EARLY ADOLESCENCE:

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A REVIEW OF THE LITERATURE

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OVERVIEW

Early adolescence can be described as a period of life, typically occurring between the ages of 10 and 15 years, in which youth undergo rapid physical, cognitive, and social transformation. Since the turn of the century, and probably before that, early adolescence has been viewed as a period of tremendous upheaval, or "storm and stress," for children and virtually all who come into contact with them. The stereotypical image of young teens being trapped in changing, awkward bodies and caught in the swirl of their own "raging hormones" has been pervasive among psychologists, parents, and educators for decades. The difficulties associated with making the transition from childhood to early adolescence have historically been given much weight in research, and have also led many to view the qualities of control and patience as key for adults who are trying to interact with early adolescents.

Fortunately, over the last 25 years, a more nuanced view of early adolescent development has emerged. Recently, educators and researchers have begun to recognize early adolescence as a period of development that is unique and distinct from late childhood and later adolescence or adulthood. Rather than viewing early adolescence as one of unmitigated turmoil to be endured, researchers and educators have begun to view this stage of development as one of dramatic change that brings both multiple stressors and new possibilities for growth. The recognition that early adolescence is a unique period of development has led to changing beliefs about the nature of this developmental period as well as appropriate methods for educating this age group. The middle school movement—which emphasized creating developmentally appropriate schools designed to ease the transition into adolescence while taking advantage of the new strengths (e.g., increased cognitive sophistication, greater maturity) produced by development—was born out of this new understanding. A wave of reform efforts that have occurred at the intermediate school level, fueled in part by *Turning Points*, the Carnegie Council on Adolescent Development's 1989 report, represents a continuation of this movement.

As recent research has begun to answer some of the questions regarding development during early adolescence and the institutions designed to serve these youth (i.e., schools, social welfare and health agencies), new questions have emerged. The purpose of this paper is to review some of the research on early adolescent development, particularly as it relates to

schooling, and to generate some ideas for future research in this area. Rather than providing an exhaustive review of the literature on adolescent development, this paper provides a selective review that presents the major issues of early adolescent development. Particular attention will be paid to the relationship between middle-level schooling and the physical, cognitive, social, and motivational changes that occur in early adolescence.

STRUCTURE OF THE PAPER

Early adolescence is a formative period in which youth explore a variety of personal and social issues. Since decisions made during this interval can affect subsequent life and career outcomes, it is important that youth are given the proper support during this time. This paper explores the literature on early adolescence to identify key issues and challenges that youngsters and their parents confront during this difficult developmental period. A fundamental assumption underlying this work is that schools, and the manner in which they are organized and function, can have an important impact on students' academic growth and personal development. Accordingly, this paper focuses on relating characteristics and risk factors of young adolescents to the manner in which educational programs are structured and delivered.

This paper, which focuses on raising questions for future discussion regarding the interaction between development and schooling for early adolescent students, has three primary objectives. The first is to provide a representative overview of the literature on early adolescent development in the physical, cognitive, social, and motivational domains. Second, within each of these domains, the paper examines the relationship between early adolescence development and educational policies and practices in middle-level schools, paying particular attention to the quality of the fit between development and education. Third, the paper raises a set of questions regarding adolescent development and middle-level schooling in each of the domains. The conclusion suggests a set of potential areas for future research at OERI.

COGNITIVE DEVELOPMENT

For many years, Piaget's theory dominated views of cognitive development in early adolescence (Inhelder & Piaget, 1958). According to this theory, sometime during early adolescence, children undergo a fundamental shift in the way they think and view the world that involves moving away from thinking in concrete terms to thinking in a more abstract, logical manner. Upon entering what he labeled the "formal operations stage," early adolescents, Piaget believed, developed the ability to think more scientifically; to design and test multiple hypotheses; and to manipulate objects, operations, and future outcomes in their minds without having to actually interact with physical objects. This view of cognitive development in early adolescence has played a major role in the sequencing of curriculum in schools (e.g., waiting until the middle grades to introduce abstract mathematical concepts, such as those taught in algebra).

More recent research has extended and altered the work of Piaget. Most notably, information processing theorists (Case, 1991; Siegler, 1991) have argued that rather than progressing through radical, discrete, and global stages, cognitive development occurs in gradual, accumulative steps, usually one domain at a time. For example, a student may have developed considerable quantitative skills by 8th grade, but her or his verbal skills may still be relatively low. According to this view of cognitive development, physical maturation and improved use of cognitive strategies combine to improve the efficiency of cognitive processing. This improved efficiency, in turn, produces greater cognitive sophistication. Thus, the more individuals interact with information in a certain domain, and the degree to which they are trained to effectively use cognitive strategies in that domain, the more expert they will become in that domain.

In addition, constructivist theory has had a significant impact on current educational practice and understanding of cognitive development, (Linn & Songer, 1991). This view of development, which has several different theoretical underpinnings (e.g., Piaget, Vygotsky, Bandura's "social-learning," and information processing), posits that knowledge is constructed through interaction with information, material, and instruction. Accordingly, cognitive development occurs as individuals gain experience with concepts and information and then develop strategies for organizing that information into mental structures, or schemas.

Much of the debate among educators centers not on whether a constructivist view of cognitive development is accurate, but rather on which processes most directly aid in the construction of knowledge structures. Whereas Piaget argued that experience teamed with biological maturation created distinct stages through which cognitive structures develop (rendering direct instruction relatively ineffective), other theories (most notably Vygotsky's theory of social construction [1978]) provide teachers with the opportunity to assume a significantly larger role in cognitive development. Many current educational practices at all levels of schooling are based directly on constructivist theory—for example, reciprocal teaching for reading (Palincsar & Brown, 1986); expert-novice models of instruction (Bereiter & Scardamalia, 1993); and constructivist approaches to curriculum reform (Blumenfeld, 1992).

In addition to the major theories of cognitive development mentioned above, advances in biological and biochemical research in the area of brain research and the biological precursors of cognitive development have contributed significantly to our understanding of cognitive development. For example, recent brain studies have begun to clarify our understanding of gender differences in brain functioning that may partially explain different preferences for academic subjects, learning styles, and communication patterns among adolescent boys and girls (e.g., Milgram, 1992). Although it is unclear at present whether such gender differences are attributable to social or biological factors (see Parsons & Goff, 1980; Gilligan, 1982; Maccoby & Jacklin, 1974), biological research holds great promise for bolstering our understanding of cognitive development in early adolescence.

Combining the theory and research from these four perspectives (Piaget, information processing, constructivist, and biological), the current state of thinking about cognitive development during early adolescence is that it is a period usually marked by increases in a youngster's ability to think abstractly and hypothetically, at least in some domains. Changes brought about by physical maturation, experience, and socialization processes allow early adolescents to envision not only what they will be like in the future but also to develop strategic plans for either becoming this kind of person or not. In addition, early adolescents become more interested in "knowing for themselves" and less willing to accept the word of an authority figure (i.e., a teacher or a parent). Generally, they also become more willing and able to explore issues of interest for themselves in a systematic manner. As early adolescents develop a more refined sense of who they are, including increased sensitivity to gender-appropriate behavior and racial–ethnic identity, their interests become more focused. This often leads to their selecting certain areas in which they will invest their time and mental energy while ignoring other areas. In this sense, early adolescents become more specialized in their interests and, as a result, in their expertise (or cognitive development).

