DEVELOPMENT BETWEEN THE AGES OF 11 AND 25

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In this chapter we discuss development across a fascinating part of the life span, early adolescence, adolescence, and young adulthood. The time span covered is one in which individuals experience many changes, including the biological changes associated with puberty, and the social/educational changes resulting from transitions from junior high to high school, high school to college or the work force, and from college to the work force. During this period individuals make many choices that will have a continuing impact on the rest of their adult lives. For many these choices include whether or not to stay in school, what career or occupation to undertake, and whether or not to get married, among others. Despite its obvious importance, at least until recently in the developmental literature the adolescent and young adulthood periods have not received as much attention as has childhood. This has changed during the last decade, however; evidence of that change includes the new Society for Research on Adolescence, new journals on adolescence, and increased interest in the post-secondary period as shown by OERT's funding of a center on post-secondary education focused on learning and thinking.

We will attempt to convey in this chapter the most important changes occurring during this interesting part of the life span. We discuss changes in characteristics such as self-concept, motivation, cognition, and achievement that are the topics of other chapters in the Handbook; what makes this chapter unique is its explicit developmental focus, and our discussion of a variety of psychological processes and how they change. Thus we organize the chapter chronologically, beginning with the early adolescence and adolescent periods, and moving to young adulthood. We also will pay particular attention to contextual effects on development. We examine how the social contexts of school, family, and peer group influence adolescent and young adult development, and focus on the important changes that occur in these contexts during this time period: school transitions, the "distancing" in parent-child relations, and emerging influence of the peer group during early and middle adolescence. We contrast this emphasis on contexts with more organismic approaches to development that focus primarily on changes within the individual as determining
most developmental outcomes. The distinction between contextual and organismic approaches is elucidated more fully in the section on developmental change during and after the college years.

There are several critical issues that we address in this chapter. First is the interaction of the various processes that we discuss, such as motivation and cognition. Second is a consideration of both changes within individuals as well as changes in the environments individuals experience to understand the outcomes of development. Third is how different developmental trajectories (both positive and negative) across this period can be understood; for instance, we will discuss adolescents who drop out of school versus those who enroll and succeed in college. Last will be concern for individual difference variables, particularly gender and race, and how they influence the choices adolescents and young adults make during this time period.

Finally, a note about our general approach and coverage in this chapter. Most of our own theoretical and empirical work has concerned adolescents' and young adults' achievement motivation, achievement beliefs and attitudes, the relation of these beliefs to student cognition, and their influence on students' performance in school (e.g., Eccles, 1984a, 1984b; Eccles et al., 1989; Eccles, Adler, & Meece, 1984; Eccles & Wigfield, 1985; Meece, Wigfield, & Eccles, 1990; Pintrich, 1988; Pintrich, 1989; Pintrich & DeGroot, 1990; Pintrich & Garcia, 1991; Wigfield & Eccles, 1992; Wigfield, Eccles, Mac Iver, Reuman, & Midgley, 1991). Eccles and Wigfield also have been particularly interested in sex differences in these beliefs and attitudes. Hence our emphasis will be on research that has examined students' motivation, cognition, and their relation to students' achievement, an emphasis that seems entirely appropriate to a handbook focused on educational psychology. Because the research in these areas across the age span under consideration here is voluminous, we have had to be selective in our review. Wherever possible we make suggestions where readers can find more information about topics that they find to be of particular interest.

DEVELOPMENT DURING EARLY AND MIDDLE ADOLESCENCE

During the early adolescent years children experience the social and biological changes associated with puberty. Most adolescents also make two important school transitions during early
and middle adolescence, moving from elementary to middle school or junior high school, and then middle school to high school. Different theorists (e.g., Blyth, Simmons, & Carlton-Ford, 1983; Eccles & Midgley, 1989; Hill & Lynch, 1983; Rosenberg, 1986; Simmons, Blyth, van Cleave, & Bush, 1979) have proposed that these changes have significant impact on a variety of developmental outcomes. Many children make these changes relatively easily. Others, however, have difficulty with one or another of these changes and as a result are at risk for a number of unfortunate developmental outcomes, such as dropping out of school, drug abuse, and delinquency. We begin our discussion of these changes with a consideration of the biological changes that occur during the early adolescent period.

Biological Changes Associated With Puberty

The biological changes associated with puberty are the most dramatic ones that individuals experience during their lifetimes (outside of prenatal development), and these changes often have been used to characterize the early adolescent period as a period of "storm and stress" (Hall, 1904; where there is a great deal of conflict between children, parents, and teachers (e.g., Blos, 1979; Freud, 1958). We have heard teachers (and parents) say that "If we could just lock kids up for those years things would be fine"! While it is undeniable that major physical changes occur during early adolescence, many researchers now believe that the characterization of this time period as one of storm and stress is a great overstatement (see for example Brooks-Gunn & Reiter, 1990; Dornbusch, Petersen, & Hetherington, 1991). This is not to deny the importance of the biological changes that do occur, and their potential impact on psychological processes, however.

A complete review of those biological changes is beyond the scope of this chapter (see Brooks-Gunn & Reiter, 1990; Buchanan, Eccles, & Becker, 1992; Malina, 1990; Paikoff & Brooks-Gunn, 1990, and the volume edited by Adams, Monemoyer, and Gullotta [1989] for a thorough discussion of these changes). Briefly, during early adolescence children undergo a growth spurt and develop secondary sex characteristics, as a result of the activation of the hormones controlling these physical developments. The processes by which the hormones become activated are still not well understood, but their effects are quite clear. One important point to not
is that the timing of puberty is quite different for girls and boys. Girls enter puberty approximately 18 months before boys do, which means that during early adolescence girls and boys of the same chronological age are at quite different points in their physical development, a fact that is readily apparent to anyone observing in middle grades classrooms. There now is a large literature on the effects of early versus late maturity for boys and girls. There is some consensus that for boys early maturity is advantageous, particularly with respect to their participation in sports activities (see Malina, 1990) and social standing in school (Petersen, 1985). For girls early maturity can be problematic, since they will be the first to experience pubertal changes and thus can feel “out of synch” with their agemates (see Petersen, 1998; Simmons & Blyth, 1987). In fact Simmons and her colleagues report that early maturing girls have the lowest self-esteem, and the most difficulty adjusting to school transitions, particularly the transition from elementary to junior high school (e.g., Simmons et al., 1979). Like early maturing girls, later maturing boys also may have some difficulties due to their physical development being out of synch with their agemates.

Magnusson and Stattin have traced the long term consequences of early maturation in females (Magnusson, 1988; Stattin & Magnusson, 1990). Early maturing girls in Sweden obtained less education and marry earlier than their later maturing peers despite no initial differences in achievement levels. They present evidence that this effect is mediated through the association of early maturation with involvement with older adolescents: Early maturing females are more likely to join older peer groups and to begin dating older males; in turn, the early maturing girls in these peer groups are more likely to drop out of school and get married, perhaps because school achievement is not valued by their peer social network while early entry into the job market and early marriage are. These results are consistent with the oft cited finding that underachievement in males tends to begin in early elementary school while underachievement in females is more likely to begin at early adolescence. Clearly there is a need to better understand the link between puberty development and school achievement for females in particular.

Recently a number of researchers have been assessing how the hormonal changes occurring at early adolescence relate to children's behavior at this time. Both Paikoff and Brooks
Gunn (1990) and Buchanan et al. (1992) proposed several different possible models to account for these relations, ranging from models which propose a direct link between hormonal change and behavior, to mediated and cumulative effects models in which hormones' effects on behavior are said to be mediated through the physical changes in children's bodies and the social experiences early adolescents have. There is some interesting evidence for the relatively direct effects of hormones on behaviors such as aggression (Olweus, Mattsson, Schalling, & Low, 1980, 1988; Susman, Inof-Germain, Nottelmann, Loriaux, Cutler, & Chrousos, 1987), sexuality (Udry, 1988), and mood swings (Buchanan, 1989; Buchanan et al., 1992). However, many researchers (e.g., Buchanan et al., 1992; Petersen & Taylor, 1980) adopt the mediated effects model, arguing that hormones affect behavior indirectly through their impact on secondary sex characteristics, or in combination with social and personality factors. As an example of the latter kind of effect, Brooks-Gunn and Warren (1988) reported that pubertal changes influenced girls' body image and descriptions of themselves; for instance, breast development was associated with a positive body image, superior adjustment, and positive peer relations; these psychological differences likely influence other psychological and behavior outcomes, such as school achievement. Similarly, Steinberg (e.g., Steinberg, 1987, 1988) argued that parent-child relations change most at the peak of pubertal development, a point we return to below.

These physical changes are not the only changes early adolescents face; they also undergo school transitions, and important social changes as well. Those researcher adopting a "cumulative effects" model (e.g., Simmons & Blyth, 1987; Simmons, Burgeson, Carleton-Ford, & Blyth, 1987) argue that it is the combination of changes occurring at early adolescence that can be problematic for some early adolescents. Pubertal change, school transitions, social changes such as dating, and (possibly) family changes all can occur at this time; if several of those changes are negative children can be at risk for developmental problems such as lowered self-esteem and early sexual activity (Simmons et al., 1987). Again, because girls enter puberty earlier than boys do, they are more likely to have to be coping with pubertal changes at the same time they make the
middle grades school transition than are boys, and thus are more likely to face multiple transitions simultaneously.

One important educational implication of this work concerns when students should make the transition from elementary to secondary school. Given the difficulties of coping with several transitions at once, some researchers have argued that middle grades school should begin earlier, so that students make the school transition before they enter puberty. The recent movement to make middle grades schools more like elementary schools and less like traditional junior high schools also reflects concern over the variety of changes early adolescents have to face. Others have argued that a K-8 organizational structure may be most beneficial to early adolescents. There is increasing awareness among educators that this is a unique developmental phase that requires careful structuring of educational environments (see further discussion later).

In sum, the physical changes that occur at adolescence are dramatic, and they have been shown to relate to emotional and behavioral changes occurring at that time. While many adolescents have little difficulty going through these changes, they can be a source of problems for some, particularly when other social and psychological changes occur at the same time for these adolescents. Although developmental researchers recently have done much important work on the impact of these changes on different behaviors, educational researchers need to pay more attention to how these physical changes influence early adolescents' school performance, interactions with peers, and interactions with teachers. We will refer back to the effects of these changes in later sections of this chapter.

Changes in Cognition and Achievement During Early and Middle Adolescence

A great deal has been written about how children's thinking changes during the adolescent years (e.g., see Keating, 1990, for an excellent review), and many chapters in this Handbook are devoted to students' cognition and information processing (see in particular the chapters by Greeno; Mayer & Wittrock; Gustafson, Undheim, & Holmberg, as well as the chapters on learning in different subject areas). Because of this coverage we discuss this issue only briefly in this section; additional details on how cognition changes during this part of the life span are provided in
the section on development during the college years. The most important changes to note are the increasing ability of children to think abstractly, consider the hypothetical as well as the real, and engage in more sophisticated and elaborate information processing strategies (see Keating, 1990, for more complete discussion). Abstract thought and hypothetical thinking are of course hallmark of Piaget's formal operations stage, the stage that he and his colleagues stated should emerge during adolescence (e.g., Piaget, 1952; Piaget & Inhelder, 1973). Although there currently is much debate about when exactly these kinds of cognitive processes emerge and whether their emergence reflects global stage-like changes in cognitive skills as described by Piaget, most theorists do agree that these kinds of thought processes are more characteristic of adolescents' cognition than of younger children's cognition. Along with their implications for learning, these changes in children's thinking have important implications for individuals' self-concepts, thoughts about their future, and understanding of other.

Other cognitive theorists have focused on more specific information processing skills, cognitive learning strategies, and metacognitive skills (see Bjorklund, 1989; Brown, Bransford, Ferrara, & Campione, 1983; Pressley, Borkowski, & Schneider, 1987; Siegler, 1986; Weinstein & Mayer, 1986, along with the chapters by Greeno, Mayer and Wittrock, and Gustafson et al., in this volume). This work demonstrates a steady increase in children's information processing skills and use of learning strategies, in their background knowledge, and in their ability to apply their knowledge to new learning situations, and in their awareness of their strengths and weaknesses as learners. All of these changes should allow adolescents to be more efficient, sophisticated learners, ready to cope with relatively advanced topics in different subject areas.

These changes in cognitive skills are used as a rationale for special middle grades schools. However, observational studies of 7th grade classrooms in traditional middle grades schools show that the intellectual level of content taught in these classrooms often is lower than the intellectual level of content in elementary school classrooms, which could contribute to the decrease in academic engagement of some students (see Eccles, Wigfield, Midgley, Reuman, Mac Iver, and Feldlaufer, in press). In addition, these advances in information processing skills do not
necessarily translate into better school performance. Several investigators have found that grades for many early adolescents decline following the transition to junior high (see Simmons & Blyth, 1987), and that this lower performance was predictive of later dropping out (Finn, 1989; Roderick, 1992; Rumberger, 1987). These declines reflect in part to the stricter grading standards in junior high and high school (see Blyth, Simmons, & Bush, 1978; Kavrell & Petersen, 1984; Schulenberg, Asp, & Petersen, 1984 and further discussion later), but they also reflect some students' difficulties in dealing with the transition to middle grades schools, and subsequent disengagement from academic pursuits.

**Group Differences in Cognition and Performance**

Group differences in academic performance between minority and majority adolescents are well documented, and often increase during secondary school (see Parham & Parham, 1990). Although some ethnic groups (particularly Asian Americans) continue to excel in school and on standardized tests, other minority students (particularly African-Americans and Hispanics) fare less well in the secondary school years. Compared to whites and Asians, adolescents from these groups continue to perform worse on standardized achievement tests, and enroll in more remedial and less advanced courses (Council of the Great City Schools, 1992; Rumberger, 1987; Slaughter, Defoe, Nagagawa, Takanishi, & Johnson, 1990). The latter difference is especially marked for math and science. African-American and Hispanic adolescents also drop out of high school at substantially higher rates than do white or Asian students (Rumberger, 1987), although the drop out rate among African American students has leveled off of late.

In contrast to these widening differences between ethnic groups, the pattern for gender differences is less consistent. Boys' and girls' grades do not differ substantially during secondary school and college; and in fact girls often continue to outperform boys even in math and science (see Linn & Hyde, 1989; Vetter, 1992). Comparisons on standardized test performances and course enrollments show a different pattern: There are gender differences favoring males on both of these indicators for math and physical science achievement, even among the highly gifted and
talented (Eccles & Harold, 1993; Vetter, 1992; White, 1992). In contrast, females are more likely than males to enroll in advanced courses in language and literature.

Many researchers have tried to explain these ethnic group and gender differences in achievement performance and choice. Explanations have focused on differences in quality of instruction, differences in cognitive and learning styles, differences in aptitude, and differences in self, social and motivational factors. Much of the work on the first three of these explanations is reviewed elsewhere in this volume (see chapters by Eisenberg, Martin, & Farbes; Gustafson et al., Laosa; and Slaughter-Defoe and Scott-Jones). We turn next to a discussion of self, social, and motivational factors that are a crucial aspect of adolescent development, and also help explain group differences in school achievement.

