School and Family Effects on the Ontogeny of Children's Interests, Self-Perceptions, and Activity Choices

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Why do children choose such different activities and have such different goals? Why do some invest time and energy in developing their intellectual skills while other children, often with comparable intellectual abilities, invest their time and energy in developing physical or musical skills or no particular skills at all?

Why do children with fairly similar grades in school have different opinions of their intellectual abilities and place different value on various activities? Why, for example, do girls develop lower estimates of their math ability and lower math achievement expectancies than boys, even though they get equivalent grades? And why are girls less likely to take advanced math courses when they reach high school?

Why do children's self-perceptions and interests change as they get older? For example, why do many adolescents seem to lose confidence in their intellectual abilities and lose interest in school as they move into secondary school?

These questions, and others like them, lie at the heart of achievement and self-perception theory and have been the focus of our re-

search over the past fifteen years. Using a longitudinal approach, we have studied the determinants of both activity and course choices, as well as actual performance, during the early to middle adolescent years. We have explored children's perceptions of their various abilities and interests and have looked at how these perceptions are affected by experiences at school and at home. This work has demonstrated (1) that perceptions of one's abilities, of the probability of success, and of the value of these competencies are important mediators of activity and course choice and performance; (2) that parents' attitudes, beliefs and perceptions about their children's abilities are critical mediators of children's academic self and task beliefs—more critical in some instances than either the children's own academic performance or classroom experiences; and (3) that changing classroom characteristics have a significant impact on the developmental trajectory of early adolescents' motivational orientation in school, as well as on their self beliefs and task beliefs (see Eccles & Midgley, 1989; Eccles, Midgley, & Adler, 1984; Eccles et al., 1987; Eccles, Jacobs, Harold-Goldsmith, Jayaratne, & Yee, 1989; and Eccles Parsons et al., 1983). This work is summarized here. The chapter focuses on the social contextual influences on the ontogeny of a specific set of motivational constructs—the set associated with the following achievement-related self-perceptions and task perceptions: perceptions of one's competence in achievement-related activities (activities that involve skill acquisition and potential performance evaluation); the value one attaches to competence in these activities; and one's intrinsic interest in these activities. We have documented elsewhere that these constructs are important because they influence individuals' actual involvement and performance in various achievement-related activities (e.g., Eccles, Adler, & Meece, 1984). The chapter is organized around two general themes: individual differences and developmental change. Within each of these major sections, we present a general theoretical framework along with empirical evidence documenting the proposed links. In both of these major sections, evidence is given for family and school influences: family influences are highlighted in the discussion of individual differences; school influences are highlighted in the discussion of developmental changes.

Social Contextual Influences on the Ontogeny of Individual Differences in Motivation

Figure 1 summarizes the major categories of influence discussed in this section. First we discuss how these characteristics have been operationalized in the family context and how they might relate to each other. We present some of our findings in detail to illustrate the relation of parents' specific beliefs and practices to the ontogeny of motivation. These findings will focus primarily on the socialization of gender differences, but we believe that similar processes underlie the ontogeny of other individual differences as well. Then we briefly summarize how these same categories can be used to describe the work on classroom influences.

The Family as a Context for Socializing Individual Differences in Self Beliefs and Task Beliefs and in Activity Choices

COMMUNITY-BASED AND DEMOGRAPHIC CHARACTERISTICS

Sociological work on the relation between social class and school achievement has documented the importance of such factors as family structure, parents' financial resources and education, competing demands on parents' time, community characteristics, and dramatic changes in the family's economic resources in shaping children's motivation (e.g., Coleman et al., 1966; Kohn, 1969; Laosa, 1984; Marjoribanks, 1980; Sampson, in press; Thompson, Alexander, & Entwisle, 1988). Factors such as these are associated both with different parent beliefs and practices and with different opportunity structures in the child's environment. For example, Eccles, in collaboration with Furstenberg, Cook, Elder, and Sameroff, has been studying the relation of family management strategies to neighborhood characteristics. These investigators are interested in how families try to provide both good experiences and protection for their children, especially when the families live in high-risk neighborhoods—neighborhoods with few resources and many risks and hazards. To
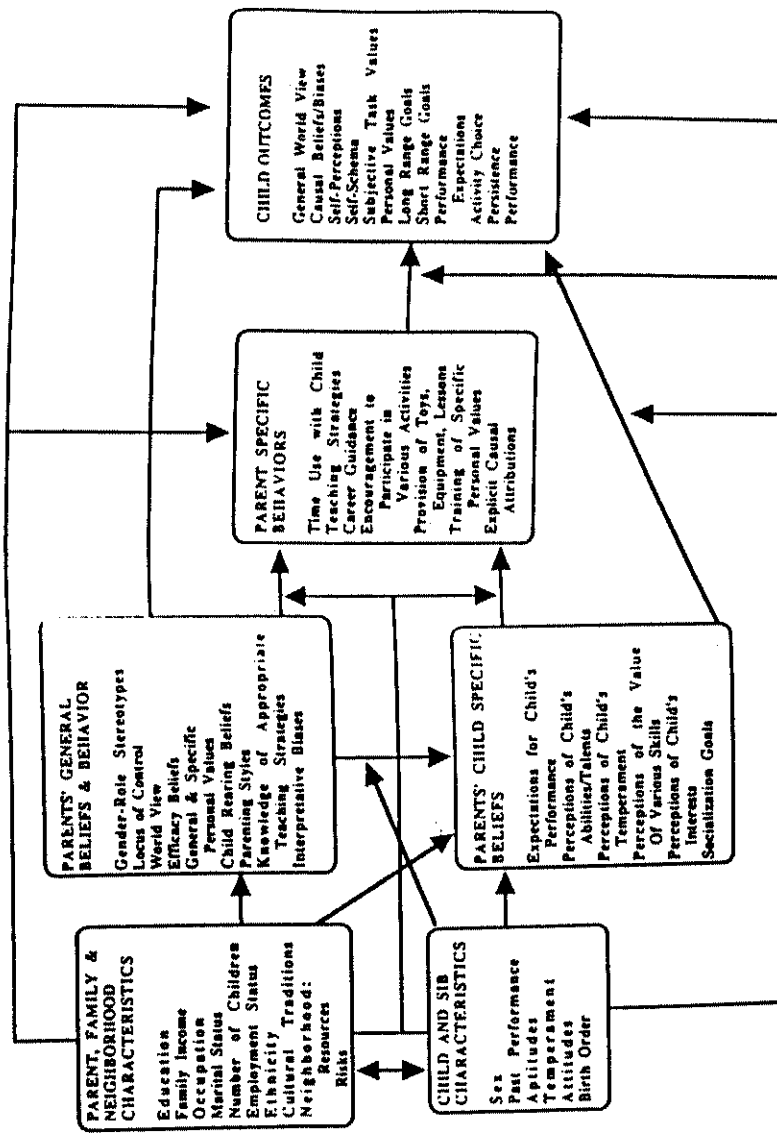
study this issue, they are conducting a survey interview study of approximately 500 families living in high- to moderate-risk neighborhoods in inner-city Philadelphia. Initial results suggest that families who are actively involved with their children's development use different strategies depending on the resources available in their neighborhoods. As one would expect, families living in high-risk, low-resource neighborhoods rely more on in-home management strategies both to help their children develop talents and skills and to protect them from the dangers in the neighborhood; families in these neighborhoods also focus more attention on protecting their children from danger than on helping them develop specific talents. In contrast, families in less risky neighborhoods focus more on helping their children develop specific talents and are more likely to use neighborhood resources, such as organized youth programs, to accomplish this goal—perhaps because such resources are more readily available and accessible and because there are fewer dangers in their neighborhoods. In addition, many families appeared to be quite disengaged from their children's lives, and these highly disengaged families were equally likely to live in low-risk and high-risk neighborhoods (e.g., Eccles, Furstenberg, McCarthy, & Lord, 1992; Furstenberg, 1992).

Demographic and economic factors also influence how successfully parents can translate their general beliefs, goals, and values into effective practices. Several studies suggest that it is harder to do a good job of parenting if one lives in a high-risk neighborhood or is financially stressed (e.g., Elder & Caspi, 1989; Elder, Caspi, & Van Nguyen, 1985; Furstenberg, 1992; Garbarino & Sherman, 1980; McLoyd, 1990; Sampson, in press). Not only do such parents have limited resources available, they also have to cope with more external stressors than middle-class families living in stable, resource-rich neighborhoods. Being confronted with these stressors may force parents to adopt a less effective parenting style because they do not have the energy or the time to use more effective but more demanding strategies. For example, several investigators have found that economic stress in the family (e.g., loss of one's job or major financial change) has a negative affect on the quality of parenting (e.g., Elder, 1974; Elder & Ardelt, 1992; Elder, Conger, Foster, & Ardelt, 1992; Flanagan, 1990a, 1990b; Goldsmith, 1986; Harold-Goldsmith, Radin, & Eccles, 1988). High levels of stress may also hamper

Figure 1.

CHILD OUTCOMES
General World View
Causal Beliefs/Biases
Self-Perceptions
Self-Schema
Subjective Task Values
Personal Values
Long Range Goals
Short Range Goals
Performance
Expectations
Activity Choice
Persistence
Performance

PARENT SPECIFIC BEHAVIORS
Time Use with Child
Teaching Strategies
Career Guidance
Encouragement to Participate in Various Activities
Provision of Toys, Equipment, Lessons
Training of Specific Personal Values
Explicit Causal Attributions

PARENTS' GENERAL BELIEFS & BEHAVIOR
Gender-Role Stereotypes
Locus of Control
World View
Efficacy Beliefs
General & Specific Personal Values
Child Rearing Beliefs
Parenting Styles
Knowledge of Appropriate Teaching Strategies
Interpretative Biases

PARENTS' CHILD SPECIFIC BELIEFS
Expectations for Child's Performance
Perceptions of Child's Abilities/Talents
Perceptions of Child's Temperament
Perceptions of the Value Of Various Skills
Perceptions of Child's Interests
Socialization Goals

PARENT, FAMILY & NEIGHBORHOOD CHARACTERISTICS
Education
Family Income
Occupation
Marital Status
Employment Status
Number of Children
Ethnicity
Cultural Traditions
Neighborhood: Resources, Risks

CHILD AND SIB CHARACTERISTICS
Sex
Past Performance
Aptitudes
Temperament
Attitudes
Birth Order

parents' ability to adapt their parenting strategies to developmental changes in their children's needs. For example, they may either remain too controlling or become too detached as their children move through adolescence, making it more difficult for their children to adapt effectively to this stressful period of life.

General Child-Rearing Climate and General Beliefs

Historically, most studies of parental influence have focused on the impact of general patterns of child rearing on children's overall orientation toward achievement. These studies have related a broad array of general behaviors and beliefs to the development of self-esteem, achievement motivation, locus of control, sense of personal efficacy, and so forth. For example, studies have focused on general emotional warmth and supportiveness in the home (e.g., Estrada, Arsenio, Hess, & Holloway, 1987; Maccoby & Martin, 1984); the timing and magnitude of independence training (e.g., McClelland & Pilon, 1983; Winterbottom, 1958); the valuing of achievement (Hess & Holloway, 1984); general parental child-rearing beliefs and theories, values and goals, as well as specific beliefs, goals, and values linked to sex-role and cultural ideologies (Crandall & Battle, 1970; Crandall, Dewey, Katkovsky, & Preston, 1964; Eccles & Hoffman, 1984; Goodnow, 1988; Goodnow & Collins, 1990; Hess, Chih-Mei, & McDevitt, 1987; Kohn, 1969; McGillicuddy-DeLisi, 1982; Rosen & D'Andrade, 1959; Sameroff & Feil, 1985; Stevenson, Lee, Chen, & Stigler, 1990); general child-rearing style as well as authority structure, discipline tactics, and general interaction patterns (Baumrind, 1971, 1989, 1991; Hess & McDevitt, 1984; Lamborn, Mounts, Steinberg, & Dornbusch, 1991); parental locus of control and personal efficacy (Maccoby & Martin, 1984); communicative style and teaching style (McGillicuddy-DeLisi, 1982; Sigel, 1982); and the quality of organizational management of household activities.

The recent work by Grolnick, Ryan, and their colleagues combines many of these features; they suggest the importance of three general components: involvement, support for autonomous behaviors, and structure (e.g., Grolnick & Ryan, 1989). Within this framework, involvement is defined as "the parents' active interest in the child, knowledge about the child, and dedication of time and re-

sources to the childrearing process"; autonomy support is defined as encouraging "children to figure answers for themselves" and allowing children "some choice and latitude rather than assigning actions to them"; and structure is defined as "the extent to which parents provide clear and consistent guidelines, expectations, and rules for behaviors, without respect to the style in which they are enforced or encouraged" (Grolnick & Ryan, in press).