COGNITIVE DEVELOPMENT AND SCHOOLING

There is a disjunction between the teaching methods and materials found in many middle-level schools and the cognitive developmental advances that occur during early adolescence. Typically, middle-level schools are organized more like high schools than elementary schools; that is, middle schools typically have a number of periods, usually about an hour long, in which students study different academic subjects. Moreover, in middle schools, time is structured inflexibly; for instance, when the bell rings at the end of the period, students move on to their next class whether they have finished what they are currently working on or not. Also, because individual subjects are taught by different teachers, issues raised in science class, for example, are rarely, if ever, discussed in math class. In the first year of middle school, there is some evidence that work is less cognitively demanding than the work students did in the last year of elementary school (Rounds & Osaki, 1982). In addition, instruction tends to focus on basic skills, taught in whole-class, lecture format, and drill-and-practice style (Becker, 1990; Eccles & Midgley, 1989). Finally, although students can take more electives in middle school than in elementary school (Becker, 1990), the opportunities students have for decision making in the classroom appear to decline after they move on to middle school, because students are offered fewer such opportunities in their middle school classrooms than in elementary classrooms (Midgley & Feldlaufer, 1987).

Considering that early adolescents are developing their reasoning abilities, the system of schooling in which they enter appears to be particularly ill suited to their needs (Eccles & Midgley, 1989). As early adolescents become increasing able and desirous of opportunities to make mental connections among the various topics they learn about in school, the curriculum becomes more fragmented. As they develop the ability to engage in longer, more involved projects, hypothesis testing, and experimentation, the school day is divided up into short periods that inhibit such lengthy explorations. As they seek to take more responsibility for their schooling through choosing what to work on, where to sit, and how to demonstrate their knowledge, they are more likely to be denied these opportunities. And as they develop increased capabilities for sustained, self-directed learning, they are more often placed in classrooms where a whole-class, lecture format is the norm.

Although there is often a developmental mismatch between early adolescents and the schools that serve them, educators and researchers have begun to recognize this disparity and are taking steps to correct it. One area where schools appear to be incorporating cognitive developmental research involves efforts to integrate constructivist theory into curriculum and instructional methods. At all levels of schooling, including middle schools, it is evident that

attempts are under way to make learning activities more experiential. In the domain of mathematics, for example, teachers are increasingly using manipulatives. In addition, in some schools, the daily schedule has been changed from discreet, short periods to more flexible blocks of time; these multi-hour blocks allow teachers to spend more time working on a given task than would be possible with 50-minute periods. The longer periods allow both teachers and students the possibility of engaging in more complex, authentic tasks, such as science experiments or field-based learning trips, than would have been feasible under the old schedule of 50-minute periods. These longer, more experiential tasks dovetail well with current theories of the ways in which students process information and develop more elaborated cognitive structures.

Another practice that has been recommended and, in some schools, implemented is interdisciplinary instruction. This method of creating links between the various academic subjects is believed to have many benefits for teachers and students, including helping students to realize the interrelatedness of the core academic disciplines (Mac Iver and Epstein, 1990). By coordinating instruction across disciplines, schools are better able to take advantage of early adolescent students' increasing ability to understand the connections among the various subjects they study in school.

QUESTIONS FOR CONSIDERATION

Although attempts to combine knowledge about early adolescent cognitive development with educational practices have already begun, there are many questions that still remain. The first, and perhaps most pressing issue, involves curriculum. It is understood that as students develop into and through early adolescence, their cognitive sophistication generally grows. This increasing sophistication allows early adolescents to think more abstractly, reason more systematically, and remain engaged in subjects of interest for extended periods of time. Constructivist theory and research has demonstrated the benefits of having the learner become actively engaged in constructing knowledge, or coconstructing it with peers or teachers. What is less clear is 1) the extent to which constructivist principles are being applied in middle-level schools; 2) how these practices, to the extent that they have been implemented, have affected academic achievement; and 3) which modes of delivery are best able to tap into and facilitate the cognitive development experienced in early adolescence. For example, what mixture of direct instruction and cooperative group work is most effective for students at this level of development? What are effective strategies for ensuring that students at various points in their cognitive development who are in the same classroom are all doing work that matches their capabilities? What role should textbooks play in instruction, and how should they be

organized to take advantage of the unique developmental characteristics of early adolescents? Finally, what role should computers play in delivering instruction, and what are characteristics of effective computer programs for this age group?

A second, related issue to curricular reform involves the structural features of middle-level schools. Although advocates of middle school reform have long promoted certain strategies designed to take advantage of development during early adolescence (e.g., interdisciplinary teaming, block scheduling), many middle-level schools fail to implement these programs (Mac Iver & Epstein, 1990). Why is this so? In other words, what are the structural and philosophical impediments to change at the middle school level? Urdan, Midgley, and Wood (1995) have identified a number of possible impediments to middle school reform, including 1) teachers' and administrators' perceptions of early adolescence as a time of such strong physical and emotional changes that teaching and learning are impossible; 2) teacher certification programs that offer no specific training for working with early adolescents; 3) large, bureaucratic schools with unwieldy, inflexible schedules; and 4) state-level mandates that emphasize testing of discrete pieces of information rather than integrative and critical thinking skills. To create middle-level schools that are developmentally appropriate for early adolescent students, it is necessary to develop a better understanding of the factors, including the attitudes and beliefs of educators and parents; policies at the building, district, and state levels; and school structures that impede middle school reform.

Perhaps the most effective method of creating curriculum, policies, and practices that suit the cognitive developments of early adolescence is to identify specific school- and classroom-level practices that are effective in helping these students learn. For example, does the grouping of students by ability, either within the classroom or between classrooms, help early adolescent students learn? Is a diverse curriculum that allows students some latitude to chose which classes they take more or less effective than a more narrow curriculum? Does interdisciplinary teaming produce greater learning gains for students than subjects taught in isolation from each other? Perhaps most importantly considering the wide variety of cognitive developmental levels among early adolescent students, what specific instructional practices are best for handling the diversity?

DEVELOPMENTAL SHIFTS IN MOTIVATION

Research has consistently shown that early adolescence is a period marked by negative changes on a variety of motivational indices. For example, Harter (1981) found that intrinsic motivation for academic work generally decreased as students moved into adolescence. Other studies have shown similar declines across a variety of constructs, including interest in school (Epstein & McPartland, 1976); self-concept and self-esteem, especially for girls (American Association of University Women, 1992; Eccles et al., 1983; Marsh, 1989; Simmons & Blyth, 1987); and perceived competence (Parsons & Ruble, 1977). In addition, there is evidence that students experience an increase in such debilitating motivational cognitions as test anxiety (Hill, 1980) and learned helpless responses to failure (Rholes, Blackwell, Jordan, & Walters, 1980). Behavioral indications of motivation also decrease as students move into middle-level schools, including lower grades (Simmons & Blyth, 1987) and the beginning of a performance slide that predicts dropping out of school for some students (Roderick, 1992). For reviews of these motivational and performance shifts in early adolescence, see Eccles and Midgley (1989) and Midgley (1993).

