

Negotiating the Transition to Middle School: The Role of Self-Regulatory Processes

Karen D. Rudolph, Sharon F. Lambert, Alyssa G. Clark, and Kathryn D. Kurlakowsky

The present research examined the role of maladaptive self-regulatory beliefs as vulnerability factors for academic and emotional difficulties during the transition to middle school. A short-term longitudinal design was employed to follow two groups of early adolescents: 187 adolescents who experienced a school transition between the fifth and sixth grades, and 142 adolescents who did not experience a school transition between the fifth and sixth grades. Adolescents completed measures of perceptions of academic control and importance of academic success, experience of chronic academic strain, daily school hassles, and depressive symptoms. Teachers reported on students' academic engagement, including levels of helpless behavior, effort, and academic performance. Consistent with the proposed model of self-regulation, maladaptive self-regulatory beliefs (i.e., decreased perceptions of academic control and importance) predicted individual differences in perceived school-related stress and depressive symptoms over the course of the middle school transition, but were not associated with academic and emotional difficulties in adolescents who remained in a stable school environment. Moreover, a self-regulatory sequence was identified proceeding from maladaptive self-regulatory beliefs, to academic disengagement, to enhanced perceptions of school-related stress, to depressive symptoms. This study bridges prior theory and research concerning the psychological impact of normative developmental transitions, the developmental context of depression, and the associations among self-regulatory beliefs, achievement-related behavior, and emotional experience.

INTRODUCTION

Early adolescence is a pivotal stage of development that is marked by a confluence of normative biological, psychological, and social challenges (Eccles & Midgley, 1989; Lord, Eccles, & McCarthy, 1994). Importantly, developmental trajectories diverge in early adolescence toward either healthy adjustment or psychopathology (Petersen & Hamburg, 1986). For example, this period is associated with sharp increases in rates of psychological symptoms and maladaptive behaviors, such as anxiety, depression, substance abuse, and antisocial conduct (e.g., Hankin et al., 1998; Kazdin, 1993; Nolen-Hoeksema & Girgus, 1994; Petersen et al., 1993). Because impairment in functioning during this critical stage of maturation may compromise children's achievement of key cognitive and social milestones that act as building blocks for future growth, identifying the determinants of adolescent adjustment difficulties is essential to understanding long-term developmental pathways and outcomes.

Why might early adolescence serve as a developmental context of risk for psychological disruption? To address this issue, many developmental researchers have turned to the ecology of adolescence. The entrance into adolescence is characterized by a range of new experiences, expectations, and stressors (Eccles & Midgley, 1989; Petersen & Hamburg, 1986; Simmons, Burgeson, Carlton-Ford, & Blyth, 1987). Most young-

sters undergo a school transition as they move from elementary to secondary (i.e., middle/junior high) school. Ecological transitions such as a change of schools may exert a strong influence on emerging developmental trajectories as a result of the multiple role disruptions and the new task demands that frequently accompany such transitions (Bronfenbrenner, 1979; Fenzel, 1989). In fact, a wealth of research has documented quite extensive normative changes that occur during the transition to secondary school (Harter, Whitesell, & Kowalski, 1992; Lord et al., 1994; Seidman, Allen, Aber, Mitchell, & Feinman, 1994; Simmons et al., 1987; for comprehensive reviews, see Eccles & Midgley, 1989; Eccles, Wigfield, & Schiefele, 1998).

Less integral to research on school transitions has been the identification of individual differences in adolescents' psychological outcomes. Studying individual differences in reactions to the middle school transition may yield vital information about why early adolescence is a high-risk period for the onset of psychological difficulties in some youth. The present research investigated the pathway leading to one type of adverse developmental outcome, namely depressive symptoms, with a focus on the role of self-regulatory processes. The first goal was to test the

proposal that the transition to middle school would interact with personal vulnerability, in the form of maladaptive self-regulatory beliefs, to predict academic and psychological maladjustment. In particular, it was hypothesized that maladaptive self-regulatory beliefs in the academic domain would be more strongly associated with perceptions of school-related stress and depressive symptoms in adolescents who underwent a school transition than in those who did not. The second goal was to identify the processes leading from pretransition maladaptive self-regulatory beliefs to posttransition depression. Specifically, it was hypothesized that (1) such beliefs would interfere with adolescent's academic engagement in middle school, (2) academic disengagement would generate higher levels of perceived stress at school, and (3) higher levels of school-related stress would be associated with increases in depression.

Characteristics and Effects of School Transitions

During the transition from primary to secondary school, children face a range of new demands associated with differences in school structure, classroom organization, teaching strategies, academic standards, and teacher expectations (Blyth, Simmons, & Bush, 1978; Blyth, Simmons, & Carlton-Ford, 1983; Feldlaufer, Midgley, & Eccles, 1988; Harter et al., 1992; Kavrell & Petersen, 1984; Midgley, Anderman, & Hicks, 1995; for reviews, see Eccles & Midgley, 1989; Eccles, Midgley, & Adler, 1984; Eccles et al., 1998). Such changes in the academic environment may lead youngsters to experience a lack of predictability and increased ambiguity about the criteria for evaluation and success. Moreover, theory and research have suggested that there may be a developmental mismatch between the more controlling atmosphere of secondary school classrooms and the optimal level of autonomy during early adolescence (Eccles & Midgley, 1989; Eccles, Midgley, & Adler, 1984; Feldlaufer et al., 1988). This mismatch may create further tension and stress in the classroom. For instance, secondary school teachers provide students with less opportunity to give input into classroom decision-making and rules than do elementary school teachers (Eccles & Midgley, 1989). Paradoxically, despite the higher levels of control and decreased opportunity for decision-making, secondary schools often require more self-motivation and personal responsibility than do elementary schools (Harter et al., 1992). For example, students may be expected to complete class assignments and homework with less direct monitoring from adults and to assume more responsibility for coordinating workloads in different subjects.

The many changes experienced in secondary school have been found to exert an adverse influence on adolescent functioning that includes declines in academic motivation, perceived competence, and intrinsic interest in school (Harter, 1981; for a review, see Eccles & Midgley, 1989); lower levels of achievement (Blyth et al., 1983; Crockett, Petersen, Graber, Schulenberg, & Ebata, 1989; Seidman et al., 1994); negative attitudes toward learning (Brush, 1980; for a review, see Eccles, Midgley, & Adler, 1984); and decreased classroom engagement (Skinner, Zimmer-Gembeck, & Connell, 1998). In addition to these negative effects on academic orientation and success, the transition has been linked to problematic emotional outcomes, such as declines in self-esteem (Blyth et al., 1983; Eccles, Midgley, & Adler, 1984; Wigfield, Eccles, Mac Iver, Reuman, & Midgley, 1991); increases in self-consciousness (Simmons, Rosenberg, & Rosenberg, 1973); and more negative academic task-related affect (Harter et al., 1992). Surprisingly little research, however, has examined negative outcomes in terms of the expression of psychological symptoms (see Roeser & Eccles, 1998). Although a few studies have investigated predictors of depression and other types of symptoms across the middle/junior high school transition period (Hirsch & DuBois, 1992; Robinson, Garber, & Hilsman, 1995; Roeser & Eccles, 1998), the samples did not include groups of adolescents who did not undergo a transition. Thus, conclusions could not be drawn about the specificity of these results to the school transition itself versus the general transition into adolescence that occurs at this time. To build on past findings, the present study explicitly compared psychological outcomes in groups of adolescents who experienced a school transition and those who did not.

An Individual Difference Approach to Studying the Middle School Transition

In contrast to much of the prior research on school transitions, which has examined mean changes in functioning over the course of a transition (for exceptions, see Fenzel, 2000; Hirsch & Rapkin, 1987; Lord et al., 1994; Roeser & Eccles, 1998; Seidman et al., 1994; Simmons & Blyth, 1987), the present research employed an individual difference approach. Both theory and research point to the utility of an individual difference approach to studying normative developmental transitions (see Eccles, Lord, Roeser, Barber, & Hernandez Jozefowicz, 1997). First, some adolescents may experience greater difficulties negotiating challenging encounters such as transitions than other adolescents. On the one hand, the novelty presented by a transition may act as a stressor that taxes available

resources and undermines healthy development. On the other hand, novelty may be viewed as a challenge that promotes mobilization of resources and provides an opportunity for psychological growth. Which type of reaction is expressed may depend on the individual characteristics or experiences of adolescents. Thus, a comprehensive understanding of the middle school transition requires the identification of specific determinants of adaptation or risk and the mechanisms underlying particular outcomes (see Eccles et al., 1997; Lord et al., 1994).

Second, despite the evidence for detrimental effects of school transitions, findings regarding patterns of global change have been inconsistent. Some studies have found limited evidence of negative change or have found no differences across the transition in self-perceptions or perceptions of the school environment (Crockett et al., 1989; Fenzel & Blyth, 1986; Harter et al., 1992; Hirsch & Rapkin, 1987; Thornburg & Glider, 1984), and other studies have documented positive perceptions and effects (Berndt & Mekos, 1995; Nottelmann, 1987; Schulenberg, Asp, & Petersen, 1984). Indeed, recent research on the climate of secondary schools following a period of school reform has yielded a more optimistic view of the transition, which has been found to be associated with either little impact or even improvements in overall emotional well-being of students (for a review, see Midgley & Edelin, 1998). It is important to draw the distinction here between earlier studies, which often were based on the transition to traditional junior high schools, and recent studies, which were based on the transition to middle schools. One goal of school reform during recent years has been to institute substantive policies in middle schools aimed at significantly altering both educational practices (e.g., an emphasis on mastery-oriented rather than performance-oriented goals) and school climate (e.g., a "team" approach that creates a more intimate atmosphere and facilitates student-student and student-teacher relationships). Although the difference between middle and junior high schools may, in practice, range from nominal (e.g., the transition occurs following fifth rather than sixth grade) to substantial (e.g., significant efforts toward supportive student-teacher relationships), some of the characteristics previously attributed to junior high schools may no longer be relevant in middle schools (see Midgley & Edelin, 1998).