Although the magnitude of the effects of these various constructs varies by race, sex, socioeconomic class, nationality, and other family and community characteristics, there is consensus that these parental beliefs and practices do affect children's general orientation toward mastery and global self-esteem (Coleman et al., 1966; Hess & Holloway, 1984; Marjoribanks, 1980). What seems important is the right match of control and structure in a warm and supportive environment with positively motivated role models. These results are consistent with three general principles: appropriate scaffolding, good and consistent parenting, and observational learning. Families who know enough about their children to provide the right amount of challenge with the right amount of support seem more likely to produce highly competent and motivated children. Families who provide a positive emotional environment are more likely to rear children who want to internalize the parents' values and goals and therefore imitate the behaviors they model. Finally, children growing up in such homes should be more likely to develop a positive achievement orientation if the parents themselves provide a model of a positive general achievement orientation.

Much less is known about how these general factors might relate to specific behaviors and beliefs across various achievement-related activity domains. This issue, however, is beginning to attract attention. For example, it is one of the central foci of a recent book by Goodnow and Collins (1990; see also Eccles, 1989; Goodnow, 1988; Jacobs & Eccles, 1985). Figure 1 depicts a general overview of how one might think about these interrelationships. It suggests several important questions. First, what is the relation of general parental beliefs and practices to domain and child-specific parental beliefs, values, and practices? For example, do parents' gender-role stereotypes affect their perceptions of their own children's abilities in various activity domains? This will be discussed later.

Second, do cultural beliefs about the nature of ability affect how parents explain their children's successes and failures? Recent work by Hess and his colleagues (e.g., Holloway, Kashiwagi, Hess, & Azuma, 1986; Hess et al., 1987) and by Stevenson and his colleagues (Stevenson et al., 1990) have focused on this question. They have provided consistent evidence that Japanese and Chinese parents make different causal attributions than Euro-American parents for their children's performance on schoolwork: Japanese and Chinese parents are more likely to attribute success at schoolwork to effort and hard work than to natural talent. In contrast, Euro-American parents give natural talent much greater weight. These investigators also suggested that this difference results from a cultural difference in beliefs regarding the nature of ability and competence.

Third, do parents' general developmental theories affect the specific teaching strategies they use with their children? Some of the best work related to this question has been done by Sameroff and by Sigel, McGillicuddy-DeLisi, and their colleagues. McGillicuddy-DeLisi (1982), for example, has shown that fathers' general developmental theories do affect the teaching strategy they use with their children in a specific laboratory setting, though mothers' specific teaching strategies are not related to their general developmental theories to the same extent.

Fourth, are there other factors, such as mental health and social support, that influence parents' beliefs and practices? Evidence from the depression literature suggests that parents who are depressed feel less efficacious in implementing their parenting goals (see Elder & Ardelt, 1992). Similarly, work on the impact of neighborhoods and of economic stress suggests that these demographic characteristics may affect parenting through their influence on the parents' mental health and social support networks (e.g., Elder & Ardelt, 1992; Elder et al., 1992; Goldsmith, 1986; Harold-Goldsmith et al., 1988; McLoyd, 1990).

Fifth, how do general beliefs and practices interact with more specific practices in shaping children's preferences and beliefs? Are the effects of the parents' general beliefs on their children's development mediated primarily by their impact on specific practices and beliefs, or do these general beliefs and practices have substantial direct effects themselves? If so, do general beliefs particularly influence some types of motivational outcomes while specific beliefs and

practices have more influence on other outcomes? One might predict, for example, that parents' general beliefs and practices will affect traitlike aspects of motivation, whereas specific beliefs and practices are more likely to affect the specific domains in which the traitlike characteristics are manifest.

Finally, what is the relation of these general beliefs and practices to children's integration of self and task beliefs in the process of maintaining self-esteem over time and in response to experiences outside the home? For example, what happens when a child finds out he or she either does not want to or cannot fulfill the parents' goals? Or what happens when children discover their peers have a different set of general beliefs than their parents do?

ROLE MODELS

Experimental research has established the importance of adults' behavior as a standard or model for children's behavior. "Observational learning" has been suggested as one of the mechanisms accounting for the efficiency with which children absorb a variety of social norms (cf. Bandura & Walters, 1963; Parsons, Adler, & Kaczala, 1982). There are several ways parents as models might influence their children's attitudes toward various activities. At the most basic level, they could influence their children's attitudes simply by engaging in different pursuits. If children want to be like their parents, they are likely to place high value on the activities their parents value. Similarly, within a family, boys and girls may develop differential preferences as a result of sex differences in the behavior patterns of their mothers and fathers. Status-attainment models of occupational choice provide good support for this type of effect (e.g., see Marjoribanks, 1980).

Parents might also influence children's beliefs through the messages they provide about their own abilities and preferences. For example, if mothers and fathers differ in their estimates of their own intellectual or athletic abilities, then boys and girls might develop different ability self-concepts and different preferences by incorporating their parents' beliefs into their own self-perceptions (Eccles Parsons et al., 1983). We know of few studies that have assessed these hypotheses. Our own work (Parsons, Adler, & Kaczala, 1982)

suggests that parents have less of an effect on their children's academic beliefs as role models of math achievement than as interpreters of their children's experience. But this work has been done only within the academic achievement domain and only among families with a narrow range of variation in parents' self-perceptions and interests. The role modeling effect of parents may be more evident when we look at younger children and a wider range of activities and families.

Role models outside the home are also likely to influence children's interests and self-perceptions. Observing powerful others engage in a particular activity or behavior increases the likelihood that a child will imitate the behavior or seek out the activity (Bandura & Walters, 1963). These powerful others can engage either in positive or in risky or less desirable behaviors and activities. Neighborhoods, and particular schools, for example, differ in the prevalence and salience of positive and negative role models. Parents must deal with the possible influence of such role models on their children. Very little research has looked at how they go about managing this aspect of their children's experience and what distinguishes effective parents from less effective ones.

SPECIFIC BELIEFS, VALUES, AND PERCEPTIONS: PARENTS AS INTERPRETERS OF REALITY

Parents hold a variety of specific beliefs about their children and about more general things such as the nature of talent. We assume these beliefs affect both parents' behavior vis-à-vis their children and the type of messages parents give as they help their children interpret their own experiences. Therefore we think it is important to understand these beliefs. Although work is just beginning in this area, the following parental beliefs and interpretative processes seem most promising: (1) parents' causal attributions concerning their children's performance in each domain; (2) parents' perceptions of the difficulty of various tasks for their children; (3) parents' expectations for their children's probable success at the task and their confidence in their children's ability; (4) parents' view of the value of the task for each particular child and the extent to which they believe they should encourage their children to master various

tasks; (5) parents' achievement standards for their children for activities from each domain; (6) parents' beliefs regarding the stability of low competence and the strategies for increasing competence in various domains; (7) parents' beliefs about the origin of individual differences in competence in various domains; and (8) parents' beliefs about the external barriers to success for each child and about effective strategies to overcome these barriers as well as their own ability to implement these strategies for a particular child.

We assume that parents convey these beliefs to their children in a variety of ways. For example, they may make causal attributions concerning their children's performance—praising them for that A in math by pointing out either their natural talent or their great diligence. Similarly, they may make statements about the origins of individual differences in competencies in various domains—statements such as "You have to be born with math talent" or "Anyone can be good at sports if they just work hard enough." They also form impressions of their children's competencies and may communicate these impressions in both overt and subtle messages; for example, by explicitly telling children what they are good at or more subtly by encouraging or discouraging particular activities.

These messages do influence children's developing self beliefs and task beliefs. Evidence from several investigators suggests that parents' estimates of their children's academic abilities are important predictors of children's own self and task beliefs (Parsons et al., 1982; see also Alexander & Entwisle, 1988; Entwisle & Baker, 1983; Miller, Manhal, & Mee, 1991). In our earlier work, for example, parents' perceptions of their children's math ability had a significant effect on the children's view of their own math ability that was independent of the impact of their actual performance on both the parents' and children's perceptions (Parsons et al., 1982).

We have now replicated this effect in the Michigan Study of Adolescent Life Transitions (MSALT), a longitudinal study of adolescent development in the context of the family and the school. In 1983, approximately 2,000 sixth graders were recruited into this study. About 1,000 of their mothers also agreed to participate. (About 600 fathers participated too, but their data are not presented here owing to space limitations; their results mirror the findings based on the mothers' data.) These families represent a wide range of socioeconomic backgrounds. Parents were asked a series of ques-

tions regarding their perceptions of their children's competency and their expectations for the child's performance in math, English, and sports. All scales reported in this chapter had several items, and all scales had good reliabilities (Cronbach alphas > .65) and good predictive validity (see Parsons et al., 1982, for predictive validity information). In this chapter we present findings from the first two years of this study, when the children were in the sixth and seventh grades.

One of the path analyses we performed to test the relation of mothers' perceptions of their sixth-grade children's abilities to the children's own self-perceptions is shown in Figure 2. Although this figure illustrates the results for boys, the effects for girls are virtually identical. As you can see, mothers' ratings of their children's abilities in math and English are related to the teachers' ratings of the children's math ability. But more important, the parents' view of their children's ability in both math and English had an important predictive relation to the children's own self-perceptions (Eccles et al., 1989). Furthermore, we have tested the causal direction implied in this relationship using longitudinal cross-lagged panel analyses, done with structural equation modeling as specified by Rogosa (1979). The results for the math domain are illustrated in Figure 3 (similar results hold for the sports domain as well). The findings are consistent with the hypothesized causal direction. Clearly, parent and child perceptions are reciprocally related. Nonetheless, mothers' perceptions of their children's ability at this age do appear to influence change over time in the children's self-perceptions more strongly than vice versa (Eccles, Jacobs, et al., 1991, in press).

The path analysis shown in Figure 2 suggests two other important conclusions. First, mothers' perceptions of their children's math abilities also predict the children's interest in doing mathematics. Second, there is a negative effect of mothers' perceptions of their children's English ability on the children's perceptions of their own math ability. Individuals use a variety of information in making an inference about how good they are in various domains. We have suggested, for example, that they compare their relative performance across domains and generate a hierarchy of ability perceptions from these internal self-comparisons, that is, they decide they are very good at math because they do better, and find it easier to do better, at math than at other school subjects (Eccles, 1987; Eccles
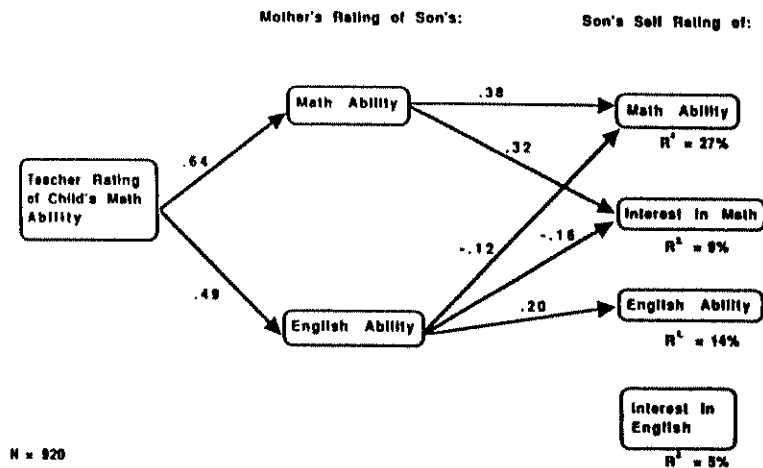
FIGURE 2: Mothers' influence on sons' self-perceptions. This is a path analysis using sequential columnwise multiple regression. Coefficients are standardized. N is approximately 900. Sons are in the sixth grade. Comparable results were obtained for daughters.

Parsons et al., 1983; see also Marsh, 1990). The results depicted in Figure 2 suggest that a similar phenomenon may characterize the impact of mothers' perceptions of their children's abilities on the development of the children's self-perceptions. If their mothers think they are very good in English, the children in this study have a lower estimate of their math ability than one would predict given their teachers' and their mothers' rating of their math ability. These findings suggest two conclusions: (1) mothers form, and communicate, a hierarchical view of their children's relative abilities, and (2) where math falls in this hierarchy has an impact on the children's conclusions regarding their math ability independent of their mothers' absolute assessment of it.

