Fresh Starts: Reinvestigating the Effects of the Transition to High School on Student Outcomes

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Seemingly endless tinkering and adjustment of the structure of education in the United States over the past century have led to the adoption of different school forms (grouping particular grades into separate schools) at different times. These different school forms necessitate transitions between schools (e.g., from a middle school to a high school), which, prior research has argued, have detrimental effects on students' well-being. In this article, we use natural variation in the American educational system to reexamine the effects of school transitions. Contrary to most prior research on the subject, we directly compare the ninth-grade outcomes of students who make a transition in moving to ninth grade with those who do not. Our results show that for both academic and nonacademic outcomes, the presence of a transition from eighth grade to ninth grade makes almost no difference for students' ninth-grade outcomes relative to those of students who do not change schools between those grades. This is not to suggest that outcomes do not change between eighth grade and ninth grade but that the degree of difference is the same for students who change schools as for those who do not. Where differences appear, they are small and point to the benefits of school transitions for providing fresh starts to adolescents in socially difficult situations.

Introduction

The first year of high school is an extraordinarily difficult one for many students. Research from numerous sources has documented the difficulties that students experience when they enter high school: grades decline, the likelihood of course failure rises dramatically, behavioral trouble increases, and absences become much more common. For example, using data from Chicago, Roderick and Camburn (1999) found that over 40 percent of students fail one

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or more major subjects during the first semester of high school. Similar figures have been reported in several other urban districts (e.g., Neild and Weiss 1999). Moreover, the problems students experience in starting high school extend well beyond the ninth grade. For many students, poor performance in the first year of high school establishes a pattern of failure, leading to lower educational trajectories and poor outcomes throughout school and a substantially higher risk of dropping out of school (Roderick 1993).

Much of the research in this area has attributed these declines to the negative effects of the transition into high school. The transition between schools and the numerous changes that accompany the transition are held to be responsible for these negative changes. However, despite claims about the effects of transitions, the fundamental question of whether the transition itself is the problem has seldom been examined. Rather, it may be that such declines occur between eighth grade and ninth grade regardless of whether a student changes schools. Although much has been made about the negative consequences of school transitions, there has been almost no research comparing changes in outcomes for students of the same grades in different schooling forms. That is, very few studies have compared trajectories of students who change schools between eighth grade and ninth grade with those who remain in the same school in moving from eighth grade to ninth grade. In the absence of such comparisons, it is logically difficult to argue for any effect of a school transition.

In this article, we directly examine the extent to which the high school transition—that is, a change of schools between eighth grade and ninth grade—influences student outcomes. We focus on two questions that have received significant attention in previous education research thus far: Do transitions between schools, necessitated by particular configurations of grades—or schooling forms—make a difference for student outcomes? If so, does it matter differently for different groups of students? However, unlike most previous research in this area, we consider these questions with respect to the timing of the transition to high school, explicitly comparing student outcomes for those attending schools that require a change of school in moving from

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eighth grade to ninth grade with those who move from eighth grade to ninth grade within the same school. To anticipate the central findings of this analysis, we find that the move from eighth grade to ninth grade is accompanied by negative changes regardless of whether it is accompanied by a change in school and that some students benefit from transitions.

Previous Research: Transitions and Schooling Forms

Transitions between schools are a by-product of the organization of American schools into distinct schooling forms—particular configurations of grades into distinctive school types such as elementary school, middle school, and high school. Since its inception, education in the United States has been marked by constant efforts to alter schooling forms, reforms intended to better meet the needs of students, teachers, and society at large. Indeed, the introduction of age-graded schooling and the subsequent decline of the one-room school in the mid-nineteenth century was presented as a reform designed to enhance educational attainment, here eliminating heterogeneity of ability and maturity of students in a single classroom to better tailor instruction for children's needs and abilities (Tyack and Cuban 1995).