Adolescents’ Self-Concepts, Achievement Beliefs, and Achievement Values

In this section we consider work on different aspects of children’s self-beliefs, including their general self-concepts and beliefs focused more on their achievement activities. Regarding these achievement beliefs, we focus in particular on adolescents’ sense of ability and competence for different activities, their valuing of those activities, and the goals they have for different activities. Adolescence is a time in which these beliefs change in important ways. It is also a time in which many more choices and options become available to adolescents, which means that the beliefs they have about different activities could have more substantial effects on their behavior. For instance, earlier in school students have little choice about which subjects to take, and so even if they believe they lack competence for a particular subject and don’t like it much, they still have to take it. During high school students can make choices about whether to continue taking classes in areas like math and science. As we will see, their beliefs about those subjects, as well as their performance in them, have a strong impact on these choices. Thus to understand adolescents’ specific choices of which activities to pursue and more general choices about whether or not to stay in school, we must understand how their self-beliefs change during adolescence.
General Self-Concept and Identity Development

Research on adolescents' general self-concept has burgeoned during the last decade. Adolescence has long been thought to be a time of great change in children's self-concepts; in Erikson's (1963) ground breaking work, he characterized adolescence as the time in which individuals searched for their identity, either finding it or sinking into role confusion. More recently, Harter (1990) has discussed how during middle adolescence the self-concept is both less integrated and more unstable than at earlier or later time periods, and that perceived inconsistencies or conflicts in one's characteristics were a source of great concern during middle adolescence (see also Simmons & Blyth, 1987). Thus like Erikson, Harter proposed that a major task of adolescence is to integrate the disparate aspects of self.

One hallmark of recent research on adolescents' general self-concepts is that much of it is more theoretically based than earlier work (see Byrne, 1984; Harter, 1990). Also, researchers have focused on more particular aspects of self-concept rather than just measuring individuals' general sense of themselves, and developed measures of self-concept that have better psychometric properties, and convergent and divergent validity (see Byrne, 1984; Wigfield & Karpathian, 1993; Wylie, 1989 for further discussion). Byrne (1984) discussed different theoretical models of the self-concept. Three of these models have received the most research attention. First is the nomothetic position that the self-concept is unidimensional. Second is a taxonomic model that proposes a multifaceted self-concept with the facets relatively distinct and also a more general self-concept factor. Third is a hierarchical model that posits multiple facets of self-concept arranged in a hierarchy, with more specific aspects of self-concept at the base and general self-concept at the apex. Most researchers now reject the nomothetic model, but there continues to be debate between proponents of taxonomic models (e.g., Harter, 1985, 1986) and hierarchical models (Marsh, 1990b; Marsh & Shavelson, 1985; Shavelson, Hubner, & Stanton, 1976).

Marsh and his colleagues have done a great deal of empirical work to examine the structure of self-concept, utilizing Shavelson et al.'s (1976) hierarchical model of the self-concept as the theoretical basis for their work. They developed three different scales to measure children's self-
concept, called the Self-Description Questionnaire (SDQ) I, II, and III, for use with different-aged children and adolescents. These scales contain subscales that assess children's self-concepts in many different activity domains, including both academic and non-academic activities. The primary constructs assessed in each domain are children's perceptions of ability and liking of the domain.

Marsh and his colleagues' factor analytic work with these scales has shown that during middle childhood and early adolescence children's self-concepts appear to be organized hierarchically (e.g., Marsh, 1990b; Marsh & Hocevar, 1985; Marsh & Shavelson, 1985); however, the model is more complex than the one originally proposed by Shavelson et al. (1976). Interestingly, during later adolescence there is less evidence for a hierarchical self-concept. Marsh & O'Neill (1984) and Marsh & Shavelson (1985), using the SDQIII, found that the 13 SDQIII scales were very clearly defined. However, correlations among these factors were very low (averaging .09), leading Marsh and Shavelson to conclude that late adolescents' self-concepts, though multifaceted, are not hierarchically organized. As noted above Harter also (1990b) has proposed that the self-concept is less integrated and more unstable during middle adolescence. Marsh and O'Neill's results may reflect this "disintegrated" self. These findings suggest an intriguing pattern in self-concept development across childhood and adolescence, from differentiated and hierarchical to differentiated into quite distinct components. We know less about how these components of self-concept are organized during the college years and after, because researchers have not assessed this issue as frequently in those populations. The research on self and identity processes during the college years and later has taken more of a process approach (see further discussion below).

Researchers also have examined how children's and adolescents' general self-esteem changes. Simmons, Rosenberg, and Rosenberg (1973) showed that following the transition to junior high school early adolescents' general self-esteem is lower and less stable, and their self-consciousness higher, though there has been some debate about how prevalent these negative changes in general self-esteem are. In our work (Eccles et al., 1989; Wigfield et al., 1991),
children's self-esteem was lowest immediately after the transition into junior high school in seventh grade, but increased during students' seventh grade year. In their longitudinal work Blyth et al. (1983) and Simmons et al. (1979) found that for most children, self-esteem scores increase across adolescence (see also Dusek & Flaherty, 1981; Nettelmann 1987; O'Malley & Bachman, 1983). In Simmons' and Blyth's work, white girls who make the transition to junior high school are the only group to show consistent evidence of declines in self-esteem. Eccles and her colleagues (Eccles & Midgley, 1989; Eccles, Wigfield, Midgley, et al., in press) and Simmons and her colleagues (Blyth et al., 1983; Simmons et al, 1973; 1979; Simmons & Blyth, 1987) have postulated that these changes in early adolescents' self-beliefs are due in part to changes in the school environment that occur following the transition to junior high; these changes are discussed in more detail later.

How specific components of children's self-concepts relate most strongly to their overall self-esteem or self-worth at different ages has been an important research topic in this area. Harter (1985a, 1986) reported that during childhood and adolescence children's perceptions of competence correlated positively to one another and with their general self-worth, with the correlations between these constructs ranging between .40 to .67 (these correlations are somewhat lower in Marsh's work, though still significant). Harter also found that during the elementary school years and adolescence perceptions of physical appearance and social acceptance relate most strongly to children's feelings of self-worth (see Harter, 1990a, 1990b). These findings probably will come as no surprise to teachers and others working with early adolescents. Social status and physical appearance often seem to be much more important to adolescents than more mundane things like school success. The great changes in physical appearance occurring at this time likely are a major reason why adolescents are so concerned about their appearance.

A more difficult issue is determining exactly how the specific aspects of self-concept may influence general self-worth. Taking a broad perspective on this issue that she derived from William James, Susan Harter (1985, 1990) has posited that individuals' general self-worth is determined in part by the synchrony between their sense of competence at different activities, and
the importance of those activities to them. Doing well on activities that are important should foster positive general self-worth. Harter has found support for this notion in her empirical work: children believing they are good at activities they think are important have more positive general self-worth than do children who believe certain activities are important but do not think they are competent at those activities.

In their discussion of how specific aspects of self-concept relate to one's overall sense of self, Marsh and Shavelson (1985) argued against merely summing scores from different subscales to form a total score. Instead, they proposed that a weighted combination of self-concept facets would be a more appropriate method. However, Marsh and Shavelson (1985) stated that it is not known how exactly individuals would engage in the process of weighting different aspects of the self-concept in determining general self-concept, a problem also noted by Harter (1986). This equation likely differs from individual to individual; however, as we have seen beliefs about physical appearance and social acceptance appear to have relatively large weights for most adolescents. Further assessment of this issue should be a priority for self-concept research in the 1990’s.

This issue also has very important implications for students' school engagement. To the extent that adolescents' do well in school and believe it is important, they should remain engaged in academic activities. If either their performance decreases, or they begin to decide that school is not important, then their engagement will decrease. As we just noted, the importance of school often decreases during adolescence because many adolescents begin to see social activities as more important to them at this time, and like those activities much more than academic tasks (see Eccles et al., 1989; Wigfield et al., 1991).

**Links of General Self-Concept to School Achievement**

There has been a running debate among educational researchers concerning the direction of causality in this relationship. Some have argued that achievement determines self-concept. Others take a "self-concept enhancement" approach, arguing that increases in self-concept can improve achievement (see Byrne, 1984; Calysn & Kenny, 1977, for more complete discussion of these
different views). In earlier reviews, Hansford & Hattie (1982) concluded that general self-concept and achievement were only moderately related. Scheier and Kraut (1979) argued that programs attempting to boost children’s general self-concept had little effect on their achievement; thus they strongly rejected the self-concept enhancement view. These reviewers focused primarily on general self-concept; the more recent work just discussed suggests that specific aspects of self-concept relate more closely to achievement in a given area than does general self-concept (see Byrne, 1984; Eccles & Wigfield, 1985; Wigfield & Karpathian, 1991, for more detailed discussion). However, based on her review of studies of more specific aspects of self-concept and achievement Byrne (1984) concluded that causal predominance in this relationship still had not been established.

Two recent studies have addressed the issue of causality in the self-concept - achievement relation, using more sophisticated designs than in many previous studies. Skaalvik and Hagtvet (1990) looked at longitudinal relations between academic self-concept of ability, general self-esteem, and school achievement in third and fourth grade and sixth and seventh grade cohorts of Norwegian students. They hypothesized that academic achievement would predict academic self-concept of ability more strongly than vice versa, and that self-concept of ability would predict general self-esteem more strongly than would academic achievement. Their structural equation modeling analyses provided some support for these hypotheses in both cohorts; however, important cohort effects emerged. For the younger cohort, academic achievement more strongly predicted self-concept of ability than vice-versa, but in the older cohort there was some evidence that the relationship between the two variables was reciprocal. Results of this study thus show that there are age differences in the nature of the relation between self-concept and achievement.

In a longitudinal panel study, Marsh (1990a) examined relations at four time points between ability perceptions and grades in a sample of high school males. Prior ability perception and grades influenced subsequent grades, but subsequent ability perceptions were most strongly influenced by prior ability perceptions. In fact, previous grades did not relate to subsequent ability perceptions at any of the time points. Based on these findings, Marsh concluded that "the effects
of academic self-concept were 'causally predominant' over those of reported grades, and these results provide strong support for the self-concept enhancement model of the relation between self-concept and achievement" (p. 651). These findings contradict Scheier and Kraut's (1979) point that self-concept is not causal, but need replication before this conclusion is fully supported. We continue to believe that the relations between these constructs likely is reciprocal, at least by the middle school years (see also Eccles & Wigfield, 1985; Marsh, 1990a; Wigfield & Karpathian, 1991). It also appears that the importance individuals attach to different tasks influences their overall self-worth, and their engagement in different activities. We discuss these links more closely next.

Adolescents' Specific Achievement Beliefs and Achievement Motivation

Work on motivation and achievement-related beliefs also flourished in the 1980s. As discussed in more detail in the chapters by Graham and Stipek in this volume, much of this work has taken the broad perspective that it is children's interpretations of their achievement outcomes that are critical mediators of subsequent achievement behavior; thus children's beliefs about their accomplishments have been studied extensively. The beliefs receiving the most attention include attributions for success and failure (Weiner, 1979, 1985, 1986), self-concepts of ability (Blumenfeld, Pintrich, Mecece, & Wessels, 1982; Covington, 1984; Dweck & Elliott, 1983; Eccles et al., 1983; Harter, 1982; Nicholls, 1984; Stipek & Mac Iver, 1989), perceptions of efficacy at different tasks (Bandura, 1986; Schunk, 1991a, 1991b), perceptions of control over outcomes (Connell, 1985; Skinner, 1990), achievement goals (Ames & Archer, 1988; Dweck & Leggett, 1988; Nicholls, 1984; Wentzel, 1989), and achievement values (Eccles et al., 1983; Wigfield & Eccles, 1992). Still other work has focused on children's intrinsic versus extrinsic motivation (Deci & Ryan, 1986; Harter, 1981a, 1981b), and children’s anxiety (Wigfield & Eccles, 1989). One important feature of much of this work has been that it has focused on these relatively specific beliefs, rather than more global beliefs such as "self-concept."

Researchers looking at how these beliefs change during early adolescence and adolescence often have found that adolescents' beliefs and values become more negative (see Eccles, Midgley,
& Adler, 1984; Eccles & Midgley, 1989, 1990; Harter, 1990; Sjöpe & Mac Iver, 1989, for reviews). Many early adolescents become more anxious about school (Fyans, 1979; Harter, Whitesell, & Kowalski, 1987) and have lower academic intrinsic motivation (Harter, 1981; Harter et al., 1987). Early adolescents have lower ability self-concepts than do their younger peers (Eccles et al., 1983; Eccles, Adler, & Meece, 1984; Eccles et al., 1989; Marsh, 1989; Wigfield et al., 1991). In a summary of his cross-sectional studies of age differences in aspects of self-concept, Marsh (1989) reported that children's beliefs about their ability in a variety of different activity domains show quadratic effects that look like an inverted U: lower in eighth and ninth grade than in seventh grade, and higher in 10th and 11th grade. Some studies suggest that early adolescents' beliefs about mathematics become particularly negative (Brush, 1980; Eccles, Adler, & Meece, 1984; Wigfield et al., 1991). Because most of these studies were done in schools, they include only adolescents who are at least engaged enough in school to still be there; the achievement beliefs of adolescents dropping out may become even more negative at earlier ages.

The work on achievement goals also suggests change across age. Nicholls (1979b, 1983) defined two major kinds of goal orientations that children have, ego involvement and task involvement (see Dweck & Elliott, 1983, for a complementary analysis). Individuals adopting an ego-involved orientation seek to maximize favorable evaluations of their competence and minimize negative evaluations of competence. Questions like "Will I look smart?" and "Can I outperform others?" reflect ego-involved goals. With task involvement, individuals focus on mastering tasks and increasing competence at different tasks. Questions such as "How can I do this task?" and "What will I learn?" reflect task involvement. Nicholls has discussed that when children focus on ego-involved goals, they try to outperform others, and are more likely to do tasks they know they can do. Task-involved children choose challenging tasks and are more concerned with their own progress than with outperforming others. Researchers (e.g., Nicholls, 1979b) have suggested that ego-involved goals become more dominant during secondary school.

Wentzel (1989) assessed a broader set of goals obtained from interviews with adolescents. Some of these are similar to Nicholls' (1979b) task goals, including "being a successful student".
"learning new things", "understanding new things", and "doing one's best". Other academic goals like "being better than others" are more like Nicholls' ego goals. Some of the goals concern social aspects of school (making friends, winning approval, being helpful, getting others to help, being dependable and responsible), and others concern enjoyment of school (having fun). Wentzel found that high, middle, and low achieving adolescents had quite different sets of goals, with the high achievers focused more on several of the achievement-related goals and social responsibility. The middle achievers and low achievers focused more on social interaction goals, and low achievers in particular stated they did not try to win others' approval, or be successful. Wentzel (1989) has not looked at how these goals might differ in older and younger children. One likely change would be that for many children social goals may become more critical than academic goals, especially at early adolescence. Further, the differences between high, middle, and low achievers may become more pronounced during adolescence, as some children continue to do well in school and other struggle. Those doing poorly may be especially likely to seek goals other than academic ones in school, or reject school altogether (see Finn, 1989; Rumberger, 1987). How individuals choose among these different goals should have a lot to do with their engagement in school.

**Relations of Specific Achievement Beliefs and Values to Academic Performance and Choice**

Some researchers have examined how adolescents' specific achievement beliefs relate to their academic achievement and choice of activities. For instance, researchers interested in children's and adolescents' self-efficacy for different tasks have posited that efficacy beliefs relate to individuals performance, persistence, and choice of different activities (e.g., Bandura, 1986; Schunk, 1991b; Zimmerman, Bandura, & Martinez-Pons, 1992). In their expectancy-value approach to this issue, Eccles, Wigfield and their colleagues have extensively examined (both cross-sectionally and longitudinally) these relations in studies done with late elementary school through high school age students (e.g., Eccles, 1984a, 1984b; Eccles et al., 1983; Eccles, Adler, & Meece, 1984; Meece et al., 1990). Two fundamental findings emerge from this work. First, children's perceptions of ability and expectancies for success are the strongest predictors of
subsequent grades in math and English, predicting those outcomes more strongly than either previous grades or achievement values. Second, children's achievement values such as liking of tasks, importance attached to them, and their usefulness are the strongest predictors of children's intentions to keep taking math and actual decisions to do so (see Wigfield, in press; Wigfield & Eccles, 1992 for more complete reviews; see also Feather, 1982, 1988, for work on how student values relate to their choice of college major). As we discussed earlier, given the increasing opportunities for choice among different academic courses during middle adolescence, the finding that adolescents' achievement values relates most strongly to their choices is a particularly important finding. We know less about the processes by which adolescents come to value and devalue different activities; understanding these processes should be a research priority for the 1990s.