The putative causes for these negative motivational and behavioral changes in early adolescence have been debated and examined for decades. In accord with the earlier view of adolescence as a time of storm and stress produced primarily by physiological changes associated with puberty, students' declining interest and performance in school were associated with biological changes (Simmons & Blyth, 1987). Indeed, those who work directly with early adolescent students daily often continue to attribute motivational problems to biological causes (Midgley, 1993; Urdan et al., 1995). Although physical changes undoubtedly present challenges to many early adolescent students, research suggests that other factors, including cognitive development, the learning environment in classrooms and schools, and socialization processes contribute to changes in these students' motivation.

The increasing cognitive sophistication that accompanies the move into early adolescence brings with it the ability to engage more readily in social comparison. Whereas younger children tend to define academic ability in terms of effort expenditure (i.e., the harder you try, the smarter you are), older children and early adolescents define ability in more relative terms (Nicholls, 1990). To view one's ability in relation to others, and to view ability and effort as

inversely related (i.e., the harder you have to try, the less able you must be), one must have achieved a level of cognitive development that generally does not arrive until late childhood or early adolescence.

As a result of the increased capacity for social comparison, early adolescent students can, and often do, experience a reorganization of self-perceptions. Early adolescents are intensely aware of how they compare with their peers, and this focus on relative ability is both a source of important information about one's abilities as well as a source of debilitating information about one's weaknesses. When students believe that they are less able than others, they often lack confidence in their abilities, leading to a variety of behaviors that can negatively affect their academic performance. For example, students may take steps to protect their image, and others' perceptions of their cognitive abilities. One of these steps is to withdraw from school and to redefine one's self-concept and identity in nonacademic terms. There is evidence that as students move into middle-level schools, their self-concepts become increasingly differentiated, and non-academic self-concepts become more important (Wigfield, Eccles, Mac Iver, Reuman, & Midgley, 1991). This increasing focus on nonacademic interests may partially explain why students experience a decline in intrinsic motivation for school work as they move through school (Harter, 1981).

Another consequence of early adolescents' tendencies to think in terms of relative ability is that they are more likely to develop an "ability goal orientation" in middle school than in elementary school. Research conducted using an achievement goal theory framework has focused on the antecedents and consequences of perceiving different purposes for doing academic work (e.g., Ames, 1992; Dweck & Leggett, 1988; Nicholls, 1984; Maehr, 1984). One type of purpose, or goal, is referred to as a "task goal" (it has also been called a "mastery goal" or a "learning goal"). When task goal oriented, students perceive that the purpose of academic work is to develop and improve skills, learn for the sake of learning, or to gain new insights into a topic. Success on a task is defined in self-referent terms. A second type of goal that has been studied is referred to as an "ability goal" (also called a "performance goal" or "ego goal"). When ability goal oriented, students are more concerned with demonstrating their ability relative to others. The purpose of academic work, then, is to show how much smarter one is relative to others, or to avoid looking less able than others. When ability goal oriented, success is defined in other-referent terms. A large and growing body of research has demonstrated that having a task goal orientation is associated with a more favorable pattern of motivational and behavioral outcomes than is having an ability goal orientation (e.g., more positive feelings about school, greater confidence in one's abilities, deeper levels of cognitive process-

ing, greater persistence in the face of failure or difficulty, less negative reactions to failure, continuing motivation, high achievement, and so on).

When young, children tend to view academic ability as a malleable characteristic that can be increased through effort. As children grow older and develop cognitively, however, they become able to view effort and ability as separate, usually as inversely related constructs (Dweck, 1992; Nicholls, 1990). By early adolescence, virtually all students are sophisticated enough to hold this view of the relationship between effort and ability. Dweck and her colleagues have argued that when students view ability as malleable, they are more likely to adopt task goals. However, when effort and ability are believed to be inversely related, ability is more likely to be seen as a stable, fixed entity. By early adolescence, middle school students are more likely than younger students to view ability as fixed and, therefore, are more likely to adopt a relative ability goal orientation. Research has, in fact, shown that middle school students are more likely to adopt an ability goal orientation than are elementary students (Anderman & Midgley, in press).

Research conducted with adolescents and adults has revealed important differences between students of different cultures, racial-ethnic backgrounds, and social classes in their motivational orientations (Cooper & Tom, 1984; Steinberg, Dornbusch, & Brown, 1992). Both Ogbu (1992) and Fordham & Ogbu (1986) have argued that black students devalue academic achievement because they view it as primarily a feature of white culture in America. Moreover, Phelan, Davidson, and Cao (1991) found, among a sample of high school students, that the degree to which students viewed their home, peer, and school cultures as incompatible was related to their motivation and performance in school. Others have argued that people from different cultures often have different definitions of self (e.g., interdependent versus independent and allocentric versus idiocentric), and these differences were related to differences in motivation. Midgley, Arunkumar, & Urdan (1996), using a sample of eighth graders, found that students' achievement goals were related to their use of self-handicapping strategies in different ways for black and white students.

Overall, the research indicates that motivational trends in early adolescence are not ideal. Although most students suffer only minor declines in motivation or performance upon entering middle-level schools, and these declines often disappear after the first year of attendance, the overall trends for early adolescence are clear: less intrinsic interest in school, less positive feelings about school and about one's academic abilities, more anxiety and negative reactions to failure, and lower achievement. Nevertheless, such declines are not a necessary consequence of moving into adolescence. Rather, the effects of development on motivation in

the early adolescent years depend on a combination of personal and environmental factors, including demographic and, possibly, personality characteristics of students, organizational features of schools, instructional methods, and the curriculum.

THE INFLUENCE OF THE LEARNING ENVIRONMENT ON MOTIVATION

As described in the section on cognitive development, there is often a mismatch in middle-level schools between the learning preferences of early adolescent students and the curriculum and instruction they receive. The increasing reliance on whole-class, lecture-style delivery in middle schools, relative to elementary schools, paired with early adolescents' desire and capacity for inquiry and control, make middle school a boring place for many students. Part of students' increasing disengagement with school during early adolescence may be due to increasing interest in nonacademic domains, such as sports and dating. These competing interests may be an inevitable part of maturation that will exist regardless of efforts made by educators to counteract them. However, the ability to match curriculum and instruction with the developmental needs of early adolescents is within the power of educators, and is something that would enhance the motivation of early adolescent students.

In addition to what is taught in middle-level schools, the structure of these schools and the ways in which they have been organized have an effect on motivation. For example, the size of middle-level schools may influence student motivation. Because students typically move from smaller elementary schools to larger middle-level schools, this transition to the more impersonal world of middle-level schools can make students feel somewhat lost. This issue will be discussed in greater detail in the next section on social development. For now, suffice it to say that it is easier for students to fall through the cracks in middle schools than in elementary schools, a fact that can lead to alienation and psychological, if not physical, withdrawal.