Although the organization of the years of schooling into distinct units has been considered beneficial for students, the creation of separate institutions necessitates that students make transitions between schools, which has generally been held to be a negative occurrence. That is to say, a tension exists between the perceived benefits of creating a distinct educational institution to meet the specific needs of emerging adolescents, on the one hand, and the supposed deleterious consequences of school transitions, on the other hand. For example, middle schools were designed to address the specific developmental and academic needs of early adolescents; however, scholars have argued that both transitions associated with this form—moving from elementary school to middle school and moving from middle school to high school—negatively influence student outcomes (see, e.g., Roderick and Camburn 1999; Ruble and Seidman 1996; Simmons and Blyth 1987).

Yet such arguments usually are made in the absence of comparative data essential to support them. Arguments have been made about transitions' effects, but almost no studies have compared students who make a transition with those who do not. This persistent absence of attention to the consequences of transitions necessitated by particular schooling forms is all the more striking in view of the periodic attention to the issue in scholarly research and education policy. Writing in the late 1970s, Blyth and his colleagues argued for the benefits of studies comparing different forms, stating that "few studies have provided comparative data on the effects of making such a transition at dif-

ferent age levels or within different schooling structures" (1978, 150). Blyth et al. (1978) answered their own call in one of the few studies that directly compares different schooling forms. Examining a cohort of sixth graders in K–6 and K–8 schools as they make the transition to seventh grade, they found differences in the social and academic realms. Sixth graders in K–8 schools were more influenced by their peers and oriented toward the older students in the school, while those in K–6 schools were more academically oriented and had a greater sense of responsibility. More recently, Anderman (2002) found that students who attend K–8 or K–12 schools in the middle grades have better psychological and academic outcomes than their peers in middle schools. Barber and Olsen (2004) point out in a recent paper on school transitions that, although it is widely held that school transitions are detrimental to students' performance and well-being, there are significant gaps in the research on the topic.

Why Do School Transitions Matter?

Although it is commonly thought that school transitions are detrimental to students' outcomes (see, e.g., Barber and Olsen 2004; Carnegie Council on Adolescent Development 1989), the research that exists on the effect of transitions has offered more theory and conjecture than rigorous evidence. For the most part, research on transitions has found that the move between schools is often accompanied by declines in students' well-being or performance in school (see, e.g., Eccles et al. 1991; Simmons and Blyth 1987).

With few exceptions, the majority of the research on school transitions, either from elementary to middle school or from middle school to high school, has focused on studying how adolescent outcomes decline following the transition and on identifying mechanisms that produce these changes. Following the transition into high school, numerous measures of student performance plummet. A number of studies have shown that students experience a decline in grades following the transition to high school (Reyes et al. 1994; Roderick and Camburn 1999; Rumberger 1987; Seidman et al. 1996). However, transition effects are not limited to grades alone. Student attendance also drops in the first year of high school, a change that has been linked to changes in the composition of students' peer groups and with the corresponding changes in the normative climate of high school peer groups (Crockett et al. 1989; Felner et al. 1982; Reyes et al. 1994). Moreover, many students experience a decline in their level of engagement with their schooling, particularly in their relationships with their teachers and with their academic work more generally (Reyes et al. 1994; Roderick 1993; Seidman et al. 1996).

The mechanisms used to account for these changes are varied, though they

can be classified into one of three categories of forces that shape the transition from eighth grade to ninth grade. The first is the natural progression of the life course and adolescent development. From this perspective, it may not be the transition that matters but that the phase of life is a difficult one. The second class of explanation focuses on the changes and disruptions triggered by changing schools. Moving to a new school, even when such a move is prescribed in the organizational structure of the school, is difficult. A third class of factors centers on the high school itself, with its specific characteristics and normative demands, that is responsible for the changes that occur.

It is worth mentioning that these three mechanisms imply differences in the effect of the transition. The first of these suggests that moving from eighth grade to ninth grade should have an effect, regardless of whether the change of grade is accompanied by a change of schools. The second and third explanations would result in effects only for those students who change schools between eighth grade and ninth grade.