The messages parents provide regarding the value they attach to various activities should also influence their children's motivation. There are some data suggesting that parents convey differential task values through explicit rewards and encouragement for participating in some activities rather than others. For example, parents, teachers, and counselors are all more likely to encourage boys than girls to pursue math-related interests (see Eccles & Hoff-
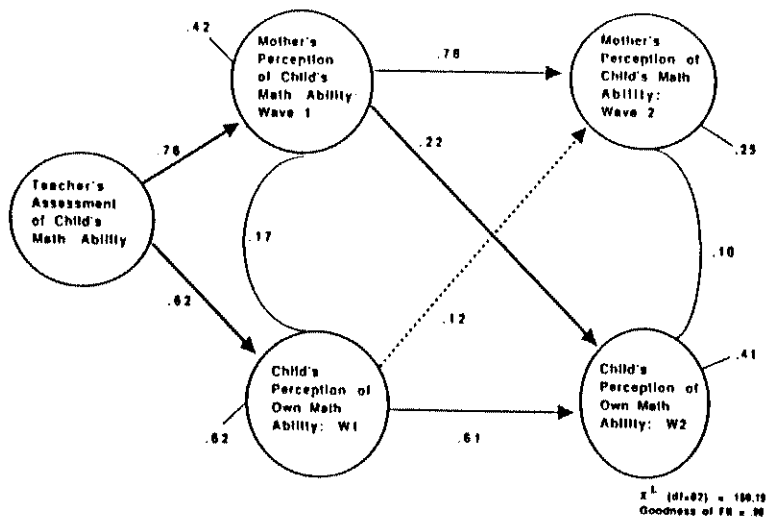
FIGURE 3: Cross-lagged structural equation model of causal directions and mediating influences on mothers' perceptions on sons' self-perceptions for the domain of mathematics. Measurement model coefficients have been omitted. Coefficients were generated with LISREL VI. *N* is approximately 900. Sons are in the sixth grade. Comparable results were obtained for daughters.

man, 1984). But whether this encouragement directly affects either the value the children attach to math or their participation in math activities has not been established. Our own work suggests rather weak relations between the values parents and adolescents place on math (Parsons, Adler, & Kaczala, 1982). Such relationships may be stronger for younger children and when a wider range of activities are included. The relationship may also be curvilinear. Work in the area of intrinsic motivation suggests that excessive attempts to influence children's interest in a specific activity can backfire and lead to a decrease in their interest and involvement (e.g., Deci & Ryan, 1985; Lepper & Greene, 1978).

We are also interested in the potential link between parents' activity-value hierarchy and children's general self-esteem. William James (1892/1963) suggested that perceptions of one's competence in a particular domain should influence one's self-esteem only if that

particular domain is highly valued. A similar case has been made by Harter (1985, 1986). Extending this idea to more than one activity domain suggests that we need to know the hierarchy of a person's subjective task values as well as the hierarchy of her or his competence perceptions if we are to understand the link between competency self-perceptions and self-esteem. If James is correct, then children with high self-esteem should have congruent hierarchies for their competency assessments and their subjective task values. In contrast, children with discrepant hierarchies (that is, children who feel relatively incompetent at those activities that are relatively high in their task-value hierarchy) are likely to be at risk for low self-esteem. Individuals may protect their self-esteem over time by lowering the value they attach to those activities that they feel relatively less competent doing. For example, they may cope with being relatively incompetent in tennis by concluding that being good at tennis is not very important. But what happens when an individual cannot use this ego-protective strategy? For example, what happens if a child's parents' activity-value hierarchy is so rigid they do not adapt it to fit well with their child's strengths and weaknesses? In this case, the children should be at high risk for developing low self-esteem because their social environment will make it difficult for them to protect their self-esteem by lowering the value they attach to those activity domains that they feel relatively less "competent" doing.

Influences on the ontogeny of parents' perceptions of their children's competencies and interests. How do parents form their impressions of their children's abilities and interests? We have already noted that they appear to rely heavily on objective feedback, such as school grades. But it is also quite possible that their more general beliefs—beliefs linked to their culture or to their gender-role beliefs—play a role. Parents' gender-role stereotypes, for example, might lead them to distort their impression of their children's competencies in a stereotypic manner. We know, for example, that parents' perceptions of their children's abilities in math are related to the children's gender, despite the fact that gender differences in performance in mathematics are quite small and do not emerge with great regularity before secondary school. We have now replicated this effect in the Michigan Study of Adolescent Life Transition Study (MSALT) and have shown gender-role-congruent differences in

these parents' perceptions of their children's ability in English and sports as well. These results are summarized in Table 1.

We have also replicated the results with a much younger sample in the Michigan Study of Middle Childhood, a four-year longitudinal study of the development of elementary-school-aged children, again in the context of the family and the school. In 1986 approximately 600 children and their families were recruited into this study. The children were in either kindergarten, first grade, or third grade at that time. The data summarized here were collected in the first year of the study (1987). We used scales and items similar to those in the MSALT study. The results for how children's sex affects parents' perceptions of the children's abilities and interests in math, reading, and sports are summarized in Table 1. Gender-role stereotypic differences emerged for both reading and sports. Parents of daughters rated their children as more competent in reading than parents of sons, and vice versa for sports. However, the children's sex did not significantly affect the parents' perceptions of the children's mathematical competence. Apparently this sex-of-child effect does not emerge until the children are somewhat older.

Why do these sex-of-child effects characterize parents' perceptions of, and goals for, their children? Many explanations have been offered to account for the gender-role stereotyping of people's ratings of males' and females' competencies in various domains. The most critical issue for this chapter is how far parents' stereotypical perceptions of their children either are accurate or reflect, at least in part, perceptual bias. It is true that parents' perceptions of their children's competence in academic subjects are highly correlated with indicators of the children's performance and achievement, such as school grades and standardized test scores (Alexander & Entwisle, 1988; Parsons, Adler, & Kaczala, 1982). But are the sex-of-child effects in their perceptions a reflection of "true" sex differences in either talent or competence? This question is difficult to answer because females and males are treated so differently by their parents and their peers from very early in their lives. Consequently it is impossible to get a good indicator of natural talent that is not influenced by the processes associated with gender-role socialization—the very processes we are trying to document. For example, can we conclude that parents' gender-role-stereotyped perceptions of their six-year-old children's talent in sports are accurate if we find that the male

Table 1
Sex-of-Child Effects on Parents' Perceptions

	Math			English/Reading			Sports		
Variables	Means Girls	Means Boys	F	Means Girls	Means Boys	F	Means Girls	Means Boys	F
Adolescent Transition Study[a]									
Parents' perception of current competence	5.45	5.40	< 1.00	5.65	4.99	101.71***	4.64	5.22	25.75***
Parents' perception of task difficulty	4.10	3.80	12.10***	3.73	4.24	39.20***	3.77	3.47	13.21***
Parents' perception of natural talent	4.76	5.01	9.85	5.03	4.51	46.76***	4.22	4.87	59.76***
Parents' perception of future performance	5.36	5.34	< 1.00	5.59	5.02	74.99***			
Parents' perception of performance in career	5.17	5.42	11.17***	5.41	4.87	54.91***			
Parents' perception of importance	6.38	6.50	9.21**	6.34	6.34	< 1.00	3.80	4.10	12.90***
Middle Childhood Development Study[b]									
Parents' perception of current competence	5.38	5.34	< 1.00	5.67	5.27	10.28***	4.50	4.98	16.41***
Parents' perception of task difficulty	2.08	2.02	< 1.00	1.64	2.01	8.33***	2.57	2.15	11.71***
Parents' perception of natural talent	5.01	5.15	1.45	5.41	5.11	7.00*	4.31	4.74	12.35***
Parents' perception of future performance	5.99	5.91	< 1.00	6.36	5.95	19.13***	5.02	5.52	19.91***
Parents' perception of importance	6.26	6.46	8.12**	6.65	6.63	< 1.00	4.20	4.72	20.00***

[a]Mothers of sixth graders, approximate N = 900.
[b]Parents of kindergarteners, first graders, and third graders, approximate N = 500.

*p < .05. **p < .01. ***p < .001.

children do, indeed, perform better than the female children on a standardized test of athletic skill at this age? Not really, because it is quite likely that the female and male children have already had different opportunities to develop their athletic skills. The best we can do at this point is to use the strategy proposed by Jussim (1986, 1989). This strategy involves assessing how closely the perceiver's judgments are related to the variables of interest (in this case the child's gender) after controlling for the possible association between the perceiver's judgment and more objective indicators of the child's actual performance level. If they are closely related, then we can begin to try to identify the mediating cognitive processes that account for the biased portion of these perceptions (i.e., the portion not due to actual differences in the performance levels of girls and boys).

In both our own work (see Parsons, Adler, & Kaczala, 1982; Eccles & Jacobs, 1986) and the work of Entwisle and her colleagues (see Alexander & Entwisle, 1988), it is clear that parents' perceptions of their children's competence in mathematics are influenced by the children's sex independent of their actual performance in mathematics. Comparable results appear to characterize other activity domains as well. For example, Jacobs and Eccles (in press) have found that a child's sex has an independent influence on parents' ratings of their sixth-grade children's athletic talent after controlling for the teachers' ratings of it. Thus it appears that something in addition to overt performance is influencing the formation of parents' perceptions of their children's competence in both math and sports. What might these factors be? This chapter presents evidence for two possible influences: (a) differential causal attributions—parents may attribute their children's performance to different causes, leading them to different conclusions regarding their daughters' versus their sons' "talents"; and (b) generalization of gender-role stereotypes—parents may generalize their category-based, gender-role stereotypes to their target-based judgments of their own children's competence.

Causal attributions. According to attribution theory (Weiner, 1972; Weiner et al., 1971), perceptions of another person's competence depend on the causal attributions made for the person's performance. If parents of boys make different attributions for their children's math performance than do parents of girls, it follows that these par-

ents should develop different perceptions of their children's math competence. In a test of this hypothesis, Yee and Eccles (1988) found that parents of boys rated natural talent as a more important reason for their children's math successes than did parents of girls. In contrast, parents of girls rated effort as a more important reason for their children's math successes than did parents of boys (see also Holloway & Hess, 1985). In addition, to the extent that the parents attributed their children's success in mathematics to effort, they also rated them as less talented in mathematics. Conversely, to the extent that they attributed their child's success in mathematics to talent, they also rated them as more talented. Thus it appears that the gender-role-stereotyped attributions parents make for their children's performance may be important mediators of the parents' gender-differentiated perceptions of their math competence.

The sixth-grade data from MSALT provide a direct test of this conclusion. The mothers in this study were asked to imagine a time when their children had done very well in mathematics, reading, and sports and then to rate, on a seven-point Likert scale, the importance of the following six possible causes in determining this success: natural talent, effort, task ease, teacher help, parent help, and current skill level. Significant sex-of-child effects were obtained on attributions of success to natural talent in each domain; the pattern of these differences reflects the gender-role stereotyping of the domains: sons' successes in math and sports were more likely to be attributed to natural talent than daughters', while daughters' successes in English were more likely to be attributed to natural talent than sons'. These results confirm our earlier evidence of stereotypic sex-of-child effects on mothers' causal attributions.

To test the mediation hypothesis directly, we did a series of regression analyses on those mothers' perceptions that yielded a significant sex-of-child effect in each domain. Support for a mediational hypothesis consists of demonstrating that the relation between variables A and C is reduced or eliminated when the hypothesized mediating variable B is entered into the regression equation. We used a path-analytic procedure to test this effect. The results for math are illustrated in Figure 4; all significant paths ($p < .05$) are shown. Consistent with the mediational hypothesis, Figure 4 shows that the significant relation of child's sex to the relevant parent outcome variables reported in Table 1 (parents' perceptions of a child's natural
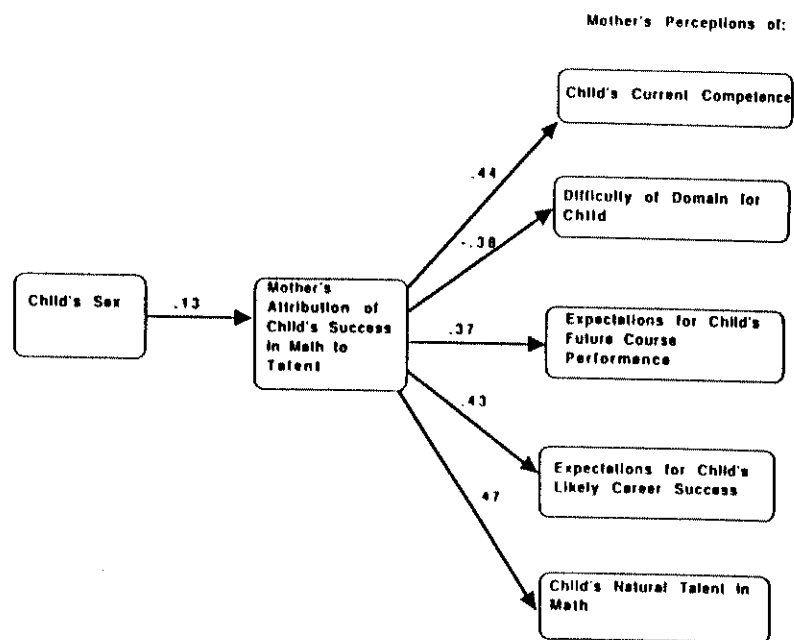
Mother's Perceptions of:

FIGURE 4: Path analysis testing mediating role of mothers' causal attributions of success to math talent. This path analysis uses sequential columnwise multiple regression. Coefficients are standardized. N is approximately 1,800. Children are in the sixth grade.

math talent, the difficulty of math for the child, and their expectations regarding the child's likely future success in both math courses and a math-related career) are no longer significant once the relation between the child's sex and the parents' attribution of the child's math success to talent are controlled (i.e., all the direct paths from the child's sex to the parent perception variables displayed in the far right column are nonsignificant). Comparable results for the talent attribution emerged in both the reading and sports domains. As predicted, children's sex influenced their mothers' causal attribution in each of these domains, which, in turn, influenced the mothers' perceptions of their children's talent. In these domains, however, we still found evidence of a direct effect of child's sex on parents' perceptions, even though the size of this effect was significantly reduced by including the mothers' causal attribution in the path analysis.