Pintrich and his colleagues have examined how adolescents' expectancies and values for different school subjects relate to their use of cognitive strategies as well as to their achievement performance (Pintrich & DeGroot, 1990; Pintrich & Garcia, 1991; Pintrich & Schrauben, 1992). They have found that students' perceived self-efficacy and values relate positively to their use of cognitive strategies and self-regulation, with the relations between achievement values, strategy use, and self-regulation stronger than those between self-efficacy, strategy use, and self-regulation. They also found that expectancies relate more strongly to performance than do achievement values. However, in predicting performance from the motivational variables, strategy use, and perceived self-regulation, they have found that it is the cognitive strategy and self-regulation scales that directly predict performance. The effects of self-efficacy and values on performance appear to be mediated through the cognitive variables. Pintrich and DeGroot argued that students' self-efficacy may facilitate their cognitive engagement, and their achievement values relate to their choices about whether to become engaged, but their use of cognitive strategies and self-regulation relate more directly to performance.

These recent findings clearly show the important role of self-beliefs on achievement and choice. What we need now is more studies of the processes involved in these evolving relations, and studies of different developmental trajectories in both these achievement-related beliefs, and
their relation to school performance and choice. From our research we know that students who don’t value math will be more likely to opt out of math when they no longer have to take it. Do adolescents’ specific achievement values relate to their bigger decision about dropping out or staying in school? Assessing students’ particular subjective values over the school years may help predict which students will become disengaged from school, and could provide a better model for how students’ achievement-related beliefs influence their decisions to stay in or leave school. Most researchers examining how students’ beliefs relate to dropping out of school have focused on students’ general self-esteem, a construct that may be too broad to have much predictive utility in explaining specific decisions like dropping out of school (see Finn, 1989 for a critique of the self- esteem explanation of dropping out of school). Certainly other factors, besides achievement beliefs and values, such as the economic pressure many poor students face, discrimination, and bad schools, play a major role in the decision to drop out (see Finn, 1989, Rumberger, 1987). Y the relative contribution of both specific achievement values and more general valuing of education also is likely to play a significant role, one that has not been addressed sufficiently.

Group Differences in Self-Concept, Motivation, and School Performance During Adolescence

Gender Differences. Though sex-typing itself occurs in the preschool years (see Huston, 1983), several researchers have suggested that engaging in gender-role appropriate activities may become quite important to early adolescents, as they try to conform more to gender-role stereotypes once they enter puberty (Eccles, 1987; Hill & Lynch, 1983; Parsons & Bryan, 1978). Hill & Lynch labeled this phenomenon gender-role intensification. This phenomenon may lead early adolescents to have less positive beliefs and be less involved in activities that they see as less appropriate to their own gender. For instance, girls who believe that math is not appropriate for females, and who wish to conform to perceived feminine roles, may decide to discontinue taking math when the possibility becomes available, even if they are doing very well in math.

Rosenberg (1986) suggested that girls are more affected by the physical changes occurring at puberty and thus their self-concepts are more volatile than those of boys during this time period. Simmons and Blyth (1987) found that the junior high transition had a negative effect only on girls.
self-esteem; our own work did not replicate this finding (Eccles et al., 1989; Wigfield et al., 1991).

Whether this difference reflects sample differences, measure differences, or some more substantive differences remains unclear. However, in our studies (e.g., Eccles et al., 1989; Wigfield et al., 1991) and those of others boys report higher self-esteem than do girls during the early adolescence period (e.g., Blyth et al., 1983; Marsh, 1989; Nottelmann, 1987; Rosenberg & Simmons, 1972; Simmons et al., 1979). We are unsure whether this finding reflects "true" gender differences in self-esteem or response bias, since boys tend to be more self-congratulatory than girls in their responses to self-report measures (Maehr & Nicholls, 1980), while girls may be more modest in their self-reports (Eccles, Adler, & Meece, 1984).

There are many gender differences in children's competence beliefs for activities in different domains. We find these differences to be particularly intriguing in light of recent evidence that actual achievement and test score differences between boys and girls are decreasing. In an important article Linn and Hyde (1989) presented a meta-analysis of recent work on sex differences in verbal, mathematics, and science aptitude test performance. They concluded that sex differences in verbal ability now are negligible; differences in quantitative skills show that girls' computation skills are better at all ages and boys do better on mathematics conceptual "word" problems in high school, though again these differences have decreased in the past 15 years; and differences in science knowledge and process still favor boys, though they also are decreasing and appear to reflect experiential differences between boys and girls in science.

Despite these achievement findings, gender differences in self-perceptions remain. In our work boys have higher self-concepts of ability for sports and math than do girls, and girls have higher self-concepts of ability for English (see Eccles et al., 1983; Eccles et al., 1989; Wigfield et al., 1991). Marsh (1989) also reported many gender differences in response to his self-concept scales, though he noted that the gender differences only explain about 1% of the variance in responses. Across all three SDQ measures boys' physical appearance, physical ability, and math self-concept scores are higher than those of girls, whereas girls' scores are higher for verbal/reading and general school subscales. Interestingly, there are few age by sex interactions in
children's and adolescents' responses to our measures or those of Marsh, suggesting that the gender differences neither increase nor decrease in magnitude across age.

Eccles, Wigfield and their colleagues also have found differences in boys' and girls' valuing of different tasks. Boys like sports and rate it as more important than do girls, whereas the opposite pattern occurs for social activities and English. There were no differences in math (Eccles et al., 1989; Wigfield et al., 1991). Though it is encouraging that boys and girls like math similarly and think it equally important, the fact that girls have less positive views of their ability in math could be problematic. If these trends continue into high school as other studies suggest (e.g., Eccles et al., 1983; Wigfield, 1984), the girls should be less likely than the boys to take optional advanced level math courses. This potential problem could be further exacerbated by the fact that girls report liking social activities so much more that math; social activities also could interfere with continued participation in mathematics.

Minority Adolescents. Less is known about motivational differences across adolescents from different racial and ethnic groups. Of the work that has been done, most has concerned African-American adolescents, and this work can help us understand achievement differences in different groups. Graham (1989) stated “Far too many minority children perform poorly in school not because they lack basic intellectual capacities or specific learning skills but because they have low expectations, feel hopeless, lack interest, or give up in the face of potential failure” (p. 40). In reviewing the research on differences between African-American and white students on motivational constructs such as locus of control and achievement attributions, Graham concluded that the (relatively small) literature in each area shows that differences between those groups are not very large, and often are not found. Further, she argued that many existing studies have not adequately distinguished between race and socioeconomic status, thus confounding the effects of those two variables. Graham stated that we do not yet have adequate theories explaining achievement motivation in African-American children and adolescents, and called for theoretical work focusing on cognitive motivational variables, such as attributions, achievement goals and values, and beliefs about ability and efficacy. We strongly concur with this suggestion, but believe
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work focusing on cognitive motivational variables, such as attributions, achievement goals and
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current theoretical models such as expectancy-value theory and self-efficacy theory could be utilized. To give two examples of the importance of these kinds of variables in minority adolescents' achievement, Gurin and Epps (1974) found that perceived efficacy was an important predictor of academic achievement among black adolescents. Hale-Benson (1989) also pointed to the importance of beliefs about academic efficacy, as contrasted to personal efficacy, to the achievement of African-American children, particularly males.

Other researchers have looked at differences in components of self-concept between white and African-American children. Often there are no differences between groups in general self-concept or self-esteem (see Powell, 1989). However, Hare (1985) has found that in black adolescents' academic self-concepts are lower than those of black children, and he postulated that this was due to the adolescents' increasing understanding of their relatively poor academic performance. Other studies have indicated that academic self-concept is not predictive of general self-esteem for black children (Bledsoe, 1967; Hare, 1977), suggesting that academic self-concept is not of critical importance to black children's sense of worth. Indeed, some studies have shown that possessing academic skills actually works against black students' social acceptance by their peers (McDermott, 1987; see also Fordham & Ogbo, 1986). Similarly, in looking at black students' performance in college, Claude Steele (1992) has suggested that they develop an ambivalent orientation to academic achievement. Confronted throughout their school career with mixed messages about their competence and their potential, they lower the value they attach to academic achievement. Fordham and Ogbo have made a similar argument linking black students' perception of limited future job opportunities to lowered motivation to work hard on academic achievement. They argue that society and schools give black youth the dual message that academic achievement is unlikely to lead to positive adult outcomes for them and that they are not valued by the system. In response to these messages, black youth create an oppositional culture that rejects the value of academic achievement. Ogbo (1992) has discussed cogently how this dynamic is different for forced minorities (African-Americans) and voluntary minority immigrant groups (such as recent immigrants from Asia).
Thus in considering performance and motivational differences across different ethnic and minority groups, it is essential to point out that such differences must be considered in light of larger contextual issues that influence development. Indeed, several researchers have pointed out the importance of taking a contextual view of minority achievement. For example in an important article Spencer and Markstrom-Adams (1990) discussed identity formation (or self-concept development) during childhood and adolescence in different groups of minority children. They argued that in forming their identities minority children have to deal with several difficult issues that majority adolescents do not face, such as the (often) negative view of their group held by many members of the majority society, conflict between the values of their group and those of larger society, and lack of "identity achieved" adults in their group that can serve as models for them. These difficulties sometimes impede identity formation in these adolescents, leading to identity diffusion or (possibly) an inadequate exploration of different possible identities that the adolescent could take on. In discussing some of these same issues Cross (1987) posited that to understand identity development in African American children and adolescents, their personal identities and orientation to their racial group both must be understood. For instance, some African American adolescents may have positive personal identities but be less positive about their racial group as a whole, whereas others may have negative personal identities but positive orientations toward their group. Cross argued that many researchers have confounded these two constructs in their studies, leading to confusion in our understanding of identity development in African American adolescents.

Research on these issues, while growing, still is lacking, and like Graham's (1989) suggestion that more research be done on minority children's motivation in achievement settings, Spencer and Markstrom-Adams (1990) called for more research on the processes involved in the self-concept development of children from different ethnic and racial groups. We concur strongly with these recommendations, and believe such work would make a very important contribution to both theory and application in these areas. At present we do not know enough to say whether or not current theoretical models are adequate for describing the development of self-concept and
motivation in different groups of adolescents, or whether new models will need to be developed.
As a result, it often is difficult to formulate appropriate intervention strategies to help minority
children struggling with school to do better. Certainly these topics should be a research priority
through the 1990s.

Finally, in thinking about the achievement and motivation of minority youth, it is important
to look at the quality of the educational institutions that serve these youth. Thirty-seven percent
of black youth and 32 percent of Hispanic youth, compared to 5 percent of white and 22 percent of
Asian youth are enrolled in the 47 great cities schools. Twenty-eight percent of these youth live
in poverty; 55 percent are eligible for free or reduced cost lunch. Teachers in these schools report
feeling less safe than teachers in other school districts; and drop out rates are highest in these
schools; achievement levels at all grades are the lowest (Council of the Great City Schools, 1991).
Finally schools that serve this population are less likely than schools serving advantaged
populations to offer either high quality remedial services or advanced courses and courses that
facilitate the acquisition of higher order thinking skills and active learning strategies (Mac Iver &
Epstein, 1991). Even children who are extremely motivated may find it difficult to perform well
under these educational circumstances.

Friendships and the Peer Group at Early and Middle Adolescence

Another major difference between children and adolescents concerns adolescents' more
extensive involvement in social activities, sports activities, and a variety of other extracurricular
activities. We have found that early adolescents rate social activities as very important to them,
like them more other activities that they do, especially more than academic activities (Eccles et
al., 1989; Wigfield et al., 1991). Indeed, activities with peers, peer acceptance, and appearance
take precedence over school activities at this time period, often to the chagrin of parents and
teachers. In fact, as mentioned earlier, Harter (1990a) found that early adolescents' physical
appearance and social acceptance are the most important predictors of their general self-esteem
more important than their perceptions of their own cognitive competence.
Children’s friendships undergo some important changes during adolescence (see Berndt & Perry, 1990; Damon & Hart, 1987; Savin-Williams & Berndt, 1990; Selman, 1980). Sullivan (1953) suggested that adolescent friendships are characterized more by fulfilling intimacy needs than are earlier friendships, and indeed most research shows that children state that friends are those with whom one can share intimate thoughts (this depiction may be somewhat more true for girls; see Douvan & Adelson, 1966). In addition, adolescents state that their friends share similar psychological characteristics, interests, and values, and that friends should be loyal to one another (see Berndt, 1990; Savin-Williams & Berndt, 1990). Many of these changes in adolescents’ conceptions of friendships can be linked to changes in their growing cognitive skills, increased perspective taking ability, and more varied social experiences (see Eisenberg, 1990; Selman, 1980, but also see Elkind, 1967, 1985 and Lapsley & Murphy, 1985 for discussion of the intriguing phenomenon of "adolescent egocentrism").

Perhaps because of the importance of social acceptance during adolescence, friendships during this time period often are characterized by their organization into cliques and groups (see Brown, 1990; Eder, 1985). Adolescents often form relatively rigid "groups" that sometimes differ in overall status in the school. For instance, Perry (1987) found that more popular children tended to have friends who also were more popular, whereas less popular children’s friends also were less popular. One reason for the existence of these cliques is to help adolescents establish a sense of identity; belonging to a group is one way to solve the problem of "who am I". A second (and related) phenomenon is that children’s conformity to their peers peaks during early adolescence; children are most likely to go along with others’ wishes at this time (see Hartup, 1983). This also has been related to the overwhelming importance of social acceptance to adolescents, as well as to children’s developing identity. Individuals less certain of their own identities may be more likely to conform to others.

In the popular literature, much has been written about how conformity to peers can create many problems for adolescents, and that "good" children often are corrupted by the negative influences of peers. Although pressure from peers to engage in misconduct does increase during
adolescence (see Brown, 1990), many researchers disagree with the simplistic view that 
adolescents are corrupted by their peer groups. Hartup (1983) discussed how most adolescents 
tend to agree more with their parents’ views on “major” issues such as morality, the importance 
of education, politics, and religion. Peers had more of an influence on things such as dress and 
clothing styles, music, and activity choice. Brown (1990) reviewed studies showing that it is poor 
parenting that sometimes leads children to get in with a “bad” peer group, rather than the peer 
group pulling the child into difficulties. He also argued that adolescents usually seek out similar 
peers; this means that those involved in sports will have other athletes as friends; those serious 
about school will seek those kinds of friends. Again, according to Brown the peer group acts 
more to reinforce predispositions, rather than totally changing adolescents.

Social acceptance also has been shown to relate to a variety of positive mental health 
outcomes, both before and during adolescence (see Parker & Asher, 1987). For instance, Perry 
(1987) found that adolescents who were satisfied with their friendships report higher self-esteem. 
Miller and Berndt (1987) reported that children whose friendships had more positive characteristics 
were themselves more involved in school and received better grades. And Berndt and Hawkins 
(1987) found that children with good friendships during sixth grade were more popular in seventh 
grade, following the transition to junior high school. Unfortunately, school transitions often 
disrupt children’s friendships, perhaps causing some difficulties in these important psychological 
outcomes. In our study of how the transition to junior high school influenced children’s 
perceptions of social ability, we found a dramatic decrease in those beliefs immediately after the 
transition. Fortunately, this effect moderated during the seventh grade year, though children’s 
perceptions of their social ability at the end of seventh grade still were lower than they were at the 
end of sixth grade, before the transition (Wigfield et al., 1991).

