score for both boys and girls, girls ranked this activity significantly higher than did boys [$F(1, 838) = 49.56$; $p < .001$]. Girls also ranked social [$F(1, 838) = 12.42$; $p < .001$] and reading [$F(1, 838) = 49.56$; $p < .001$] activities higher than did boys, whereas boys ranked math [$F(1, 838) = 11.92$; $p < .001$] and computer [$F(1, 838) = 35.06$; $p < .001$] activities higher.

Across Domain Comparisons of Reasoning About Best Activity

The children were then asked how they know they are the best at the activity they selected. Children could give up to three reasons. Feedback about ability was given as a reason 46% of the time (500 of the 1,082 reasons given), followed by positive effort (30% or 322 of the 1,082 reasons), and positive extrinsic value (15% or 165 of the 1,082 reasons).

Chi-square analyses were used to examine grade and gender level differences for the reasons given. First graders were less likely than expected and fourth graders more likely than expected by chance to offer positive intrinsic reasons [$\chi^2(2, N =$

56) = 7.25, $p < .05$] and positive extrinsic reasons [$\chi^2(2, N = 165) = 6.12, p < .05$]. Girls were less likely than expected (and boys more likely than expected) to identify ability reasons for how they know they are best at a particular activity [$\chi^2(1, N = 500) = 2.65, p < .05$].

We then assessed whether these reasons differed depending on which activities the child chose. The frequency of three of the reasons (ability, positive effort, and extrinsic value) differed significantly across activities. Ability reasons [$\chi^2(5, N = 862) = 43.52, p < .001$] were offered more often than expected by chance when children identified their best activity as math or social activities. Ability was given as a reason less often than expected when music was the activity chosen. Positive effort [$\chi^2(5, N = 862) = 60.53, p < .001$] was given less often than expected by chance when math and social activities were chosen, and more often when sports and music were chosen. Finally, positive extrinsic reasons [$\chi^2(5, N = 862) = 28.78, p < .001$] were given more often than expected when music was chosen and less often when sports or computers were chosen.

Beliefs About Improving: Across Domain Comparisons

Children next were asked if someday they could be better at their worst than their best activity, and 66% of the children (571 of 862) said they could be. First (69.7%) and second (71.9%) graders answered this question "yes" more frequently than did fourth graders (55.8%) [$\chi^2(1, N = 862) = 18.53, p < .001$]. A higher percentage of girls (69.9%) than boys (62.6%) answered this question affirmatively [$\chi^2(1, N = 862) = 4.82, p < .05$]. The children answering "yes" to this question were then asked what they would do to improve. Fifty-one percent simply said they would do the activity more (442 of 862 children); 20% said they would do it differently (173 of 862). Although there were no significant grade and gender differences, there were significant domain differences in these two responses. For social activities, the children were more likely than expected to say they would do the activity differently to improve; the opposite was true for math, reading, computers, sports, and music [$\chi^2(5, N = 862) = 147.73, p < .001$]. In contrast, for math, reading, computers, and to some extent sports and music, children were more likely than expected to say they would do the activity more as a strategy to improve; the reverse was true for the social domain [$\chi^2(5, N = 862) = 106.66, p < .001$].

Discussion

We begin this section by considering briefly the general grade and gender differences in ability beliefs. We then discuss the major findings regarding how changeable children think their abilities are. We conclude with some practical implications of the results.

Grade and Gender Differences in Children's Ability Beliefs

Surprisingly, grade differences in children's beliefs about which activities they performed best and worst were not strong in any of the domains, especially the academic and music/arts domains. These results contrast to some degree with the

questionnaire results reported by Marsh (1989), and by Eccles et al. (1993) and Wigfield et al. (1997). In the latter two studies, using this same sample, children's competence beliefs for both math and reading were lower among older than younger children. The different kinds of questions asked could explain why the results were different. The questionnaire data reflect children's beliefs about their abilities within each subject. By contrast, interview data allow us to examine children's comparative sense of their abilities across different subjects; these are quite different kinds of questions. The strongest grade-related differences were in the sports domain. Younger children focused on individual noncompetitive sports as ones at which they were best. Older children focused on team competitive sports. These differences may reflect age differences in participation in these kinds of sports activities.