These data provide good preliminary support for the hypothesized biasing effect of causal attributions on parents' perceptions of their children's competencies. However, it is important to note that these beliefs are all highly interrelated, and the data are correlational in nature. The consistency of the findings across domains indicates that the relationships are reliable, but their actual causal direction is still at issue. We are just beginning the longitudinal analyses necessary to pin down the predominant causal directions of influence among these various beliefs; preliminary analyses support the direction illustrated in these figures: Causal attributions at time 1 do appear to influence parents' perceptions of their children's ability at time 2 (one year later) after controlling for the parents' time 1 perceptions of their children's abilities.

Biasing influence of gender-role stereotypes. We have hypothesized that parents' gender-role stereotypes regarding the extent to which males or females, in general, are likely to be more talented in a particular domain affect their perceptions of their own children's ability in this domain, leading to a distortion in the parents' perceptions of their ability in the gender-role-stereotyped direction (see Eccles, 1984; Eccles Parsons et al., 1983; Jacobs, 1987; Jacobs & Eccles, 1985). Evaluating this hypothesis requires testing two specific subhypotheses: (1) the impact of children's gender on parents' perceptions of their ability in any particular domain will depend partially on the parents' gender-role stereotypes regarding ability in that domain; and (2) this effect will be significant even after one has entered an independent indicator of the children's actual level of competence in the domain as a control. We have begun to test these hypotheses (see Jacobs, 1987, 1991; Jacobs & Eccles, in press). As reported earlier, parents hold gender-differentiated views of their children's academic and nonacademic abilities at a very early age, and these beliefs are more gender-differentiated than are objective indicators of the children's actual performance in these domains (e.g., Alexander & Entwisle, 1988; Eccles et al., 1989; Eccles & Harold, 1991; Jacobs & Eccles, 1985). But are these beliefs related to parents' more general gender-role stereotypes? The critical issue is not whether parents, on the average, give gender-differentiated estimates of their children's abilities. Instead, the issue is whether parents who endorse the culturally dominant gender-role stereotype

regarding the distribution of talent between males and females dis-
tort their perception of their own children's abilities in a direction
that is consistent with their gender-role stereotype to a greater ex-
tent than parents who do not endorse the stereotype. Evidence from
both our studies supports this hypothesis.

In the Michigan Study of Middle Childhood, mothers were
asked who they thought was naturally better at mathematics, read-
ing, and sports—boys, girls, or neither. They were also asked on a
separate questionnaire to state how much natural talent their chil-
dren had in each of these three domains and how important they
thought it was for them to be good in each domain. The interaction
of children's sex with the parents' category-based gender-role ste-
reotypes in predicting the parents' ratings of their own children's
competency was tested in each domain. All nine interactions were
significant at $p < .01$ (Eccles et al., 1989). The results for mathematics
are particularly interesting. As you may recall, on the average the
sex of their children did not affect these mothers' perceptions of ei-
ther the children's math talent or the difficulty of math for them. But
the children's sex did affect their rating of the children's competence
in math when it was included in an interaction term with their gen-
der-role stereotype of mathematical competence. As predicted,
mothers who believed that males are naturally more talented in
mathematics also rated sons as having more math talent than
daughters; in contrast, the sex-of-child effect was not significant for
those mothers who believed that males and females are equally
likely to be talented at mathematics. Similar results were obtained
for the importance ratings (Eccles et al., 1989, 1991, in press). Similar
gender-role stereotypic effects characterized the mothers' reports on
their children's talent in sports and English. Although it is possible
that these effects are due to the impact of objective gender differ-
ences in the children's performance on the mothers' general gender-
role stereotypes rather than vice versa, the extreme stability of gen-
der-role stereotypes across time in a variety of populations makes
this an unlikely alternative interpretation.

Jacobs and Eccles have more fully explored these effects in the
domains of math and sports using data from the Michigan Study of
Adolescent Life Transitions (Jacobs, 1987; Jacobs & Eccles, in press).
Using path-analytic techniques, we tested the interaction of the sex
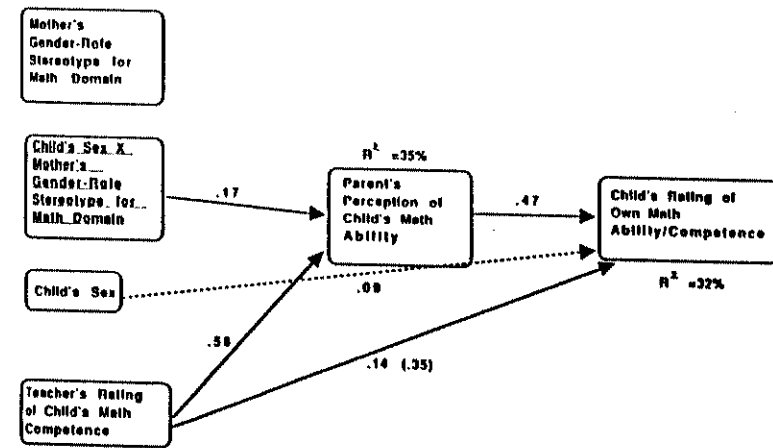of one's child and one's category-based gender-role stereotypes on

FIGURE 5. Path analysis showing moderating influence of mothers' gender-role stereo-
types for the math domain on the effect of children's sex on mothers' perceptions of
their abilities in math. This path analysis uses sequential columnwise multiple regres-
sion. Coefficients are standardized. N is approximately 1,800. Children are in the
sixth grade.

mother's perceptions of their children's ability, controlling for the ef-
fect of an independent indicator of the child's actual ability level (the
teacher's rating). The model tested is shown in Figure 5, which illus-
trates the results for the math domain. Comparable results charac-
terized the sports and social domains (see Jacobs & Eccles, in press).
The interaction term was created so that a positive coefficient indi-
cates that the mother was distorting her impression of her child in
the gender-role appropriate direction. That is, if she was talking
about a son, her perception of her child's ability was higher than
would have been predicted using only the teacher's rating; in con-
trast, if she was talking about a daughter, her perception was lower
than would have been predicted using only the teacher's rating.

Once again the data are consistent with our hypothesis. The in-
teraction term is significant, and the coefficient is positive. Thus, to
the extent that these mothers endorsed the traditional gender-role
stereotypic belief that males are naturally better than girls in math
and sports, they distorted their perception of their children's com-
petence in the gender-role stereotypic direction. In addition, con-

sistent with the findings of Parsons, Adler, and Kaczala (1982), the mothers' perceptions of their children's competence in each domain had a significant influence on the children's own self-perceptions even after their actual performance in each domain was controlled. These results provide support for the hypothesis that general gender-role-stereotyped beliefs lead to a bias in parents' perceptions of their own children's competencies. Given the extensive exposure parents have to their children's actual performance levels, we would not expect the biasing effects to be large, and they are not. Nevertheless, the effects are both reliable and consistent across several activity domains, and they do appear to influence children's own self-perceptions in a manner consistent with the self-fulfilling prophecy hypothesis.

Evidence from these studies thus suggests that both parents' causal attributions for their children's successes and parents' category-based gender-role stereotypes lead to perceptual bias in their impressions of their children's competencies in gender-role-stereotyped activity domains. Although parents' perceptions of their children's competencies in various domains are strongly related to independent indicators of actual competence in these domains, the evidence clearly indicates that such perceptions are also influenced by the children's sex and by the parents' gender-role-stereotyped beliefs about which sex is naturally more talented in these domains. Furthermore, the evidence supports the conclusion that these influences are independent of any actual differences in the children's competencies. Thus our findings suggest that perceptual bias is operating in the formation of parents' impressions of their children's competencies in gender-role-stereotyped activity domains.

Other specific external factors should also affect the impressions parents form of their children's competencies. For example, teachers should play an important role. We have already noted that parents' perceptions of their children's academic abilities are strongly related to the grades teachers give them. But how teachers communicate and involve parents should also affect parents' and children's beliefs. Cultural factors, such as ethnic and religious heritage as well as their culture's view of the world should also affect parents' perceptions of their children.

In summary, in this section we have provided examples of how parents' general beliefs can affect their specific perceptions of their

children. We have also shown how other types of experience can affect the ontogeny of these perceptions. In the next section we discuss how these specific and general beliefs affect parents' behaviors vis-à-vis their children.

PROVISION OF SPECIFIC EXPERIENCES AT HOME

Parents' behavior can influence their children's interests and activity choices in a number of ways. One way is through the pattern of reinforcements they provide for engaging in various behaviors. Negative reinforcement, especially, is likely to decrease the likelihood that the child will engage in the activity in the future. The effect of positive reinforcement is less clear. There is clear evidence that excessive positive reinforcement that is not linked to the quality of the child's performance can undermine children's intrinsic motivation for the activity and decrease the likelihood that they will engage in it in the future (e.g., Deci & Ryan, 1985).

Parents may also influence the ontogeny of their children's self and task beliefs by the things they do with them and by the types of experiences and toys they provide. In most families parents and children do many things together. It seems likely that parents' general and specific beliefs are related to which particular activities they choose and which experiences they try to provide for their children. For example, Katkovsky, Crandall, and Preston (1964) found that parents who value intellectual competence are more likely to become involved in their children's intellectual pursuits. Several studies have shown that parents' involvement in reading to their children and providing reading materials in the home predicts children's later reading achievement (e.g., Dix, 1976; Durkin, 1966). This work suggests that parents' involvement with their children and their attitudes toward the children's achievement have important consequences for achievement motivation and behavior. More recent confirmation of the importance of parents' involvement comes in the work of Grolnick and Ryan (e.g., 1989). Furthermore, these investigators have been able to show that the impact of parents' involvement on children's motivation is likely to be mediated by children's perceptions of their parents' behavior (Grolnick, Ryan, & Deci, 1991).

The socialization of gender roles provides a good example of these processes. It is likely that the sex differences we see in children's competencies, self-perceptions, interests, and aspirations result in part from sex differences in the types of experiences parents provide for them (Huston, 1984). For example, we have shown that parents have gender-role-biased perceptions of their children's competencies. Proponents of a self-fulfilling prophecy view of the socialization of gender differences would argue that these differences in parents' perceptions set in motion a series of events that ultimately create the very differences the parents originally believed to exist. But few studies have looked at the link between the experiences provided by parents and parents' beliefs. Our recent work has investigated how this differential provision of experiences is linked to general and specific beliefs, particularly with regard to gender-role socialization. The evidence suggests that general gender-role beliefs influence perceptions of individual children's competencies and interests, which in turn affect the kinds of experiences parents provide. This sequence is illustrated in Figure 6, which shows the theoretical model we have used to address this question. Essentially, we believe that parents' gender-role stereotypes, in interaction with their children's sex, affect the following mediators: (1) parents' causal attributions for the children's performance; (2) parents' emotional reaction to their children's performance in various activities; (3) the importance parents attach to their children's acquiring various skills; (4) the advice parents provide their children regarding involvement in various skills; and (5) the activities and toys parents provide. In turn, we predict that these subtle and explicit mediators influence the development of the following child outcomes across the various gender-role-stereotyped activity domains: (1) children's confidence in their ability; (2) children's interest in mastering various skills; (3) children's affective reaction to participating in various activities; and as a consequence of these self and task perceptions, (4) the amount of time and type of effort the children end up devoting to mastering and demonstrating various skills (see Eccles, Jacobs, & Harold, 1990).