The organization of the school day into short periods in which academic subjects are taught in isolation from each other may also contribute to the declines in motivation many early adolescent students experience. Short periods that preclude working on longer and more authentic tasks may contribute to teachers' reliance on worksheets and whole-class lectures. In addition, when teachers are asked to teach the same subject to four or five different groups of students in short periods during the day, it may be difficult to avoid having instruction become somewhat automated. Fortunately, following the recommendations of the Carnegie Council on Adolescent Development (1989) and the National Middle School Association (1995), middle schools have begun adopting such practices as block scheduling, organizing

teachers into interdisciplinary teams, and small house structures in order to reduce the number of students they see daily, as well as thematic instruction to help students see how academic subjects are interconnected. However, impediments to implementing these structures and practices have kept these reforms from being effectively implemented in many middle-level schools (Felner et al., 1997; Mac Iver & Epstein, 1990).

Regarding the issue of social comparison and its potential effects on motivation described above, there is evidence that middle-level schools promote social comparison more than do elementary schools. First, middle schools are more likely to divide students into separate classes on the basis of ability than are elementary schools. This practice, known as tracking, makes relative ability a salient feature of the learning environment. Although many middle-level schools are abandoning formal student tracking, some form of ability grouping remains in evidence at most middle-level schools (McEwin, Dickinson, & Jenkins, 1996). Second, grading systems in middle-level schools tend to be more rigid and based on normative information than grading systems in elementary schools. In middle-level schools, students are more likely to be ranked by class standing, and these ranks are more likely to be displayed publicly, either in classroom progress charts, schoolwide honor roles, or other recognition systems. Also, teachers in middle-level schools are more likely to report engaging in instructional practices that emphasize ability goals in their classroom (i.e., that make ability differences between students in the classroom obvious) than are elementary school teachers. Students at the two levels of schooling confirm these teacher reports, saying that they perceive a greater emphasis on ability goals in their middle-level classrooms than they did in their elementary school classrooms (Midgley, Anderman, & Hicks, 1995).

Another element of middle grade education that may contribute to the motivational difficulties of some students involves the grading system. Many students experience a significant decline in their grade point average after they have made the transition to middle-level schools. Although some of this can be traced to declining interest and effort on the part of students, there is evidence that middle school teachers simply assign lower grades for the same quality of work than do elementary school teachers.

Finally, the declining sense of control reported by early adolescent students may be partly due to middle school teachers' tendencies to be more controlling than elementary school teachers. Whereas students report a desire for a greater voice in classroom decisions after moving on to middle-level schools (Midgley & Feldlaufer, 1987), middle school teachers believe that students need to be more firmly controlled, and given fewer choices, than do elementary school teachers (Feldlaufer, Midgley, & Eccles, 1988). This mismatch between stu-

dents' desires and teachers' beliefs and practices in middle-level schools may be due, in part, to the traditional lack of preparation that teachers who work specifically with early adolescent students receive.

QUESTIONS FOR CONSIDERATION

The study of motivation, like the study of most psychological phenomenon (especially development), has always involved a conflict between organismic and environmental perspectives. Is motivation a matter of individual differences, such that some people are simply more motivated than others? Or is student motivation determined largely by contextual factors, such as type of work, evaluation practices, or teaching methods? From the perspective of educators, viewing student motivation from an individual difference perspective can be debilitating. For example, if a student appears unmotivated, and the teacher believes this is a stable personality trait, the teacher is left with little hope for increasing the student's motivation. However, clinging to the belief that all students can be motivated by the right material or practices may lead only to frustration and self-blame while ignoring important motivational differences among students.

To fully understand motivation and development in early adolescence, researchers need to examine the interactions between personality factors and features of the learning environment (Lerner, 1987; Bronfenbrenner, 1994). For example, how do specific features of the learning environment (e.g., grading practices, lecture versus cooperative group structures, and tracking) interact with students' perceptions of their ability to become motivated? If some early adolescents experience a natural decline in their intrinsic motivation for school work as a result of growing interests in other domains, what features of school either offset or augment this decline? If students really do have stable differences in their need for achievement or need for affiliation (see Atkinson & O'Connor, 1966; Mclelland, 1961) what instructional practices are best for accommodating these differences? What, specifically, do teachers do that influences whether students adopt task or ability goals? These are some of the questions that need to be examined regarding the development of motivation in early adolescence.

Another set of questions involves differences in motivation by gender, racial-ethnic background, and social status. For example, gender differences in self-esteem and self-efficacy in mathematics emerge in early adolescence and tend to persist thereafter (AAUW, 1992; Pajares & Miller, 1994). Undoubtedly, societal messages (e.g., lack of female scientist role models) play a role in this difference, but it is still not clear what instructional factors are involved. The AAUW report suggests that differences in the ways in which teachers interact

with boys and girls are partly to blame (i.e., teachers in math classes are more patient in soliciting answers from boys than from girls). However, other work points to the different interaction and learning styles of boys and girls and that traditional classrooms favor boys' styles; this research is supported by findings from studies of single-sex classrooms and schools in which girls tend to fare better in the single-sex environments (e.g., Lee & Bryk, 1986). Clearly, additional research examining effective practices in coeducational environments that facilitate the motivation and learning of both male and female early adolescents is needed.

Because cultural and ethnic identity begins to crystallize in early adolescence, it is logical to assume that differences in motivation among cultural and ethnic groups may develop in early adolescence. However, little research has examined cultural and ethnic differences in motivation in this age group. Among early adolescent students, what are the differences in motivational orientation, and how do these differences affect academic attitudes and achievement? What are the factors, particularly in the school environment, that create these differences? What can schools do to address differences in motivational orientation between groups so that the achievement gaps that exist can be reduced or eliminated? Finally, what are some of the existing programs that have been designed to address these issues, and how effective are they?

A final set of questions concerns what is already known about motivation and reform targeting the middle grades. Much is already known about which motivational orientations lead to optimal learning and how to achieve them. For example, when teachers engage in practices that make ability differences between students a salient feature of the classroom (by pointing out the highest achievers in the class, for instance), students are more likely to adopt an ability goal orientation that has been associated with less adaptive learning outcomes than has a task goal orientation. Similarly, when students feel that their teachers are controlling them, for example, by using certain types of extrinsic rewards or threats of punishment, they are less intrinsically motivated, more anxious, less creative, and their performance is impaired (Deci & Ryan, 1985; Lepper & Hodell, 1989). Despite this knowledge, policies and practices that undermine motivation continue to exist in middle-level schools, and may perhaps increase as calls for accountability through standardized testing grow louder. Why is the gap between research and practice so large in the area of motivation? And what can be done to reduce it? Because policymakers, educators, and researchers continue to operate in separate venues, suggestions for increasing the intergroup exchange are needed.

Similarly, changes that have been advocated for years that are designed, in part, to increase the engagement of early adolescent students continue to be only sporadically implemented in middle-level schools. As small-house, advisory, interdisciplinary-teaming, and block-scheduling programs continue to proliferate in middle-level schools, several questions need to be continually asked. What are the impediments to implementing these programs effectively? What effects do these programs have on motivation, and how much do the effects depend on the quality of the implementation? What are the consequences of implementing only some of the programs, while maintaining some traditional programs (e.g., instituting an advisory program while maintaining tracking)? Felner and his colleagues (1997) have undertaken an ambitious evaluation of the effects in schools that have adopted, to varying degrees, the reforms proposed in the Carnegie Council's report *Turning Points,* which may provide an effective model for answering these questions in the future.