As predicted, children's ability beliefs for the various activities differed by gender in a culturally stereotyped way, in all of the domains. These gender differences in children's ability beliefs parallel those reported by Eccles et al. (1993), Marsh (1989), and Wigfield et al. (1997) in their questionnaire-based studies of sex differences in children's beliefs. The current results add to those of the earlier studies by specifying more clearly children's perceptions of their incompetence and competence for many different activities in several domains. Results from the sports domain raise important methodological concerns about previous studies that found that girls' global physical competence beliefs were lower than boys' (Harter, 1982; Marsh, 1989). The general nature of the questions asked in these studies may underestimate girls' sense of physical competence. When asked about *specific* sports, girls' beliefs about their ability often are more positive than are those of boys'.

Children's Beliefs About How Much Their Abilities Can Change

The purpose of this study was to build on earlier work regarding the extent to which children think their abilities are modifiable. Nearly all children believed they could improve on their worst activity. This optimism was particularly apparent in the academic and sports domains. Further, contrary to what we expected, there were no grade differences in answer to this question.

We also asked the more stringent question of could children be *best* at their current worst activity. Well over half the children responded positively to this question in the academic and sports domains, and just over half did so in the music and arts domain. These results extend Stipek and Gralinski's (1996) finding that children's beliefs about the stability of intelligence were not activity-specific across the academic subjects of math and social studies. Across the several domains asked about in this study, there was variation in whether children thought their abilities could change. Stipek and Gralinski's results may have occurred because both activities they asked about were academic ones.

On the question of could children be best at their worst activity, we found the predicted grade difference in two of the areas we asked about: sports and across all domains. In both cases younger children were more optimistic than older children that they could improve. It is interesting that the one grade effect regarding a particular domain occurred for sports. Perhaps the growing belief that one cannot become best at all sports underlies the beginning of sports specialization that begins

to occur in later elementary school. The grade differences on the across-domain question suggest that as they become older, children understand that across all the things they do, it is difficult to become best at their worst activities. Yet, many children (even fourth graders) continue to believe such great improvement is possible.

As noted in the introduction, researchers have found that across the elementary school years, children increasingly make dispositional judgments about others as they grow older (see Benenson and Dweck, 1986; Rholes et al., 1990). They also see others' abilities as more stable (or constant), both over time and across situation (Droege and Stipek, 1993; Pomerantz & Ruble, 1997; Ruble & Flett, 1988). At first glance, our results that even the fourth-grade children in our study continue to think their abilities can improve, and that over half of the children think they can be best at their current worst activity, contradict these findings. Differences in the kinds of questions asked may explain the different results, however. First, we only asked children about their own abilities; the other work just cited focused for the most part on children's beliefs about others. Ruble and Flett (1988) also asked the children in their study how constant their own ability was, and found no age differences in this belief. This finding is similar to our findings. These findings may reflect the long-established finding in the adult literature that traits are seen in others before they are seen in ourselves. Benenson and Dweck's (1986) study with children also showed how children use trait labels in making inferences about others' behaviors before they do so for their own behaviors.

Second, our questions did not ask directly about ability. We used terms like *best* and *worst*, that implicate, but do not explicitly address, children's ability beliefs. Children also may have been thinking about improving their performance when answering the questions. Perhaps performance is seen as more modifiable than ability. Researchers like Droege and Stipek (1993), Pomerantz and Ruble (1997), and Ruble and Flett (1988) asked children about smartness, which perhaps more directly captures ability. However, we believe the self versus other difference in the questions is the most crucial one for explaining the different findings.

Our findings regarding whether children think their abilities can change have important consequences for our understanding of the development of children's motivation. Researchers have shown that children's ability beliefs become less positive during the elementary school years (e.g., Benenson & Dweck, 1986; Eccles et al., 1993; Wigfield et al., 1997). Results of the present study, however, show that most children remain surprisingly optimistic about how much their ability can change in different areas, and that many children believe they can become the best at activities in which they currently think they perform poorly. This appears to be true even at the ages in which children are beginning to understand the notions of ability as capacity (Nicholls, 1978) and entity intelligence (Stipek & Gralinski, 1996). The oldest children in this study are somewhat younger than those in Nicholls' (1978) study. It therefore is possible that children older than the ones included in this study would be less optimistic about how much their ability can change. This issue should be addressed in future research.