We are just beginning to explore these links with the information we have gathered in the Michigan Study of Middle Childhood. In addition to questions regarding their perceptions of their children's abilities and interests, the parents in this study were asked for
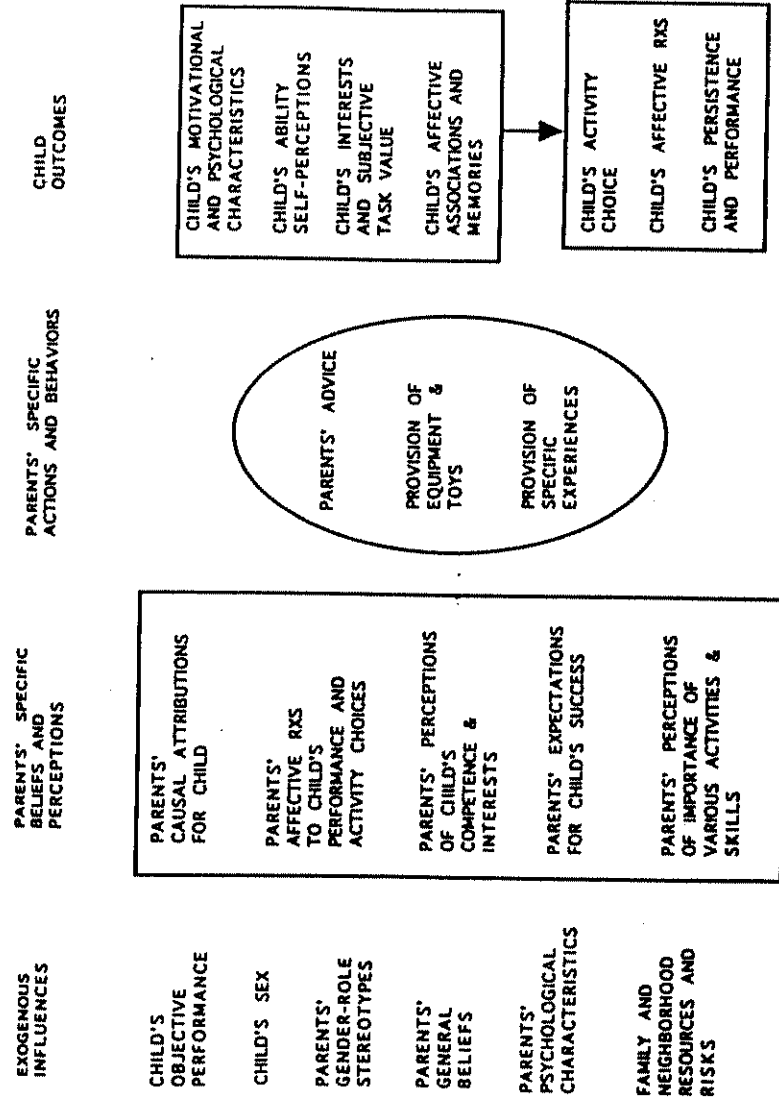

FIGURE 6: General model of relation of exogenous influences influences and parents' specific beliefs to parents' specific behaviors.

a detailed report of the types of activities and experiences they provide for their children in several activity domains. They were also asked what types of skills and activities they encourage their children to develop. Finally, they were asked what they do with their children. Longitudinal analysis of these data is under way. As a first step in this process, we tested whether parents provide different types of experiences for girls and boys. They clearly do in several of the activity domains we are studying. These results are summarized in Table 2 (adapted from Harold, Eccles, Yoon, Aberbach, & Freedman-Doan, 1991).

As the second step, we used path analysis to determine whether the sex-of-child effects on the types of activities parents provide and encourage are mediated by the parents' perceptions of their children's ability and interests in each domain. Consistent with the mediational hypothesis, the sex-of-child effect on parents' encouragement of participation becomes nonsignificant when the sex-of-child effect on parents' perceptions of their children's sports ability and interest is entered into the path analysis (Eccles, Jacobs, & Harold, 1990; Harold et al., 1991).

In summary, we have presented evidence of the influence of social factors on parents' perceptions of their children's abilities in various activity domains. We have focused on children's sex as one potentially critical social factor and have presented data showing how it might influence parents' perceptions of their children's ability independent of actual performance in the domain. We have summarized some work documenting the link of these parents' perceptions to the types of experiences parents provide for their children. Work by Miller and his colleagues (e.g., Miller, Manhal, & Mee, 1991) also provides important information about the connection between parents' specific beliefs regarding their children's abilities and their interactions with them. They argue that parents who have an accurate view of their children's level of competence are better at providing appropriate tasks and appropriate levels of scaffolding as the children go about mastering these tasks.

Wentzel and her colleagues are also looking at these connections and are finding less evidence that the influence of parents' expectations for their children's performance on the children's commitment to schoolwork is mediated via their effect on parenting behaviors (e.g., Wentzel & Feldman, 1991). Instead, the effect of parents'

Table 2

Sex-of-Child Effects on Parents' Time Use with Children and Activity Encouragement

Activity	Mean for Daughters	Mean for Sons	F Value
Work with child on computer[a]	1.76	1.89	4.14*
Play computer games with child[a]	1.73	2.04	17.79***
Encourage child to do math/science activities[b]	4.78	5.04	11.44***
Have child read to you[a]	3.76	3.55	4.84*
Encourage child to read[b]	6.41	6.20	12.41***
Play sports with child[a]	2.72	3.37	38.07***
Take child to sports event[a]	1.61	1.91	53.14***
Encourage child to play competitive sports[b]	4.43	5.08	66.43***
Encourage child to watch sports on television[b]	3.97	4.29	24.19***

[a] Answered on seven-point time scale with 1 = never and 7 = almost every day for a long time.
[b] Answered on a seven-point Likert scale with following labeled points: 1 = discourage, 2 = neither encourage or discourage, 3 = slightly encourage, 5 = moderately encourage, and 7 = strongly encourage. $*p < .05$ $**p < .01$ $***p < .001$

expectations seems to be direct. We have also found that parents' beliefs have a direct influence on children's developing self-concepts, as well as on the experiences parents encourage their children to have in various activity domains. But like Wentzel and Feldman, we are having a hard time identifying all the specific mechanisms through which these experiences affect children's self-perceptions and interests.

Characteristics such as social class, family income, and ethnicity also affect the types of toys and other experiences children receive (e.g., Coleman et al., 1966; Laosa, 1984; Marjoribanks, 1980). As noted earlier, family economic resources clearly influence what experiences parents can afford to provide for their children. Economic distress is also likely to limit the psychological resources parents can bring to bear as they attempt to structure their children's experience. For example, Elder has found that economic distress leads to withdrawal from the parenting role as well as to erratic parenting (Elder et al., 1985). Social class also influences which neighborhood a family lives in. In turn, the neighborhood influences the kinds of resources readily available to the family and the children and also the kinds of stresses and the complexity of the family management tasks

parents must cope with. Finally, the neighborhood is likely to influence the availability of social supports to help the parents cope with the demands of the environment and provide their children with opportunities and varied experiences. As a consequence of all of these factors, families living in poor neighborhoods will have an especially difficult time providing their children with rich and varied experiences both within and outside the home.

But how might exposure to toys and activities affect children's preferences and activity choices? Through the processes associated with channeling (Hartley, 1964), familiarity (Zajonc, 1968), and both operant and classical conditioning, children should come to prefer the toys and activities they are exposed to. However, the extent to which this is true should depend on the affective climate created by parents when the children are engaged in any particular experience. The affective climate is part of the experience parents provide. If learning a particular skill takes place in a positive affective setting, it is likely children will come to enjoy the activity. If, instead, learning takes place in a highly charged negative affective setting, it is likely that the children will develop an aversion to it. In addition, the controlling nature of the situation in which the child learns a particular skill has been shown to influence intrinsic interest in that skill domain in the future (e.g., Boggiano, Main, & Katz, 1988; Deci & Ryan, 1985).

But at a more specific level, exposure to different toys and activities also gives children the opportunity to develop different competencies and a differentiated set of task values. We know that exposure to reading materials predicts later reading achievement (e.g., see Hess & Holloway, 1984; Laosa, 1984). Similarly, exposure to manipulative toys and large-space play appears to affect the development of such basic cognitive skills as spatial facility (Connor, Schackman, & Serbin, 1978). Without the opportunity to try a particular activity, children will never get a chance to find out if they are good at it or if they enjoy it.

In this section we have presented several ways that socializers —in this case parents—might influence the ontogeny of individual differences in self and task perceptions, interests, and various indicators of involvement (e.g., activity choice, intensity of effort, and performance level). We have also presented data from our longitudinal studies to support several of the hypotheses. In the next section, we present a similar analysis of the school context.

Social Contextual Characteristics in the School

GENERAL PRACTICES AND BELIEFS

Historically, most studies of teacher influence have focused on the impact of their general personal characteristics and teaching style on children's overall achievement, motivation, satisfaction, and self-concept (see Dunkin & Biddle, 1974). As with parents, these studies document the importance of such characteristics as teacher warmth and positive classroom climate (e.g., Fraser & Fisher, 1982; Moos, 1979), efficient organization and management (e.g., Blumenfeld, Hamilton, Bossert, Wessels, & Meece, 1983; Moos, 1979), sense of personal efficacy (Ashton & Webb, 1986; Brookover, Beady, Flood, Schweitzer, & Wisenbaker, 1979), general focus on learning goals (Ames & Archer, 1988), and support for autonomous learning behavior (de Charms, 1980; Deci & Ryan, 1985; Lepper & Greene, 1978).

Recently several investigators have suggested that it is important to look at these characteristics in combination. For example, it has been suggested that there is a cluster of teaching practices (e.g., individualized/differentiated versus whole-group instruction; ability grouping practices; and reward structure and the publicness of feedback) that make ability differences in classrooms very salient to the students (see Rosenholtz & Rosenholtz, 1981; Rosenholtz & Simpson, 1984). These investigators assume that the salience of ability differences will affect students' motivation by focusing everyone's attention more on extrinsic motivators, social comparison information, and the perception of ability as a stable entity state rather than an incremental condition. Similarly, work on classroom organization has highlighted the importance of a cluster of characteristics linked to the open-classroom philosophy. This work suggests that students are more satisfied and motivated, and may develop more autonomy, have more positive self-concepts, and learn to capitalize better on their individual strengths and preferences in classrooms where many activities occur simultaneously, materials are varied in level and content, and they are given choice and control over what to work on and with whom (Horwitz, 1979). Evidence in this line of work also suggests that these motivational gains can be made without sacrificing rigor and learning provided the teacher is a very good classroom manager. Finally, evidence is emerging that there may be

sex differences as well as individual differences in children's preference for different learning contexts, and that these differences may interact with subject area in such a way as to yield a sex difference in interest in different subject areas. Our own work, and that of others in the field (e.g., Casserly & Rock, 1980), suggests that females respond more positively to math and science instruction if it is taught in a cooperative or individualized manner rather than a competitive manner, if it is taught from an applied/person-centered perspective rather than a theoretical/abstract perspective, if it is taught using a hands-on approach rather than a "book learning" approach, and if the teacher avoids sexism in its many subtle forms.

Thus, as was true for families, positive school environments seem to be characterized by the integration of emotional support, good management, and high teacher expectations and involvement with the students. For example, many studies assume that warm relationships increase a teacher's influence by increasing children's desire to do what the teacher says (owing either to identification or to the increased power of teachers' social reinforcement properties). If this is true, then variations in teacher warmth and supportiveness should influence the value children attach to working hard in the classroom only if the teacher also provides both clear guidelines on what to do and sufficient opportunity for autonomous behavioral involvement. That is, the impact of teacher warmth and support on motivation and performance should depend on the extent to which the teacher also runs a well-managed but not overly controlling classroom. This idea is analogous to Baumrind's conclusions regarding the greater effectiveness of authoritative parenting and to Ryan and Grolnick's three components of effective parenting.

Recent work has extended this general approach to the climate of the entire school. These researchers suggest, and provide some evidence, that schools are like communities that can vary in their climate and general expectations for all students (e.g., Bryk & Driscoll, 1988; Comer, 1980). Furthermore, they suggest that this general climate affects both the teachers and the students in fundamental ways. Taking this idea one step further, Simmons and Blyth (1987), for example, suggest that there are widely shared differences between elementary schools and secondary schools in organizational factors linked to climate. These differences, they say, may account

for the climate differences between these school levels and, in turn, may explain the motivational differences we see between students in elementary schools and secondary schools. We will discuss this perspective more fully later.

SPECIFIC BELIEFS, EXPECTATIONS, AND TASK VALUE SOCIALIZATION: TEACHERS AS INTERPRETERS OF REALITY

Teachers convey many particular messages to specific students that could influence children's beliefs, motivation, and self-perceptions. Evidence from the teacher expectancy literature provides the best example of this type of effect (see Eccles & Wigfield, 1985; Jussim, 1989). This work suggests that teachers convey their interpretations of children's ability more through subtle modes of interaction than through direct, overt statements. Generally, teachers make few explicit and public statements concerning the causes of success and failure in classwork (Blumenfeld et al., 1983; Parsons, Kaczala, & Meece, 1982). When they do, their comments focus almost exclusively on effort; they almost never refer to lack of ability. In addition, such statements most often concern the potential negative consequences of not finishing assignments rather than relating to the purpose, interest, or value of the work (Blumenfeld et al., 1983). Indeed, when teachers make statements about the purpose or value of a task, students often ignore or mistrust the information, believing it means the task will be too difficult. Instead, those teachers who produce expectancy effects in their students convey their expectations through the ways they interact with different children and the types of assignments they give different children (and not all teachers produce these effects). For example, these teachers give high-expectancy students more opportunity to answer questions in class, and if these students make a mistake, the teachers give them more opportunity to correct it. Consistent with this evidence, Weinstein and her colleagues have shown that teacher expectancy effects are most likely in classrooms where the students themselves believe the teacher treats high and low achievers differently (e.g., Weinstein & Middlestadt, 1971).