Although recent modifications in the structure and climate of the middle school environment may attenuate the universal negative influence of the transition, some adolescents may still feel overwhelmed by the inevitable changes faced at this time (e.g., larger and more crowded schools, changes in daily school rou-

tines, increased emphasis on grades, and higher teacher expectations). Thus, a critical step in this line of research is to determine which groups of adolescents may continue to be at particular risk for school-related stress and negative emotional outcomes, such as depression, during the transition. To address this need, the present study tested a diathesis-stress model, which proposed that personal vulnerability would increase risk for negative outcomes in adolescents who experienced a school transition, but would have less influence in adolescents who experienced a stable school environment.

Why might certain adolescents have difficulty navigating a school transition? Why might the transition be an especially sensitive period for the onset of depressive symptoms? Answering these questions requires a consideration of the psychological mechanisms that are involved in mastering new environments and experiences. The present study examined the role of self-regulatory processes in the academic domain as key determinants of individual differences in reactions to the transition.

Self-regulation can be conceptualized as a combination of cognitive, evaluative, and behavioral processes that guide goal-directed action and emotional responsiveness. Common to diverse conceptualizations of self-regulation is an emphasis on the joint contribution of one's expectations regarding outcomes (e.g., perceptions of control, expectancies, perceptions of competence) and one's personal investment in outcomes (e.g., goals, standards, values, subjective importance) to the determination of behavior and affect (Carton & Nowicki, 1994; Higgins, 1987, 1991; Rotter, 1954; Scheier & Carver, 1982). For example, expectancy-value models hold that the expected probability of success on academic tasks combined with the value attached to these tasks will determine task-oriented behaviors, such as goal setting and persistence, as well as resulting academic performance (for reviews, see Eccles et al., 1983; Eccles, Adler, & Meece, 1984). Similarly, self-discrepancy theory holds that outcome expectancies and the degree of discrepancy between actual and valued outcomes have predictable evaluative and affective consequences (Higgins, 1987, 1991). Thus, self-regulatory sequences can be viewed as integrated sets of beliefs, actions, outcomes, evaluations, and emotional reactions.

Indeed, research has supported this integrated conceptualization of self-regulatory processes. For instance, studies have linked personal investment to positive self-perceptions of competence and worth (e.g., Emmons, 1986; Harter et al., 1992; Pelham & Swann, 1989), which suggests an association between different types of self-regulatory beliefs. Moreover,

adaptive self-regulatory beliefs, such as high perceptions of control and goal importance, have been found to yield a range of positive behavioral and emotional consequences, including mastery-oriented behavior, higher levels of achievement, lower levels of negative affect, and enhanced life satisfaction (e.g., Bandura, Pastorelli, Barbaranelli, & Caprara, 1999; Emmons, 1986; Harter & Connell, 1984; for comprehensive reviews, see Dweck & Leggett, 1988; Skinner et al., 1998; Weisz & Stipek, 1982). Such behavioral and psychological benefits were hypothesized to lay the groundwork for more positive reactions to the middle school transition in adolescents with adaptive self-regulatory beliefs.

Overview of the Present Research

This study focused on two types of self-regulatory beliefs—namely, perceptions of control over academic outcomes and investment in academic success—that were hypothesized to influence achievement-related behavior, academic performance, evaluation of the school environment, and emotional adjustment during the school transition. It was anticipated that self-regulatory beliefs would be especially likely to determine evaluative and emotional reactions in novel environments. Specifically, possessing a strong sense of control over academic outcomes and a reliance on internal motivation and personal investment in academic success were expected to enhance adolescents' capacity to negotiate the transition. In contrast, low perceptions of academic control and a lack of personal investment in academic success were expected to cause adolescents to feel overwhelmed by the novel environment and, therefore, to increase their sensitivity to school-related challenges and depressive symptoms. A critical design characteristic of this study was the inclusion of both transition and non-transition groups. This design enabled us to examine directly the first hypothesis that individual differences in self-regulatory beliefs would be more strongly associated with perceptions of school-related stress and depression in adolescents who experienced a school transition than in those who did not.

The intervening pathway from self-regulatory beliefs to depression over the course of the transition was also examined. The hypothesized pathway is depicted in Figure 1. Elucidating the specific pathway through which self-regulatory beliefs enhance risk for negative outcomes provided a critical complement to prior research on individual differences in reactions to the transition. Drawing from theories of self-regulation (Bandura et al., 1999; Carton & Nowicki, 1994; Connell, 1985; Higgins, 1987, 1991; Rotter,

1954; Scheier & Carver, 1982; Skinner et al., 1998; Weisz, 1990; Weisz & Stipek, 1982), it was predicted that high perceptions of academic control and high personal investment in academic success would promote academic engagement, in the form of effort and persistence in the face of challenge and better academic performance, whereas low perceptions of academic control and low personal investment in academic success would undermine effort and persistence in the face of challenge and would interfere with academic performance. Academic disengagement, in the form of deficits in goal-directed behavior and performance, was then expected to heighten adolescents' sensitivity to school-related challenges associated with the transition. Disengagement may exacerbate stress through two pathways. First, academic disengagement may cause adolescents to feel more alienated at school and, therefore, to perceive the environment as more hostile and threatening. Second, academic disengagement may cause adolescents to actually *generate* more stressful circumstances at school. For example, lack of effort or poor performance is likely to elicit negative feedback from others. Finally, consistent with life-stress models of depression (e.g., Rudolph et al., 2000), higher perceptions of stress were expected to foster increases in depressive symptoms over the course of the transition. In sum, it was expected that academic disengagement would account for the negative impact of maladaptive self-regulatory beliefs on perceptions of school-related stress, and perceived stress would account for the negative impact of academic disengagement on depressive symptoms.

METHOD

Participants

The present study was part of the University of Illinois Transition to Adolescence Project. The sample included 329 adolescents (168 girls, 161 boys) drawn from three midwestern school districts. There were 187 adolescents who experienced a transition from elementary school to middle school between the fifth and sixth grades (M age = 11.2 years, SD = .46; 52% female; 63% European American, 29% African American, 3% Asian American, 3% Latino, 2% other), and 142 adolescents who remained in the same school for these two grades (M age = 11.3 years, SD = .51; 49% female; 69% European American, 29% African American, 1% Native American, 1% other). The transition and nontransition groups did not significantly differ in gender or ethnicity, $t_s < 1$, although the nontransition group was slightly older than the transition

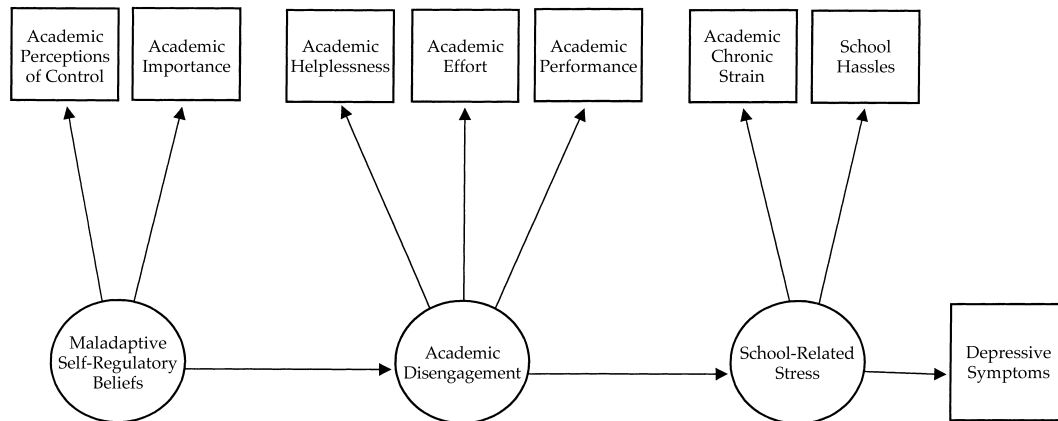


Figure 1 Theoretical model of the proposed self-regulatory sequence within the academic domain.

group, $t(328) = 2.18, p < .05$. On the basis of district-wide information, approximately 45% of children in the transition group and approximately 52% of children in the nontransition group would have been receiving free or reduced-cost lunch, which suggests equivalent distributions of socioeconomic status between the two groups.

The transition group was drawn from two small urban communities. The structure of the school system in the two districts was similar. In both school districts, children from multiple neighborhood elementary schools transitioned into one of several middle schools. In one district, 10 elementary schools fed into 3 middle schools; in the other district, 9 elementary schools fed into 2 middle schools. The present sample included students from 5 elementary schools; 95% of the sample attended 1 of 4 middle schools; the remainder moved into another middle school within one of the same districts. In the elementary schools, students were taught by a single teacher and remained in the same classroom all day, with the exception of specialty classes (e.g., band, physical education). In the middle schools, each grade was divided into two or three teams. Students were taught by each of the teachers on their team, resulting in exposure to three or four teachers. For the most part, students switched classes every period, which resulted in changes in the peer group for each class. Thus, students in these two districts had very similar transition experiences. Adolescents from the two districts did not differ in gender, age, or ethnicity, $t_s < 1$. Although the transition shared many characteristics with traditional junior high school transitions (e.g., new geographic location, larger class and school sizes, novel peer groups, switching classes, greater responsibility placed on students for self-guidance), the general

structure of these middle schools reflected some of the changes that have emerged from the middle school reform movement. For example, students were divided into smaller teams that were coordinated by a subset of teachers. Moreover, the school districts made active efforts to ease the students' acclimation to the new context, such as providing visits during the fifth grade from current middle school students to discuss their experiences and answer questions, a comprehensive orientation for students and parents before the beginning of school, and orientation activities throughout the first few months of middle school.