It also should be noted that some children did not think they could become the best at their current worst activity, and that there were very few grade differences

in this belief. These findings mean that some first-grade children believe they cannot become best at their current worst activity, either within or across domains. Further, the major reason given by children who said they could not be the best at their worst activity was that they lacked ability for the activity; this was true in all three domains and for all three age groups. In Weiner's (1985) attribution model, lack of ability is viewed as one of the least positive attributions for failure because ability is seen as a stable, internal factor. Thus children who believe they cannot be best because of lack of ability (I'm not good at it, I can't do it) may be most at risk for poor performance or failure in these different activities. These findings fit with evidence that some young children display helplessness at unexpectedly young ages (e.g., Cain & Dweck, 1995; Heyman, Dweck, & Cain, 1992; see also Stipek, Recchia, & McClintic, 1992, for research with even younger children). It appears that the motivational die may be cast quite early. Children either think they can improve and continue to think so, or doubt their ability to improve, beginning at quite early ages.

An important issue for future research is to address how the particular learning and activity environments of children influence beliefs about whether abilities can change. Instructional practices and strategies for improving children's motivation vary greatly across different classrooms and schools (see Stipek, 1996; Wigfield, Eccles, & Rodriguez, 1998, for detailed discussion). These practices and strategies can impact how children think about their abilities, and whether they are concerned with improvement or outperforming others (Maehr & Midgley, 1996). Similarly, coaching styles in sports and early exposure to art media and music can impact children's beliefs about their abilities. That many children in this study thought they could improve their performance strongly suggests that their teachers used practices that allowed them to maintain this belief. A limitation of this study is that we did not address this issue directly. The specific links between instructional practices and children's beliefs about their abilities in different areas should be studied in future research.

How Do Children Think They Can Improve?

Another way we built on earlier work was to ask children who thought they could improve how they would do so. In the academic domain, the most frequently given methods were to try harder, to use better strategies, and to seek help. In the sports and music/arts domain and in the across domain comparison, trying harder and using new strategies were mentioned with great frequency. Thus, as work in the attribution theory tradition has shown, putting more effort into an activity is seen as an excellent way to improve performance (see Forsterling, 1985). However, some children realize that effort alone may not be enough; rather, their efforts also must be directed into more efficient strategy use. Children giving this answer may be on their way to becoming sophisticated self-regulated learners (see Zimmerman, 1994). The answer, "doing the activity differently" was more common for math, reading, and computer activities than for social activities. Perhaps children at these ages understand that they must try different things to become better at these skill-based activities, whereas with social activities, simply doing them more may suffice.

These findings have important implications for our understanding of children's motivation. Many children think they can change how they are doing in different areas through more effective effort. As mentioned above, this occurs even as children are developing the "ability as capacity" notion. An important difference between Nicholls' (1990) work on conceptions of ability and Dweck and Leggett's (1988) work on conceptions of intelligence and our work is that we asked about improvement on specific activities rather than about general ability or intelligence. Children may continue to believe they can improve in particular subject areas and in particular activities even if they take an entity view of their intelligence (see also Stipek & Gralinski, 1996).

Implications of the Findings

Our work has a number of educational implications. First, our analyses of gender differences in children's ability beliefs extend previous work to new activity areas. We found that children's beliefs about their abilities continue to differ in gender stereotypical ways, despite the fact that there were few actual performance differences between boys and girls in any of the domains. The most important implication of these results concerns their possible impact on later activity choice. We found that girls think they are worst at computers and science, and boys think they are worst at reading. As specified in Eccles et al.'s (1983) model of achievement choice, children doubting their abilities for certain activities will be less likely to perform these activities as they become older. Teachers and parents must do more to continue to encourage girls and boys in areas in which they doubt their ability. High technology positions will dominate our economy in the next century, and facility with computers and science is crucial for success in this economy. Girls' beliefs that they are least skilled in these areas compared with other activities do not bode well for their full participation in these areas, and this must be changed. For boys, reading is the area of concern. Reading is the foundation for good performance in most other school subjects, and so it is crucial that boys get off to a good start in reading (Slavin, Madden, Karweit, Livermon, & Dolan, 1990). Teachers and parents must monitor children's beliefs about their ability along with their performance and work to maintain children's confidence that they can perform activities in different domains.