How do children’s friendships relate to their school achievement? From Brown’s (1990) 
review (see also the chapter by Webb and Palincsar in this volume), it appears that friends 
potentially can have both positive and negative effects on school achievement. High achieving 
children who seek out other high achievers as friends could end up performing better as a result.
their interactions with these other children. In contrast, low achievers whose friends are primarily other low achievers may begin to do even worse in school. There is evidence to indicate that low achievers do tend to gravitate together in class (see Michaels, 198x). Given the importance of social acceptance to adolescents, children lacking friends may not only not get involved in extra-curricular activities, but their school performance may suffer as well. Rejected children are at risk for numerous negative social and psychological outcomes (see Asher & Coie, 1990). One way that positive social interaction has been facilitated in classrooms is through cooperative learning (see Johnson & Johnson, 1987; Slavin, 1990); the use of such techniques could mitigate the effects of peer rejection on students' achievement.

**Group Differences in Children's Friendships**

Relations between boys and girls undergo important and obvious changes during adolescence. Most researchers doing sociometric studies of children's friendships during elementary school have children do same-sex ratings of their friendships, because same-sex friendships are most prevalent at that time. During early adolescence cross-sex interactions become more prevalent, although often interactions between the sexes are awkward initially. In her fascinating observational study of friendships in a middle school, Schofield (1980) found that boys and girls often did not interact that much, though some cross-sex friendships were developing. More important, in talking with boys and girls she found that they were very aware that they soon would be dating, and many of the awkward interactions between boys and girls featuring teasing, pushing and shoving, and halting conversation that seemed to reflect that awareness. Because of this awareness of the imminence of dating, Schofield described boys and girls as having "complementary" social identities.

The work by Magnusson and Stattin (Magnusson, 1988; Stattin & Magnusson, 1990) extends this idea into the high school years and beyond. They report that some young women (early matures in particular) are particularly likely to be channeled into complementary relations with their male peers. Because these females look sexually mature, they are more likely to become involved with older peers, particularly with older male peers who interact with them in terms of
reciprocal gender roles. As the young women get caught up in this peer social system, they shift their attention away from academic activities and into heterosocial activities and roles. As a result, they lower their educational aspirations, and, in fact, end up obtaining less education than other females - marrying and becoming parents earlier instead. Thus, what appears initially as a "cute" set of complementary social identities can have quite negative consequences for some females (especially those who mature early) as their social identity detracts from educational focus and attainment.

Relations across different ethnic and racial groups do not seem as complementary. In Schofield's (1980) study, despite strong efforts by school staff to create mixed groups of children in different school activities, children would re-segregate at the first opportunity they had. In addition, different groups in the school did not have extremely positive views of one another; in many instances white students thought black students were aggressive, disruptive, and poor achievers, whereas black students thought white students were conceited and racist. As a result of these patterns Schofield suggested that black and white children have conflicting rather than complementary social identities. These patterns may be exacerbated by the separate neighborhoods in which children of different races often live. DuBois and Hirsch (1990) found that 80% of both black and white early adolescents said they have friends from other races at school. However, only 25% of the adolescents said that they had friends from other races in their neighborhoods.

One way to increase cross-race friendships is the use of cooperative learning in the classroom: Slavin (1990) and Johnson and Johnson (1987) reported that cross-race acceptance and interaction both increase when more cooperative learning is used. The issue of promoting positive social relations among different groups will become even important as our schools continue to become more diverse.

It is also important to consider the possible impact of peer groups on achievement behavior. As noted above, the reciprocal gender role peer interactions of early maturing females appear to have a negative effect on their academic achievement. Similar processes have been suggested for various ethnic groups. As noted earlier, several investigators have suggested, and provided
evidence, that black youth are likely to receive less peer support for academic achievement than white youth (e.g., Fordham & Ogbu, 1986). Steinberg, Dornbusch, and Brown (1993) concluded based on their recent study of ethnic differences in achievement in California and Wisconsin that both the lower performance of both blacks and Hispanics and the higher performance of whites and Asians are more a result of ethnic differences in peer support for academic achievement than a result of ethnic differences in either the value parents attach to education or the youths' beliefs regarding the likely occupational payoff for academic success. Young family relations continue to have an important impact on adolescents' school achievement and many other aspects of their development; we consider family relations at adolescence next.

Changes in Family Relations During Early and Middle Adolescence

As mentioned earlier, there is a prevalent view that relations between parent and adolescent are much stormier than parent-child relations or relations of parents and their adult children. This view is more common in the clinical literature (e.g., Blos, 1979; Freud, 1958) and in anecdotal reports from some parents than it is in the research literature (e.g., Buchanan et al., 1992; Collins, 1990; Dornbusch et al., 1991; Petersen, 1988). Although the extent of actual disruption in parent-adolescent relations is debated, there is little question that parent-child relations do change during adolescence. As adolescents become physically mature they often seek more independence and autonomy, and can begin to question family rules and roles. One clear finding is that parents and adolescents do have more conflicts than are reported in earlier parent-child relations, with those conflicts often centering on things like dress and appearance, chores, and dating (see Collins, 1990; Paikoff & Brooks-Gunn, 1990, for reviews). These conflicts appear to be especially likely when families experience different kinds of stress, particularly the stresses associated with economic hardships, and broader patterns of discord in the family (see Barber & Eccles, 1992; Hauser & Bowlds, 1990; McLoyd, 1990). Despite these conflicts over day to day issues, as mentioned earlier many researchers find that regarding core values such as beliefs about the importance of education, politics, and spirituality, parents and adolescents agree more than they disagree (Hartup, 1983).
Other ways in which relations between parents and adolescents differ from earlier parent-child relations is that they have fewer interactions and do fewer things together outside the home; this is perhaps best illustrated by the horror many adolescents express at seeing their parents at places like shopping malls. Also, particularly at puberty, affective relations can be more negative, and girls in particular report feeling less accepted by parents (see Collins, 1990 for a more thorough review). In fact, Steinberg (1989) has argued that puberty has a special role in this "distancing" in relations between adolescents and parents. He argued for an evolutionary basis for this distancing, citing evidence from non-human primates that puberty is the time at which parents and offspring often go their separate ways. Because in our culture parents and adolescents usually continue to live together for a long time after adolescents go through puberty, distancing rather than complete separation may be the evolutionary vestige in humans. Although he did not take an evolutionary perspective, Collins (1990) wrote that the distancing in parent-adolescent relations has great functional value for adolescents, in that it fosters their individuation from their parents, allows them to try more things on their own, and develops their own competencies and efficacy.

One arena in which this distancing may not be as advantageous is in parents' involvement in their adolescents' education. Most studies of parental involvement in schooling show that it is highest in elementary school, and drops off after that (see Eccles & Harold, 1993; Epstein, 1991; Harold, Blumenfeld, Eccles, Yoon, Wigfield, & Roeser, 1992). There are many reasons why this occurs; one is the structure of the schools themselves. Elementary schools are smaller, often located in the neighborhood, and children usually just have one teacher most responsible for their education. Secondary schools are much larger, more diffuse, and adolescents have different teachers for each subject area. Parents often might find this larger and more bureaucratic institution much harder to deal with. At the same time, during adolescence children also may make it clear they do not want their parents to be as directly involved in their school activities, either at home or at school. Yet numerous studies indicate that continued parental involvement in their children's education is a critical factor in their school performance (see Eccles & Harold, 1993; Epstein, 1991, for reviews). This has also been demonstrated in studies of black adolescents (see Hale-
Benson, 1989; Jenkins, 1989); indeed, one hallmark of Comer’s (1988) school reform programs is to enhance parental involvement in many different aspects of schooling.

SCHOOL TRANSITIONS AND ADOLESCENT DEVELOPMENT

As we have discussed, very few developmental periods are characterized by so many changes at so many different levels as adolescence - changes due to pubertal development, social role redefinitions, cognitive development, school transitions, and the emergence of sexuality. With rapid change comes a heightened potential for both positive and negative outcomes. And, although most individuals pass through this developmental period without excessively high levels of "storm and stress", many individuals do experience difficulty during this period. As a result a substantial portion of America’s adolescents are not succeeding as well as might be hoped for: Between 15 and 30 percent (depending on ethnic group) drop out of school before completing high school; adolescents as a group have the highest arrest rate of any age group; and increasing numbers of adolescents consume alcohol and other drugs on regular basis (Office of Educational Research and Improvement, 1988). Many of these problems appear to begin during the early adolescent years (Carnegie Council on Adolescent Development, 1989). Why? Is there something unique about this developmental period that puts individuals at greater risk for difficulty as they pass through it? In this section, we look more closely at this question, reviewing evidence for the hypothesis that some of the "negative" psychological changes associated with adolescent development result from a mismatch between the needs of the developing adolescent and the opportunities afforded them in their school environment. Thus we will be discussing an important context, the school environment, in which adolescent development takes place. We focus especially on the transition from elementary to middle or junior high school, but also discuss the transition into high school.

The Middle Grades School Transition

As reviewed earlier, evidence suggests that the early adolescent years mark the beginning for some individuals of a downward spiral that can lead to academic failure and school drop out. For example, both Roderick (1992) and Simmons & Blyth (1987) found a marked decline in some early adolescents' school grades as they move into junior high school. Furthermore, the
magnitude of this decline was predictive of subsequent school failure and drop out. Similar declines have been documented for such motivational constructs as: interest in school (Epstein & McPartland, 1976); intrinsic motivation (Harter, 1982); self-concepts/self-perceptions (Eccles, Midgley, & Adler, 1984; Simmons, Blyth, Van Cleave, & Bush, 1979), and confidence in one's intellectual abilities, especially following failure (Parsons & Ruble, 1977). There are also reports of increases during early adolescence in such negative motivational and behavioral characteristics as test anxiety (Wigfield & Eccles, 1989), learned helpless responses to failure (Rehfeld, Blackwell, Jordan, & Walters, 1980), focus on self-evaluation rather than task mastery (Nicholls, 1990), and both truancy and school drop out (Rosenbaum, 1976; See Eccles, Midgley, & Adler, 1984 and Eccles & Midgley, 1989 for full reviews). Although these changes are not extreme for most adolescents, there is sufficient evidence of 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 review). And although few studies have gathered information on ethnic or social class differences in these declines, we do know that academic failure and drop out is especially problematic among some ethnic groups and among youth from low SES communities and families (e.g., Hauser, 1991). It is likely then that these groups are particularly likely to show these declines in academic motivation and self-perception as they move into and through the secondary school years.

A variety of explanations have been offered to explain these "negative" changes: Some have suggested that declines such as these result from the intrapsychic upheaval assumed to be associated with early adolescent development (e.g., Blos, 1965). Others have suggested that it is the coincidence of the timing of multiple life changes. For example, Simmons and her colleague 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 particularly for females (e.g., Blyth, Simmons & Carlton-Ford, 1983; Simmons & Blyth, 1987). Still others suggest that it is the nature of the junior high school environment rather than the transition per se that is important (e.g., Eccles, Midgley, & Adler, 1984; Eccles & Midgley, 1989). Drawing upon
Person-Environment Fit theory (see Hunt, 1975), Eccles and Midgley (1989) proposed that the negative motivational and behavioral changes associated with early adolescence could result from the fact that traditional junior high schools are not providing appropriate educational environments for early adolescents. According to Person-Environment theory, behavior, motivation and mental health are influenced by the fit between the characteristics individuals bring to their social environments and the characteristics of these social environments. Individuals are not likely to do very well, or be very motivated, if they are in social environments that do not fit their psychological needs. If the social environments in the typical middle grades schools do not fit well with the psychological needs of adolescents, then person - environment fit theory predicts a decline in the adolescents' motivation, interest, performance, and behavior as they move into these environments.

Evidence for this perspective is reviewed in this section. But in order to understand the role school environments might play in beginning negative motivational changes at early adolescence, two types of evidence need to be considered: evidence drawn from studies that follow the standard environmental influences approach and evidence from studies that adopt a developmental variation of the person-environment fit paradigm, or as Eccles and Midgley have termed it, the "stage/environment fit" approach (see Eccles & Midgley, 1989).

General Environmental Influences

Work in a variety of areas has documented the impact of various classroom and school environmental characteristics on motivation. For example, the big school/ small schools literature has demonstrated the motivational advantages of small secondary schools especially for marginal students (Barker & Gump, 1964). Similarly, the teacher efficacy literature has documented the positive student motivational consequences of high teacher efficacy (Ashton, 1985; Brookover, Beady, Flood, Schweitzer, & Wisenbaker, 1979). Finally, organizational psychology has demonstrated the importance of participatory work structures on worker motivation (Lawler, 1976). The list of such influences could, of course, go on for several pages. The point is that there may be systematic differences between the academic environments in typical elementary...
schools, and those in typical junior high schools and middle schools; if so, these differences could account for some of the motivational changes seen among early adolescents as they make the transition into junior high school or middle school. In other words, the motivational problems seen at early adolescence may be a consequence of the type of school environment changes these students are forced to adapt to rather than to characteristics of the developmental period per se (see Higgins and Parsons, 1983, for a full elaboration of this argument). The same argument could be made for the problems associated with the transition to high school and college; these transitions are discussed later in this chapter.

**Stage-Environment Fit**

A slightly different analysis of the possible environmental causes of the motivational changes associated with the junior high school transition draws on the idea of person-environment fit. Such a perspective leads one to expect negative motivational consequences for individuals when they are in environments that do not fit well with their needs (Hunt, 1975; Lewin, 1935). At the most basic level, this perspective suggests the importance of looking at the fit between the needs of early adolescents and the opportunities afforded them in the traditional junior high school environment. A poor fit would help explain the declines in motivation associated with the transition to either junior or senior high school.

An even more interesting way to use the person/environment fit perspective is to put it into a developmental framework. Hunt (1975) argued for the importance of adopting a developmental perspective on person-environment fit in the classroom. He suggested that teachers need to 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 the children along a developmental path toward higher levels of cognitive and social maturity. Eccles and Midgley (1989) extended this perspective to an analysis of the motivational declines associated with the junior high school transition. They suggested that different types of educational environments may be needed for different age groups in order to meet the individual's developmental needs and to foster continued developmental growth. Exposure to the developmentally appropriate environment would facilitate
both motivation and continued growth; in contrast, exposure to a developmentally inappropriate environment, especially a developmentally regressive environment was predicted to create a particularly poor person-environment fit, which, in turn, would lead to declines in motivation as well as in the attachment to the goals of the institution. Image two trajectories: one a developmental trajectory of individual growth, the other a trajectory of environmental change across the school years. Positive motivational consequences are predicted when these two trajectories are in synchrony with each other; that is, when the environment is both responsive to the changing needs of the individual and offers the kinds of stimulation that will propel continued positive growth. In other words, transition to a facilitative and developmentally appropriate environment, even at this vulnerable age, should have a positive impact on children's perception of themselves and their educational environment. In contrast, negative motivational consequences are predicted when these two trajectories are out of synchrony. If this is true, then a 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 analysis suggests a set of researchable theoretical and descriptive questions. First, what are the developmental needs of the early adolescent? Second, what kind of educational environment would be developmentally appropriate in terms of both meeting these needs and stimulating further development? Third, what are the most common changes in the academic environment before and after the transition to middle or junior high school? Fourth, and most importantly, are these changes compatible with the physiological, cognitive, and psychological changes early adolescents are experiencing? Or is there a developmental mismatch between maturing early adolescents and the classroom environments they experience before and after the transition to the junior high school - a mismatch that results in a deterioration in academic motivation and performance for some children? Finally, can a similar analysis be used to understand motivational changes associated with the transition to high school and college? What about the transition from school to work?
Eccles and Midgley (1989) argued that there are developmentally inappropriate changes at the junior high school in a cluster of classroom organizational, instructional, and climate variables, including task structure, task complexity, grouping practices, evaluation techniques, motivational strategies, locus of responsibility for learning, and quality of teacher-student and student-student relationships. They argued, in turn, that these changes contribute to the negative change in students' motivation and achievement-related beliefs assumed to coincide with the transition into junior high school. The research of Eccles, Midgley, Wigfield and their colleagues, as well as that little other available research, provides support for these suggestions. This research is summarized below.