SOCIAL DEVELOPMENT IN ADOLESCENCE

At no other time during the course of development are people more susceptible to the influence of peers than during early adolescence. Although studies vary somewhat regarding the exact age or grade of maximum peer influence, early adolescence (between 7th and 9th grade) has been identified frequently (Berndt, 1979; Steinberg & Silverberg, 1986). As youth develop the confidence and capacity to decide for themselves what is right and wrong, and what their identity will be, they begin to separate themselves from their parents and establish some independence from their influence. At the same time, early adolescents become highly concerned with the perceptions of their peers, with fitting in, and with establishing their social identity (Juvonen & Weiner, 1993). These factors combine in early adolescence, giving peers a larger role than at other times in development in shaping each other's attitudes and behaviors. Despite the increasingly important role of peers during this period, it should be noted that adults, especially parents, continue to exert a large influence over youths' beliefs and behaviors. Whereas peers are turned to for guidance in such matters as fashion, style, and many social behaviors (e.g., dating, peer-group affiliation, and after-school activities), parents remain the dominant influence in such domains as career aspirations and college plans (Epstein, 1983; Steinberg et al., 1992).

In addition to changes in the importance of social relationships with peers during early adolescence, there are a number of changes in the structure and function of these relationships during this period. For example, with the transition to middle-level schools, friendship groups are often shuffled and students from different elementary schools come together in the larger middle school. Early adolescent students find themselves with new and more varied options for selecting friends. Although this shuffling of friendship groups can be exciting and often leads to strong new friendships, research shows that when students make the transition to middle-level schools, old friendship networks are often disrupted or destroyed. Students who are able to maintain friendships during the transition find the adjustment to middle-level schools easier than do students whose old friendships are broken at this time (Hawkins & Berndt, 1985).

During early adolescence, friendships tend to become more intimate. For example, friends spend less time in play activities and more time simply talking and "hanging out," es-

pecially girls (Parker & Gottman, 1989). Friendship groups also tend to become larger, with several different cliques forming accompanied by the emergence of a status hierarchy among cliques. These cliques can often have rigid rules, understood if not written, that govern issues of dress, ways of speaking, appropriate levels of academic success, social activities, and acceptable friends (Brown, 1989; Eder, 1985). Whereas girls and boys tend to socialize in gender homogeneous groups during childhood, by early adolescence, the social groups begin to grow more integrated in terms of gender, and sexual interest between the genders emerges.

For several decades, concerns about social relationships in adolescence were believed to impair academic achievement and motivation. Coleman (1961) argued that, among high school students, high academic achievement was not viewed by either boys or girls as a precursor to popularity. Horner (1972) claimed that college women actually feared that academic success would lead to social rejection, especially by men. And theories of motivation prevalent in the 1950s and 1960s proposed that achievement motivation was inversely related to social, or affiliation, needs (Atkinson & O'Connor, 1966; McClelland, 1961). This view of the relationship between social and academic motivation is also common among educators and parents of early adolescents who frequently witness the co-occurrence of declining motivation in school and increasing social activity with peers.

The causal relationship between social and academic concerns is complex. Does an increased emphasis on gaining acceptance from peers during early adolescence reduce the emphasis placed on striving for high academic achievement? Or does declining interest in school lead many adolescents to strengthen their social bonds with peers who hold similar views about education? The answer to these questions appears to be both yes and no. Research has shown that in childhood (Kinderman, 1993) and adolescence (Epstein, 1983, 1989), peers select their friends largely on the basis of proximity and similarity (of appearances, interests, achievement levels, and so on). Once friends have selected each other, their attitudes tend to grow more similar over time. When friendships are disrupted (e.g., by moving to different middle schools or by meeting new friends), or when friends' attitudes grow dissimilar over time, children and adolescents choose new friends, again on the basis of proximity and similarity. The cycle continues throughout life, but early adolescence represents a period of high social network disruption and intensification of social interest in peers.

The study of friends' influence on each others' school-related attitudes, beliefs, and achievement has revealed that friends can influence each other in positive or negative ways (Berndt & Keefe, 1992). When an early adolescent has a friend who strives to do well in school, likes school, and gets good grades, her own motivation and achievement will probably

be positively affected over time. Conversely, students who befriend other students who dislike school, do not try to do well, and do poorly in school will likely be negatively affected over time. If disparities in attitudes and achievement levels of friends persist over time, students will likely disband the friendship and seek new friends with more similar school-related attitudes and behaviors.

Unfortunately, little is known about the strength of peer influence on school-related beliefs and behaviors or about the process of peer influence. One reason there is so little information on these issues is that early adolescents have a difficult time describing the ways in which their friends or other peers affect them (Berndt & Keefe, 1992). When asked directly, early adolescents often deny that their friends have any effect on the way they view school or how well they do. They usually say that they do not discuss school with their friends, and overt pressure to increase or reduce effort or achievement in school is very rare. Adolescents are particularly reluctant to say that their friends or other peers exert a negative influence on them. Although it is possible that these declarations and perceptions are accurate, it is more likely that peers do influence each other in positive and negative ways, and that much of this influence occurs unconsciously, through identification (Berndt & Keefe, 1992).

There is also some evidence of differences in peer influence by race-ethnicity, gender, and culture (see Urdan & Maehr, 1995). Regarding gender, there is evidence that girls are more concerned with maintaining their social relationships through equality of achievement, whereas boys' positive relationships are more competitive in nature (Urdan, 1997). Several studies have suggested that the concern among girls with maintaining equality and not belittling friends by greatly outperforming them may reflect a caring, interconnected orientation more often found among girls and collectivist cultures (Gilligan, 1982; Markus & Kitayama, 1991; Triandis, Leung, Villareal, & Clack, 1985). In some studies, this type of orientation has led some students to intentionally sacrifice their own performance in school for the sake of helping their friends do well (Phelan et al., 1991). An additional body of research has examined racial-ethnic differences in peer influence. Some of this research has found that black students are more likely than white or Asian-American students to discourage high academic achievement (Fordham & Ogbu, 1986; Steinberg et al., 1992). However, it is not clear from this research whether such negative attitudes toward high achievement among black students are widespread or have a direct effect on peers' attitudes and performance in school, or whether these differences were due to racial-ethnic background versus some other factor, such as socioeconomic status.

Although peer relationships in early adolescence have received the bulk of research attention, it should be noted that their relationships with adults also change during this period. In addition to their growing independence from parents in some domains, early adolescents also seek different types of relationships with adults other than their parents. Specifically, early adolescents seek close relationships with adults from whom they can seek advice and friendship that is more mentoring in nature than parental. While young adolescents may appear to have disdain for authority, in fact, they often seek personal relationships with adults.