The nontransition group was drawn from a single district in a small urban community, in which students attended a kindergarten-through-fourth-grade school, a fifth/sixth-grade center, and a traditional junior high school. The present sample included students from one of the fifth/sixth-grade centers. Thus, students in the nontransition sample had moved into the school the previous fall, approximately 7 to 9 months before the beginning of the study. The changes encountered during this move were fairly minimal, however. Specifically, students moved to the fifth/sixth-grade center with their classmates from elementary school. Students were taught by two teachers, and the curriculum was integrated across all subject areas. Although the school day was divided into periods, students did not switch classes every period. When they did switch classes, they remained with the same peer group. The structure was identical in the fifth and sixth grades; thus, these students experienced a stable school environment over the course of the study.

Parents received a letter describing the study and requesting that they contact the school or the research investigators if they did not want their child to partic-

ipate. The original fifth-grade sample represented 95% of the eligible students in the targeted schools; 82% of the original sample participated in the sixth-grade assessment. The majority of the nonparticipants at follow-up were unavailable because of a move to a new district or to absence at all of the assessment sessions. The participants and nonparticipants at follow-up did not differ significantly in gender, age, ethnicity, or Wave 1 scores on the study variables, $t_s < 1.54$, n_s , with two exceptions: Nonparticipants had lower levels of academic performance at Wave 1 than did participants, $t(388) = 3.22$, $p < .01$ (global rating), and $t(374) = 2.45$, $p < .05$ (school subjects rating), and showed lower levels of academic effort, $t(373) = 2.38$, $p < .05$.

Procedure

A two-wave, short-term longitudinal design was employed to assess predictors of changes in school-related stress and depression following the transition to middle school. Questionnaire measures were administered to students during two or three sessions in the spring of fifth grade (between March and May) and in the fall of sixth grade (between September and December), approximately 6 to 7 months apart. Questions were read aloud by a research assistant and the students recorded their responses; individual assistance was provided as needed. Teachers completed several measures at the time of data collection. Teacher questionnaires were completed on 99% of the students at the initial assessment and 89% of the students at the follow-up assessment. (The primary analyses using the teacher measures were conducted on

the transition group only, which had a 99% completion rate at both waves.) All measures, with the exception of the Academic Helplessness Scale, were administered at both waves.

Measures

Table 1 provides descriptive and psychometric information about the measures. All of the measures showed adequate internal consistency and test-retest reliability. Although the α s for the academic perceived control subscale were only moderate (.56–.75), the small number of items on this subscale likely reduced the α . A factor analysis of the subscale yielded a single factor with all item loadings $\geq .62$, which suggests that the items tap a single construct. Also, it should be noted that there are limitations to the single-item rating of importance. A multiple-item scale would have been preferable, but there is a precedent for measuring importance in a similar manner (e.g., Eccles et al., 1989; Turner & Cole, 1994). Moreover, lower internal consistency for the perceptions of control measure and the single-item rating of importance most likely would have led to an *underestimation* of effects.

Self-regulatory beliefs. Perceptions of control in the academic domain were assessed with one subscale of the Perceived Control Scale (Weisz, Southam-Gerow, & McCarty, 2000). Adolescents rated (1 = not at all to 4 = very much) the degree to which they felt that they were able to exert control over academic outcomes (e.g., "I can get good marks for my homework if I really work at it."). Because of time constraints, only half of the items from the original subscale were used.

Table 1 Measure Characteristics

Measure	Potential Range	Transition Group			Nontransition Group		
		Wave 1 α	Wave 2 α	Stability Correlation	Wave 1 α	Wave 2 α	Stability Correlation
Academic perceived control	1–4	.67	.56	.48***	.75	.68	.38***
Academic importance ^a	1–5	—	—	.17*	—	—	.40***
Academic helplessness ^b	1–5	—	.95	—	—	.96	—
Academic effort ^a	1–7	—	—	.58***	—	—	.71***
Academic performance							
Global ^a	1–7	—	—	.63***	—	—	.76***
School subjects	1–5	.96	.95	.67***	.94	.97	.74***
Academic chronic strain	1–5	.85	.78	.49***	.85	.87	.48***
School hassles	18–90	.79	.82	.54***	.79	.79	.54***
Depressive symptoms	0–2	.87	.86	.58***	.87	.85	.66***

^a Single-item measure; α not computed.

^b Measure not administered at Wave 1.

* $p < .05$; *** $p < .001$.

The abbreviated subscale included two positively coded and two reverse-coded items. Good internal consistency, $\alpha = .79$, was found for the original subscale (Weisz et al., 2000), which supports the formation of an abbreviated scale. Scores were calculated as the mean of the four items. Higher scores indicate enhanced perceptions of control.

To assess perceptions of importance in the academic domain, adolescents rated (1 = not at all to 5 = very much) the degree of importance they ascribed to academic achievement ("How important is it to you that you do well in school and get good grades?"). Higher scores represent greater importance.

Academic engagement. Academic engagement was assessed in terms of adolescents' persistence in the face of challenge, academic effort, and academic performance. Persistence versus helpless behavior was assessed at Wave 2 with the Academic Helplessness Scale (Nolen-Hoeksema, Girgus, & Seligman, 1992). For each of 12 items, teachers rated (1 = not true to 5 = very true) students' tendency toward helpless behavior in the context of schoolwork (e.g., "Gives up when you correct him/her or find a mistake in his/her work." "When he/she encounters an obstacle in schoolwork he/she gets discouraged and stops trying."). Scores were calculated as the mean of the 12 items. Higher scores represent more helpless academic behavior. Teachers also rated (1 = much less to 7 = much more) students' academic effort ("How hard is he/she working?") as compared with typical students. Finally, teachers rated students' academic performance. First, teachers provided a global rating of academic achievement (1 = bottom of the class, doing very poorly to 7 = top of the class, doing very well). Second, teachers provided separate ratings (1 = far below grade to 5 = far above grade) of students' performance in specific academic subject areas (e.g., science, math, English). The average of these specific subject-area ratings was calculated. Because the global academic achievement rating and the average of the specific subject-area ratings were strongly correlated, $r_s = .78$ and $.82$, $p_s < .001$, a composite score of academic performance was formed by averaging the standardized scores for the two measures. Higher scores reflect better academic performance.

School-related stress. Adolescents completed two measures of school-related stress. First, ongoing academic strain was assessed with one subscale of the Chronic Strain Questionnaire for Children (Rudolph, Kurlakowsky, & Conley, 2001). This measure was adapted from an interview format (see Rudolph et al., 2000). Adolescents rated (1 = not at all to 5 = very much) several aspects of academic strain experienced since the beginning of the school year (e.g., "Have

you had trouble doing your homework?" "Does your teacher tell you that you need to work harder on your schoolwork?"). Scores were calculated as the mean of the six items. Second, adolescents rated (1 = not at all to 5 = very much) their perceptions of 18 daily school hassles presumed to be associated with the school transition. The hassles concerned multiple aspects of the school environment, such as academic expectations (e.g., "The teachers expect too much from you." "You have had too much homework."), school structure (e.g., "You have had problems finding your way around school." "School is large and crowded."), changes in peer relationships (e.g., "Your friends from last year went to a different school."), and schedule issues (e.g., "The periods between classes are too short to get to your next class on time." "You don't have enough time to eat lunch."). The subgroup of 18 school hassles was drawn from the School Hassles Questionnaire (Robinson et al., 1995) on the basis of the extent to which they tapped aspects of the school environment that were expected to specifically characterize middle schools. Other hassles on the original measure were not necessarily expected to be more problematic in adolescents who experienced a transition than those who did not (e.g., "The food in the cafeteria is not good." "The teachers at this school don't like you." "You have had problems on the bus with other kids."). Scores were calculated as the sum of the ratings across the 18 hassles. High scores on the two measures of school-related stress reflect higher levels of stress.

Depressive symptoms. Adolescents' depressive symptoms were assessed with the Children's Depression Inventory (CDI; Kovacs, 1980/1981). This measure includes 27 items that reflect a variety of symptoms associated with depression. Each item presents three response alternatives representing varying severity of symptoms. Adolescents indicated which alternative best described how they had been feeling in the past 2 weeks. The CDI has well-established reliability and validity (Kovacs, 1980/1981; Smucker, Craighead, Craighead, & Green, 1986). A previous factor analysis of the CDI (Rudolph & Lambert, 2001) yielded four factors, one of which reflected acting-out behavior (i.e., "I get into fights all the time." "I never do what I am told." "I am bad all the time."). Because this factor is nonspecific to depression, these items were omitted in the present study. Moreover, several other items (e.g., "I have trouble sleeping every night." "I am sure that terrible things will happen to me." "Nobody really loves me.") did not load onto any of the four factors. To provide a more pure index of depression, an abbreviated scale was formed from the mean of the remaining 19 items.