With the first category of explanation, that of the developmental perspective, research from studies of the life course have highlighted numerous exogenous changes that accompany the transition, such as how parental involvement with youth changes as the adolescent gets older and how different forms of parental involvement are effective at different times of a student's life (Muller 1995). Some research has shown that parental involvement with children's schooling changes as students make the transition to high school (Baker and Stevenson 1986; Eccles and Harold 1993; Muller 1995). As an adolescent enters high school, his/her parent generally gives him/her greater autonomy (Romo and Falbo 1996; Schiller 1999). Given that some forms of parenting have been shown to have a powerful effect on high school students' performance (see, e.g., Dornbusch et al. 1987), we might expect that these changes in adolescents' relationship with their parents might be of some consequence. At the same time that parental influence wanes, that of the peer group increases. Peer networks have been identified as an important influence on students' academic performance following the transition into high school (Brown et al. 1993). As adolescents age, the influence of peers comes to outweigh the influence of parents (Fletcher et al. 1995; Harris 1998).

The second line of explanation, that focusing on the consequences of changing schools, has largely focused on the broken social connections involved in moving to a new school. One line of argument focuses on the loss of positive social connections to teachers and staff that are typically broken in moving to a new school (see, e.g., Roderick 1993; Seidman et al. 1996). Moreover, in many school districts, not all students transition into the same school. Attendance patterns may split friendships and ties to other students. From this perspective, the negative impact of the transition arises from the broken ties to teachers and other students that typically accompany a change of school.

The transition to a new school also typically brings changes in the social and academic environment. Tougher teacher standards for academic work, reduced levels of engagement with teachers and course work, and heightened attention to the consequences of performance all accompany the move to high school (Eccles et al. 1991; Seidman et al. 1994). With the move to high school, students are also required to take greater responsibility for their work (Schiller 1999). Changes in the organization of instruction often yield difficulties for students, particularly with respect to the introduction of the period-based schedule of the school day, with different teachers for different subjects (Felner et al. 1982). These differences in instructional organization have been linked to lower levels of trust, greater emphasis on discipline on the part of teachers (Midgley et al. 1988), and lower levels of connection and engagement for students (Eccles et al. 1991).

Likewise, the size of the instructional unit, whether classroom or school, has been shown to influence student learning and experience (e.g., Bryk et al. 1993; Lee and Smith 1995). The findings from Tennessee's Project STAR experiment show significant benefits of smaller class sizes for student achievement (Finn and Achilles 1999). Similarly, studies examining the relationship between school size and student outcomes have reported a negative relationship between the number of students in a school and student learning (e.g., Fowler and Walberg 1991; Lee and Smith1997). Moreover, studies examining the relationship between school size and student outcomes have reported a negative relationship between the number of students in the school and student learning (e.g., Fowler and Walberg 1991; Lee and Smith 1997). In addition, the past decade has seen a number of secondary school reforms that divide comprehensive high schools into smaller academies or schools-within-schools. These reforms are designed to alleviate the negative consequences that stem from the organization of such schools, particularly the high degree of student anomie and disengagement (Fine 1994).

Some research has also argued that the decline in performance and rise in trouble that follow the transition to high school are due to changes in the normative environment of the school. This feature of school climate has been linked to a broad set of academic outcomes, such as student grades and the odds of dropping out of school before graduating (Bryk and Thum 1989; Lee and Bryk 1989; Rice 2001). Among nonacademic outcomes linked to school environment are fighting (Felson et al. 1994), use of alcohol and tobacco (Maes and Lievens 2003), delinquency (Rutter et al. 1979), sexual activity (Teitler and Weiss 2000), and carrying a weapon to school (Wilcox and Clayton 2001). Socially, school transitions necessarily entail moving from membership in the oldest and dominant group in the school's social system to the youngest and lowest-status group.[1]