TEACHERS AS EXPERIENCE PROVIDERS

Teachers also affect children's self and task beliefs by the types of material presented, the amount of work assigned, frequency of coverage, and instructional style (Blumenfeld, Pintrich, Meece, & Wessels, 1982). If the teacher gives too much work, students are less likely to enjoy the task. And if topics are infrequently covered they decline in perceived value. Thus young children say they do not work hard on science or social studies because these subjects are not often dealt with and so are not thought of as important (Blumenfeld & Pintrich, 1982). In addition, if the teacher makes the subject matter interesting and provides variety, children are more likely to respond positively (Blumenfeld & Pintrich, 1983). In fact, teacher attitudes and enthusiasm are more important than particular curriculum materials in affecting student attitudes.

In summary, then, one can use the same approach as outlined earlier for studying family social context to identify and study the important social and structural characteristics of schools. But because schools are a more widely shared social environment than families, one can ask an even more interesting question about the school as a social context. We know there are fairly consistent age-related changes in various indicators of children's motivational orientation, interests, and activity involvement, particularly with regard to school-related achievement tasks. These changes are often interpreted as reflecting some developmental change going on in the individual. Is it possible that there are systematic changes in the social context of the school? Furthermore, is it possible that these changes could contribute to the age-related changes we see in children's school-related motivation? We turn to these questions in the next section.

Developmental Changes in Individuals' Self and Task Beliefs: The Effects of Stage-Environment Match

Several investigators have suggested that there are general developmental declines during early adolescence in such motivational constructs as interest in school (Epstein & McPartland, 1976); intrinsic motivation (Harter, 1981); theories about the nature of ability (Stipek

& Mac Iver, 1989); and self-concepts (Eccles, Adler, & Meece, 1984; Simmons & Blyth, 1987; see also Eccles & Midgley, 1989; Eccles, Midgley, & Adler, 1984). For example, Simmons and Blyth (1987) found a marked decline in some early adolescents' school grades as they moved into junior high school. Furthermore, the magnitude of this decline was predictive of subsequent school failure and dropout. Similarly timed developmental declines have been documented for such motivational constructs as interest in school (Epstein & McPartland, 1976); intrinsic motivation (Harter, 1981); self-concepts/ self-perceptions (Eccles, Midgley, & Adler, 1984; Simmons & Blyth, 1987); and confidence in one's intellectual abilities, especially after failure (Parsons & Ruble, 1977). There are also reports of age-related increases during early adolescence in such negative motivational and behavioral characteristics as test anxiety (Hill, 1980), focus on self-evaluation rather than task mastery (Nicholls, 1980), and both truancy and school dropout (Rosenbaum, 1976; see Eccles, Midgley, & Adler, 1984, for a full review). Although these changes are not extreme for most adolescents, there is sufficient evidence of a gradual decline in various indicators of academic motivation, behavior, and self-perception over the early adolescent years to make one wonder what is happening (see Eccles & Midgley, 1989, for a review).

A variety of explanations have been offered for these "negative" changes. Some have suggested that such declines result from the intraspsychic upheaval assumed to be associated with early adolescent development (e.g., Freud, 1969). Others have implicated the coincidence of the timing of multiple life changes. For example, Simmons and her colleagues have suggested that the coincidence of the junior high school transition with pubertal development accounts for the declines in the school-related measures and self-esteem (e.g., Blyth, Simmons, & Carlton-Ford, 1983; Simmons & Blyth, 1987). Drawing on cumulative stress theory, these theorists hypothesize that declines in motivation result because adolescents making the transition to junior high school at the end of grade six must cope with two major transitions: pubertal change and school change. And since coping with multiple transitions is more difficult than coping with only one, they conclude that these adolescents are at greater risk of negative outcomes than those who have to cope only with pubertal change during this developmental period. To test this hypothesis, Simmons and her colleagues compared the pattern of

changes in school-related outcomes for early adolescents who moved from sixth to seventh grade in a K–8, 9–12 system with the pattern of change for those adolescents who made the same grade transition in a K–6, 7–9, 10–12 school system. This work separates the conjoint effects of age and transition operating in most developmental studies of this age period. These researchers find clear evidence, especially among girls, of greater negative change among those adolescents making the junior high school transition than among those remaining in the same school setting. We have obtained similar findings using the data from the National Educational Longitudinal Study (NELS). We compared eighth graders in a K–8 school system with eighth graders in either a K–6, 7–9 system or a K–5, 6–8 system. The students in the K–8 systems looked better on several motivational indicators such as self-esteem, preparedness, and attendance than the students in the other two systems (Eccles, Lord, & Midgley, 1991).

But are these differences due to the impact of a major school transition at the time of their pubertal changes, or are they due to differences in the nature of the school environments in these two educational structures? Or are the differences due to both sets of experiences? Simmons and her colleagues, as well as others, now argue for the last (see Carnegie Council on Adolescent Development, 1989; Simmons & Blyth, 1987). Other investigators have suggested that the changing nature of the educational environments many early adolescents experience is a plausible explanation for the declines in the school-related measures associated with the junior high school transition (e.g., Eccles & Midgley, 1989; Eccles, Midgley, & Adler, 1984; Lipsitz, 1981). Drawing upon person-environment fit theory (see Hunt, 1975), Eccles and Midgley (1989) proposed that these motivational and behavioral declines could result because junior high schools are not providing appropriate educational environments for early adolescents. According to person-environment fit theory, behavior, motivation and mental health are influenced by the fit between the characteristics individuals bring to their social environments and the characteristics of those social environments. Individuals are not likely to do very well, or be very motivated, if their social environments do not fit their psychological needs. If the social environments in the typical junior high school do not fit very well with the psychological needs of young adolescents, then person-environ-

ment fit theory predicts a decline in their motivation, interest, performance, and behavior as they move into this environment.

Hunt (1975) has suggested an even more interesting way to apply the person-environment fit perspective to the issues of declining motivation at early adolescence. Bringing a developmental perspective to the idea of person-environment fit, he argued that "maintaining a developmental perspective becomes very important in implementing person-environment matching because a teacher should not only take account of a student's contemporaneous needs by providing whatever structure he presently requires, but also view his present need for structure on a developmental continuum along which growth toward independence and less need for structure is the long-term objective" (Hunt, 1975, p. 221). In other words, teachers should provide the optimal level of structure for children's current levels of maturity while at the same time providing a sufficiently challenging environment to pull them along a developmental path toward higher levels of cognitive and social maturity. What we find especially intriguing about this suggestion is its application to an analysis of the motivational declines associated with the junior high school transition. If it is true that different types of educational environments may be needed for different age groups in order to meet developmental needs and to foster continued developmental growth, then it is also possible that some types of changes in educational environments may be especially inappropriate at certain stages of development. In fact, some changes in the educational environment may be "developmentally regressive." Exposure to such changes is likely to lead to a particularly poor person-environment fit, and this lack of fit could account for some of the declines in motivation seen at this developmental period. In essence, then, we are suggesting that it is the fit between the developmental needs of the adolescent and the educational environment that is important—we refer to this type of fit as a stage-environment fit. If this hypothesis is true, transition to a facilitative and developmentally appropriate environment, even at this vulnerable age, should have a positive effect on children's perceptions of themselves and their educational environment. In contrast, transition into a developmentally inappropriate educational environment should result in the types of motivational declines that have been identified as occurring with the transition into junior high school. This should be particularly true if

the environment is developmentally regressive; that is, if it affords the children fewer opportunities for continued growth than previous environments.

Is there any evidence that such a regressive change in the social environment occurs with the transition to junior high school? Yes, and it occurs at both the macro and micro levels. For example, Simmons and Blyth (1987) enumerated the following types of macro changes: increased school size, increased bureaucratic organization, increased departmentalization, and decreased teacher-student individual contact and opportunity to have a close relationship with a particular teacher. In addition, the increased size, coupled with departmentalized teaching, can disrupt the students' opportunity to interact with their peer networks. Each of these changes could have a detrimental effect on early adolescents.

Although remarkably few empirical studies have been done on more micro-level changes in the classroom environment, there is evidence of regressive changes at this level as well. Looking across the various relevant studies, six patterns have emerged with a fair degree of consistency. First, junior high school classrooms, compared with elementary school classrooms, are characterized by a greater emphasis on teacher control and discipline and fewer opportunities for student decision making, choice, and self-management (e.g., Brophy & Evertson, 1976; Midgley & Feldlaufer, 1987; Midgley, Feldlaufer, & Eccles, 1988b; Moos, 1979). For example, Brophy and Evertson (1976) found evidence that junior high school teachers spend more time maintaining order and less time actually teaching than elementary school teachers. In our own work with the MSALT study, sixth-grade elementary school teachers reported less concern with controlling and disciplining their students than these same students' seventh-grade junior high school math teachers reported one year later (Midgley et al., 1988b). Similar differences emerge on indicators of students' opportunity to participate in decision making regarding their own learning. For example, Ward and his colleagues found that upper elementary school students are given more opportunities to take responsibility for various aspects of their schoolwork than seventh-grade students in a traditional junior high school (Ward et al., 1982). Similarly in the MSALT study, both seventh graders and their teachers in the first year of junior high school reported less opportunity for students to participate in classroom decision making than these same students and their sixth-grade elementary school teachers had one year earlier (Midgley & Feldlaufer, 1987).

Second, junior high school classrooms, compared with elementary school classrooms, are characterized by a less personal and positive teacher-student relationship (see Eccles & Midgley, 1989). For example, in Trebilco, Atkinson, and Atkinson (1977), students reported less favorable interpersonal relations with their teachers after the transition to secondary school than before. Similarly, in the MSALT study, both students and observers rated junior high school math teachers as less friendly, less supportive, and less caring than the teachers they had had one year earlier in the last year of elementary school (Feldlaufer, Midgley, & Eccles, 1988). In addition, the seventh-grade teachers in this study also reported that they trusted the students less than did these students' sixth-grade teachers (Midgley et al., 1988b).

Third, the shift to junior high school is associated with an increase in practices such as whole class task organization, between-classroom ability grouping, and public evaluation of the correctness of work (see Eccles & Midgley, 1989). For example, in the study by Ward and his colleagues mentioned above, whole-group instruction was the norm in the seventh grade, small-group instruction was rare, and individualized instruction was not observed at all. In contrast, the sixth-grade teachers mixed whole- and small-group instruction within and across subject areas (Rounds & Osaki, 1982). Similar shifts toward increased whole-class instruction with most students working on the same assignments at the same time, using the same textbooks, and receiving the same homework assignments were evident in the MSALT (Feldlaufer et al., 1988). In addition, several reports have documented the increased use of between-class ability grouping beginning at junior high school (e.g., Oakes, 1981).

Changes such as these are likely to increase social comparison, concerns about evaluation, and competitiveness (see Eccles, Midgley, & Adler, 1984; Rosenholtz & Simpson, 1984). They may also increase the likelihood that teachers will use normative grading criteria and more public forms of evaluation, both of which have been shown to negatively affect many early adolescents' self-perceptions and motivation. These changes may also make aptitude differences more salient to both teachers and students, leading to increased

teacher expectancy effects and decreased feelings of efficacy among teachers.

Fourth, junior high school teachers feel less effective as teachers, especially for low-ability students. This was one of the largest differences we found between sixth- and seventh-grade teachers in the MSALT study. Seventh-grade teachers in traditional junior high schools reported much less confidence in their teaching efficacy than sixth-grade elementary school teachers in the same school districts (Midgley, Feldlaufer, & Eccles, 1988b, 1989).

Fifth, contrary to what one might expect, there is evidence that classwork during the first year of junior high school requires lower-level cognitive skills than classwork at the elementary level. One rationale often given for the large, departmentalized junior high school system is its efficiency in providing early adolescents with higher-level academic work and more varied academic courses taught by specialists in their fields. It is argued that early adolescents are ready for more formal instruction in the various subject areas and that such instruction can provide more intense and challenging training in higher-order learning skills. But evidence suggests that this is not occurring when students make the transition into secondary school. For example, in an observational study of 11 junior high school science classes, only a very small proportion of tasks required higher-level creative or expressive skills; the most frequent activity involved copying answers from the board or textbook onto worksheets (Mitman, Mergendoller, Packer, & Marchman, 1984). Similarly, Walberg, House, and Steele (1973) rated the level of complexity of student assignments across grades 6 to 12. The proportion of low-level activities peaked at grade 9, the first year after the students in this district made the transition into secondary school. Both of these studies, as well as other studies, suggest that the actual cognitive demands made on adolescents decrease rather than increase at this time.