Second, our findings indicate that nearly all children think they can improve their abilities, and many children think they can become best at their current worst activity. Much has been written about the decline in the mean level of children's ability beliefs over the elementary school years, with discussion of children's greater realism and (in some cases) pessimism about their abilities. This change is well established in the literature (e.g., see Eccles et al., 1998; Stipek & MacIver, 1989). What our findings add is that even as the level of children's ability beliefs decline, most children continue to think they can improve their skills greatly. These beliefs, coupled with encouragement and appropriate training from teachers and parents, should allow children to continue to improve their skills and abilities. Teachers and parents can build on the knowledge children already seem to have about how to improve: through effort, better strategy use, and changing one's approach to an activity.

Another implication applies to children who do not believe they can improve. Our findings indicate that even some first-grade children already have decided they cannot improve or become best at their current worst activity. The most prevalent reason given by these children is that they lack the ability to do so. Interestingly, more first graders than expected by chance also stated it was because the activity does not interest them. The group of children thinking they cannot become best at their current worst activity is smaller than the group that thinks they can. Yet, this group may be the one most at risk for later difficulties in school; even in the early elementary school years they are pessimistic about their prospects of improvement (see also Heyman et al., 1992). Teachers must pay close attention to how children react to their achievement outcomes. For those children who discourage easily and early in elementary school, teachers must work to instill the belief that improvement is possible through one's efforts. Further, activities must be presented to children in interesting ways so as to engage children in the activities (see Stipek, 1996, and Wigfield et al., 1998, for detailed discussion).

To conclude, this study provides new information about the extent to which children believe they can modify their abilities. The interview measure we used asked children to compare their abilities within and across various domains rather than rating each domain individually. This format more realistically reflects the choices children are faced with daily in terms of how to channel their time and energies. Such choices will have important implications for children's ultimate developmental outcomes. The study of children's activity choice and involvement in different activities remains an important priority for future research.

Acknowledgments: This research was supported by grant No. HD17553 from the National Institute for Child Health and Human Development. The authors thank the principals, teachers, students, and parents of the cooperating school districts for their participation in this project.

NOTE

1. Logit log linear analyses also were computed on all chi-square values in these analyses to examine the relations among gender, grade level, and activity chosen, using the reason given as the dependent variable. Again, in general these models yielded results similar to those obtained by the chi-square analyses. Only limited interaction effects were found, and they were not sufficiently informative to include in this paper. Results of the logit log linear analyses can be obtained from the first author.

REFERENCES

Bandura, A. (1997). *Self-efficacy: The exercise of control.* New York: W. H. Freeman.

Bempechat, S. J., & London, P. (1991). Children's conceptions of ability in major domains: An interview and experimental study. *Child Study Journal, 21*, 11–36.

Benenson, J. F., & Dweck, C. S. (1986). The development of trait explanations and self-evaluations in the academic and social domains. *Child Development, 57*, 1179–1187.

Cain, K. M. & Dweck, C. S. (1995). The relation between motivational patterns and achievement cognitions through the elementary school years. *Merrill-Palmer Quarterly, 41*, 25–52.

Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behavior.* New York: Plenum.

Droege, K. L., & Stipek, D. J. (1993). Children's use of dispositions to predict classmates' behavior. *Developmental Psychology, 29*, 646–654.

Dweck, C. S., & Elliott, E. S. (1983). Achievement motivation. In P. H. Mussen (Ed.), *Handbook of child psychology* (Vol. 4, pp. 643–691). New York: Wiley.

Dweck, C. S., & Leggett, E. (1988). A social-cognitive approach to motivation and personality. *Psychological Review, 95*, 256–273.

Eccles, J. S., Adler, T. F., Futterman, R., Goff, S. B., Kaczala, C. M., Meece, J., & Midgley, C. (1983). Expectancies, values and academic behaviors. In J. T. Spence (Ed.), *Achievement and achievement motives* (pp. 75–146). San Francisco: W. H. Freeman.

Eccles, J. S., Wigfield, A., Harold, R. D., & Blumenfeld, P. (1993). Age and gender differences in children's self and task perceptions during elementary school. *Child Development, 64*, 830–847.