Although most of the research on school transitions has focused on the

negative consequences of transferring between schooling forms, there are a handful of exceptions. For example, Schiller (1999) found that students who struggled academically in eighth grade benefited from attending a high school in which the majority of students did not come from their eighth-grade school. Kinney (1993) showed that the high school transition is beneficial to many students, especially those who were unpopular in middle school. Similarly, Seidman et al. (1996) found that the transition to high school was marked by increased engagement with peers, although the degree of benefit was contingent on the orientation and norms of the peer group. In addition, a recent paper by French and her colleagues (2000) found that the transition to high school can serve as an event that raises awareness of a student's race/ethnicity and stimulates the formation of his/her own racial/ethnic identity.

Previous research on school transitions has focused largely on school-related outcomes, with some additional work being done on aspects of students' psychological dispositions. However, the same factors that have been held to negatively influence school outcomes might also influence nonschool outcomes. Yet, with few exceptions (e.g., Moffitt 1993), the effects of the transition on nonschool outcomes, such as delinquency and substance abuse, have not been explored. In this article, we consider the effect of school transitions on both academic and nonacademic outcomes.

Data and Analytic Strategy

In this article, we consider the relationship between school form and a range of academic and nonacademic outcomes. In order to do this, we analyze data from the National Longitudinal Study of Adolescent Health (Add Health). Add Health is an ongoing, nationally representative, school-based study of adolescents in grades 7–12 that was initiated in 1994. The sample was created using a stratified design, with the primary sampling frame derived from the Quality Education Database (QED), a listing of all high schools in the United States. From the QED, Add Health selected a sample of 80 high schools with probability proportional to size, stratified by region, urbanicity, school type (public, private, parochial), and ethnic mix. For each high school selected, Add Health recruited one of its feeder schools with probability proportional to its student contribution to the high school, yielding a school pair. Schools varied in size from less than 100 students to more than 3,000 students. The Add Health sample includes private, religious, and public schools from communities located in urban, suburban, and rural areas of the country. The schools, as well as the students in them, are nationally representative samples. Almost 80 percent of the schools that were contacted by Add Health agreed

to participate in the study. This multistage sampling design resulted in a final sample of 132 schools located in 80 communities.

From September 1994 until April 1995, in-school questionnaires were administered to all students in each school, resulting in data on more than 90,000 students. Each school administration occurred on a single day within one class period. Over 80 percent of all students completed the questionnaire that provided measurement on the social and demographic characteristics of respondents. Students were asked about the educational and occupational background of parents and about their household structure, risk behaviors, visions of the future, self-esteem, and health status. Students were also asked to nominate their five best male and female friends. School administrators also completed a self-administered questionnaire in the first and third years of the study.

For the second stage of data collection (the wave 1 in-home survey), Add Health obtained rosters of all enrolled students in each school. From the union of students on school rosters and students not on a roster who completed an in-school questionnaire, Add Health randomly selected a sample for the in-home interview. Students who did not participate in the in-school survey were eligible to be selected for participation in the in-home main sample. Consequently, the wave 1 sample includes students who did not participate in the in-school survey as well as students who had dropped out of school. Add Health completed 20,745 wave 1 in-home interviews, with an 80 percent response rate. Data collected during the in-home phase of Add Health provide measurement on more sensitive health risk behaviors, such as drug and alcohol use, sexual behavior, and criminal activities, in addition to detailed measurement of health status, family dynamics, aspirations, and attitudes. In wave 2, follow-up interviews with adolescents who participated in the first wave of the in-home survey were conducted between April and September 1996. Interviews were not attempted with wave 1 seniors in wave 2. Over 85 percent of all eligible wave 1 respondents participated in wave 2, resulting in 14,787 interviews. (For more detail on the study design, see Bearman et al. 1997.)