Remarkably few empirical studies have focused on differences in the classroom or school environment across grades or school levels. Most descriptions have focused on school level characteristics such as school size, degree of departmentalization, extent of bureaucratization, and so on. For example, Simmons & Blyth (1987) point out that most junior high schools are substantially larger (by several orders of magnitude) than elementary schools and instruction is more likely to be organized and taught departmentally. As a result of both of these differences, junior high school teachers typically teach several different groups of students each day and are unlikely to teach any particular students for more than one year. In addition, students typically have several teachers each day with little opportunity to interact with any one teacher on any dimension except the academic content of what is being taught and disciplinary issues. Thus, the opportunity for forming close relationships between students and teachers is effectively eliminated at precisely the point in the students' development when they have a great need for guidance and support from non-familial adults (see Carnegie Report on Adolescent Development, 1989). Such changes in student-teacher relationships, in turn, are likely to undermine the sense of community and trust between students and teachers - leading to a lowered sense of efficacy among the teachers, an increased reliance on authoritarian control practices by the teachers, and an increased sense of alienation among the students. Such changes are also likely to decrease the probability that any particular student's difficulties will be noticed early enough to get the student necessary help - the
increasing the likelihood that students on the edge will be allowed to slip onto negative trajectories leading to increased school failure and drop out.

Although differences on these characteristics can have important effects on teacher beliefs and practices and on student alienation and motivation, until quite recently these links have rarely been assessed. Most attempts to assess the classroom environment have included only one grade level and have related differences in the environment to student outcomes, particularly scores on achievement tests. Little research has focused on systematic differences between the classroom environment of elementary and junior high/middle schools. But looking across the various relevant studies, six patterns emerge with a fair degree of consistency.

Authority relationships. First, despite the increasing maturity of students, junior high school classrooms, as compared to 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 & Everston, 1978; Midgley & Feldlaufer, 1987; Midgley, Feldlaufer, & Eccles, 1988; Moos, 1979). For example, Brophy, Everston, and their colleagues have found consistent evidence that junior high school teachers spend more time maintaining order and less time actually teaching than elementary school teachers (Brophy & Everston, 1978). Similarly, Midgley et al. (1988) found that sixth grade elementary school math teachers report less concern with controlling and disciplining their students than these same students’ seventh grade junior high school math teachers reported one year later.

Similar differences emerge on indicators of student 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 grader students in a traditional junior high school (Ward, Mergendoller, Tikunoff, Rounds, Dadey, & Mitman, 1982). Similarly, Midgley and Feldlaufer (1987) reported that both seventh graders and their teachers in the first year of junior high school indicated less opportunity for students to participate in classroom decision-making than did the same students and their sixth grade elementary school teachers one year earlier. In addition, us
a measure developed by Lee, Statuto, and Kedar-Voivodes (1983) to assess the congruence between the adolescents' desire for participation in decision-making and their perception of the opportunities for such participation, Midgley and Feldlaufer (1987) found a greater discrepancy when the adolescents were in their first year in junior high school than when these same adolescents were in their last year in elementary school. Clearly, the fit between the adolescents' desire for autonomy and their perception of the extent to which their school affords them opportunities to exchange in autonomous behavior had decreased over the junior high school transition.

As outlined earlier, person-environment fit theory suggests that such mismatch between young adolescents' desires for autonomy and control and their perception of the opportunities in their environments should result in a decline in the adolescents' intrinsic motivation and interest in school. More specifically, given the general developmental progression towards increased desires for independence and autonomy during the early adolescence period, Eccles & 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 should be at particularly high risk for negative motivational outcomes. In a longitudinal analysis of the Lee et al. (1983) measure, Mac Iver and Reuman (1988) provide some support for this prediction. They compared the changes in intrinsic interest in math for adolescents reporting different patterns of changes in the match between their desire for participation in classroom decision-making and their perception of the opportunity for such decision-making across the junior high school transition. Consistent with the prediction, it was the adolescents who thought that their seventh-grade math classrooms were putting greater constraints on their preferred level of participation in classroom decision-making than their sixth-grade math classrooms who showed the most marked decline in their intrinsic interest in math as they moved from the sixth grade into the seventh grade.

Another way to look at stage-environment mismatch is to look for differences between children of the same age who are at different maturational levels. Miller and her colleagues adopted just such a strategy with the Michigan Study of Adolescent Life Transitions (MSALT). They
focused on individual differences between sixth grade girls at different stages of pubertal development in the match between the girls' desire for decision-making opportunities and their perceptions of the opportunity for such decision-making in their classrooms. 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 did their less developmentally mature female classmates (Miller, 1986). Unfortunately, as was true for the longitudinal results, the more physically mature females did not perceive greater opportunities for participation in classroom decision-making. Although the females with varying degrees of pubertal development were in the same classrooms, the more physically mature females (i.e., the early developers) reported fewer opportunities for participation in classroom decision-making than did their less mature female peers (i.e., the on-time and late developers).

These maturational differences are even more striking when one looks at the within-year changes in these female adolescents' perceptions of the opportunities they have to participate in classroom decision-making. Miller calculated the mean change in these females' perceptions of opportunities from fall to the spring testing and then looked at this change as a function of their pubertal status. The early-maturing females showed a negative change (a decline) over the course of the school year in the extent to which they felt they could participate in classroom decision-making. In contrast, the late-maturing females in these same classrooms showed a positive change (an increase) over the course of the school year (Miller, 1986). How could this be, given that these adolescents were in the same classrooms? Did the teachers actually treat these adolescent females differently (i.e., did the teachers respond to earlier physical maturity with more control behavior)? Or did the adolescents perceive a similar environment differently (i.e., did the early-maturing adolescents perceive the same level of adult control as providing less opportunity for 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 differ.
perceive similar environments differently depending on their cognitive and/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 importantly for the issues central to this article, 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 a greater degree of mismatch among the more physically mature female adolescents than among the less mature.

These last results are especially interesting in light of the finding by Simmons and her colleagues (e.g., Simmons & Blyth, 1987; Simmons, Blyth, Van Cleave, & Bush, 1979) that in the more physically mature girls who are also involved in dating who respond to the transition to junior high school with increased levels of truancy and school misconduct and decreased self-esteem. Simmons et al. (1979) and Simmons and Blyth (1987) have explained this result in terms of multiple risks - these girls are the early adolescents who are experiencing school and pubertal transitions simultaneously. Alternatively, it is possible that it is the mismatch between their desire for a less controlling adult environment and their perceptions of a decline in the actual opportunities for participation that puts these females at risk for the most negative motivational outcomes.

Affective relationships. Second, junior high school classrooms, as compared to elementary school classrooms, are characterized by a less personal and positive teacher/student relationship (see Eccles & Midgley, 1989). For example, in Trebilco, Atkinson, Atkinson (1977), students reported less favorable interpersonal relations with their teachers after the transition to secondary school than before. Similarly, in Feldlaufer, Midgley, and Eccles (1988), both students and observers rated junior high school math teachers as less friendly, less supportive, and less caring than the teachers these same students had one year earlier in the last year of elementary school. 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., 1988).

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.
Fraser & Fisher, 1982; Moos, 1979; Trickett & Moos, 1974). Consequently, there is reason to believe that transition into a less supportive classroom will impact negatively on early adolescents' interest in the subject matter being taught in that classroom. Midgley, Feldlaufer and Eccles (1988), tested this hypothesis: As predicted, it was the early adolescents who moved from elementary teachers they perceived to be high in support to junior high school teachers they perceived to be low in support who showed the commonly reported decline in the value they attached to math; in contrast, the early adolescents who moved from teachers they perceived to be low in support to teachers they perceived to be high in support showed an increase in the value they attached to math. These differences were especially marked among the low achieving students, suggesting that low achieving students are particularly at risk when they move to less facilitative classroom environments following a school transition.

**Organization of instruction.** Third, the shift to junior high school is associated with an increase in practices such as whole class task organization, and between classroom ability grouping (see Eccles & Midgley, 1989). For example, in the Junior High School Transition Study, 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 subjects areas (Rounds & Osaki, 1982). Similar shifts towards increased whole-class instruction with most students working on the same assignments at the same time, using the same textbooks, and the same homework assignments were evident in the Michigan Study of Adolescent Life Transitions (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 et al., 1984 and Rosenholtz & Simpson, 1984). They may increase the likelihood that teachers will use normative grading criteria and more public formal evaluation, both of which are likely to impact negatively on many early adolescents' self-perceptions and motivation. These changes may also make aptitude differences more salient.
both teachers and students, leading to increased teacher expectancy effects and decreased feeling of efficacy among teachers (see Eccles & Wigfield, 1985).

**Teacher efficacy.** Fourth, junior high school teachers feel less effective as teachers, especially for low ability students. This was one of largest differences we found between sixth and seventh grade teachers in the Michigan Study of Adolescent Life Transitions. Seventh grade teachers in these junior high schools reported much lower confidence in their teaching efficacy did the sixth grade elementary school teachers in the same school districts (Midgley, Feldlauer, Eccles, 1988). Others have reported similar results. Alexander and George (1981) found that teachers in traditional junior high schools had a lower sense of their teaching efficacy than did teachers in a more innovative middle grades school.

Several studies have documented the impact of teacher efficacy on student beliefs, attitudes, motivation, and achievement. For example, Brookover et al., (1979) using schools as the unit of analysis, found negative correlations between teachers’ sense of academic futility and students self-concept of ability and self-reliance. Alexander and George (1981), in the study just mentioned, found that teachers in the more innovative middle grades school had higher expectancies for student success, and also were more likely to take personal responsibility for student failure than were the junior high school teachers. Ashton (1985) has found that teacher sense of efficacy relates positively to high school students performance on math and language achievement test scores. More efficacious teachers also were more encouraging and supportive students.

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. Midgley, Feldlauer, and Eccles. 1989 tested this hypothesis. They divided their adolescent sample into four groups based on median splits of math teachers’ ratings of their personal teaching efficacy. The largest group of students (55 of the 1329 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...
years, 117 moved from low to high efficacy teachers, and 179 had high efficacy teachers both years. As predicted, the adolescents who had 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 had experienced no change in teacher efficacy or who had moved from low to high efficacy teachers. These effects were especially marked among the low achieving adolescents. By the end of the junior high school year, the confidence that those low achieving adolescents who had moved from high to low efficacy teachers had in their ability to master mathematics had declined dramatically - a drop that could well mark the beginning of the downward spiral in school motivation that eventually leads school drop out for so many low achieving adolescents. It is important to note, however, that this same decline was not characteristic of the low achieving adolescents who moved to high efficacy seventh grade math teachers.

**Cognitive level of academic content.** Fifth, despite what one might expect given what we know about cognitive development at this age, 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 the early adolescents are ready for more formal instruction in the various subject areas. Two assumptions are implicit in this argument. First, it is assumed that more formal, departmentalized teaching is conducive to the learning of higher-order cognitive processes. Second, it is assumed that children in junior high school are undertaking higher-order learning tasks in their departmentalized courses. Both of these assumptions are being questioned. 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, & Steele (1973) rated
the level of complexity of student assignments across grades 6 to 12 according to Bloom's taxonomy of educational objectives. 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 as they make the transition from primary school into secondary school. No one has researched the impact of this decline in the cognitive demands placed on students, but one could speculate that its impact is likely to be negative, especially in light of the more rigorous grading practices often associated with this school transition (see review below). Although the students have been lead to believe that they are moving to a more challenging school environment, they may well find themselves in classes that are reviewing the material they learned in elementary school and they are likely to be given lower grades for their work. As we shall see below, this experience is not likely to facilitate their motivation.

**Grading practices.** 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 efficacy 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, Finger and Silverman (1966) found that 54% of the students in New York State schools experienced a decline in their grades when they moved into junior high school. Similarly, 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. Roderick (1992) found a similar difference in the likelihood of a grade drop between fifth and sixth grade depending on whether the students moved into a middle school or remained in a K-6 elementary school between these two grades. Finally, the decline in grades is
not matched by a decline in the adolescents' scores on standardized achievement tests, suggesting that the decline 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 in light of the fact that the material is not likely to be more intellectually challenging. Although neither Simmons & Blyth (1987) or Roderick (1992) looked at this specific question, both documented the impact of this grade drop on subsequent school performance and drop out. Even controlling for a youth's performance prior to the school transition, the magnitude of the grade drop following the transition into either junior high school or middle school is a major predictor of early school leaving in both studies.

Summary. Changes such as those reviewed in the last several pages are likely to have a negative effect on many children's motivational orientation toward school at any grade level. But Eccles and Midgley (1989) have argued that these types of school environmental changes are particularly harmful at early adolescence given what is known about psychological development during 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 (see Brown, 1990; Eccles & Midgley, 1990; Harter, 1990; Katchadourian, 1990; Keating, 1990; Simmons & Blyth, 1987). Simmons & 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 new challenging opportunities for growth. In light of these needs, the environmental changes often associated with transition to junior high school often seem especially harmful to these adolescents' 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. 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 adolescents who are having difficulty succeeding in school academically. One task for researchers in the 1990s is to assess whether the kinds of mismatch between school environments and early adolescent development we have discussed occur can be generalized to early adolescents in different kinds of educational settings (e.g., rural vs. urban schools; rich vs. poorer schools), and indeed, for different groups of early adolescents (see Berliner, 1989).

The High School Transition

Although there has been less work on the transition to high school than on the transition to junior high school, the work on high school environments suggests that many of the same problems noted earlier for the junior high school transition characterize the high school transition well. Several of changes are continued and exaggerated. For example, high schools are typically even larger and more bureaucratic than junior high schools and middle schools. Based on arguments related to the economies of scale, most public school districts have moved toward consolidation at the secondary school level. It was hoped that consolidation would increase efficiency and provide more equal educational opportunities for all students in the district. In a major review of the impact of high school organization on teachers and students, Bryk, Lee and Smith (1991) conclude that

"these aims ... have not been achieved. The incidence of dropping out ... increased through the 1970’s and remains depressingly high, with rates in excess of 50 percent not uncommon in urban schools. ... the expansion of school bureaucracy ... has contributed to student passivity and teacher alienation, both of which are now pervasive. A system of mass education relying on processes of specialization and centralization has promoted a breakdown in human commitment ... These forces appear especially disruptive in large urban districts."
They go on to give numerous examples of how the sense of community among teachers and students is undermined by school size and bureaucratic structure (e.g., Bryk & Driscoll, 1988; Newmann, 1981). Teachers do not know each other and do not know the students. Little effort is made to make the instruction relevant to the students. There is little opportunity for students and teachers to get to know each other and, likely as a consequence, there is distrust between them and little attachment to a common set of goals and values. And was true for the junior high school transition, there is also little opportunity for the students to form a mentor-like relationship with a nonfamilial adult. One would certainly predict that such an environment would likely undermine the motivation and involvement of many students, especially those who are not doing particularly well academically, those not enrolled in the favored classes, and those who become alienated from the values of the adults in the high school. But few studies have actually followed students through this transition in order to test this hypothesis. And even fewer studies have investigated ways we could modify existing high schools to overcome some of these problems. Designing and evaluating such interventions is an important challenge for the 1990s.