SCHOOLING AND SOCIAL DEVELOPMENT

There has been little research that has directly examined the ways in which the structures or instructional practices in middle-level schools affect social relationships or social influence processes. However, on the basis of knowledge about social development in early adolescence and middle-level school structures and practices, it is possible to speculate about what the effects may be. Indeed, this knowledge has informed the recommendations of the Carnegie Council on Adolescent Development, among others, to suggest changes in the social structure of middle-level schools in order to better meet the developmental needs of early adolescents. Small house organization and advisor-advisee programs are two examples of such changes.

When early adolescent students make the transition to middle-level schools, they typically enter schools that are larger than their elementary schools. In addition, they often experience profound changes in their social networks such that the social supports they have developed in elementary school (i.e., friends, a teacher) are no longer present in middle school. Socially speaking, students often have to start over when they enter middle school, developing new school-based social networks. In some sense, traditional middle school structures meet this need well because they provide many opportunities for students to interact with each other and several different teachers. Because students change classes five or six times a day, moving to a new teacher each time and having different students in each class, they come into contact with a wide variety of potential additions to their peer and adult social networks. Unfortunately, the instability and sheer number of people students come into contact with during the typical school day, coupled with the short period of time spent with each group, can also cause students to feel more alienated than socially connected.

To reduce this instability and increase students' chances for establishing solid social relationships, small house structures and advisor-advisee programs have been recommended for, and implemented in, many middle-level schools. In a well-organized small-house structure,

students are divided into smaller "houses" with a limited number of teachers. For example, each house may involve one-third of the student body and teachers. This effectively reduces the size of the school for students because they take classes only with other students and teachers in their "house," thus, improving their chances of getting to know them. Within houses, teachers may also be organized into interdisciplinary teams. One team may have four teachers, each teaching one of the core academic subjects (math, science, English/language arts, and social studies). This team may be responsible for teaching 100 students, organized into four 25-student groups. Each group moves, intact, from class to class, increasing the amount of time they spend with one small group of students, while decreasing the number of students they share classes with each day. The desired effect of such organizational changes is that students get to know each other and their teachers better.

To further reduce the anonymity of the middle school experience while satisfying early adolescents' desires to develop close relationships with nonparental adults, many middle schools have adopted advisor-advisee programs. Such programs generally involve a group of students who begin each day in their homeroom with their advisor-teacher. A brief period is spent discussing adjustment issues, such as how students are feeling that day, whether they're having problems with school or in their personal lives, and so on. Some programs have a more formal curriculum where such issues as coping strategies, relationship issues, and the like are discussed. Students are then sent off to their academic classes, and often end the day back in their advisor-teacher's classroom. The advisor often tries to establish a personal relationship with each advisee, assuming a supportive role. In addition, the advisor also often becomes the contact person for other teachers and parents when problems arise with one of his or her advisees.

Despite these efforts to create structures and programs designed to meet the social-developmental needs of early adolescents, many middle schools still do not appear to meet these needs well. There is evidence that such programs and structures as small-house, teacher teams, and advisor-advisee, although widely recommended by middle school advocates, are often either not adopted nor effectively implemented in middle-level schools (Mac Iver & Epstein, 1990). This means that at a time when many students are developing a desire to build personal relationships with adults other than their parents, they are moved from a system in which they spend the entire day with one adult to one in which they spend about 50 minutes a day with several different teachers, each of whom interacts with between 100 and 150 students a day.

Because students tend to develop friendships largely on the basis of proximity, practices that place students in proximity to each other need to be considered in light of the influence patterns they might spawn. Tracking by ability puts students in close proximity with students who have similar ability levels and, most likely, similar attitudes toward school. For those placed in the high track, this may lead to friendships that are supportive of academic effort and achievement. Students placed in low tracks, however, are more likely to develop friendships with other low-achieving students who may be starting the process of disassociation with school than if they were placed in mixed-ability classes where they would be in close proximity with high-achieving, positively-oriented students.

Instruction in middle-level schools typically utilizes more whole-class and less cooperative group work methods. Because this shift in instructional techniques occurs at a time when students are becoming more concerned with their social relationships with peers, a developmental mismatch may be occurring. Some research has shown that at the high school level, students who are particularly concerned with social relationships try hard and do well in classes where they are allowed to work cooperatively with friends, but withhold effort and do poorly in classes where cooperation and discussion among peers is not allowed (Phelan et al., 1991). Cooperative learning programs, if effectively implemented, may provide a useful way of combining instruction in middle-level schools with the social-developmental needs of early adolescent students (Slavin, 1983).

Finally, research indicates that middle-level schools tend to place a greater emphasis on relative ability and competition than do elementary schools. This competitive orientation may be directly at odds with the social orientation of some students, particularly girls and those from cultural groups with a more collectivist orientation. When success is defined competitively, those students with a more cooperative or collectivist orientation are placed in an awkward position because their academic goals are in direct conflict with their social goals. By providing alternative, less competitive ways of succeeding, middle-level schools may help all students in their efforts to coordinate their social and academic goals.

QUESTIONS FOR CONSIDERATION

Although much study has been conducted on social development and early adolescents' changing social relationships, there is much less research examining the extent to which, and the processes by which, friends and the larger peer group influence students' academic motivation, beliefs, and behaviors in middle-level schools. Epstein (1983) has provided evidence that some social influence occurs in middle-level schools, and there is limited evidence that the

influence of friends and peers can be either positive (i.e., toward academic effort and achievement) or negative (Berndt & Keefe, 1992; Urdan, 1997). However, this work is generally small in scope, more inferential than direct, and equivocal. Researchers to date have had a difficult time verifying what everyone seems to know intuitively: early adolescent students' motivation and performance in school is affected by their peers. How this process occurs, and what role school structures and instructional practices play in the process, are questions remaining to be answered.

Another set of questions revolves around differences in peer influence according to student characteristics. Do girls influence each other differently than boys on achievement-related beliefs and behaviors? Do instructional practices interact with social development differently for boys and girls, or for students from different racial-ethnic backgrounds or cultures? Is there a buffering effect against potential negative influences of the larger peer group for those students with one or more close friends who value academic achievement? There is indirect evidence to support the assumption that students who view their commitment to their social relationships in various ways will be affected differently by educational practices that promote cooperation, competition, and independence. However, the lack of direct examination of these issues leaves them unanswered questions in need of research.

Finally, still little is known about the effect of programs designed to improve the match between middle-level schools and the social-developmental needs of early adolescent students. In those schools where small-house structures, interdisciplinary teams, and advisor-advisee programs have been implemented, what are the effects on students? Do they feel less isolated in school? Is their adjustment to middle school, both academic and psychological, more adaptive? Are the benefits of these programs cumulative (over time) and additive (by number of programs), or is one good program enough to make a difference? And what are the keys to successful implementation and maintenance of these programs?

PHYSICAL DEVELOPMENT

Early adolescence is triggered by biochemical changes that alter children's physical characteristics. Somewhere between the ages of 10 to 15 years, youth normally experience a radical growth spurt second only to that of infancy: primary and secondary sexual characteristics assert themselves, and observable increases may be noted in body size, body symmetry, and the skeletal and structural framework (George & Alexander, 1993). During this period of intense physical change, some body parts (e.g., the arms, nose) may grow faster than others, causing young adolescents to appear gangly and uncoordinated or to become overly fixated on their appearance (Lawrence, 1980; Milgram, 1992).