This study draws upon data collected from those cases interviewed in both the wave 1 and the wave 2 in-home interviews. We restrict our analysis to those students who were in eighth grade at the time of the wave 1 in-home interview and in ninth grade at the wave 2 interview. Eliminated from the sample are the handful of cases who were retained in eighth grade. With this restriction, the number of cases for analysis is 1,680. The majority of outcome and control variables are drawn from the wave 1 and wave 2 interviews, though social network data are taken from the in-school instrument and school characteristics are drawn from the school administrator survey.

While all respondents were in the eighth grade at wave 1 and in the ninth grade at wave 2, they attended school in a wide array of educational forms. The modal setting was a middle school made up of grades 6–8; however, only

44 percent of the sample attended this form of school in eighth grade. The next most common form was a middle school consisting of only grades 7 and 8, followed closely by schools containing grades 7–12. In all, students in this sample attended eighth grade in one of 10 different educational settings, with four of these settings involving a change of schools between eighth grade and ninth grade.[2] We group four of these forms under the heading of middle schools: those containing grades K–8, 5–8, 6–8, and 7–8. At the individual level, 70 percent of the sample changed schools in moving from eighth grade to ninth grade.

In the multivariate analysis, we use hierarchical linear models, estimated using MLWin software,[3] including controls for Add Health's stratified sampling design and for the probability of selection for individuals. In these models, we use a common set of predictor variables consisting of respondents' sociodemographic characteristics, their experience in school and scholastic ability, and their social ties in the school. The first set of models examine the effects of the transition through bivariate and multivariate models. Later models examine the possibility of interaction effects, to examine whether certain characteristics exacerbate or dampen the effects of the transition. Finally, school-level measures are added to detect effects of school characteristics on individuals' transitions.

These models also take advantage of the panel design of the Add Health study by controlling for respondents' status on the outcome measures in eighth grade in predicting their ninth-grade outcomes. That is, these models predict individuals' status in the ninth grade, controlling for their status on these measures in eighth grade. This control not only allows us to specify more precisely transition effects but also provides a control for any effects that might have resulted from previous school transitions.

We examine two sets of outcome measures, one for nonacademic outcomes and another composed of academic outcomes The four nonacademic outcomes are physical fights; use of drugs, alcohol, or tobacco; delinquency; and carrying a weapon to school. The four school-related outcomes we consider are grades in school, school integration, trouble in school, and college aspirations. The specific survey items we used to create these measures are described more fully in table 1.[4]

The individual-level predictor variables we use in the models are also described in table 1. The majority of the predictors are dichotomous and are based on students' or parents' self-reports. Four of these variables merit additional description. First, the inclusion of the measure for previous grade retention precludes the inclusion of a predictor for age, given the high correlation between the two.[5] Second, the measure of IQ is taken from adolescents' performance on the Peabody Picture Vocabulary Test (PPVT), whose scoring system accounts for the age of the test-taker. Additionally, the variables "social connectedness" and "socially isolated" are derived from the Add Health

TABLE 1

Description of Variables

	Variable Definition
Outcome measures	
Nonacademic:	
Fighting	Dichotomous variable equal to one if the respondent reports that he/she had been in a serious physical fight in the past 12 months.
Drug/alcohol/tobacco index	Dichotomous measure equal to one if the respondent reports that he/she (1) drank alcohol in the past 12 months, (2) used tobacco in the past 30 days, or (3) used drugs in the past 30 days.
Delinquency	Dichotomous variable equal to one if respondent reports that he/she engaged in one of the following delinquent activities in the previous 12 months: (1) painted graffiti on someone else's property or in a public place, (2) deliberately damaged property that didn't belong to him/her, (3) took something without paying for it, (4) stole something worth more than $50, (5) went into a house or building to steal something, or (6) stole something worth less than $50.
Weapon to school	Dichotomous variable equal to one if respondent reports that he/she has brought a weapon to school in the past 30 days.
Academic:	
Grade point average	Continuous measure equal to the mean of the respondent's self-reports of grades in four subject areas (math, English, science, social studies/history).
School integration	Continuous variable equal to the mean of the respondent's reports of (1) how close they felt to people at their school, (2) how much they felt like they were part of their school, and (3) how happy they felt to be at their school.
Trouble	Continuous variable equal to the mean of the respondent's reports of how often he/she had trouble (1) getting along with teachers, (2) paying attention in school, (3) getting homework done, and (4) getting along with other students.