Also for reasons of efficiency, most large public high schools have organized instruction around curricular tracks that sort students into different groups. As a result, there is even greater diversity in the educational experiences of high school students than of middle grades students; unfortunately, this diversity is often associated more with the students social class and ethnic group than with differences in the students' talents and interest (Lee & Bryk, 1989). As a result, curricular tracking has served to reinforce social stratification rather than foster optimal education for all students, particularly in large schools (Lee & Bryk, 1989). Lee and Bryk (1989) go on to document the fact that average school achievement levels do not benefit from this curricular tracking. Quite the contrary - evidence comparing Catholic high schools with public high schools suggests that average school achievement levels are increased when all students are required to take the same challenging curriculum. This conclusion is true even after one has controlled for student selectivity factors. A more thorough examination of how the organization and structure of our high schools influences cognitive, motivational, and achievement outcomes should be an important task.
for research in the 1990s. During the 1980s we learned much about the transition from elementary to junior high school; now it is time to look more closely at transitions in and out of high school.

Leaving High School Early: The Problem of Dropping Out

One major difference between middle school and high school is that there are many more social and educational choices available to high school students, choices that can have both positive and negative consequences. The educational choices students face include the kinds of classes they will continue to take in high school; for example, whether to focus on academically-oriented or vocationally-oriented courses. A more fundamental educational decision is whether or not to stay in school at all. Along with these choices about schooling and academics, high school students (and increasingly, middle school students) face a variety of social choices as well: how sexually active they will become, whether or not to use drugs and alcohol; and whether or not to engage in different kinds of deviant/criminal behaviors. Some adolescents struggle with eating disorders. Others (for a variety of reasons) decide that they cannot cope with their circumstances, and commit suicide. These distressing choices, and the troubling statistics showing higher levels of teen pregnancy, adolescent drug use, and adolescent crime and violence, indicate that more and more adolescents are engaging in what McCord (1990) calls "problem" behaviors. A complete review of the work on these problem behaviors is outside the scope of this chapter; interested readers should consult Hauser and Bowlds (1990) and McCord (1990) for excellent discussion of stress, coping, and problem behaviors that occur during adolescence. Because we are focusing primarily on academic outcomes in this chapter, in this section we consider the choice of whether or not to drop out of school.

The most fundamental educational decision students make during high school is whether or not to stay in school; we have discussed factors contributing to this decision at different points earlier in this chapter. In middle or junior high school students can disengage from school by not trying, acting out, or being truant; however, they still are required to be in school. At age 16 students can make the decision to leave school, and unfortunately, many choose to do so. Although there is debate about the exact numbers of students dropping out (see Rumberger, 1987).
the numbers are large enough to be a major social problem. Further, as we have discussed in earlier sections of this chapter, there are a disproportionate number of African-American and Hispanic students who leave high school before graduating; in some school districts as many as 50% or more of these students leave school before completing their degree (Bryk et al., 1991). Entwisle (1990) reviewed the work that has examined the characteristics of students more likely to drop out of high school (see also Rumberger, 1987). These characteristics include students with lower ability, those who achieve less well, those from poverty backgrounds, those who begin working too early, and girls who become pregnant. Entwisle pointed out that we as yet do not have adequate prospective studies that can be used to identify which children will be most likely to drop out. Work that is available, however, suggests that students doing poorly when they are in elementary school, exhibiting serious behavior problems in school, and being truant on a frequent basis will be more likely to drop out of high school; Finn (1989) discussed how these problems often are interrelated. Understanding the factors related to dropping out certainly is important; however, Rumberger (1987) argued for the need to understand better processes related to dropping out, rather than just listing factors associated with the problem. In beginning to address that issue, Finn (1989) argued for a participation - identification model of the drop out process, stating that students who participate less in academic and non-academic activities in school (beginning in elementary school) will identify less with the educational process, and ultimately be more likely to drop out of school. As part of participation - identification processes, Finn pointed to the importance of valuing of school, a construct we have discussed extensively in this chapter and elsewhere (e.g., Eccles et al., 1983; Wigfield & Eccles, 1992; Wigfield, in press).

Of course, one of the major outcomes of dropping out of school is that it seriously limits the adolescent's chances of obtaining a well-paying job (see Rumberger, 1987). Rumberger estimated that the economic and social costs of dropping out both to the individual and to our society at large run into the many billions of dollars. Individuals who drop out lose potential earnings; society often has to provide more extensive social services for drop outs, because they often are more likely to engage in some of the other problem behaviors that McCord (1990)
discussed. Although receiving a high school diploma may alleviate some of these problems, that is not necessarily the case. Unfortunately, in today's society a high school degree no longer ensures reasonable job prospects. When our society was an industrial society a high school diploma often was enough to guarantee access to reasonably well-paying and secure jobs. As we move to a post-industrial society that no longer is the case; indeed, some students now may be dropping out of high school because they realize a high school diploma will not mean much to them in terms of job prospects. Rumberger and Finn both have discussed the need for intervention programs to keep more students in school, programs that focus on giving those students skills they will need in the workplace. Encouraging more students to stay in school, and finding meaningful and rewarding things for them to do after they finish high school, is an important challenge for the 1990s. This challenge is important enough that the new Clinton administration already is talking about ways to restructure high schools so that students not going to college receive adequate technical skill training so that they can obtain good jobs in the increasingly technological workplace.

Other students finish high school, and move on to the world of work, or to college. What happens to them? That is the broad focus of the next section.

DEVELOPMENTAL CHANGES DURING AND AFTER THE COLLEGE YEARS

In this section, we describe the important changes that occur after the high school years. As in the previous section, we focus first on change in later adolescents' cognition, self-concept, and motivation that occur during the college years and after. We then discuss how individuals cope with the transitions from high school to college, and from college to the work force. We begin with a consideration of different general theoretical models that have been used to describe development during the college years.

These models can be classified into two metatheoretical types, organismic and contextual, that rely on different assumptions and metaphors for the description of change and development (Lerner, 1986; Pepper, 1942; Pintrich, 1990). The organismic models use a metaphor that highlights the individual organism as it develops through its active construction and organization of the environment. Organismic models also tend to assume that development is characterized by
an epigenetic pattern of change involving qualitative and discontinuous growth. Individuals' cognitive, social, or personal development at higher levels of development are distinctly different from those at lower levels, involving not just quantitatively more of some function or structure, but qualitatively new functions, structures, or organizations. In addition, many, although not all, organismic models assume that there is a teleological endpoint or final stage of development (e.g., formal operations in Piagetian theory) that some individuals will reach over the course of their life (Lerner, 1986; Pintrich, 1990).

In contrast, contextual models use a basic metaphor of the "historical event" as the key organizer of development, thereby shifting the focus away from the individual to the context. Contextual models emphasize the nature of the individual's interactions with others in different situations and different environments over the life course as the main influence on development (Lerner, 1986; Pintrich, 1990). Although both Vygotskian and life-span theories focus on the importance of the contextual and situational demands on the individual, change and development is not just a function of different life events, but an active, constructive, and dialectical process among the multiple contextual determinants of change and the individual's personal construal of these determinants (Pintrich, 1990). Life-span approaches (see Abeles, 1987; Baltes, 1987; Baltes & Schaie, 1973; Featherman, 1983) also assume that development can be both quantitative and qualitative and is on-going across all ages, not just limited to certain ages like childhood and adolescence. Life-span approaches generally describe development as being multidimensional (changes occur across biological, social, cognitive, and affective dimensions), multidetermined (changes can be a function of biological, social, physical, psychological, and historical events), and multidirectional (changes can occur in different patterns and trajectories depending on both individual and situational factors; change is not necessarily directed along a single path to a particular endpoint). Finally, a recent assumption of the life-span approach is that the process of development is a dynamic between both growth (gain) and decline (loss) with a larger ratio of gains to losses early in life with the ratio declining with age (Baltes, 1987).
The contrast between these two metatheoretical positions is a major theme of this section. Psychology and education are both experiencing a transition to more contextual models (Bruner, 1990; Pintrich, 1992). The move in both theory and research is away from organismic models that highlight the individual without giving equal or more weight to the context. This general move is represented in our review of the literature. Of course, there are a variety of contextual models from life span to Vygotskian to constructivist to postmodern deconstructionist views available to guide future research and thinking. One of the key issues for future research is the specification of these different models and their application to issues in developmental and educational psychology. Organismic models that focus on the individual have been the most frequently used at this point in research on college students but life span approaches seem to represent an adequate integration of the tensions between organismic and contextual perspectives (Lerner, 1986). Nevertheless, there needs to be research on college students and college classrooms from a variety of perspectives in the future.

Cognitive Development in the College Years and After

We discussed earlier how cognition changes during adolescence; because in the later adolescent years many of the changes reach full fruition, we discuss them in more detail in this section. To recapitulate briefly, in terms of research on adolescent thinking and cognitive development, Piagetian theory (Inhelder & Piaget, 1958) is the standard model with the fourth stage, formal operations, representing the sine qua non of mature thinking. The hallmarks of formal operational thinking (cf., Flavell, 1985; Keating, 1980, 1990) include: (a) abstract thinking; ability to think about possibilities beyond concrete reality; (b) propositional thinking, ability to think about logical relations among ideas, concepts, propositions, and cognitive operations; (c) combinatorial thinking, ability to generate in all possible combinations of ideas and cognitive operations; (d) hypothetical-deductive thinking, ability to think scientifically including definition and control of variables, generating, testing, and revising hypotheses; (e) ability to regulate cognition, including planning for problem solving including problem definition, strategy selection and revision; (f) ability to be metacognitive, thinking about cognitive processes, memory, learning.
language, and thinking; and (g) ability to be self-reflective about not just cognitive processes but also issues such as identity, existence, morality, and personal relationships.

The second decade of life is when much of this thinking should develop, especially the later third (18-20 years) when many students are in college. In fact, following classic Piagetian theory, most college students should have attained formal operations. However, the research on college students suggests that almost half of the students have not obtained formal operations by their freshmen year (Pascarella & Terenzini, 1991). In addition, the few longitudinal studies of college samples (e.g., Eisert & Tomlinson-Keasey, 1978; Mentkowski & Strait, 1983) have shown very small gains in formal operational thinking from freshmen to senior years. Moreover, depending on the sample (including both secondary and postsecondary students) and the nature of the assessment tasks, the results can range from zero to 100 percent of the sample demonstrating formal operations, with most estimates in the 40 to 70 percent range (King, 1986; Neimark, 1983; Pascarella & Terenzini, 1991).

Obviously, there are difficulties in the operational definition and assessment of formal operations (Keating, 1980, 1990). These formal operations are typically assessed by interviewing students regarding their strategies for solving a variety of Piagetian-type tasks such as conservation, the balance beam problem, the pendulum problem, and their reasoning on syllogisms or the creation of combinations. These tasks are decontextualized and often do not accurately reflect students’ knowledge on academic or school tasks (Keating, 1980; King, 1986; Laboratory of Comparative Human Cognition-LCHC, 1983). In addition, the problem of intraindividual differences in the level of reasoning depending on the domain assessed remains a major problem for any strong stage model (in Piagetian terms, the problem of horizontal decalage). For example, DeLisi and Staudt (1980) found that college students majoring in physics, political science, and English were more likely to display formal operational reasoning on problems relevant to their discipline when presented with the traditional pendulum problem (physics), a political socialization problem, or a literary analysis problem. This type of domain specificity of reasoning suggests that students’ thinking may depend more on their knowledge in a particular subject area and on the type...
of task presented to them than on any broad general logical structure such as a stage of formal operations (cf., Glaser, 1984; Brown et al., 1983; Gelman & Baillargeon, 1983). Accordingly, there has been a move away from strong stage formalizations such as Piagetian formal operations in the study of adolescent cognitive development (Keating, 1990; Pintrich, 1990).

There are, however, more recent post-Piagetian or neo-Piagetian models that describe cognitive development beyond formal operations. These models are organismic and assume that cognitive development is hierarchical with later stages dependent on the attainment of earlier stages such as formal operations. These models do propose stage-related descriptions of thinking, but they tend to use a "soft" stage model where stages can be more domain-specific and related to actual experience rather than "hard" stage models where development is universal and not context-dependent (Kohlberg & Armonn, 1984). This issue concerning the nature and definition of a "stage" is one of the key issues in current cognitive developmental theory and research in adolescence and adulthood (Alexander, Druker, & Langer, 1990).

Fischer and his colleagues (Fischer, 1980; Fischer, Hand, & Russell, 1984; Fischer & Kenny, 1986; Fischer, Kenny, & Pipp, 1990) have proposed a skill theory of development that builds on Piagetian theory but does not assume universal change in cognition across domains (i.e., accepts horizontal decalage as both theoretically and empirically important not as something to be explained away). Fischer argues that skill development is domain-specific as a function of individual differences in aptitude and motivation as well as variations in environmental conditions which might support or discourage skilled performance. He uses the same construct as Vygotsky's zone of proximal development, albeit labeled range of development, to describe the difference between displaying a skill under conditions of optimal support and not being able to use a skill in many ordinary environmental conditions (Fischer et al., 1990). There are 10 levels in skill theory with levels 7-10 emerging between 10 and 25 years of age. Levels 7 and 8 (approximately ages 10-15) parallel many of the operations subsumed in formal operations concerning the use of abstractions and the coordination of two abstractions. Level 9 (ages 19-21) involves the building of abstract systems where a number of different abstractions (intention,
responsibility, morality) can be related to one another in complex ways. Finally, Level 10 (ages 24-26) involves the integration of two or more abstract systems from Level 9 to form a general theory or generate general principles such as an overall epistemological framework (Fischer, et al., 1990). This models represents a integration of organismic and life span views and provides a useful theoretical model that can be applied to development in many domains, not just cognition. For example, Harter (1990) suggests that the development of the general ability to coordinate and integrate abstractions serves an adaptive function for adolescents as they become better able to cope with their multiple, and potentially conflicting self-concepts.

In another model that describe thinking beyond formal operations, Commons and his colleagues (Commons & Richards, 1984a,b; Commons, Richards, & Kuhn, 1982; Richards & Commons, 1990) have described postformal stages of development that go beyond the reasoning about variables indicative of formal operations to reasoning about systems of variables (fifth stage) to reasoning about paradigms (sixth stage). These abilities to think systematically and paradigmatically would be especially relevant to college courses where students are asked to compare and contrast different theories and paradigms (e.g., social science, education courses). Related model includes the empirical research on college students' ability to think dialectically (Basseches, 1980, 1984, 1986; Benack & Basseches, 1989) based on Riegel's (1973, 1975, 1976) suggestion that a fifth stage of development beyond formal operations would involve dialectical thinking. Basseches has described 24 schemata or dialectical operations that include the ability to look for and recognize examples of the dialectic inherent in competing principles, models, or theories (cf., the systematic and paradigmatic thinking of Commons) as well as the ability to use dialectical logic to analyze different systems of knowledge and theories in terms of their context and relationships to each other (Basseches, 1986). The ability to use these operations would be related to students' and teachers' understanding of many of the neo-Vygotskian and situated cognition models which emphasize the situational, contextual, and dialectical nature of behavior. To the extent that students in educational psychology courses at the undergraduate or graduate level
are not able to use these dialectical schemata, this model would predict that they would have difficulty in our courses.