Finally, junior high school teachers appear to use a higher standard in judging students' competence and in grading their performance than do elementary school teachers (see Eccles & Midgley, 1989). There is no stronger predictor of students' self-confidence and sense of personal efficacy for schoolwork than the grades they receive. If grades change, then we would expect to see a concomitant shift in the adolescents' self-perceptions and academic motivation.

There is evidence that junior high school teachers use stricter and more social-comparison-based standards than elementary school teachers to assess student competency and to evaluate student performance, leading to a drop in grades for many early adolescents as they make the junior high school transition. For example, Simmons and Blyth (1987) found a greater drop in grades between sixth and seventh grade for adolescents making the junior high school transition at this point than for adolescents enrolled in K–8 schools. That this decline in grades is not matched by a decline in the adolescents' scores on standardized achievement tests suggests that it reflects a change in grading practices rather than a change in the rate of the students' learning (Kavrell & Petersen, 1984). Imagine what this decline in grades might do to early adolescents' self-confidence, especially since the material they are being tested on is not likely to be more intellectually challenging.

Changes like these are apt to have a negative effect on many children's motivational orientation toward school at any grade level. But Eccles and Midgley (1989, 1990) have argued that these types of changes are particularly harmful during early adolescence, given what is known about psychological development at this stage of life. Evidence from a variety of sources suggests that early adolescent development is characterized by increases in desire for autonomy, peer orientation, self-focus and self-consciousness, salience of identity issues, concern over heterosexual relationships, and capacity for abstract cognitive activity. Simmons and Blyth (1987) have argued that adolescents need a reasonably safe, as well as an intellectually challenging, environment to adapt to these shifts—an environment that provides a "zone of comfort" as well as challenging new opportunities for growth. In light of these needs, the environmental changes often associated with the transition to junior high school seem especially harmful in that they emphasize competition, social comparison, and ability self-assessment at a time of heightened self focus; they decrease decision making and choice at a time when the desire for control is growing; they emphasize lower-level cognitive strategies at a time when the ability to use higher-level strategies is increasing; and they disrupt social networks at a time when adolescents are especially concerned with peer relationships and may be in special need of close adult relationships outside the home. We believe the nature of these environmental changes, coupled with the

normal course of individual development, is likely to result in a developmental mismatch so that the "fit" between the early adolescent and the classroom environment is particularly poor, increasing the risk of negative motivational outcomes, especially for those who already have difficulty succeeding academically.

EFFECT OF ENVIRONMENTAL CHANGES
ON EARLY ADOLESCENTS' MOTIVATION

To test these predictions, we conducted a large-scale two-year, four-wave longitudinal study of the effect of changes in the school and classroom environment on early adolescents' achievement-related beliefs, motives, values, and behaviors. These data comprise the first two years of the MSALT study. The sample was drawn from twelve school districts in middle-income communities in southeastern Michigan. Approximately 1,500 early adolescents both participated in all four waves of the study and experienced the junior high school transition during the course of the study as they moved from sixth to seventh grade. Questionnaires were administered at school during the fall and spring terms of the two consecutive school years. In this section we summarize the results for changes in teacher efficacy, teacher support and warmth, and opportunities for involvement in autonomous decision making.

Teacher efficacy. As noted earlier, one of the largest differences we found between the sixth- and seventh-grade teachers was in their confidence in their teaching efficacy; the seventh-grade teachers reported less confidence. Several studies have documented a relation between teacher efficacy and student beliefs and attitudes (e.g., Ashton & Webb, 1986; Brookover et al., 1979; Eccles & Wigfield, 1985). Given these associations, differences in teachers' sense of efficacy before and after the transition to junior high school could contribute to the decline in early adolescents' beliefs about their academic competency and potential.

To test this hypothesis, we divided our adolescent sample into four groups based on median splits of their math teachers' ratings of their own personal teaching efficacy (see Midgley, Feldlaufer, & Eccles, 1989, for a full description of this study). The largest group (559

out of the 1,329 included in these analyses) moved from a high-efficacy sixth-grade math teacher to a low-efficacy seventh-grade math teacher. Another 474 adolescents had low-efficacy teachers in both years, 117 moved from low- to high-efficacy teachers, and 179 had high-efficacy teachers in both years. Thus, fully 78% of our sample of children moved to a low teacher-efficacy math classroom in the seventh-grade. As predicted, the adolescents who moved from high-efficacy to low-efficacy teachers during the transition (the most common pattern) ended their first year in junior high school with lower expectancies for themselves in math, lower perceptions of their performance in math, and higher perceptions of the difficulty of math than the adolescents who experienced no change in teacher efficacy or who moved from low- to high-efficacy teachers. Also as predicted, teacher-efficacy beliefs had a stronger impact on the low-achieving adolescents' beliefs than on the high-achieving adolescents' beliefs. The results for the low-achieving students are shown in Figures 7 and 8. By the end of the junior high school year, those low-achieving adolescents who had moved from high- to low-efficacy teachers experienced a dramatic decline in confidence in their ability to master mathematics. Note, however, that this same decline was not characteristic of the low-achieving adolescents who had moved to high-efficacy seventh-grade math teachers, suggesting that the decline is not a general feature of early adolescent development but rather a consequence of the fact that so many early adolescents experience a debilitating shift in their classroom environments as they make the junior high school transition.

Student-teacher relationships. As reported earlier, we also found that student-teacher relationships deteriorate after the transition to junior high school. Research on the effects of classroom climate indicates that the quality of student-teacher relationships is associated with students' academic motivation and attitudes toward school (e.g., Fraser & Fisher, 1982; Moos, 1979; Trickett & Moos, 1974). Consequently there is reason to believe that transition into a less supportive classroom will negatively affect early adolescents' interest in the subject matter being taught in that classroom. Using a strategy similar to that described for teacher efficacy, we divided the sample of students into four groups based on the pattern of change they experienced in teacher support and warmth as they made the junior high
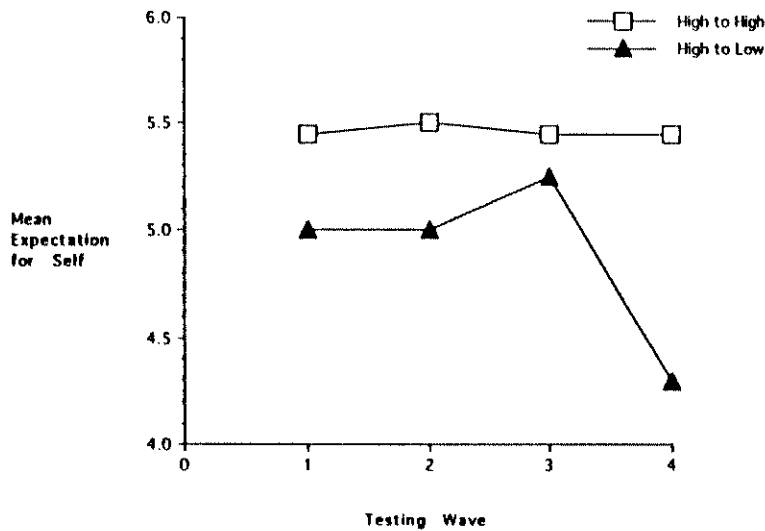
FIGURE 7. Expectations for one's own performance in math for the low-achieving students plotted across the transition into junior high school. "High to high" students had a high-efficacy teacher during both their sixth- (waves 1 and 2) and seventh-grade (waves 3 and 4) school years. "High to low" students had a high-efficacy teacher during their sixth-grade school year and a low-efficacy teacher during their seventh-grade school year.
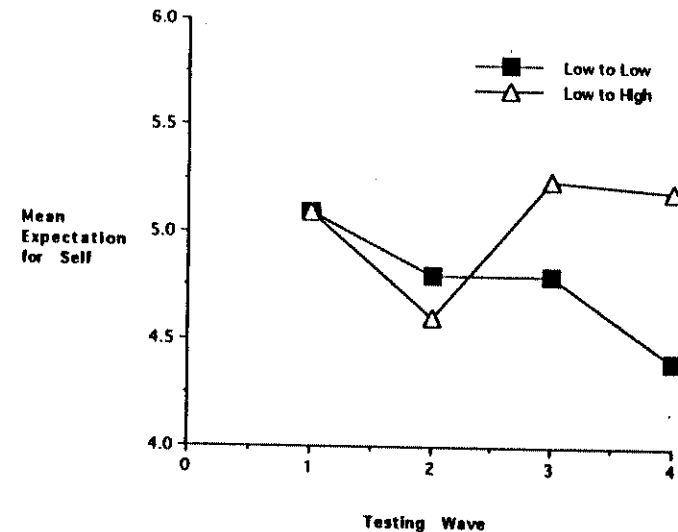
FIGURE 8. Expectations for one's own performance in math for the low-achieving students plotted across the transition into junior high school. "Low to low" students had a low-efficacy teacher during both their sixth- (waves 1 and 2) and seventh-grade (waves 3 and 4) school years. "Low to high" students had a low-efficacy teacher during their sixth-grade school year and a high-efficacy teacher during their seventh-grade school year.

school transition. As predicted, the early adolescents who moved from elementary teachers they perceived to be low in support to junior high school teachers they perceived to be high in support showed an increase in the value they attached to math; in contrast, the early adolescents who moved from teachers they perceived to be high in support to teachers they perceived to be low in support showed a decline in the value they attached to math. Again we found evidence that low-achieving students are particularly at risk when they move to less facilitative classroom environments after the transition (Midgley, Feldlaufer, & Eccles, 1988a).

Both of these studies show that the declines often reported in studies of early adolescents' motivational orientation to school subjects are not inevitable. Instead, these declines are associated with specific types of changes in the classroom environment experienced by many early adolescents as they make the junior high school transition. The studies also show that a transition into more facilitative

classrooms can induce positive changes in early adolescents' motivation and self-perceptions. Unfortunately, our findings also indicate that most adolescents experience a negative change in their classroom experiences at this time.

Stage-environment fit in classroom decision making. Neither of these studies, however, directly tests our stage-environment fit hypothesis. To do this one must directly assess person-environment fit and relate this fit to changes in adolescents' self-perceptions and motivation. Using items developed by Lee, Statuto, and Kedar-Voivodas (1983), we asked both the adolescents and the teachers in this study to rate whether students were allowed input into classroom decisions regarding where to sit, classwork, homework, class rules, and what to do next, and whether students ought to be allowed input into each of these decisions. These questions can be used in the following ways: (1) to plot the developmental changes in

adolescents' preferences for decision-making opportunities in the classroom; (2) to determine changes in the opportunity for them to participate in decision making; and (3) to determine the extent of match or mismatch between their preferences and the opportunities afforded them in the school environment. If developmental changes in this match are related to developmental changes in the adolescents' self-perceptions and school-related motivation, then we would have support for our stage-environment fit hypothesis.

As noted earlier, both the early adolescents and their teachers reported that there was less opportunity for participation in classroom decision making at the seventh-grade level than at the sixth-grade level. In contrast, there was a longitudinal increase over the school transition in the early adolescents' desire for more participation in classroom decision making. As a consequence of these two divergent patterns, the congruence between early adolescents' desire for the opportunity to participate in classroom decision making and their perception of how much these opportunities were available to them was lower when the adolescents were in the seventh grade than when they were in the sixth grade (Midgley & Feldlaufer, 1987).

How might the widening mismatch between the students' desire for autonomy and their perceptions of their opportunity for autonomy affect motivation? Person-environment fit theories suggest that a mismatch between one's needs and what the environment affords will lead to decline in motivation and engagement. Mac Iver, Klingel, and Reuman (1986) tested this prediction with the sixth-grade students by relating perceived congruence versus perceived incongruence to student motivation and behavior. Congruent children differed from incongruent children in several ways. They rated math as more useful and interesting; in general they liked the teacher and school better; they had higher expectations for their own performance in math; and they misbehaved less according to their own and their teachers' reports. Therefore it seems likely that this decline in the opportunity for decision making and this increase in the misfit between students' desire for autonomy and their perceptions of the opportunities for autonomy in their seventh-grade math classrooms could contribute to the decline we find in their motivation to study math.

But more specifically, given the general developmental progres-sion toward increased desire for independence and autonomy during the early adolescent period, Eccles and Midgley (1989) predicted that adolescents who experience decreased opportunities for participation in classroom decision making along with increased desires for greater participation in such decisions (a "can't but should be able to" mismatch) should be most at risk for negative motivational outcomes. In a longitudinal analysis, Mac Iver and Reuman (1988) provide some support for this prediction. They compared the changes in intrinsic interest in math for adolescents reporting different types of changes in their responses to the actual and preferred decision-making items across the four waves of data. Consistent with our prediction, the adolescents who perceived their seventh-grade math classrooms as putting greater constraints on their preferred level of participation in classroom decision making than their sixth-grade math classrooms showed the largest and most consistent declines in their intrinsic interest in math as they moved from sixth grade into seventh grade. These are the students who are experiencing the type of developmental mismatch we outlined in our discussion of stage-environment fit.