TABLE 1 (*Continued*)

	Variable Definition
Aspirations for college	Continuous variable based on respondent's self-assessed desire to go to college (measured on a scale of 1 [lowest] to 5 [highest]).
Predictors:	
Poor	Dichotomous measure equal to one if at least one of the following conditions is met: (1) parent reports receiving (current) public assistance, (2) parent reports receipt of AFDC last month, (3) parent reports receipt of food stamps last month, (4) adolescent reports that resident mother receives public assistance, or (5) adolescent reports that resident father receives public assistance.
IQ	Continuous measure equal to students' performance on Peabody Picture Vocabulary Test (PPVT)
Held back	Dichotomous measure based on student self-reports, equal to one if the respondent reports that he/she had been held back a grade in school at least once.
Social connectedness	Continuous measure based on the number of times the respondent was nominated by other students in the study's friendship nomination rosters.
Socially isolated	Dichotomous measure equal to one if respondent is nominated by no other student in the school in the study's friendship nomination roster.
School-level predictors:	
School size	Two dichotomous measures, based on administrators' reports of the number of students who attend the school, with the "small" measure equal to one if the school has more than 900 students.
School minority status	Dichotomous measure, based on administrators' reports, equal to one if 40% or more of the student body is nonwhite.
Private	Dichotomous measure, based on administrators' reports, equal to one if the school is a private or parochial school.

friendship nomination rosters. Social connectedness is a measure of the number of students in the school who nominated a particular student as a friend.[6] Socially isolated is a dichotomous variable coded one if the student received no nominations in his/her school and zero otherwise.

The distributions of the school-level variables are presented in the lowest panel of table 1. Data characterizing schools' public/private status are taken from the School Administrator Questionnaire. The measures for school minority status (a dichotomous measure equal to one if 40 percent or more of students in a school are nonwhite) and school size were created using data from the In-School Questionnaire wave of the study.[7]

Results

Results from these analyses are presented in three sections. The first compares levels of unadjusted outcomes for adolescents who attend eighth grade in a middle school and those who attend eighth grade in another school form. These results document the degree of changes that students in these two forms of schooling experience as they move from eighth grade to ninth grade. We then examine the effect of the school transition in a multivariate framework, using multilevel regression to gauge differences between these two groups of adolescents. Finally, we examine a series of models with numerous interaction terms to determine whether various individual-level factors exacerbate or dampen the effects of schooling form.

Bivariate Analysis

We start our analysis of transition effects by examining students' levels of all eight outcomes in both eighth grade and ninth grade. Based on previous research on the effects of transitions, negative consequences of the transition should be evident from comparisons of how students fared in eighth grade and ninth grade, with those making the transition between schools suffering a decline (or greater decline) between those years. The figures presented in table 2 compare both eighth-grade and ninth-grade outcomes.

Comparisons of eighth-grade levels of nonacademic outcomes, presented in the top panel of the table, show that students who attended a middle school in eighth grade had somewhat higher levels of these negative behaviors relative to their peers in other forms of schooling. A significantly higher percentage of middle school–based eighth graders were involved in a fight in eighth grade as compared with their peers in other schooling forms (37 percent as compared to 29 percent). Similarly, a significantly greater percentage of middle school

TABLE 2

Bivariate Relationships, Forms of School, and Outcomes in Grade 8 and Grade 9

	MIDDLE SCHOOL		OTHER FORMS	
	Grade 8	Grade 9	Grade 8	Grade 9
Nonacademic outcomes (%):				
Fighting	37.1*	22.4	28.7*	18.5
Alcohol, tobacco, or drug use	41.9*	52.6	33.8*	47.9
Delinquency	38.9	35.1	34.9	29.5
Weapon to school	6.2	8.3*	4.6	4.7*
Academic outcomes:				
Grade point average	2.88	2.76	2.90	2.80
School integration	2.86	2.82	2.84	2.75
Trouble	1.01	.98	1.07	1.09
College aspirations	4.57	4.47	4.57	4.42