Another developmental model that addresses some of the same issues and has enjoyed immense popularity in the higher education literature is Perry's (1970, 1981) model of college student development. In contrast to the emphasis on the formal logic of students' reasoning as described above, Perry was more concerned with the content of college students' epistemological reasoning about the intellectual and moral relativism often encountered in the course of a college education. The nine stages and transitions are quite detailed (see Perry, 1970, 1981) but the intermediate positions describe students who are moral and intellectual absolutists and believe that there are correct solutions for every moral and intellectual problem and rely on authorities to teach them proper answers. The middle positions in Perry's scheme are characterized by the discovery of relativistic answers to problems and contextual reasoning about issues. In these stages authorities are perceived as other individuals who have beliefs and opinions which may be helpful to the student in understanding the moral and intellectual issues, but authorities' beliefs may be challenged on contextual and relativistic grounds. The final stages in the Perry model describe students as developing a set of personal values that they become committed to as an expression of their own identity. This personal commitment helps the student cope with the relativity inherent in many intellectual and moral issues and allows the student to move away from absolutism and idealism to the pragmatic considerations and commitments of adulthood (Labouvie-Vief, 1982).

Besides the methodological issues concerning operationalization and measurement (use of interviews and reliable coding of responses) and sampling (original developmental scheme based on longitudinal study of 84 undergraduate men from Harvard), one of the theoretical difficulties with Perry's description of the stages of college student development is that it seems to elide some important distinctions between intellectual, moral, and identity development. In particular, the model seems to shift away from the epistemological concerns of stages one through five to identity issues in stages six through nine (Pascarella & Terenzini, 1991). Following this criticism, Kitchener and her colleagues developed the Reflective Judgment Model which focuses solely on
the development of individuals' beliefs and assumptions about the nature of knowledge or formal epistemic cognition (Kitchener, 1983, 1986; Kitchener & King, 1981; King, Kitchener, Davison, Parker, & Wood, 1983). This includes individuals' understandings about what can and cannot be known (e.g., how a child learns), how they can come to know something (e.g., through experience, research, intuition, etc.), and how certain they can be in their knowledge (e.g., absolutely, probabilistically). These assumptions about the nature of knowledge influence how individuals will justify their beliefs as well as identify and define problems, seek solutions, and revise their problem solving behavior (Kitchener, 1986; cf., Arlin, 1986; Posner et al., 1982).

The model proposes that there are seven stages that characterize the different levels of epistemic cognition. Individuals in the first stage believe that reality can be understood through direct observation, that there is no uncertainty in this knowledge, and, therefore, no need to justify or revise beliefs. Stages two and three reflect a move away from these absolutist beliefs, although there is still an assumption of a true reality and differences in perceptions of reality are due to false claims or uncertainty. Direct observation and knowledgeable authorities provide a means of deciding among competing claims in these stages. In stages four and five reality is seen as subjective depending on individuals' perceptions and experience. Accordingly, in this world view, beliefs are not certain and can only be developed through a reliance on data, logic, and rules of inquiry that are applicable to a specific context. In the final two stages, there is move away from the purely relativistic thinking of stages four and five to beliefs that reality is constructed through personal interpretations, but that there are appropriate methods (e.g., personal evaluation of the opinions of experts, critical inquiry or synthesis) for evaluating the evidence for different world views. This leads to the development of a personal world view that acknowledges that some claims about reality are better or more complete than others (Kitchener, 1986).

Baxter Magolda (1992) and Kuhn (1991) also have examined the development of epistemological reasoning. Baxter Magolda (1992a, b) interviewed 70 male and female college students over the course of five years from their first year in college to one year after graduation. She found that students' responses to her open-ended interviews about the nature of learning and
knowledge evolved over time through four levels from a focus on absolute knowing (knowledge is certain) through transitional knowing (knowledge is partially certain, partially uncertain) to independent knowing (all knowledge is uncertain) to the final level of contextual knowing (knowledge is contextual and judged on the basis of evidence within a certain domain or context). Kuhn's (1991) cross-sectional study of individuals ranging in age from middle adolescents (14-15 years old) to adulthood (through the 20's, 40's and 60's) found a similar shift across age groups from an absolutist to multiplist to evaluative perspective on the nature of knowledge and epistemology.

The development of epistemological thinking is certainly an important aspect of a college education. It appears that there is a developmental shift over time (in both cross-sectional and longitudinal studies) with upperclass students demonstrating higher levels of thinking about the nature of knowledge, evidence, and rules of inquiry with the biggest shift often coming between the first and second years of college (Pascarella & Terenzini, 1991). In addition, even when controlling for age, socioeconomic status, and general ability differences between those who attend and those who do not attend college, there appears to be a strong effect of a college education on students' ability to reason about epistemological issues (Kuhn, 1991; Pascarella & Terenzini, 1991).

Although an important outcome of college, these models of epistemological reasoning (Baxter Magolda, Perry, Kitchener et al; Kuhn) still focus on general reasoning schemas that cut across domains, reflecting their general organismic metatheory. There is a need for more research on the domain-specificity of students' reasoning in line with the assumptions of a life-span approach. For example, Donald (1990) has shown that experts in certain disciplines (professors in both basic and applied fields of study in physics, psychology, and English) use different methods for determining truth and verifying knowledge claims as well as make differential use of conceptual models and empirical evidence. It would seem likely that students majoring in the different disciplines might reason differently depending on the principles used by their professors. Moreover, Kuhn (1991) found domain and intraindividual differences in students' reasoning and
epistemological theories about school failure, unemployment, and recidivism in criminals, three social science topics, suggesting a role for content knowledge within a discipline. According to there is a need for more research on how these general reasoning schemas interact with students' content and disciplinary knowledge in specific domains. For example, Schommer and her colleagues (Schommer, 1990; Schommer, Crouse, & Rhodes, 1992) have shown that college students' beliefs about the nature of knowledge and learning influences their comprehension and metacognition. Students who believed that knowledge is simple (isolated facts), that learning occurs quickly, and that knowledge is unchanging were lower in metacognitive comprehension monitoring and actual comprehension even with prior knowledge taken into account. These studies focused on specific domains (statistics, psychology, health/nutrition) and parallel son the findings for students' beliefs about mathematics (Schoenfeld, 1983, 1985). Research on epistemological beliefs and the role they play in student learning, cognition, and motivation is beginning but promises to be an important future area of research in a postmodernist era where traditional scientific and rational models of thinking and reasoning are being called into question constructivist, deconstructionist and feminist scholars. In addition, research on epistemological beliefs is important not just for understanding student learning, but also for research on teacher development, learning, and education (Pintrich, 1990).

At the same time, there is a great deal of conceptual and definitional work that remains done. The general epistemological beliefs about knowledge and reasoning that are a concern Perry and Kitchener are not the same as beliefs about how to learn in mathematics or learn in general (e.g., Baxter Magolda). There has been a tendency to label a variety of beliefs as epistemological beliefs (e.g., learning is innate, success is unrelated to hard work, see Schommer et al, 1992) when some of these beliefs may be classified as motivational beliefs (cf., Dweck Leggett, 1986). These different beliefs may be related and general epistemological beliefs may have some motivational "force" to inspire more cognitive engagement, but there needs to be theoretical and empirical work on the nature of these beliefs and the different roles they may play. In addition, there has been very little research on how gender, ethnicity, and socioeconomic...
differences may influence students' reasoning and their beliefs. Belenky, Clinchy, Goldberger, and Tarule (1986) interviewed college women about their epistemological beliefs and found that some women emphasized a more connected and empathic reasoning style beyond their earlier absolutist and multiplist stages. They suggested that this trajectory may be an equally valid path for the development of reasoning in contrast to the final stages of Perry's or Kitchener's models, which rely on a more traditional scientific paradigm as the sine qua non of sophisticated thinking. At the same time, Baxter Magolda (1992) and Kuhn (1991) who included both men and women in their samples, in contrast to Belenky et al (1986) or Gilligan (1982), did not find very important gender differences in epistemological reasoning. In this sense, Belenky et al's argument parallels other feminist critiques (e.g., Gilligan, 1982; Noddings, 1984) of Kohlberg's and Piaget's models of development. The nature of these gender differences and potential ethnic or class differences need to be explored in more detail in future research. At the same time, the basic construction and search for differences along gender, ethnicity, or class lines can paradoxically reify some of the bias and inequality inherent in the social structures that create the need to examine questions of differences (Hare-Mustin & Marecek, 1988). Accordingly, future research needs to be sensitive to this issue and the possibility that, given a life span perspective that emphasizes contextual influences and experiences, there may be important individual differences within the broad categories of gender, class, or ethnicity.

In summary, current research on cognitive development in the college years has addressed both issues of the content and form of thinking. As domain-specific and contextual models become more important and we move away from very general Piagetian and information processing models, issues regarding the content of students' thinking will become even more important. There is a great need for research on students' understanding of the disciplinary and epistemological knowledge, not just the domain specific declarative knowledge, represented in college courses. It appears that acquisition of domain specific and disciplinary specific knowledge is one of the key cognitive aptitudes that college students acquire as they major in different areas (Shulman, 1990; Snow & Swanson, 1992), paralleling the research on the cognitive development
of very young children (Wellman & Gelman, 1992). Accordingly, research on adolescent thinking needs to develop in-depth descriptions of students' theories and frameworks for thinking in these different domains.

Self-Concept and Motivation in the College Years and After

Identity Development: General Models

Paralleling the Piagetian view of cognitive development, many of the traditional organismic models of social and personal development conceptualize development as evolving over time in terms of both the objective events (i.e., physical, social, biological) that occur at certain chronological ages or stages in the development of the individual as well as the more subjective, psychological issues that these events seem to evoke in individuals (e.g., Erikson, 1963; Levinson, 1978; Neugarten, 1968; Veroff & Veroff, 1980). Obviously, as Brim and Ryff (1980) point out, biological events (i.e., normative changes in hormonal levels over the life span), social role changes in marital, career, and family status, as well as physical events (i.e., changes in the physical environment as a function of relocation, physical injuries or illness, changes in physical appearance) are all objective events that individuals must cope with as they develop. These events provide one aspect of the context that help shape individuals' social and personal development.

Traditional stage models propose that these contextual events are usually age-dependent and in the course of normal development most individuals will cope with the psychological issues elicited by these events at approximately the same time. For instance, regarding self-concept development, during the college years, the issue of identity remains the most salient (Chickering, 1969; Erikson, 1963; Marcia, 1980). Research has focused on the dimensions of identity as well as the structure and form of the developmental patterns. For example, one of the most popular models in the higher education literature is Chickering's (1969) model of the seven vectors or domains of college student identity development (achieving competence, managing emotions, developing autonomy, establishing a stable identity, developing interpersonal relations, developing purpose including career goals, and developing integrity). Development within and across these domains is assumed to show directional change following the general orthogenetic principle of
increased differentiation and integration. It appears that there is development in these areas in the course of a students' four years in college, but there is very little evidence that attending college per se influences the course of development (Pascarella & Terenzini, 1991). This would be expected given that the seven domains reflect normative life tasks most individuals confront in our society regardless of college attendance.

A model that has focused more on the form of identity development is Marcia's (1980) extension of Erikson's identity vs. diffusion stage. Marcia proposes that there are two dimensions of identity, presence or absence of a crisis and extent of personal commitment to an occupation and an ideology. By crossing these two dimensions, a 2 X 2 matrix is formed, generating four different individual modes or personal styles for coping with the identity issue. The most adaptive mode is labeled identity achievement and represents students who have experienced a crisis and wrestled with the issues and made a commitment to a particular identity. In contrast, students who have made a commitment to an identity, but have not experienced a crisis are said to be in a foreclosure status, suggesting a too early resolution of identity (e.g., going along with a parentally chosen occupation). The identity diffusion mode represents students who have not made any commitments and may or may not have experienced a crisis. Finally, the moratorium mode reflects students who are actively in crisis but only have a vague commitment (Marcia, 1980). Although these four distinct modes were originally seen as mutually exclusive categories of stable individual differences, current theorizing suggests that they may represent a normative developmental sequence (Harter, 1990; Waterman, 1982; 1985). In addition, Waterman (1982), in line with a life-span perspective, has suggested that there may be alternative trajectories of identity development with the potential of diffusion and moratorium reappearing after the attainment of identity achievement. Finally, Marcia's empirical work on this model remains limited, and we do not know the extent to which it can be generalized.

Identity Development: More Specific Models

As in the area of cognitive development, these general stage models provide an important description of self-concept development. However, more recent research has taken a more social
cognitive and life-span perspective and focused on the domain-specific features of development, intraindividual and individual differences in development, and contextual influences on development. This general constructivist approach has suggested that there are more idiosyncratic, personal, and contextual construals of the general life events and psychological issues that are experienced by individuals over the life course. Accordingly, the resolution of identity issues is an important psychological event in most of our lives, but there is a great deal of variability in how these issues are defined, represented, and resolved. There are a number of models of this process, including life tasks (Cantor & Kihlstrom, 1987), current concerns (Klinger, 1977), personal projects (Little, 1983), and life themes (Csikszentmihalyi, 1985). In these constructivist models, an individual's life tasks may not follow a proscribed, universal pattern of development (e.g., identity and generativity issues may be resolved before intimacy issues). For example, in a series of studies of college students, Cantor and her colleagues (see Cantor & Kihlstrom, 1987) found that students could identify a number of concerns that were personally demanding and guided their activities. These included academic goals (doing well, getting organized) as well as social goals (making friends, being on my own, and establishing an identity). Eisenhart and Holland (e.g., Eisenhart, 1990; Holland & Eisenhart, 1988) in an ethnographic study of 23 college women found that negotiating male/female intimate relationships was a major life-task of the transition to college. In addition, they noted that there were a number of different strategies the women used to resolve the difficulties surrounding these relationships but that the range of strategies was limited by certain peer group beliefs. As Cantor & Kihlstrom (1987) point out, these concerns reflect normative life tasks (i.e., achievement, intimacy, independence) that would be predicted by most developmental models (e.g., Erikson, 1963, Veroff & Veroff, 1980). However, the life task approach, in line with the assumptions of a life span contextual approach, differs in assuming that individuals will define these issues somewhat differently as well as seek different strategies for solution. For example, some students defined independence in terms of coping without parental support, while other concentrated on more practical matters such as money management. In addition, students had very different problem solving strategies as a function of their personal construal of college life.
tasks (Cantor & Kihlstrom, 1987). Accordingly, this model suggests that all college students will have to cope with issues related to achievement, identity, and intimacy but that a more microgenetic, intradividual, and contextual analysis will reveal, not a linear developmental sequence as in classic organismic models, but a variety of personal construals, strategies, and developmental trajectories that describe social development in different contexts.

Although there are a number of social cognitive models, one commonality is that the notion of a life task (or current concern or personal project) includes an individual's representation of both a goal for the task and a strategy for solving the task. Accordingly, this approach attempts to describe personal development in terms of both motivational (goals, self-beliefs) and cognitive (strategies for problem solving and self-regulation) components. This conceptualization of personal and social development makes explicit the links with more general cognitive models of learning and thinking. In fact, the life task approach of Cantor and Kihlstrom (1987) is isomorphic with models of cognition based on declarative and procedural knowledge. This basic distinction about knowing what and knowing how can be applied to traditional motivational and cognitive constructs generating a framework for the analysis of motivational self-knowledge and motivational strategies and cognitive knowledge and cognitive strategies. Accordingly, in terms of motivational and social development, there should be changes in both self-knowledge and strategies for regulating the self over the life span.