Eccles, J. S., Wigfield, A., & Schiefele, U. (1998). Motivation to succeed. In B. Damon (Series Ed.) & N. Eisenberg (Vol. Ed.), *Handbook of child psychology: Vol. 3. Social, emotional, and personality development* (5th ed., pp. 1017–1095). New York: Wiley.

Forsterling, F. (1985). Attributional retraining: A review. *Psychological Review, 98*, 495–512.

Harter, S. (1982). The perceived competence scale for children. *Child Development, 53*, 87–97.

Heyman, G. D., Dweck, C. S., & Cain, K. M. (1992). Young children's vulnerability to self-blame and helplessness: Relationship to beliefs about goodness. *Child Development, 63*, 401–415.

Maehr, M. L., & Midgley, C. M. (1996). *Transforming school cultures.* Boulder, CO: Westview Press.

Marsh, H. W. (1989). Age and sex effects in multiple dimensions of self-concept: Preadolescence to early adulthood. *Journal of Educational Psychology, 81*, 417–430.

Newman, R. S. (1994). Adaptive help-seeking: A strategy of self-regulated learning. In D. H. Schunk & B. J. Zimmerman (Eds.), *Self-regulation of learning and performance: Issues and educational applications* (pp. 283–301). Hillsdale, NJ: Erlbaum.

Nicholls, J. G. (1978). The development of the concepts of effort and ability, perceptions of academic attainment, and the understanding that difficult tasks require more ability. *Child Development, 49*, 800–814.

Nicholls, J. G. (1984). Achievement motivation: Conceptions of ability, subjective experience, task choice, and performance. *Psychological Review, 91*, 328–346.

Nicholls, J. G. (1990). What is ability and why are we mindful of it? A developmental perspective. In R. J. Sternberg & J. Kolligian (Eds.), *Competence considered* (pp. 11–40). New Haven, CT: Yale University Press.

Nicholls, J. G., & Miller, A. T. (1984). Development and its discontents: The differentiation of the concept of ability. In J. G. Nicholls (Ed.), *Advances in motivation and achievement: Vol. 3. The development of achievement motivation* (pp. 185–218). Greenwich, CT: JAI Press.

Pintrich, P. R., & De Groot, E. V. (1990). Motivational and self-regulated learning components of classroom academic performance. *Journal of Educational Psychology, 82*, 33–40.

Pomerantz, E. M., & Ruble, D. N. (1997). Distinguishing multiple dimensions of conceptions of ability: Implications for self-evaluation. *Child Development, 68*, 1165–1180.

Rholes, W. S., Newman, L. S., & Ruble, D. N. (1990). Understanding of self and other: Developmental and motivational aspects of perceiving persons in terms of invariant dispositions. In E. T. Higgins & R. M. Sorrentino (Eds.), *Handbook of motivation and cognition* (Vol. 2, pp. 369–407). New York: Guilford Press.

Ruble, D. N., & Flett, G. C. (1988). Conflicting goals in self-evaluation information seeking: Developmental and ability level analyses. *Child Development, 59*, 97–106.

Slavin, R. E., Madden, N. A., Karweit, N. L., Livermon, B. J., & Dolan, L. (1990). Success for all: First-year outcomes of a comprehensive plan for reforming urban education. *American Education Research Journal, 27*, 255–278.

Stipek, D. (1996). Motivation and instruction. In D. Berliner & R. Calfree (Eds.), *Handbook of educational psychology* (pp. 85–113). New York: Macmillan.

Stipek, D. J., & Gralinski, J. H. (1996). Children's beliefs about intelligence and school performance. *Journal of Educational Psychology, 88*, 397–407.

Stipek, D. J., & MacIver, D. (1989). Developmental change in children's assessment of intellectual competence. *Child Development, 60*, 521–538.

Stipek, D. J., Recchia, S., & McClintic, S. (1992). Self-evaluation in young children. *Monographs of the Society for Research in Child Development, 56* (1, Serial No. 226).

Weiner, B. (1985). An attributional theory of achievement motivation and emotion. *Psychological Review, 92*, 548–573.

Wigfield, A., & Eccles, J. S. (1992). The development of achievement task values: A theoretical analysis. *Developmental Review, 12*, 265–310.