* $p \leq .05$.

eighth graders used alcohol, drugs, or tobacco than did eighth graders in other school forms. Interestingly, however, for both of these outcomes the differences for these same students in ninth grade are smaller and not statistically significant. That is, for both fighting and substance usage, the differences between transition and nontransition students are smaller after the move to high school. The only outcome that exhibits the expected pattern with negative transition effects is carrying a weapon to school. A significantly greater percentage of students who changed schools in moving from eighth grade to ninth grade carried a gun to school in ninth grade as compared with their peers in other schooling forms.

The lower panel of table 2 shows differences between transition and nontransition students in their academic outcomes for eighth grade and ninth grade. Unlike the nonacademic behaviors we examine, these two groups of students are nearly identical across these four measures. Students' grade point averages (GPAs), level of integration with the school, trouble index, and aspirations for higher education vary only by a tiny amount, if at all. Comparing the changes in outcomes between eighth grade and ninth grade for these two groups also shows little negative effect of the high school transition. Students who move from middle school to high school between eighth grade and ninth grade experience a decline of .12 grade points, a value only slightly larger than the .10 grade point decline experienced by those who do not make a transition. With the measures of school integration and trouble, although the changes between eighth grade and ninth grade are small, they are in the opposite direction to what theory and previous research would predict. Students who make no transition in moving from eighth grade to ninth grade

experience a greater (albeit not very large) decline in attachment to school relative to those who change schools in moving from eighth grade to ninth grade. While the level of trouble increases slightly for those who remain in the same school, there is a small decline for those who make the transition. Finally, while aspirations for higher education decline modestly for both groups, the amount of decline is greater for those who remain in the same school as compared to those who experience a transition.

Taken all together, table 2 shows little evidence that students are harmed by making a transition between schools as they move from eighth grade to ninth grade. Although levels of these activities change as students move from eighth grade to ninth grade, the magnitude of change is roughly the same for transition and nontransition students. Where statistically significant differences appear between the two groups, they appear before the transition. After moving to ninth grade, these differences are largely diminished. In two of the four nonacademic outcomes examined here, statistically significant differences in eighth grade are reduced and become nonsignificant in ninth grade. Only for the measure of carrying a weapon to school is there evidence of a negative transition effect. For the four academic measures, only GPA shows evidence of an expected decline, with students moving from middle school to high school experiencing a steeper decline in grades than those who remain in the same school. But the impact is minimal, and for the other academic outcomes, the transition effect (while miniscule) appears positive.

Multilevel Regression Analysis

We now examine these differences in a multivariate context, using hierarchical linear regression to investigate whether a greater transition effect is revealed when controlling for potentially confounding individual-level differences of transition and nontransition populations. These models contain a set of predictors that previous research has shown to be influential for the outcomes examined here. Each model also contains a measure of the eighth-grade status of the outcome variable being predicted. For all models that have dichotomous outcomes, we use second-order penalized quasi-likelihood (PQL) estimation procedures to minimize downward bias in between-group variances (Guo and Zhao 2000; Rodríguez and Goldman 1995). Results of this analysis are presented in table 3.