MATURATIONAL DIFFERENCES IN THE DESIRE FOR AUTONOMY

Another way to look at developmental change is to look for interindividual differences between same-aged children of different maturational levels. At this age, the extent of pubertal development of the females provides a good indicator of individual differences in maturation. We related an indicator of maturational level to the female adolescents' desire for input into classroom decision making on the Lee et al. (1983) items. Consistent with the intraindividual longitudinal pattern of age-related change reported above, the more physically mature female adolescents expressed a greater desire for input into classroom decision making than their less physically mature female classmates (Miller, 1986). Unfortunately, as was true for the longitudinal results, the more physically mature females did not perceive greater opportunities for such participation. Although the females with varying degrees of pubertal development were in the same classrooms, the more physically mature females (the early de-
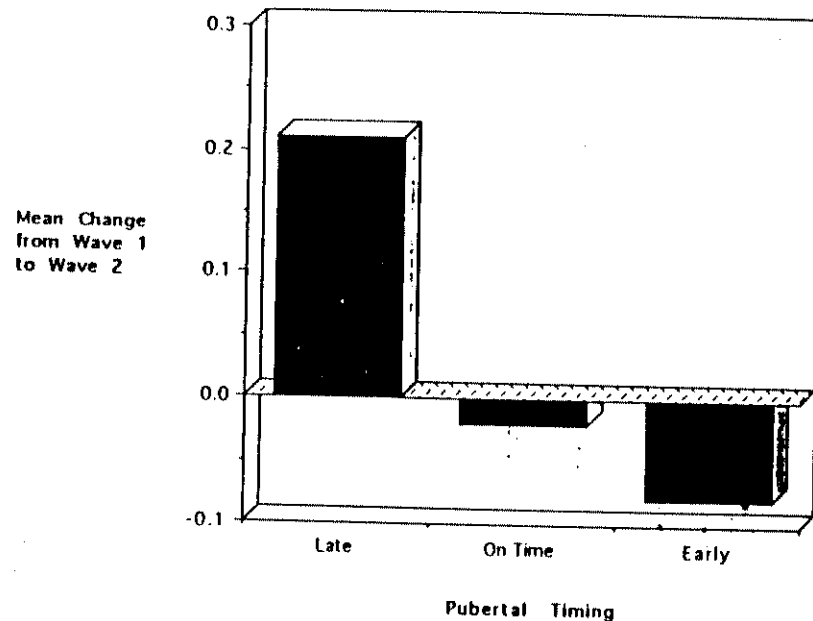
Figure 9. Mean change in girls' perception of the opportunities to participate in classroom decision making as a function of pubertal timing. Late-maturing girls are relatively less physically mature than the early-maturing girls.

velopers) reported fewer opportunities for participation in classroom decision making than did their less mature female peers (the on-time and late developers).

These maturational differences were even more striking when we looked at the within-year changes in these female adolescents' perceptions of their opportunities to participate in classroom decision making. We calculated the mean change in these females' perceptions of opportunities from fall to the spring testing. We then looked at this change as a function of their pubertal status. These results are shown in Figure 9. The early-maturing females showed a negative change (a decline) over the course of the school year in perceived opportunities to participate in classroom decision making. In contrast, the late-maturing females in these same classrooms showed a positive change (an increase) over the school year (Miller, 1986). How can this be, given that these adolescents were in the same classrooms? Did the teachers actually treat these adolescent fe-

males differently? (Did the teachers respond to earlier physical maturity with more controlling behavior?) Or did the adolescents perceive a similar environment differently? (Did the early-maturing adolescents perceive the same level of adult control as providing less opportunity for self-control than did the later maturing adolescents?) Evidence from educational psychology, developmental psychology, and general psychology suggests that either or both of these explanations could be accurate: Teachers do respond differently to various children in the same classroom depending on a variety of characteristics (Brophy & Evertson, 1976), and people do perceive similar environments differently depending on their cognitive or motivational orientation (see Baron & Graziano, 1991). More detailed classroom observations are needed to determine the exact nature of the relation between teachers' behavior and adolescents' perceptions.

But more important for the issues central to this chapter, the pubertal maturity of the female adolescents was related to the degree of mismatch between the adolescents' desires for input and their perceptions of these opportunities in their classroom environment: There was greater mismatch among the more physically mature female adolescents than among the less mature. In fact, by the end of the school year, almost twice as many early-maturing females as their less physically mature classmates reported experiencing the "can't but should" type of mismatch (e.g., answering "no" to the question, "Do you get to help decide what math you work on during math class?" but "yes" to the question "Should you have a say about this?").

We find this last set of results especially interesting in light of the findings of Simmons and her colleagues (e.g., Simmons & Blyth, 1987). They found that the pubertal status of female adolescents at the time of the junior high school transition is related to changes in the females' self-esteem and to the females' reports of truancy and school misconduct: the more physically mature females reported the higher amounts of truancy and school misconduct and lower self-esteem than their less mature classmates following the junior high school transition. Simmons and Blyth (1987) suggest that experiencing the school and pubertal transitions simultaneously puts these girls at risk for negative outcomes. Alternatively, it is possible that it is the mismatch between their desire for a less controlling

adult environment and their perceptions of the actual opportunities for participation that puts them at risk for the most negative motivational outcomes.

We have begun to provide an in-depth description of the classroom environment changes most children experience as they make the transition from elementary school into junior high schools. In general, we find evidence of the types of changes we had predicted: an increase in the teachers' focus on student control and a decrease in teachers' feelings of efficacy and in the quality of student-teacher relationships. We have also begun to assess the effect of these changes on student motivation using a quasi-experimental approach. These results confirm the negative consequences of these changes and provide evidence that a different type of change would produce positive motivational effects at this developmental period. Together these two outcomes support our suggestion that the declines in motivation often assumed to be characteristics of the early adolescent period are less a consequence of the students' developmental stage than of the mismatch between their needs and the opportunities afforded them in the traditional junior high school environment. Is there any evidence of a comparable process going on in the family? Yes!

Stage-Environment Fit in Perceived Control in the Family and Its Link to School Achievement and School-Related Motivation

Evidence from several investigators suggests that adolescents' relationship with their parents also undergoes a stressful period during the early and middle adolescence (e.g., Collins, 1990; Paikoff & Brooks-Gunn, 1991; Steinberg, 1981). Furthermore, this stress is often focused on issues of control and autonomy within the family. Adolescence is a time for renegotiating power and authority relations within the family. When they are young, by necessity children's relationship with their parents is asymmetrical in terms of power and authority. But as children mature they need to take more and more responsibility for themselves until, ultimately, they leave their natal home and achieve full control over their own lives. In the

optimal situation, parents will reinforce and stimulate this process of growing autonomy and independence. But it is very likely that the renegotiation processes associated with these developmental trajectories will not be perfectly smooth. It is not easy for parents to determine the optimal level of autonomy versus control for their children at all ages. And according to a stage-environment fit perspective, one would predict strained relationships whenever there is a poor fit between children's desire for increasing autonomy and the opportunities for independence provided by their parents. These strains may affect school-related motivation.

We are in the process of examining these issues in the MSALT study. We assessed decision making in the family in two ways: both the adolescents and their parents responded to two items derived from the Epstein and McPartland (1976) scale of family decision making (e.g., "In general, how do you and your child arrive at decisions?" [1 = I tell my child just what to do; 3 = We discuss it and then we decide; 5 = I usually let my child decide]; and "How often does your child take part in family decisions that concern her/himself?" [1 = never; 4 = always]). The adolescents were also asked to rate how they thought decisions ought to be made in their family and the extent to which they thought "their parents treated them more like a kid than like an adult."

Consistent with the analyses reported earlier, we found both a longitudinal increase in adolescents' desire for greater participation in family decision making and positive associations between participation in family decision making and indicators of both intrinsic school motivation and positive self-esteem (Flanagan, 1986, 1989; Yee, 1986, 1987; Yee & Flanagan, 1985). Even more interesting from the stage-environment fit perspective, the parents reported that they included their early adolescents more in family decision making than the early adolescents themselves perceived to be true (Flanagan, 1986; Yee, 1987). Furthermore, for girls in particular, the discrepancy between the adolescents' and the parents' perception of the opportunities for the adolescents to participate in family decision making increased over the four waves in our study (Yee, 1987). Finally, and most important, the pattern of changes in early adolescents' self-esteem and intrinsic versus extrinsic motivation for schoolwork were systematically, and predictably, related to changes

in their perceptions of the opportunity to participate in decision making at home. As our developmental stage-environment fit perspective on adult control implies, the adolescents who reported decreasing opportunities to participate in family decision making showed a decrease in their self-esteem and intrinsic motivation over the period of this study; the opposite pattern of change occurred for those who reported increasing opportunities to participate (Flanagan, 1989; Yee, 1987). In addition, the opportunity to participate in family decision making also predicted more positive motivation at each wave (Flanagan, 1985; Yee, 1986) and better adjustment to the junior high school transition (Eccles, Lord, & McCarthy, 1991; Eccles, McCarthy, et al., 1990). Thus, not only may a mismatch between authority relationships in the home precipitate increased conflict, it may also be detrimental to the adolescents' self-esteem and school-related motivation.

Summary and Conclusions

In this chapter we have presented two perspectives on the link between social context and the following motivational constructs: self-concept of ability and sense of personal efficacy in specific activity domains; perceptions of the value of skills in various domains; interest in various activities; activity choice; persistence; performance; and general self-esteem. In the first section, we discussed how social-contextual variables in both the family and the home could produce individual differences in the motivational constructs of interest. We presented a general framework for thinking about this issue and summarized our recent empirical work. In the second section, we discussed how systematic changes in the social environments that confront children as they develop could explain age-related changes in the motivational constructs of interest. Again we presented a general framework for thinking about this issue and summarized our empirical work testing the hypotheses generated from this framework.

Throughout this section we have argued that optimal development takes place when there is good stage-environment fit between the needs of developing individuals and the opportunities afforded in their social environments. Furthermore, we suggested that the

negative changes in motivational variables often associated with early adolescent development result from regressive changes in school and home environments. For example, the transition to junior high school, in particular, often confronts early adolescents with regressive environmental changes such as a decrease in the opportunity to participate in classroom decision making, a decrease in teacher support and teacher efficacy, and an increase in teaching styles and reporting practices likely to induce a focus on relative ability and comparative performance as well as excessive social comparison. Not surprisingly, there is also a decrease in intrinsic motivation and an increase in school misbehavior associated with this transition, and these changes are most apparent among adolescents who report regressive changes in the characteristics of classroom and school social environment. Such motivational changes are not apparent in adolescents who report the more developmentally appropriate shifts in the social context at school. Although our analysis of the family data is not as complete as our analysis of the classroom data, we have found evidence that a similar process may be going on in the family in relation to issues of control and autonomy. Excessive parental control is linked to lower intrinsic school motivation, to more negative changes in self-esteem following the junior high school transition, to more school misbehavior, and to relatively greater investment in peer social attachments. Clearly, these results point out the importance of designing educational and family environments for early adolescents that provide a better match to their growing desire for control over their own lives as well as providing the type of supportive environment necessary to explore this control and autonomy with minimal risk (see also Simmons & Blyth, 1987). However, many junior high schools, and some families, do not seem to be providing such an environment. Why? One explanation seems especially relevant to the position outlined in this chapter: beliefs and stereotypes regarding the nature of adolescence. Many adults in this culture hold negative stereotypes about adolescence. They see it as a stressful time and a time of great risk, and they see adolescents themselves as troublesome and untrustworthy (see Miller et al., 1990). Finally, they tend to feel there is little they can do to make the situation better. Consequently, it is not surprising that they resort to increased control. Unfortunately, this response may be creating the very behavior they are so worried about.

A second explanation is also relevant for the school findings. Work in the field of organizational psychology suggests that supervisors tend to use more controlling strategies and to trust their workers less if they have many workers to supervise and if there is a general ethic of mistrust in the organizational setting (Lawler, 1976). Two of the major differences between elementary schools and junior high schools are school size and departmentalization. As a result of these two characteristics, junior high school teachers have to interact with and teach many more students than elementary school teachers. In addition, there are many more students in general that have to be monitored. If the work in organizational psychology can be generalized to the school setting, then one would predict that junior high school teachers (supervisors in this case) would trust their students less than would elementary school teachers and would use more controlling strategies. This outcome should be especially likely given the negative stereotypes teachers typically hold about early adolescents.

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