Table 2 Means and Standard Deviations by Transition Group

Measure	Wave 1			Wave 2		
	Transition	Nontransition	<i>t</i>	Transition	Nontransition	<i>t</i>
Academic perceived control	3.60 (.52)	3.53 (.65) ^a	.98	3.66 (.45)	3.66 (.53) ^a	.10
Academic importance	4.75 (.76) ^b	4.56 (1.06) ^b	1.77	4.50 (1.07) ^b	4.24 (1.35) ^b	1.77
Academic helplessness	—	—	—	1.70 (.85)	1.91 (1.03)	1.83
Academic effort	4.09 (1.43)	4.09 (1.62) ^c	.03	4.15 (1.73)	4.61 (1.72) ^c	2.22*
Academic performance						
Global	4.36 (1.60)	4.41 (1.59)	.13	4.31 (1.71)	4.71 (1.77)	1.89
School subjects	3.12 (.81) ^a	3.13 (.83) ^c	.12	2.94 (.90) ^a	3.46 (1.05) ^c	4.74***
Academic chronic strain	2.23 (.96) ^c	2.10 (.98) ^c	1.18	1.81 (.76) ^c	1.58 (.78) ^c	2.60*
School hassles	36.68 (10.29)	35.63 (10.28) ^c	.89	35.66 (10.48)	31.47 (9.40) ^c	3.47**
Depressive symptoms	.42 (.34) ^c	.36 (.33) ^b	1.59	.32 (.29) ^c	.30 (.28) ^b	.54

Note: Numbers in parentheses represent standard deviations. Superscripts signify wave differences within transition group. The *t* values signify transition group differences within wave. The helplessness measure was not administered at Wave 1.

^a*p* < .05.

^b*p* < .01.

^c*p* < .001.

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

RESULTS

Descriptive Information

Table 2 displays the means and standard deviations of the measures in the transition and nontransition groups, as well as between- and within-group comparisons on each variable. These comparisons should be interpreted in light of the following main effects and interactions. A mixed-model multivariate analysis of variance (MANOVA) was conducted with Transition Group (transition, nontransition) as a between-subjects factor, and Wave (Wave 1, Wave 2) as a within-subjects factor. A significant multivariate Transition Group \times Wave interaction was found, $F(8, 177) = 4.57, p < .001$. This multivariate analysis was followed with univariate, within-subjects analyses of variance to examine the effects for each variable. Significant Transition Group \times Wave interactions were found for academic effort, $F(1, 290) = 4.37, p < .05$, academic performance (school subjects rating), $F(1, 267) = 21.94, p < .001$, and school hassles, $F(1, 261) = 7.59, p < .01$.

These significant interactions were followed with group and paired *t* tests to compare the transition and nontransition groups both within and across waves. Comparisons within wave revealed that the two groups did not differ significantly on any of the variables at Wave 1 (see Table 2). At Wave 2, teachers reported that the transition group exerted less academic effort, $t(290) = 2.22, p < .05$, and displayed worse academic performance (school subjects rating), $t(286) = 4.40, p < .001$, than did the nontran-

sition group. Adolescents in the transition group endorsed significantly more school hassles, $t(281) = 3.47, p < .01$, at Wave 2 than did adolescents in the nontransition group (see Table 2). Comparisons across waves revealed that the transition group showed no changes from Wave 1 to Wave 2 in teacher ratings of academic effort or in adolescent ratings of school hassles (see Table 2). Teachers reported that adolescents declined in their academic performance on the basis of the school subjects rating, $t(162) = 2.31, p < .05$. In the nontransition group, teachers reported increases in academic effort, $t(104) = 3.79, p < .001$, and academic performance (school subjects rating), $t(105) = 4.13, p < .001$, and adolescents reported declines in school hassles, $t(114) = 4.75, p < .001$, from Wave 1 to Wave 2 (see Table 2). Thus, the significant differences between the transition and nontransition groups at Wave 2 in part reflected declines in the transition group (i.e., worse academic performance following the transition) and in part reflected a failure to make the positive gains demonstrated by the nontransition group (i.e., increases in academic effort and decreases in hassles).

In addition to the significant interactions, Transition Group \times Wave MANOVAS yielded a significant main effect for Transition Group for academic importance, $F(1, 287) = 5.33, p < .05$, and significant main effects for Wave for academic perceived control, $F(1, 277) = 5.87, p < .05$, academic importance, $F(1, 287) = 15.71, p < .001$, academic chronic strain, $F(1, 288) = 77.55, p < .001$, and depressive symptoms, $F(1, 302) = 25.38, p < .001$.

Interactions between Self-Regulatory Beliefs and the School Transition

The first goal was to examine whether self-regulatory beliefs were more strongly predictive of perceived school-related stress and depressive symptoms in adolescents who underwent a school transition than in those who did not. To test these predictions, multi-group comparison analyses were conducted by using latent-variable structural equation modeling with Amos version 3.6 (Arbuckle, 1997). Self-regulatory beliefs were represented by a latent variable composed of perceptions of academic control and perceptions of academic importance.¹ Perceived school-related stress was represented by a latent variable composed of academic chronic strain and daily school hassles.² Depressive symptoms were represented by an observed variable. Sample sizes vary across analyses depending on the availability of complete data. Multigroup comparisons allow for the evaluation of interaction effects in two ways. First, statistical comparisons can be made between a model that constrains the path between the independent variable (e.g., maladaptive self-regulatory beliefs) and the dependent variable (e.g., depressive symptoms) to be equal across groups (transition versus nontransition) and a model that allows the path between the independent variable and the dependent variable to vary across groups. If the unconstrained model yields a better fit than the constrained model, evidence is provided for a significant interaction (that is, the path differs significantly across the two groups). Second, the unconstrained model yields information about the size and significance of the relevant path in each group.

The first analysis examined the influence of maladaptive self-regulatory beliefs at Wave 1 on perceptions of school-related stress at Wave 2, adjusting for perceptions of school-related stress at Wave 1. Self-regulatory beliefs at Wave 1 and school-related stress at Wave 1 were allowed to covary. The fit of con-

¹ When estimating the self-regulatory beliefs latent variable, the regression coefficients for the two indicators were constrained to be equal within each group for the multigroup comparisons. This constraint was made to resolve the problem of negative error variance associated with the academic importance indicator.

² Because no significant difference was found between a constrained measurement model (i.e., the paths between the indicators and the school-related stress latent factor were constrained to be equal across the two groups) and an unconstrained measurement model (i.e., the paths between the indicators and the school-related stress latent factor were allowed to vary across the two groups), the multigroup comparisons were conducted assuming measurement equivalence across groups.

strained and unconstrained models was examined to establish whether the path between Wave 1 self-regulatory beliefs and Wave 2 school-related stress differed across the transition ($n = 131$) and nontransition ($n = 113$) groups. The path between stress at Wave 1 and Wave 2 was constrained to be equal across groups in both models, whereas the path between self-regulatory beliefs at Wave 1 and school-related stress at Wave 2 was allowed to vary across groups in the unconstrained model. A χ^2 difference test, $\Delta\chi^2(1) = 8.23, p < .01$, revealed that the unconstrained model, $\chi^2(13) = 26.66, p = .014, GFI = .97, CFI = .97, IFI = .97, RMSEA = .066$, showed a significantly better fit than the constrained model, $\chi^2(14) = 34.89, p = .002, GFI = .97, CFI = .96, IFI = .96, RMSEA = .079$. Moreover, in the unconstrained model, a significant path was found between self-regulatory beliefs and school-related stress in the transition group, $\gamma = -.43, p < .001$, but not in the nontransition group, $\gamma = -.14, ns$.

The second analysis examined the influence of maladaptive self-regulatory beliefs at Wave 1 on depressive symptoms at Wave 2, adjusting for depressive symptoms at Wave 1. Self-regulatory beliefs at Wave 1 and depressive symptoms at Wave 1 were allowed to covary. The fit of constrained and unconstrained models was examined to establish whether the path between Wave 1 self-regulatory beliefs and Wave 2 depressive symptoms differed across the transition ($n = 161$) and nontransition ($n = 126$) groups. The path between depressive symptoms at Wave 1 and Wave 2 was allowed to vary across groups in both the constrained and unconstrained models, whereas the path between self-regulatory beliefs at Wave 1 and depressive symptoms at Wave 2 was allowed to vary across groups only in the unconstrained model. A χ^2 difference test, $\Delta\chi^2(1) = 6.35, p < .05$, revealed that the unconstrained model, $\chi^2(4) = 13.70, p = .008, GFI = .98, CFI = .97, IFI = .97, RMSEA = .092$, showed a significantly better fit than the constrained model, $\chi^2(5) = 20.05, p = .001, GFI = .97, CFI = .95, IFI = .95, RMSEA = .103$. Moreover, in the unconstrained model, a significant path was found between self-regulatory beliefs and depressive symptoms in the transition group, $\gamma = -.47, p < .001$, but not in the nontransition group, $\gamma = -.07, ns$.

Mediational Mechanisms

The second goal was to test hypotheses concerning the processes that linked pretransition maladaptive self-regulatory beliefs with posttransition depression. As anticipated, self-regulatory beliefs did not predict negative outcomes in the nontransition group. Hence,

the mediational analyses were conducted in the transition group only.

Correlational analyses. Table 3 displays the zero-order correlations among all of the measures at Wave 1 and Wave 2 within the transition group. Correlations are reported only for the subgroup of adolescents who participated at both waves. These bivariate analyses provided support for associations among variables *within* each self-regulatory stage, namely self-regulatory beliefs in the academic domain (perceptions of control and importance), academic engagement (helpless behavior, effort, and performance), and school-related stress (chronic strain and hassles). Moreover, the correlations supported the hypothesized links *between* each stage of the proposed self-regulatory sequence. Specifically, maladaptive self-regulatory beliefs were associated with disengagement at school; academic disengagement was associated with increased academic chronic strain and daily school hassles; and, finally, heightened perceptions of school-related stress were associated with increased depression.