Moreover, because adolescents are set to different biological clocks, physical differences may be exaggerated as youth enter and complete puberty at different times. This can lead to feelings of awkwardness and self-consciousness as they try to cope with their rapidly and, at times, irregularly changing bodies. While it has been suggested that grouping young adolescents by size, rather than by age, can diminish feelings of inadequacy in classes such as physical education (Manning, 1993), such an approach may be less viable in academic classes, where cognitive, emotional, and intellectual changes lag behind physical developments and may be manifested at different times. As such, middle grade educators often must confront classes of students who manifest a range of physical characteristics—a six- to eight-year physical age span may be found within one classroom—and who are overly sensitive to the physiological differences that set them apart (National Staff Development Council, 1994).

Physical development can complicate interactions between the sexes, because as youth begin to take a greater interest in their sexuality, their attention may be diverted from their school work and other important issues. Since females mature faster than males, there can also be friction between the sexes that can polarize intergroup relations. Girls typically begin their growth spurt two years earlier than boys, meaning that the greatest physical variability between the sexes is usually recorded around age 13 (Tanner, 1978). Girls who experience relatively early onset of puberty, so-called early developers, often have lower self-esteem than do later developing girls (Eccles & Midgley, 1989). Recent evidence suggests that certain social factors, such as poverty, can also affect the onset of physical development within and across sexes. Furthermore, the age at which young adolescents enter puberty has steadily

fallen; for example, the average age of menarche has dropped from 16 to 12 years of age over the past one and a half centuries. Since cognitive development is often not completed until the late teens, these changes may mean that sexual maturity outpaces social and emotional development (Hamburg, 1992).

The hormonal surge that initiates growth also directly affects adolescent behaviors. For instance, fluctuations in basal metabolism can affect youths' ability to concentrate, and can cause sudden bouts of fatigue that render them indifferent or lethargic. In rare cases, hormonal changes may also cause unpredictable mood swings that may lead youth to behave in aggressive or inappropriate ways (California State Department of Education, 1987). Thus, educators may face significant challenges in designing instructional programs that appeal to a wide range of student abilities, or that take into account environmental or biological factors that affect maturation rates. Engaging youth in structured learning during this time often requires using innovative strategies that motivate youth to participate; this may include providing instruction that emphasizes performance of various activities or that offers frequent opportunities for physical movement.

PHYSICAL DEVELOPMENT AND SCHOOLING

The once-dominant view that physical development during early adolescence made students virtually incapable of learning has largely been replaced by a more balanced view. However, to develop effective instructional organizations and methods for the intermediate grades, it is important to understand the contributions of physical development to the learning process. One way to think of physical development during early adolescence is as an enabling mechanism. Physical development is closely tied to cognitive development that, if appropriately served by instructional methods and curriculum, can lead to enhanced motivation and performance. Another way to think about physical development is as a stress factor. From this perspective, the awkwardness and physiological disruptions (e.g., mood swings) that often accompany physical development, when combined with other stress factors that occur at this period of development, can lead to decrements in motivation and performance in school.

One such stress factor that may interact with physical development is the transition from elementary to middle-level schools (Simmons & Blyth, 1987; Eccles & Midgley, 1989). There is some evidence that early adolescent students who attend K–8 schools rather than switching to a middle-level school in 6th or 7th grade experience less negative changes in their motivation, self-perceptions, and achievement (Eccles & Midgley, 1989). Although differences between the two grade configuration systems are not always found, when there are dif-

ferences, they tend to favor the K–8 system. One reason for this may be that simply making a transition at a time of multiple stressors, including physical changes, the onset of dating behavior, and changing social networks, adds to adjustment difficulties. Middle-level schools that have taken steps to smooth the transition from elementary school, such as creating smaller "houses" within the school and establishing advisor-advisee programs, are able to reduce the negative changes often seen during early adolescence (Eccles & Midgley, 1989). This research shows that declining self-perceptions, motivation, and achievement are not an inescapable consequence of physical changes associated with puberty. In addition, it demonstrates that responsive school practices that reduce the stress of students' transition to a new school can improve their adjustment.

QUESTIONS FOR CONSIDERATION

As the research illustrates, the stress associated with the difficulty and awkwardness of rapid physical changes during early adolescence can be exacerbated or ameliorated by features of the learning environment in middle-level schools. Much more information is needed regarding the interaction of physical development and the learning environments of intermediate schools to address the following issues. What are the most effective strategies for dealing with the enormous disparity in the level of physical development found among early adolescent students? How are these differences in maturation rates related to motivation and achievement in school? What, if anything, should schools do to accommodate possible gender and cultural differences in responses to physical development, such as body image?

The other area of physical development with important implications for education involves changes in the biochemical activity of the brain. Exciting developments in brain research may help explain the many changes in cognition that appear during early adolescence. How do changes in the brain affect early adolescent students' ability to process information? What are the implications of this development for the curriculum and instructional methods used in middle-level school? Are physical developments in the brain partially responsible for differences between boys and girls in their perceptions of and interest in different academic subjects? These are just a few of the many questions that research on brain development during early adolescence might begin to examine. More questions for consideration regarding physical development will follow.

FUTURE RESEARCH: EXAMINING PERSON-ENVIRONMENT INTERACTIONS AND EVALUATING REFORM EFFORTS

EXAMINING PERSON-ENVIRONMENT INTERACTIONS

Throughout this paper, the various areas of development in early adolescence have been discussed as though they occurred independently of each other. In fact, this unnatural division was created for ease, rather than accuracy, of presentation. After reviewing some of the research on cognitive, social, motivational, and physical development in isolation, the purpose of this section is to put the pieces back together and to add some new ones.

The overarching aim of this paper is to raise questions about the ways in which research can best inform the improvement of education for early adolescent students. As Lipsitz (1984) and others have argued, such improvements cannot be made without a deep understanding of development during this period.

> A central weakness in most schools for young adolescents is a wide-spread failure to reconsider each school practice in terms of developmental needs in order either to incorporate responsibility for meeting them into the schools' academic and social goals or to keep them from being barriers to attaining these goals. (p. 168)

To achieve this unity between educational goals, practices, and curriculum with early adolescents' developmental needs, the various areas of development need to be considered in relation to each other. It is clear that social development during early adolescence is partly dependent on physical maturation as well as cognitive developments that allow individuals to more easily empathize with others, understand and identify with gender and cultural norms, and develop more mature social relationships with adults other than their parents. More research is needed that explicitly examines how the various components of development are interrelated. Recent advances in research on physical development, particularly brain processes, offer the promise of exciting new understandings about development in all areas, especially cognitive development.

In addition to examining the relations among the various domains of development, future research would profit from exploring the interactions between individuals and the contexts in which they operate. As Lerner (1987) and Bronfenbrenner (1994) have persuasively argued, development occurs in multiple contexts, and these contexts interact with each other, and with the individual, to produce psychological adjustment and behavior. The research on the interaction of individuals and environments has already revealed interesting differences between students in their responses to the changes that occur during early adolescence. For example, the steep decline in self-esteem for girls, particularly early maturing girls, relative to boys upon entry into middle-level schools has helped to clarify the relationship between physical development and school transitions.