**Self-Schemas and Motivation**

There are a number of models that propose that motivational self-knowledge is an important construct, but self-schemas (Markus & Nurius, 1986; Markus & Ruvulo, 1989, Markus, 1991) provide a way to link a variety of motivational constructs such as goals, beliefs, aspirations, motives, and affect into an organized framework (Markus & Nurius, 1986). Self-schemas are our individually constructed, dynamic, contextual, and flexible organization of knowledge about the self. It is similar to the traditional self-concept (Wigfield & Karpathian, 1991) in its content, but functions as a much more dynamic and cognitive representation of the self rather than the static view inherent in traditional self-concept research. Self-schemas function as personal construals of
goals and provide a self-regulatory function for individual cognition, emotion, and motivation (Markus & Kitayama, 1991). There are four dimensions of self-schemas that can encompass the three traditional expectancy, value, and affect constructs (Eccles, 1983; Pintrich, 1988a, b, 1989), as well as a new dimension of probability, of possible selves that we could become in the future (Markus & Nurius, 1986). The instrumentality dimension refers to beliefs about what we can do to become or avoid particular self-conceptions and parallels the expectancy components in expectancy-value models. In this sense, this dimension incorporates beliefs about control (Connell, 1985) as well as self-efficacy (Bandura, 1986; Schunk, 1991) which are linked to persistence and level of engagement (Pintrich & Schrauben, 1992). The value dimension taps into the importance or centrality of the domain to the individual’s self-schema and would incorporate students’ beliefs about their interest, their perceptions about the utility, and the attainment value of the domain. As we have discussed, these value beliefs are often linked to students’ choice behavior in motivational models (Eccles et al., 1983; Wigfield & Eccles, 1992). The affective dimension would include students’ positive and negative affect towards particular self-schemas which would guide them to approach or avoid these self-schemas (e.g., approaching the happy, “smart” self-schema and avoiding the “anxious, unmotivated” self-schema). The probabilistic dimension refers to our beliefs about past, present, and future selves, reflecting a temporal “sign” of what we were, what we are, and what we could become in the future. In probabilistic terms, this would characterize various selves along a scale from 0>p<1.0, where p represents the probability of becoming any one of the possible selves from the past or future.

The developmental trajectories of these four dimensions in the college years have not been investigated in many studies. There are studies of these dimensions and how they relate to various outcomes or studies of how these motivational beliefs are influenced by various features of the college classroom (see reviews by McKeachie, Pintrich, Smith, & Lin, 1986; Pintrich, 1990) but there is a need for more longitudinal research on intraindividual change in instrumentality, value, affect, and possible selves in college students. In a cross-sectional study of possible selves across the life span, Cross and Markus (1991) examined 183 individuals ranging in age from 18 to 86
about their hoped for and feared selves. They found that the younger college students (18-24) had higher ratings of instrumentality in terms of believing that they could bring about hoped for selves and avoid feared selves. In addition, younger individuals generated more possible selves, but reported fewer strategies or actions undertaken to accomplish these selves. In contrast, the older individuals reported doing more to bring about a more limited number of possible selves. This result is in line with general theories of identity and personal development that suggest that over the course of the life span individuals will develop more focused and enacted personal identities in contrast to the myriad of possibilities that younger adolescents think about abstractly but do not necessarily attempt to actualize. Accordingly, these results highlight the need to examine both self schemas and the strategies to accomplish them in the course of development.

Links Between College Students' Motivation and Achievement Behavior

Although most studies are not developmental in design, there have been a number of studies that examine the motivational strategies used by college students to accomplish life tasks or achieve possible selves. These strategies, such as self-handicapping, defensive pessimism, and reevaluation of task value and interest (Cantor & Shwors, 1985) are used by students to control their effort and motivation and parallel Kuhl's self-regulatory strategies of motivation and emotion control (Kuhl, 1984; 1992). These motivational strategies may be automatic, habitual, and used without awareness and intentionality, but they can be brought under the intentional control of the learner (cf., Paris, Wixson, & Lipson, 1983; Pressley & Schneider, 1989) and they do influence students' motivated behavior in terms of choice, level of activity and persistence at a task.

Self-handicapping refers to the creation of obstacles or withdrawal of effort to make potential failure less indicative of ability (Baumeister & Scher, 1988; Tice & Baumeister, 1990). For example, procrastination before an exam can have beneficial effects on ability attributions because failure can be attributed to lack of effort, while success can be attributed to ability (Covington, 1992; Covington & Omelich, 1979). For the self-handicapper, protection of self-worth is the most important goal, so not putting forth effort, although jeopardizing actual performance, maximizes the potential for positive self-ascriptions. College students use a variety
of self-handicapping strategies that can have detrimental influences on their cognitive engagement as well as their actual learning (Covington, 1992).

Another type of motivational strategy is defensive pessimism which refers to the setting of low expectations for performance but coupling it with an increase in effort in order to gain control over anxiety (Cantor & Norem, 1989; Norem & Cantor, 1986a, 1986b, 1990). Defensive pessimists seem to activate a negative self-schema ("I'm not prepared for this test.", "This course is so hard, and I really don't understand it.") which generates anxiety about doing well which then leads to increased effort to overcome the anxiety. In this sense, the negative self-schema serves as a negative goal for students to avoid and they "harness" the fear of becoming that possible self to increase their effort. Accordingly, high levels of self-regulation (increased effort as in defensive pessimism) need not always be driven by perceptions of high-efficacy and competence (cf., Kuhl, 1987; Paris & Newman, 1990; Pintrich & Schrauben, 1992; Schunk, 1990; Zimmerman, 1990), but can also arise from concerns about lack of efficacy and competence. At the same time, Norem and Cantor (1990) report longitudinal data that suggest that over the course of several years of college life there was eventually a cost for defensive pessimists in terms of lower levels of academic achievement. Norem and Cantor suggest that this decline may be a function of accumulated stress from higher levels of anxiety over several years, increased self-expectations, and less social support from friends. Future research needs to examine under what conditions and for which individuals self-efficacy and higher levels of self-regulation are linked in a positive fashion in contrast to the negative relations between efficacy, anxiety, and self-regulation for individuals using a defensive pessimism strategy. In addition, there is a need for research regarding the intraindividual stability in contrast to the situational or domain specificity of these motivational strategies (e.g., differences in use of these strategies in academic, work, or social domains).

Finally, there is a clear need for developmental research on the ontogenesis of these motivational strategies since Norem and Cantor's work suggests that they are available to students when they enter college. In addition, there is a need for research that extends these constructs to how
individuals cope with transitions and life tasks after college (e.g., adjustment to work, marriage, family).

Although the links between these specific motivational strategies and students' actual cognitive engagement has not been tested yet, there is a fairly large literature on how various motivational beliefs are linked to college students' use of various cognitive and self-regulatory strategies (Pintrich & Schrauben, 1992). For example, as discussed briefly earlier, Pintrich and his colleagues have shown in a number of studies of both early adolescents and college students that positive motivational beliefs such as high self-efficacy, a focus on mastery goals, a belief in control over learning, and lower levels of anxiety are positively related to deeper levels of cognitive processing including the use of elaborative and metacognitive strategies (e.g., Pintrich, 1989; Pintrich & De Groot, 1990; Pintrich & Garcia, 1991). Perry and his colleagues (e.g., Perry & Magnusson, 1987) have shown that an attributional style that focuses on positive beliefs about control also have a positive effect on learning and performance. In addition, there has been work on how different types of classroom characteristics influence these motivational beliefs (Perry, 1991).

TRANSITIONS AND CONTEXTUAL INFLUENCES ON DEVELOPMENT IN THE COLLEGE YEARS AND AFTER

The literature on the influence of college on student development is vast and beyond review in a chapter of this size. However, there is an extremely important book on the effects of college on students by Pascarella and Terenzini (1991) that represents a monumental effort to review all the research in this area since 1967 (reviews over 3,000 studies in approximately 800 pages). Anyone interested in how college influences any aspect of student development from cognition to motivation to values to personality to moral development best start with this book. At the same time, much of the research in higher education that has examined contextual effects has not focused on psychological constructs that parallel the characteristics of middle schools discussed earlier nor has it focused much on classroom level analyses. Instead, higher education researchers have concentrated on more macro-level, sociological questions such as the general net effect of attending
college (the value-added question), between college differences (e.g., differences due to institutional type, size, selectivity), or within college differences in experience (differences due to academic major, residence arrangement, involvement in extracurricular activities, see Pascarella and Terenzini, 1991) that have important implications for college administrators but are less relevant to psychological models of development, learning, and teaching. Accordingly, there is a great need for more research on the psychological dimensions of college classrooms and college experience and how students interpret and construct meaning for themselves, set goals, and develop various strategies for coping with the various college contexts they encounter.

The Transition From High School to College

In terms of student development, the transition to college is often a very difficult one for many students. Attrition is highest in the first two years of college, especially the first year (Pascarella & Terenzini, 1991). There has been a great deal of research that has examined this issue, with most of it guided by a general person-environment fit model (see Tinto, 1987) that proposes that students' entry level cognitive skills and their goals and motivation for college interact with the institutional characteristics of the college, defined in terms of academic integration (e.g., involvement in and support for learning) and social integration (e.g., involvement in and support for social and extracurricular activities), which then produces a decision to either stay or leave college. This work also has generated a literature on programs to improve student retention through integrative first-year experiences and various academic and social programs (e.g., Noel, Levitz, Saluri, & Associates, 1985; Upcraft, Gardner, & Associates, 1989). In particular, these programs often have focused on the retention of minority students, given their much higher attrition rate in general (e.g., Nettles, 1985).

The general model that underlies much of this research on student attrition has been a functional one that has examined the interaction of an individual's cognitive and motivational characteristics with the various characteristics of the institutional setting. In contrast, more recent sociological and anthropological models have stressed social and cultural reproduction models whereby race, class, and gender are important considerations in the construction and reproduction
of inequities in schools at all levels (e.g., Goetz & Grant, 1988; Ogbu, 1987; Trueba, 1988). At the same time, cognitive anthropology and cultural psychology perspectives (e.g., Tharp & Gallimore, 1988; Trueba, 1988) on these issues has suggested the need for more micro-analytic research on how individuals within similar "cultures" (e.g., African-Americans, Latino, Native Americans) vary in their coping strategies and their success. For example, a number of researchers have pointed out that within those different cultural groups there are individuals who are very successful in school and achieve academic success, thereby bringing into question global explanations regarding differences in minority achievement based on a typology of ethnic groups in terms of their immigrant status (e.g., Erickson, 1987; Trueba, 1988; Pottinger, 1989). Similar arguments have been made in terms of gender differences in achievement in math and science (McDade, 1988). From a psychological perspective, this is a much needed emphasis to the more macro-level sociological and cultural explanations for race, class, and gender differences.

The Transition to the World of Work

The transition to the world of full-time work is not an easy one either, whether it is a transition that occurs after high school or after college. Although there is a great deal of research that has examined the influence of working while in high school on adolescent development (e.g., Fine, Mortimer, & Roberts, 1990; Greenberger & Steinberg, 1986), there is less developmental and psychological research on the effects of full-time work on adolescent and early adult development after formal schooling is completed. Most of the research that has examined this issue has taken sociological and economic perspectives and considered questions of access, opportunity, and equity in terms of race, class, and gender differences (e.g., Borman, 1991; Vall, 1986; Weis, 1990; Willis, 1977). In fact, there have been recent calls for more developmental and longitudinal research on the transition to work for individuals who do not go on to college (e.g., W.T. Grant Foundation, 1988). At the same time, it is clear that future psychological research on the transition to work needs to examine the person-environment fit as discussed in the research presented earlier on the transition to middle school, not just examine the "psychological" adolescent or "sociological" work context in isolation from one another.
The transition from school to work is usually seen as a difficult one given the discontinuities between the nature of schools and the nature of work settings (Candy & Crebert, 1991; Marshall, 1988; Resnick, 1987). There are a number of dimensions along which the two may differ, paralleling the organizational and structural dimensions that can be used to distinguish secondary schools from elementary schools, although there may be greater discontinuities between schools and work settings than there is between elementary and secondary schools or, alternatively, greater discontinuities between work settings depending on the nature of the industry (e.g., traditional manufacturing settings vs. traditional service organizations vs. "knowledge-generating companies). First, there is the nature of the activities or work to be done and the procedures and cognitive operations necessary to accomplish the work. As Resnick (1987) points out, our public schools often focus on individual production or performance in contrast to an emphasis on social shared performances in work settings. In addition, she notes that work settings often provide a variety of tools and contextual supports for accomplishing the task in contrast to an emphasis on "unaided" thought in schools. Finally, Resnick proposes that schools tend to focus on the teaching of generalizable cognitive skills and working with symbols and abstract ideas rather than situated competencies and contextualized reasoning as in work settings. Candy and Crebert (1991) have suggested that these same differences characterize not just differences between K-12 education and work settings, but that postsecondary classrooms actually exacerbate these differences, making it even more difficult for college graduates to make the transition to the world of work. According it would be expected that there may be a discontinuity between the students' knowledge and cognitive capabilities and the work setting, depending on the nature of the work in the specific setting. There is a need for more research on this issue, particularly longitudinal research that examines intra and interindividual differences over time and across different work contexts, rather than just simple descriptive contextual studies of what individuals do in their work settings.

Besides the nature of the work, the reward, evaluation, authority, and participation structures can be different in school and work settings (Borman, 1991; Marshall, 1988). While schools may operate under a performance/grade exchange system (Becker, Geer, & Hughes,
1968) focused on individual performance, the distribution of rewards in work settings are often based on group or unit performance. In addition, the importance of the extrinsic rewards (financial, status, power) or sanctions (loss of job) may be greater in work settings. Evaluation and authority structures may also vary. In a classroom setting, the teacher is most often the evaluator and authority figure. In work settings, there may be numerous evaluators (co-workers, supervisors, clients) who may use different evaluation criteria. In addition, in some work settings, there may be clear authority structures with very little worker autonomy (e.g., traditional manufacturing positions) or more ambiguous authority structures where the individual is allowed more autonomy and choice. Finally, there may be differences in the participation structures. Traditionally, classrooms have forced students to work individually, albeit this may be changing with the rise in the use of cooperative learning in K-12 education, although most college courses still require students to work individually (to allow students to do otherwise is "cheating" to many professors). In contrast, most work settings require some type of interaction between coworkers. In fact, lack of interpersonal skills and inability to work collaboratively is often seen as more of a problem by employers than lack of knowledge or cognitive skills. At the same time, there may be work settings that do not allow much interaction between coworkers (see Borman, 1991). Accordingly, given the obvious within-work setting differences, research on the school-to-work transition needs to examine not only the transition to work, but the nature and quality of that work experience in the same way that research that examines the transition to middle school has examined not just the transition, but the nature and structures of middle schools and their "fit" to the individual students that move into them. Given the findings in the educational literature on the effects of different reward, authority, evaluation, and participation structures on student motivational beliefs (e.g., Ames & Ames, 1984, Maehr & Midgley, 1991), it would be expected that there would be similar findings for the work settings, although Fine et al (1990) note that there has been little research on work setting and motivational beliefs. At the same time, it is important to not just examine the effects of the work setting, but how individuals construct their own
meaning of the work setting in light of their own motivational beliefs and values (cf., Borman, 1991).

In summary, in both the transition to college and the transition to work literatures, we have a number of different models of the effects from macro-level sociological and economic to more micro-level sociolinguistic, cognitive anthropological and psychological models. In terms of future psychological research, we need to incorporate the insights from cultural anthropology and sociology about the importance of context and culture. At the same time, psychological models have much to offer in terms of conceptualizing how individuals construct meaning in the context and how they develop different cognitive and motivational schemas and strategies for negotiating the demands of the transition. In addition, we need to begin to examine not just positive or negative effects of transitions in terms of producing discontinuous change, but also how transitions might accentuate preexisting individual differences, thereby producing continuous change (e.g., Caspi & Bem, 1990; Caspi & Moffitt, 1991).
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