Wigfield, A., Eccles, J. S., Harold, R. D., Blumenfeld, P., Arbreton, A., Freedman-Doan, C., & Yoon, K. S. (1997). Change in children's competence beliefs and subjective task values across the elementary school years: A 3-year study. *Journal of Educational Psychology, 89*, 451–469.

Wigfield, A., Eccles, J. S., & Rodriguez, D. (1998). The development of motivation in school contexts. In P. D. Pearson & A. Iran-Nejad (Eds.), *Review of research in education* (Vol. 23, pp. 73–118). Washington, DC: American Educational Research Association.

Zimmerman, B. J. (1994). Dimensions of academic self-regulation: A conceptual framework for education. In D. H. Schunk & B. J. Zimmerman (Eds.), *Self-regulation of learning and performance: Issues and educational applications* (pp. 3–21). Hillsdale, NJ: Erlbaum.

Appendix

Note: The following is an excerpt from the interview. Only questions relevant for this paper are included. A copy of the complete interview can be obtained from the first author.

Academic Domain

Interviewer places four picture cards in front of child and says:

Here you see a picture of a boy/girl* reading a book, doing math, figuring out spelling words, and doing science.

Interviewer then asks:

Which of these are you best at?

Which one of these subjects are you not so good at?

Could you get better at _____ (worst activity)?

If child says yes, ask: Could you be one of the best at _____ (worst activity) if you wanted to?

If child says yes, ask: What would you do to be one of the best at _____ (worst activity)?

If child says no, ask: Why not? Why couldn't you be one of the best at _____ (worst activity) if you wanted to?

Physical Domain

Interviewer says:

Let's talk about different things kids do when they play. I'm going to show you some pictures of some different activities and I'd like to know which of these things you do. Do you play (pictures are presented of the following activities; interviewer records if child does activity on interview form and lays out pictures in front of child):

T-ball	football
tennis	kickball
baseball	running
gymnastics	biking

basketball
swimming
soccer
bowling
ice hockey
karate
climbing
jumping rope
roller skating
ice skating
skate boarding

Interviewer then asks:
Of the activities that you do, which of these are you best at?
Which one of these activities are you not so good at?
Could you get better at _____ (worst activity)?
If child says yes, ask: Could you be one of the best at _____ (worst activity) if you wanted to?
If child says yes, ask: What would you do to be one of the best at _____ (worst activity)?
If child says no, ask: Why not? Why couldn't you be one of the best at _____ (worst activity) if you wanted to?

Music and the Arts Domain

Interviewer says:
Let's talk about music and art activities. Which of these activities do you do at home and at school? (Interviewer lays out four picture cards showing children singing, playing several different kinds of musical instruments, dancing ballet and modern dance, and drawing and painting. Interviewer records on interview form if child does activity and lays out pictures in front of child.)

Interviewer then asks:
Of the activities that you do, which of these are you best at?
Which one of these activities are you not so good at?
Could you get better at _____ (worst activity)?
If child says yes, ask: Could you be one of the best at _____ (worst activity) if you wanted to?
If child says yes, ask: What would you do to be one of the best at _____ (worst activity)?
If child says no, ask: Why not? Why couldn't you be one of the best at (worst activity) if you wanted to?

Across Domain Comparisons

Interviewer says:
Now I would like to ask you about all of the activities you've told me about. I'd like to know what activity you think you are the very best in. Here are the pictures of the different activities you told me about. (Interviewer lays out six cards: the reading picture, the math picture, a picture of children at a computer, the sport activity card the child identified as his or her best, a picture of children playing, and the music/arts activity card the child identified as his or her best.)

Interviewer says: Are you best at math, reading, computers, sports like (best at), social activities like making friends or joining a game, or _____ music/arts activity (best at)?
(Interviewer records best activity and removes it from in front of child.)
Interviewer says: Which activity are you next best at?
(Interviewer removes and records until all activities are ranked. Interviewer lays cards out in this order in front of child.)
Interviewer says: How do you know you are best at _____ (best activity)?
Some day could you be better at _____ (worst activity) than at _____ (best activity)?
If child says yes, ask: What would you do to be better at _____ (worst activity)?
If child says no, ask: Why not? Why couldn't you be better at _____ (worst activity) than at _____ (best activity)?

*Note: An artist rendered two sets of pictures: one set depicting a girl and one set depicting a boy involved in the various activities.