Structural equation modeling. To examine more directly the hypothesized mediational pathways and the validity of the proposed model as a whole, structural equation modeling was conducted. The components of the larger theoretical model (see Figure 1) were investigated in three steps. The first set of analyses examined the hypothesis that academic disengagement mediated the association between maladaptive self-regulatory beliefs and perceptions of school-related stress. The second set of analyses examined the hypothesis that perceptions of school-related stress mediated the association between academic disengagement and depression. The third set of analyses examined the hypothesis that academic disengagement and perceptions of school-related stress mediated the association between maladaptive self-regulatory beliefs and depression. Taken together, these analyses allowed for a test of the proposed self-regulatory sequence proceeding from academic beliefs, to academic behavior and outcomes, to evaluations of the school context, to emotional consequences. As in the prior structural equation modeling analyses, self-regulatory beliefs were represented by a latent variable composed of perceptions of academic control and perceptions of academic importance. Academic disengagement was represented by a latent variable composed of helpless academic behavior, low academic effort, and poor academic performance. Perceived school-related stress was represented by a latent variable composed of academic chronic strain and daily school hassles. Finally, depressive symptoms were represented by an observed variable. To allow for comparability across analyses,

Table 3 Correlations among the Measures at Wave 1 and Wave 2

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Wave 1															
1. Academic perceived control															
2. Academic importance	.43***														
3. Academic effort	.35***	.18*													
4. Academic performance	.38***	.17*	.78***												
5. Academic chronic strain	-.49***	-.10	-.56***	-.62***											
6. School hassles	-.47***	-.18*	-.48***	-.46***	.66***										
7. Depressive symptoms	-.48***	-.21**	-.43***	-.35***	.55***	.56***									
Wave 2															
8. Academic perceived control	.48***	.36***	.21**	.25**	-.31***	-.28**	-.33***								
9. Academic importance	.20*	.17*	.12	.13	-.08	-.11	-.06	.44***							
10. Academic helplessness	-.21**	-.23**	-.46***	-.47***	.33***	.22**	.11	-.23**	-.25**						
11. Academic effort	.30***	.19*	.58***	.61***	-.49***	-.37***	-.20**	.25**	.21**	-.74***					
12. Academic performance	.32***	.18*	.61***	.72***	-.50***	-.43***	-.22**	.29***	.22**	-.67***	.81***				
13. Academic chronic strain	-.36***	-.35***	-.26**	-.24**	.49***	.39***	.37***	-.40***	-.11	.34***	-.44***	-.41***			
14. School hassles	-.48***	-.29***	-.22*	-.23**	.50***	.54***	.48**	-.37***	-.21**	.19*	-.31***	-.30***	.61***		
15. Depressive symptoms	-.48***	-.40***	-.24**	-.21**	.48***	.48***	.58***	-.42***	-.21**	.30***	-.31***	-.32***	-.57***	.57***	

Note: Correlations are for the transition subgroup who participated in the study at Wave 1 and Wave 2 (N = 187). * p < .05; ** p < .01; *** p < .001.

these models were all tested in a subgroup of adolescents who had complete data on all of the variables ($n = 139$). To ease interpretation of the mediational analyses, all variables were coded such that higher values reflect more maladjustment (i.e., maladaptive self-regulatory beliefs, academic disengagement, higher levels of stress, and higher levels of depressive symptoms).

Baron and Kenny's (1986) guidelines for mediation were followed: (1) there must be a significant association between the independent variable (e.g., maladaptive self-regulatory beliefs) and the mediator variable (e.g., academic disengagement); (2) there must be a significant association between the mediator variable and the dependent variable (e.g., depressive symptoms), after accounting for the independent variable; and (3) the direct association between the independent variable and the dependent variable must be reduced, after accounting for the mediator variable. Using structural equation modeling, additional evidence for mediation is provided if a model that includes both the direct path and the indirect path between the independent and dependent variables does not provide a significant increment in fit beyond a model that includes only the indirect path. Because the χ^2 statistic is affected by the sample size and the number of estimated parameters (Tanaka, 1987), multiple goodness-of-fit indices were used to determine the fit of the various models.

Self-regulatory beliefs and school-related stress: The mediating role of academic disengagement. The first step of model testing examined the hypothesis that academic disengagement mediates the link between maladaptive self-regulatory beliefs and perceived school-related stress. The latent structural relation between self-regulatory beliefs at Wave 1 and school-related stress at Wave 2 was examined first, $\chi^2(1, N = 139) = 2.38, p = .123, GFI = .99, CFI = .99, IFI = .99, RMSEA = .100$. As expected, maladaptive self-regulatory beliefs at Wave 1 were associated with increased school-related stress following the transition, $\gamma = .73, p < .001$. The indirect path was examined next by adding academic disengagement as a mediator and eliminating the direct path between maladaptive self-regulatory beliefs at Wave 1 and school-related stress at Wave 2, $\chi^2(12, N = 139) = 49.58, p < .001, GFI = .92, CFI = .91, IFI = .91, RMSEA = .151$. As predicted, maladaptive self-regulatory beliefs at Wave 1 were associated with increased academic disengagement at Wave 2, $\gamma = .34, p < .05$, and increased academic disengagement at Wave 2 was associated with increased school-related stress at Wave 2, $\beta = .53, p < .001$. Using a χ^2 difference test, $\Delta\chi^2(1, N = 139) = 31.15, p < .001$, the model that included both the direct and indi-

rect paths, $\chi^2(11) = 18.43, p = .072, GFI = .97, CFI = .98, IFI = .98, RMSEA = .070$, showed a significantly better fit than the model omitting the direct path. Moreover, the direct path, although slightly reduced, was still significant, $\gamma = .61, p < .001$, which suggests that academic disengagement did not account for the effect. However, the fact that the path between academic disengagement and school-related stress was still significant after controlling for self-regulatory beliefs, $\beta = .33, p < .01$, suggests that disengagement did exert an influence on stress beyond the adverse effect of self-regulatory beliefs.

Engagement and depression: The mediating role of school-related stress. The second step of model testing examined the hypothesis that perceived school-related stress mediates the link between academic disengagement and depression was examined. The structural relation between academic disengagement at Wave 2 and depressive symptoms at Wave 2, adjusting for depressive symptoms at Wave 1, was examined first. Because depressive symptoms may undermine academic engagement, a path representing the covariation between symptoms at Wave 1 and disengagement at Wave 2 was also included, $\Phi = .20, p < .05$. The model provided an excellent fit to the data, $\chi^2(4, N = 139) = 6.40, p = .171, GFI = .98, CFI = .99, IFI = .99, RMSEA = .066$. As expected, academic disengagement at Wave 2 was associated with higher levels of depressive symptoms at Wave 2, $\gamma = .24, p < .001$. As would be anticipated given the stability of depression, symptoms at Wave 1 predicted symptoms at Wave 2, $\gamma = .58, p < .001$. The indirect path was examined next by adding school-related stress as a mediator and eliminating the direct path between academic disengagement and depressive symptoms at Wave 2. Because depressive symptoms may lead to the generation of stress or to increased perceptions of stress (e.g., Rudolph & Hammen, 1999), a path was also included between Wave 1 depressive symptoms and Wave 2 school-related stress. The resulting model provided an excellent fit to the data, $\chi^2(11, N = 139) = 15.98, p = .142, GFI = .97, CFI = .99, IFI = .99, RMSEA = .057$. As predicted, academic disengagement was associated with increased school-related stress, $\gamma = .41, p < .001$, and increased school-related stress was associated with depressive symptoms, $\beta = .58, p < .001$. The link between depressive symptoms at Wave 1 and Wave 2 was reduced, $\gamma = .29, p < .001$. Using a χ^2 difference test, $\Delta\chi^2(1, N = 139) = .00, ns$, the model that included both the direct and indirect paths, $\chi^2(10, N = 139) = 15.98, p = .10, GFI = .97, CFI = .99, IFI = .99, RMSEA = .066$, did not provide a significant increment in fit over the model that omitted the direct path. Moreover, the direct path disappeared, $\gamma = .00$,

ns, which suggests that perceived school-related stress accounted for the association between academic disengagement and depression.

Self-regulatory beliefs and depression: The mediating role of academic disengagement and school-related stress. In the third step of model testing, the full model was examined. This model proposes that academic disengagement and perceived school-related stress mediate the link between maladaptive self-regulatory beliefs and depression (see Figure 2). To simplify Figure 2, indicators for the latent variables are not shown. All of the indicators were highly significant ($p < .001$), with standardized loadings ranging from .59 to .93. The structural relation between self-regulatory beliefs at Wave 1 and depressive symptoms at Wave 2, adjusting for depressive symptoms at Wave 1, was examined first, $\chi^2(1, N = 139) = 6.08, p = .014, GFI = .98, CFI = .97, IFI = .97, RMSEA = .192$. Wave 1 self-regulatory beliefs and depressive symptoms were allowed to covary, $\Phi = .66, p < .001$. As expected, more maladaptive self-regulatory beliefs were associated with depressive symptoms, $\gamma = .38, p < .01$. Again, depressive symptoms at Wave 1 predicted depressive symptoms at Wave 2, $\gamma = .38, p < .001$. The indirect path was examined next by adding academic disengagement and school-related stress as mediators and eliminating the direct path between self-regulatory

beliefs and depressive symptoms. Because depressive symptoms may undermine academic engagement and may lead to increased perceptions of stress, paths were also included between Wave 1 depressive symptoms and Wave 2 disengagement and school-related stress. Wave 1 symptoms no longer predicted Wave 2 disengagement, $\gamma = .03, ns$; thus, the model was rerun omitting this path. The resulting model provided a strong fit to the data, $\chi^2(22, N = 139) = 33.24, p = .059, GFI = .95, CFI = .98, IFI = .98, RMSEA = .061$. As predicted, maladaptive self-regulatory beliefs were associated with increased academic disengagement, academic disengagement was associated with increased school-related stress, and school-related stress was associated with depressive symptoms. Maladaptive self-regulatory beliefs also exerted a direct effect on school-related stress. Again, Wave 1 symptoms predicted Wave 2 symptoms and perceived school-related stress. Using a χ^2 difference test, $\Delta\chi^2(1, N = 139) = .18, ns$, the model that included both the direct and indirect paths, $\chi^2(21, N = 139) = 33.06, p = .046, GFI = .95, CFI = .98, IFI = .98, RMSEA = .065$, did not provide a significant increment in fit over the model that omitted the direct path. Moreover, the direct path between maladaptive self-regulatory beliefs and depressive symptoms was close to zero and no longer significant, $\gamma = .06, ns$, which suggests that academic