A focus on the interaction between individuals and contexts needs to include the school, home, and community. Perhaps the most interesting outcome of this research will be the differences in students' reactions to various contextual factors according to the sex, race-ethnicity, developmental level, home environment, and community context of their development. Research has already provided evidence that gender and racial-ethnic differences exist in students' responses to educational structures and practices (e.g., Eccles et al., 1996; Phelan et al., 1991; Simmons & Blyth, 1987; Steinberg et al., 1992). A vast number of questions remain, however. Are the differences that emerge in the motivation and cognition of boys and girls, particularly in math and science, best handled by single-sex instruction? Or is there a style of instruction that will cater to the needs of both genders equally well? Does the curriculum and typical style of delivery fit the developmental patterns of middle class students better than poor students? Will constructivist principles, faithfully implemented, have more positive effects in rural schools than in urban or suburban schools? What are effective strategies for increasing community involvement in middle-level schooling, and will these strategies differ from community to community? This is just a sampling of the many questions that remain regarding the interaction of individual development and developmental contexts.

A related set of questions involves the relationship between schools and their communities. There is considerable evidence that parents' involvement with schools declines sharply when their children move from elementary to middle-level schools (Epstein & Lee, 1995). Epstein and Lee, in one of the rare attempts to assess parent-school interactions at the national level, analyzed the NELS:88 data set. They concluded that contacts from middle-level schools to parents were selective and infrequent, with most parents receiving little or no contact, beyond report cards, from schools. This lack of communication and interaction appears to be a two-way street, with most parents reporting that they never contact schools or serve as volunteers in the schools, although they do report talking about school with their children.

Principal and student reports supported these findings. Combining the reports of parents, principals, and students, Epstein and Lee conclude that although parents try to monitor their early adolescent students' academic activities, only "about 20 percent of families remain active and knowledgeable partners with their children's schools" (p. 147). These authors also note that parent-school partnership behaviors vary in frequency and type according to region and school characteristics (e.g., public/private, urban/rural, larger/small). The lack of communication between families and schools represents a risk factor, and there is evidence that when schools take active steps to create partnerships with parents, more families participate in the schools and student learning is supported. Therefore, additional information regarding best practices for increasing the bonds between parents and middle-level schools are needed, as is information about how these relationships affect student motivation and achievement.

EVALUATING MIDDLE SCHOOL REFORM EFFORTS

A second, related series of questions involves direct examinations of instructional practices from a developmental perspective. As researchers have paid increasing attention to adolescent development over the last two decades, a number of suggestions for reforms at the middle school level have been offered and implemented. As Felner and his colleagues (1997) have noted, large-scale, high-quality assessments of these reform efforts are lacking. Middle school reform efforts need to be evaluated on at least three levels: 1) How widespread are the faithful, thorough implementations of various reforms? 2) What are barriers and facilitators of effective reform implementation? and 3) What are the effects of the reforms on students? An example may help to clarify each of these questions.

First, regarding questions 1 and 2 above, there is evidence that middle-level schools are increasingly adopting the reforms recommended in *Turning Points* (McEwin et al., 1996). However, a number of middle-level schools have been slow to adopt many of the recommended reforms, particularly in the area of specialized training for middle school teachers. Moreover, once they do adopt some of the reforms, there is evidence that they vary widely in their quality of implementation (Mac Iver & Epstein, 1990; Felner et al., 1997). Felner and his colleagues found differences in the achievement and adjustment of students were related to the level of implementation of reforms recommended in *Turning Points*. Mac Iver and Epstein found that among schools that said they had implemented interdisciplinary teacher teams, there was wide variation in the amount of time teams were given to plan and discuss interdisciplinary instruction. Thus, researchers need to continue to track the frequency and quality of implementation of programs designed to create developmentally appropriate middle-level schools. In addition, researchers might do well to examine the structural and attitudinal barri-

ers, as well as facilitators, of change. Often, motivation to adopt reforms depends on the attitudes of teachers and administrators toward students, development, and the reform itself (Lipsitz, 1984; Mac Iver & Epstein, 1990; Urdan et al., 1995). One important question regarding this issue is whether commitment to change must precede structural changes, or whether structural changes can create commitment. Some successful projects involve only those schools in which faculty and administration members have voluntarily committed to make reforms (e.g., Cohen, 1992; Felner, 1997; Hopfenberg, 1991). However, much large-scale reform is mandated without prior commitment on the part of teachers and administrators in individual schools. It is important to determine whether this approach can lead to committed implementation and successful change.

Perhaps the most important of the three questions raised above is the last one, regarding the effects of reforms on students. Reforms designed to meet the developmental needs of early adolescent students are now in place, to some degree, in numerous middle-level schools across the nation. What effect are they having? There is very little information, particularly at the national level, about how these reform efforts affect student achievement and motivation in school. Some examples of reforms in need of evaluation include middle grades certification of teachers, now required in a number of states; the use of alternative assessments, such as portfolios and performance assessments; development of small-house and interdisciplinary team structures; advisor-advisee programs; the development and implementation of a core academic curriculum suited to the developmental levels of early adolescents; and efforts to involve parents and the community in the school. Although efforts to assess the effects of such reforms occur sporadically and on a small scale nationwide, a well-organized, systematic evaluation is needed. It may be particularly interesting to examine the effect of specialized teacher training on adolescent development, as many believe that this is key to successfully educating early adolescent students (e.g., Lipsitz, 1984). Because teachers who have a thorough understanding of adolescent development can ostensibly create lessons, assessments, and programs that meet the developmental needs of these students, this may be a particularly important aspect of reform to assess. In addition, programs to create whole-service schools, in which mental and physical health services, along with educational services, are offered to students and members of the community, have proliferated across the nation in recent years. Evaluations of these programs are needed as well.

CONCLUSION

Educators have long recognized that early adolescence can be a difficult time for some youth. Until recently, the solution has often been to ignore, or at best tolerate the behavioral

and emotional changes that characterize adolescence. Indeed, over the past decade, most school reform efforts have tended to focus on instruction in the elementary and secondary grades, with the result that middle grade curricula, instruction, and organization have remained relatively stagnant. Growing recognition that early adolescence can be a critical event in the lives of youth, one in which they make decisions that can affect their future life and career success, has increasingly drawn researchers to study the stages and events that mark its progression.

Presently, much is known about the developmental changes that characterize early adolescence, and a growing literature is addressing the manner in which traditional school organizations affect educational outcomes for this group of children. As middle school reform efforts continue to take hold in schools, the time has come to evaluate the implementation and effects of these programs on students. In particular, it is time to examine the fit between the developmental levels of early adolescent students and the programs, curriculum, and instructional practices being implemented in middle-level schools. That is, it is important to determine which reforms foster and match the cognitive, motivational, social, and physical growth of early adolescents, and for which groups of students? Understanding the programs and practices that work best, while continuing to develop an understanding of development during early adolescence in all its complexity, will enhance efforts to create developmentally appropriate schools for all early adolescent students.

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