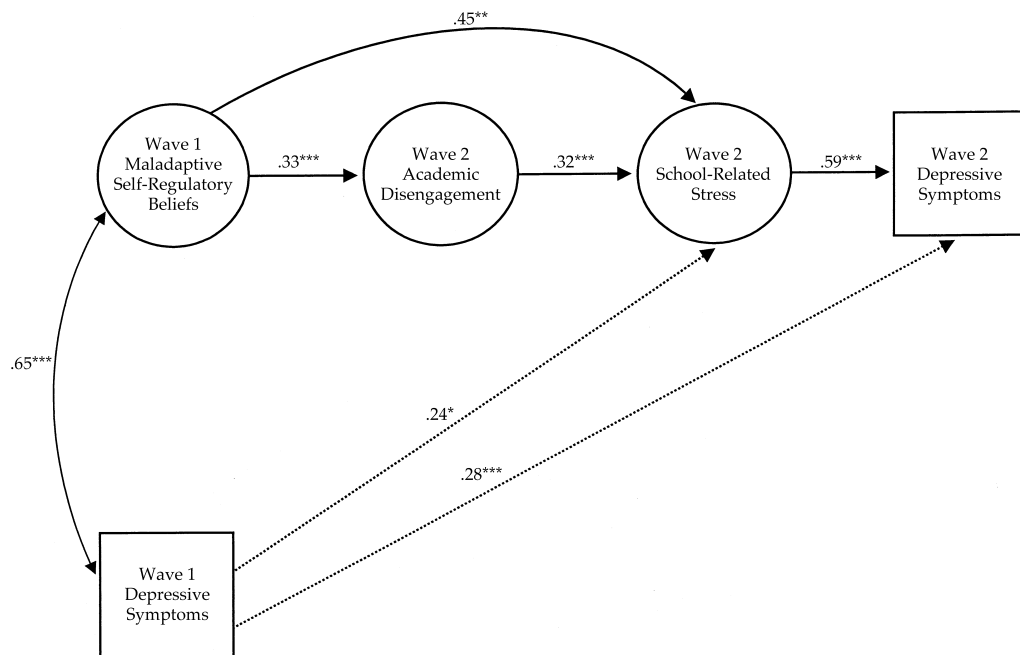


Figure 2 Structural equation model of the proposed self-regulatory sequence within the academic domain. Path coefficients are standardized. Dotted lines represent paths that are not part of the primary model but would be expected on the basis of prior research. To simplify the model, loadings of the indicators on the latent factors are not presented. All loadings were significant, range = .59–.93, $p < .001$. * $p < .05$; ** $p < .01$; *** $p < .001$.

disengagement and school-related stress accounted for the association between maladaptive self-regulatory beliefs and depressive symptoms. The remaining paths were virtually identical in the models that included and excluded the direct path.³

DISCUSSION

This research was designed to investigate the role played by the middle school transition in the onset of academic and psychological difficulties during the early adolescent period. A particular focus was placed on identifying the mechanisms underlying individual differences in adolescents' emotional reactions to the transition. The transition experience was found to interact with preexisting maladaptive self-regulatory beliefs that formed the basis for depression vulnerability. Moreover, a complex pathway was identified that linked these beliefs to early adolescent depression.

The Role of Self-Regulatory Beliefs

Results of multigroup comparison analyses revealed that maladaptive self-regulatory beliefs were more strongly predictive of increases in perceptions of school-related stress and depressive symptoms over the course of the middle school transition than in the absence of a transition. That is, adolescents who believed that they could not exert much influence over their success in school and who showed little investment in academic success reported more school-related stress and became more depressed when they experienced a transition into middle school, but not when they remained in the same school between the fifth and sixth grades.

Consideration of the changing characteristics of adolescents' school and home environments during this transition period may help to explain these results. In elementary school, children tend to receive a great deal of external direction and guidance in their daily lives. For example, both teachers and parents are likely to monitor schoolwork and homework closely and to ensure that children understand their assignments. This individualized attention may diminish the need for self-regulation on the part of students. In contrast, middle school is likely to mandate higher

levels of personal responsibility and self-motivation. Moreover, middle school often entails more difficult academic material, higher standards, and more stringent grading practices that require enhanced effort by students. Hence, adolescents who believe that academic success is not under their control and who attribute low importance to academic success may feel ill-equipped to deal with the novel demands of middle school and may become overwhelmed by this new setting. In contrast, adolescents who remain in a stable elementary school environment are likely to encounter fewer school-related challenges and to receive ongoing guidance from parents and teachers. Thus, self-regulation may play less of a role in their academic and emotional outcomes. This perspective is consistent with research suggesting that the detrimental effects of maladaptive self-regulatory beliefs, such as low perceived control, may be especially salient under conditions of stress or challenge (Skinner et al., 1998). More generally, these findings support conceptualizations of depression suggesting that some putative vulnerability factors may not come into play until youngsters confront the challenges of adolescence (Nolen-Hoeksema & Girgus, 1994).

Pathway to Depression

A novel aspect of the present research was its focus on elucidating the pathway through which maladaptive self-regulatory beliefs produced depressive responses to the middle school transition. Overall, the observed pattern of intercorrelations was highly consistent with the hypothesized links among self-regulatory beliefs, academic engagement in the form of persistence, effort, and performance, perceived school-related stress, and depressive symptoms.

Findings from path analyses provided more direct support for the proposed pathway to depression. The test of the overall model supported the proposal that academic disengagement and heightened perceptions of school-related stress accounted for the link between maladaptive self-regulatory beliefs prior to the school transition and increases in depression following the transition. Consistent with predictions, when adolescents felt a lack of control over their academic accomplishments and had a lower level of investment in academic success, they demonstrated less engagement in school. Specifically, these maladaptive beliefs led to helpless behavior in the face of challenge, decreased effort, and lower levels of achievement. In turn, this disengagement undermined adolescents' evaluations of the school environment. Adolescents who were less engaged reported

³ The CDI includes symptoms that reflect academic difficulties. Thus, the mediational analyses were also conducted with a revised depression index that omitted the relevant items to reduce the overlap between school-related stress and depression. These analyses yielded the same pattern of results as the original analyses.

chronic stressful circumstances that conveyed explicit information about their difficulties, such as receiving feedback from parents and teachers that they needed to work harder, and requiring extra help with their schoolwork. In addition, they were more likely to perceive specific aspects of the middle school environment as stressful. For example, they reported higher levels of daily stress associated with teacher expectations, workload, class difficulty and boredom, coordinating their schedule, and negotiating the school environment and demands (e.g., being on time to class, finding their way around school, and remembering books and assignments). Hence, academic disengagement appears both to create an aversive environment by eliciting negative reactions from others and to exacerbate students' perceptions of the stressfulness of transition-related changes. Perceptions of stress in turn predicted higher levels of depression.

It is important to note that academic disengagement did not account for the adverse impact of maladaptive self-regulatory beliefs. Rather, self-regulatory beliefs and behavior in the academic domain made unique contributions to perceptions of stress. Identifying other pathways that account for the negative effects of maladaptive self-regulatory beliefs will be critical for understanding the processes that underlie academic problems in middle school. For instance, decreased perceptions of academic control and low academic investment may have compromised adolescents' self-perceptions by creating feelings of discouragement or shame. Such negative self-perceptions may then have created heightened sensitivity to the challenges of middle school. Alternatively, the link between self-regulatory beliefs and engagement, or between engagement and perceptions of school-related stress, may have been attenuated because of this study's focus on global academic beliefs and performance. Assessing similar processes within specific academic subject areas may yield stronger support for this pathway.

Interactions among Self-Regulatory Processes

The present research provides a window onto multiple aspects of the experiences of adolescents during the transition to middle school. The results revealed an interesting pattern of relationships among self-regulatory beliefs, achievement-related behavior and outcomes, evaluative perceptions of school, and emotional reactions. Adolescents' perceptions of the middle school environment emerged as a key step in the self-regulatory sequence leading from cognition (i.e., maladaptive self-regulatory beliefs) to emotion (i.e., depressive symptoms). Consistent with this finding, motivation researchers have begun to emphasize the

role of subjective perceptions of social context in performance-related processes (e.g., Eccles, 1998). Individual perceptions of experiences may act as filters through which the impact of one's own beliefs and behaviors and the responses of others are processed. Thus, for example, academic difficulties may not induce decreases in self-esteem, increases in negative affect, or other symptoms of depression unless adolescents receive explicit negative feedback from their environments or unless these difficulties lead to negative perceptions of academic demands or of the broader school context. To fully understand these processes, however, future research will need to examine the joint role of objective characteristics of the school environment and subjective perceptions of stress during the school transition.

Furthermore, although the present study focused on the pathway through which self-regulatory beliefs before the school transition influenced posttransition academic engagement and perceived stress, these processes undoubtedly operate in a circular fashion. For example, stressful academic circumstances and other negative environmental feedback may lead to changes in self-regulatory beliefs and behavior. Indeed, school-related stress has been found to predict declines in perceptions of control and achievement motivation and increases in academic helplessness (e.g., Eccles et al., 1998; Rudolph et al., 2001; Skinner et al., 1998). Moreover, the impact of environmental feedback may be especially salient in unfamiliar contexts and during transition periods. For instance, the novelty and ambiguity faced in middle school may disrupt stable, preexisting individual differences in self-perception, thereby leading adolescents to rely more heavily on performance feedback and environmental cues to gauge their academic abilities or success. This proposal is consistent with research indicating that the feedback effect of prior achievement on subsequent control-related beliefs is most pronounced for middle school students (Skinner et al., 1998), and with research demonstrating reciprocal relations between academic strain and self-perceptions during the middle school transition (Fenzel, 2000).

Because the measurement in the present study of both academic engagement and stress occurred immediately following the transition, the findings cannot disentangle the direction of these effects. Further research is necessary to examine both the origins and consequences of individual differences in adolescents' perceptions of school-related stress. In light of changes prompted by the recent middle school reform movement, which have somewhat diminished the global negative impact of this transition period (Midgley & Edelin, 1998), understanding why some

adolescents continue to demonstrate ill effects at this time becomes even more critical. Moreover, in light of research suggesting that short-term negative effects foreshadow the emergence of deviant developmental trajectories (Eccles et al., 1997), future investigations will need to examine changes over the course of several years. Tracking long-term trajectories will require person-centered analytic approaches that examine within-individual change rather than group-level change, and elucidate the reciprocal influences among maladaptive beliefs, behavioral impairment, perceptions of stress, and negative emotions.

Finally, it will be important to expand research on school transitions to include other aspects of adolescents' complex environments. Although most research on the middle school transition has focused on shifts in educational climate and achievement-related processes, an equally important domain of concern is the social environment. Interpersonal relationships in adolescence often are characterized by higher levels of stress than those in preadolescence (Rudolph & Hammen, 1999; Wagner & Compas, 1990; for reviews, see Berndt, 1989; Laursen, 1996). Changes in the peer system may be particularly salient over the course of the middle school transition (Eccles & Midgley, 1989; Simmons et al., 1987). Hence, self-regulatory processes in the social domain may be equally important to adolescent adjustment during this period. Moreover, attention must be paid to the broader context of adolescents' lives over the course of a school transition, such as experiences in the family (e.g., Eccles et al., 1997) and other environmental stressors (e.g., Petersen, Sarigiani, & Kennedy, 1991). If adolescents live in fairly stable and supportive environments, they can direct psychological and tangible resources toward coping with the transition. If, however, adolescents are dealing with multiple stressors in their lives, coping resources may be diverted away from the transition and adolescents may become overwhelmed.

Understanding the interacting roles of self-regulatory processes and broader contextual influences is essential both for theory building and for the development of effective prevention programs for at-risk youth. On the one hand, the present findings suggest that one approach to reducing maladaptive academic and emotional consequences during this period would be to restructure the school experience to minimize the number of required transitions. On the other hand, given that adolescents will be faced with challenges throughout their lives, an alternative approach would be to take advantage of this opportunity to bolster their capacity for dealing with stressful experiences. Such interventions could be directed toward modifying self-regulatory beliefs (e.g., enhancing perceptions

of control, promoting investment in academic success) in an effort to foster mastery-oriented behavior, as well as providing supportive environments that optimize adaptive strategies for coping with stress within and outside of the school setting.

Conclusions

Despite the growing knowledge base concerning the changes and challenges associated with the transition to middle school, relatively little is known about individual differences in adolescents' reactions to the transition and associated stressors. The present research identified a complex pathway through which maladaptive self-regulatory beliefs create risk for academic and psychological difficulties during this stage. This work provides a preliminary step toward elucidating why normative developmental transitions during early adolescence may set some adolescents on a long-term course of dysfunction, whereas other adolescents negotiate transitions with few ill effects.

ACKNOWLEDGMENTS

The authors are grateful to the children, teachers, and principals who contributed their time and efforts to this study. They also thank Eva Pomerantz for her helpful comments on earlier versions of this manuscript. This research was supported by a University of Illinois Research Board Beckman Award, a William T. Grant Foundation Faculty Scholars Award, and National Institute of Mental Health Grant MH 56327-01 awarded to Karen D. Rudolph.

ADDRESSES AND AFFILIATIONS

Corresponding author: Karen D. Rudolph, Department of Psychology, University of Illinois, 603 E. Daniel St., Champaign, IL 61820; e-mail: krudolph@uiuc.edu. Sharon F. Lambert, Alyssa G. Clark, and Kathryn D. Kurlakowsky are also at the University of Illinois.

REFERENCES

- Arbuckle, J. L. (1997). *Amos users' guide version 3.6*. Chicago: SmallWaters Co.
- Bandura, A., Pastorelli, C., Barbaranelli, C., & Caprara, G. V. (1999). Self-efficacy pathways to childhood depression. *Journal of Personality and Social Psychology, 76*, 258-269.
- Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research:

- Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51, 1173–1182.
- Berndt, T. J. (1989). Obtaining support from friends during childhood and adolescence. In D. Belle (Ed.), *Children's social networks and supports* (pp. 308–331). New York: Wiley.
- Berndt, T. J., & Mekos, D. (1995). Adolescents' perceptions of the stressful and desirable aspects of the transition to junior high school. *Journal of Research on Adolescence*, 5, 123–142.
- Blyth, D. A., Simmons, R. G., & Bush, D. (1978). The transition into early adolescence: A longitudinal comparison of youth in two educational contexts. *Sociology of Education*, 51, 149–162.
- Blyth, D. A., Simmons, R. G., & Carlton-Ford, S. (1983). The adjustments of early adolescents to school transitions. *Journal of Early Adolescence*, 3, 105–120.
- Bronfenbrenner, U. (1979). *The ecology of human development*. Cambridge, MA: Harvard University Press.
- Brush, L. (1980). *Encouraging girls in mathematics: The problem and the solution*. Cambridge, MA: Abt Books.
- Carton, J. S., & Nowicki, S. (1994). Antecedents of individual differences in locus of control of reinforcement: A critical review. *Genetic, Social, & General Psychology Monographs*, 120, 31–81.
- Connell, J. P. (1985). A new multidimensional measure of children's perceptions of control. *Child Development*, 56, 1011–1018.
- Crockett, L. J., Petersen, A. C., Graber, J. A., Schulenberg, J. E., & Ebata, A. (1989). School transitions and adjustment during early adolescence. *Journal of Early Adolescence*, 9, 181–210.
- Dweck, C. S., & Leggett, E. L. (1988). A social-cognitive approach to motivation and personality. *Psychological Review*, 95, 256–273.
- Eccles, J. S. (1998). Perceived control and the development of academic motivation. Critique of individual differences and the development of perceived control. *Monographs of the Society for Research in Child Development*, 63 (2–3, Serial No. 254).
- Eccles, J. S., Adler, T. F., Futterman, R., Goff, S. B., Kaczala, C. M., Meece, J., & Midgley, C. (1983). Expectancies, values and academic behaviors. In J. T. Spence (Ed.), *Achievement and achievement motives*. San Francisco: Freeman.
- Eccles, J. S., Adler, T. F., & Meece, J. L. (1984). Sex differences in achievement: A test of alternate theories. *Journal of Personality and Social Psychology*, 46, 26–43.
- Eccles, J. S., Lord, S. E., Roeser, R. W., Barber, B. L., & Hernandez Jozefowicz, D. M. (1997). The association of school transitions in early adolescence with developmental trajectories through high school. In J. Schulenberg, J. L. Maggs, & K. Hurrelmann (Eds.), *Health risks and developmental transitions during adolescence* (pp. 283–320). New York: Cambridge University Press.
- Eccles, J. S., & Midgley, C. (1989). Stage-environment fit: Developmentally appropriate classrooms for young adolescents. In R. E. Ames & C. Ames (Eds.), *Research on motivation in education* (Vol. 3, pp. 139–181). New York: Academic Press.
- Eccles, J. S., Midgley, C., & Adler, T. F. (1984). Grade-related changes in the school environment: Effects on achievement motivation. In J. H. Nicholls (Ed.), *The development of achievement motivation* (Vol. 3, pp. 283–331). Greenwich, CT: JAI.
- Eccles, J. S., Wigfield, A., Flanagan, C. A., Miller, C., Reuman, D. A., & Yee, D. (1989). Self-concepts, domain values, and self-esteem: Relations and changes at early adolescence. *Journal of Personality*, 57, 283–310.
- Eccles, J. S., Wigfield, A., & Schiefele, U. (1998). Motivation to succeed. In N. Eisenberg (Ed.), W. Damon (Series Ed.), *Handbook of child psychology: Vol. 4. Personality and social development*. New York: Wiley.
- Emmons, R. A. (1986). Personal strivings: An approach to personality and subjective well-being. *Journal of Personality and Social Psychology*, 51, 1058–1068.
- Feldlaufer, H., Midgley, C., & Eccles, J. S. (1988). Student, teacher, and observer perceptions of the classroom environment before and after the transition to junior high school. *Journal of Early Adolescence*, 8, 133–156.
- Fenzel, L. M. (1989). Role strain in early adolescence: A model for investigating school transition stress. *Journal of Early Adolescence*, 9, 13–33.
- Fenzel, L. M. (2000). Prospective study of changes in global self-worth and strain during the transition to middle school. *Journal of Early Adolescence*, 20, 93–116.
- Fenzel, L. M., & Blyth, D. A. (1986). Individual adjustment to school transitions: An exploration of the role of supportive peer relations. *Journal of Early Adolescence*, 6, 315–329.
- Hankin, B. J., Abramson, L. Y., Silva, P. A., McGee, R., Moffitt, T. E., & Angell, K. E. (1998). Development of depression from preadolescence to young adulthood: Emerging gender differences in a 10-year longitudinal study. *Journal of Abnormal Psychology*, 107, 128–140.
- Harter, S. (1981). A new self-report scale of intrinsic versus extrinsic orientation in the classroom: Motivational and informational components. *Developmental Psychology*, 17, 300–312.
- Harter, S., & Connell, J. P. (1984). A model of the relationships among children's academic achievement and their self-perceptions of competence, control, and motivational orientation. In J. H. Nicholls (Ed.), *The development of achievement motivation*. Greenwich, CT: JAI.
- Harter, S., Whitesell, N., & Kowalski, P. (1992). Individual differences in the effects of educational transitions on young adolescents' perceptions of competence and motivational orientation. *American Educational Research Journal*, 29, 777–807.
- Higgins, E. T. (1987). Self-discrepancy: A theory relating self and affect. *Psychological Review*, 94, 319–340.
- Higgins, E. T. (1991). Development of self-regulatory and self-evaluative processes: Costs, benefits, and tradeoffs. In M. R. Gunnar & L. A. Sroufe (Eds.), *The Minnesota Symposium on Child Development: Vol. 23. Selfprocesses and development* (pp. 125–166). Hillsdale, NJ: Erlbaum.
- Hirsch, B. J., & DuBois, D. L. (1992). The relation of peer social support and psychological symptomatology during the transition to junior high school: A two-year longitu-

- dinal analysis. *American Journal of Community Psychology*, 20, 333–347.
- Hirsch, B. J., & Rapkin, B. D. (1987). The transition to junior high school: A longitudinal study of self-esteem, psychological symptomatology, school life, and social support. *Child Development*, 58, 1235–1243.
- Kavrell, S. M., & Petersen, A. C. (1984). Patterns of achievement in early adolescence. In M. L. Maehr (Ed.), *Advances in motivation and achievement* (Vol. 4, pp. 1–35). Greenwich, CT: JAI.
- Kazdin, A. E. (1993). Adolescent mental health: Prevention and treatment programs. *American Psychologist*, 48, 127–141.
- Kovacs, M. (1980/1981). Rating scales to assess depression in school-aged children. *Acta Paedopsychiatry*, 46, 305–315.
- Laursen, B. (1996). Closeness and conflict in adolescent peer relationships: Interdependence with friends and romantic partners. In W. M. Bukowski, A. F. Newcomb, & W. W. Hartup (Eds.), *The company they keep: Friendship in childhood and adolescence*. New York: Cambridge University Press.
- Lord, S. E., Eccles, J. S., & McCarthy, K. A. (1994). Surviving the junior high school transition: Family processes and self-perceptions as protective and risk factors. *Journal of Early Adolescence*, 14, 162–199.
- Midgley, C., Anderman, E., & Hicks, L. (1995). Differences between elementary and middle school teachers and students: A goal theory approach. *Journal of Early Adolescence*, 15, 90–113.
- Midgley, C., & Edelin, K. C. (1998). Middle school reform and early adolescent well-being: The good news and the bad. *Educational Psychologist*, 33, 195–206.
- Nolen-Hoeksema, S., & Girgus, J. S. (1994). The emergence of gender differences in depression during adolescence. *Psychological Bulletin*, 115, 424–443.
- Nolen-Hoeksema, S., Girgus, J. S., & Seligman, M. E. P. (1992). Predictors and consequences of childhood depressive symptoms: A 5-year longitudinal study. *Journal of Abnormal Psychology*, 101, 405–422.
- Nottelmann, E. D. (1987). Competence and self-esteem during the transition from childhood to adolescence. *Developmental Psychology*, 23, 441–450.
- Pelham, B. W., & Swann, W. B. (1989). From self-conceptions to self-worth: On the sources and structure of global self-esteem. *Journal of Personality and Social Psychology*, 57, 672–680.
- Petersen, A. C., Compas, B. E., Brooks-Gunn, J., Stemmler, M., Ey, S., & Grant, K. E. (1993). Depression in adolescence. *American Psychologist*, 48, 155–168.
- Petersen, A. C., & Hamburg, B. A. (1986). Adolescence: A developmental approach to problems and psychopathology. *Behavior Therapy*, 17, 480–499.
- Petersen, A. C., Sarigiani, P. A., & Kennedy, R. E. (1991). Adolescent depression: Why more girls? *Journal of Youth and Adolescence*, 20, 247–271.
- Robinson, N. S., Garber, J., & Hilsman, R. (1995). Cognitions and stress: Direct and moderating effects on depressive versus externalizing symptoms during the junior high school transition. *Journal of Abnormal Psychology*, 104, 453–463.
- Roeser, R. W., & Eccles, J. S. (1998). Adolescents' perceptions of middle school: Relation to longitudinal changes in academic and psychological adjustment. *Journal of Research on Adolescence*, 8, 123–158.
- Rotter, J. B. (1954). *Social learning and clinical psychology*. New York: Prentice-Hall.
- Rudolph, K. D., & Hammen, C. (1999). Age and gender as determinants of stress exposure, generation, and reactions in youngsters: A transactional perspective. *Child Development*, 70, 660–677.
- Rudolph, K. D., Hammen, C., Burge, D., Lindberg, N., Herzberg, D., & Daley, S. E. (2000). Toward an interpersonal life-stress model of depression: The developmental context of stress generation. *Development and Psychopathology*, 12, 215–234.
- Rudolph, K. D., Kurlakowsky, K. D., & Conley, C. S. (2001). Developmental and social-contextual origins of depressive control-related beliefs and behavior. *Cognitive Therapy and Research*, 25, 447–475.
- Rudolph, K. D., & Lambert, S. M. (2001). Developmental considerations in anxiety and depression: II. The emergence of sex differences across multiple dimensions. Manuscript submitted for publication.
- Scheier, M. F., & Carver, C. S. (1982). Cognition, affect, and self-regulation. In M. S. Clark & S. T. Fiske (Eds.), *Affect and cognition: The seventeenth annual Carnegie Symposium on cognition* (pp. 157–183). Hillsdale, NJ: Erlbaum.
- Schulenberg, J. E., Asp, C. E., & Petersen, A. C. (1984). School from the young adolescent's perspective: A descriptive report. *Journal of Early Adolescence*, 4, 107–130.
- Seidman, E., Allen, L., Aber, J. L., Mitchell, C., & Feinman, J. (1994). The impact of school transitions in early adolescence on the self-system and perceived social context of poor urban youth. *Child Development*, 65, 507–522.
- Simmons, R. G., & Blyth, D. A. (1987). *Moving into adolescence*. New York: Aldine de Gruyter.
- Simmons, R. G., Burgeson, R., Carlton-Ford, S., & Blyth, D. A. (1987). The impact of cumulative change in early adolescence. *Child Development*, 58, 1220–1234.
- Simmons, R. G., Rosenberg, F., & Rosenberg, M. (1973). Disturbance in the self-image at adolescence. *American Sociological Review*, 38, 553–568.
- Skinner, E. A., Zimmer-Gembeck, M. J., & Connell, J. P. (1998). Individual differences and the development of perceived control. *Monographs of the Society for Research in Child Development*, 63(2–3, Serial No. 254).
- Smucker, M. R., Craighead, W. E., Craighead, L. W., & Green, B. J. (1986). Normative and reliability data for the Children's Depression Inventory. *Journal of Abnormal Child Psychology*, 14, 25–39.
- Tanaka, J. S. (1987). "How big is big enough?": Sample size and goodness of fit in structural equation models with latent variables. *Child Development*, 58, 134–146.
- Thornburg, H. D., & Glider, P. (1984). Dimensions of early adolescent social perceptions and preferences. *Journal of Early Adolescence*, 4, 387–406.

- Turner, J. E., & Cole, D. A. (1994). Developmental differences in cognitive diatheses for child depression. *Journal of Abnormal Child Psychology, 22*, 15–32.
- Wagner, B. M., & Compas, B. E. (1990). Gender, instrumentality, and expressivity: Moderators of the relation between stress and psychological symptoms during adolescence. *American Journal of Community Psychology, 18*, 383–406.
- Weisz, J. R. (1990). Development of control-related beliefs, goals, and styles in childhood and adolescence: A clinical perspective. In J. Rodin, C. Schooler, & K. Schaie (Eds.), *Self-directedness: Cause and effects throughout the life course* (pp. 103–145). Hillsdale, NJ: Erlbaum.
- Weisz, J. R., Southam-Gerow, M. A., & McCarty, C. A. (2000). Control-related beliefs and depressive symptoms in clinic-referred children and adolescents: Developmental differences and model specificity. *Journal of Abnormal Psychology, 110*, 97–109.
- Weisz, J. R., & Stipek, D. J. (1982). Competence, contingency, and the development of perceived control. *Human Development, 25*, 250–281.
- Wigfield, A., Eccles, J. S., Mac Iver, D., Reuman, D. A., & Midgley, C. (1991). Transitions during early adolescence: Changes in children's domain-specific self-perceptions and general self-esteem across the transition to junior high school. *Developmental Psychology, 27*, 552–565.

This document is a scanned copy of a printed document. No warranty is given about the accuracy of the copy. Users should refer to the original published version of the material.