There are a number of features of table 3 that are worthy of note; however, the most significant finding is in the last row. Here, the coefficients for the presence of a school transition reveal that the transition has a significant impact for only one of the eight outcomes examined. Only for the measure of whether a student brought a weapon to school in ninth grade is transition a significant

TABLE 3

Hierarchical Regression Analysis of Ninth-Grade Outcomes

	Fight	Alcohol, Drug, or Tobacco Use	Delinquency	Weapon to School	GPA	School Integration	Trouble	College Aspirations
Wave 1 measure	1.468***	2.262***	1.963***	2.396***	.635***	.478***	.464***	.591***
	(.141)	(.126)	(.123)	(.253)	(.022)	(.021)	(.021)	(.025)
Female	−.680***	.036	−.319**	−1.137***	.111***	−.066	−.015	.137***
	(.143)	(.119)	(.123)	(.236)	(.029)	(.038)	(.032)	(.041)
White	.040	.463***	.073	−.259	−.016	.014	.115***	−.156***
	(.158)	(.129)	(.137)	(.229)	(.035)	(.041)	(.035)	(.047)
Family in poverty	.205	−.211	−.115	−.015	−.044	−.082	.035	−.080
	(.187)	(.170)	(.175)	(.296)	(.041)	(.052)	(.044)	(.058)
Previously retained	.085	−.141	−.117	.092	−.111**	−.120*	−.014	−.126*
	(.172)	(.157)	(.161)	(.255)	(.037)	(.048)	(.041)	(.053)
IQ	.002	.006	.008	.002	.006***	−.002	.001	.005**
	(.005)	(.005)	(.005)	(.008)	(.001)	(.001)	(.001)	(.002)
Social connectedness	−.017	.015	.010	−.047	.003	−.003	−.000	.011
	(.020)	(.018)	(.017)	(.032)	(.004)	(.005)	(.005)	(.006)
Missing network (flag)	−.337*	.146	.094	.232	−.011	−.012	.060	.038
	(.164)	(.134)	(.142)	(.229)	(.034)	(.042)	(.036)	(.048)
Socially isolated	−.390	−.088	.162	. . .	.027	.029	−.073	.032
	(.329)	(.283)	(.289)		(.068)	(.089)	(.076)	(.098)
Transition between schools	.149	.199	.290	.564*	−.056	.048	−.025	−.009
	(.179)	(.129)	(.149)	(.253)	(.045)	(.040)	(.034)	(.050)

NOTE.—Numbers in parentheses are standard errors.
* $p \leq .05$.
** $p \leq .01$.
*** $p \leq .001$.

predictor. Students who attended a middle school in eighth grade are nearly twice as likely to bring a weapon to school ($e^{.564}$) than their grade counterparts who attended another form of school.

For all other outcomes—including all four of the academic outcomes we examine—the transition has no significant impact. Students who change schools as they go from eighth grade to ninth grade have a ninth-grade GPA that is not significantly different from that of those who move from eighth grade to ninth grade in the same school. The same can be said for level of school integration, the amount of trouble the students get into, and the students' aspirations for future education. These models show that there are a number of factors that are related to ninth-grade status on these outcomes. None of these are very surprising. Females are significantly less likely than males to be in a physical fight or to carry a weapon to school. Students with higher measures of IQ have higher grade averages, while those who have been retained have lower grades. However, whether a student changes schools in moving from eighth grade to ninth grade has little impact on this set of outcomes. So far, there is no evidence from these data to support selecting one school form over another.

Interaction Analysis

In the next stage of analysis, we estimate a series of multilevel regression models containing a set of interaction terms, one for each of the predictors included in the models of table 3. It could be that the effects of school transitions are masked by the models of the previous section. Perhaps it is the case that transition effects are expressed most clearly in specific portions of the school population. Roderick (1993), for example, argues that this is the case, suggesting that the transition to high school is difficult for many students but is particularly devastating to a small group of students.

To examine whether this is the case, table 4 contains a full set of interaction terms, equal to the predictor term by whether the student changed schools in moving from eighth grade to ninth grade, to determine whether certain students benefit or suffer more from the transition. Through this method, we examine not only the extent to which the school transition yields changes in outcomes but also whether these differences are muted or exacerbated by characteristics of individuals who make the transition.

The models estimating effects on nonacademic outcomes show remarkably few statistically significant relationships. The independent effect of having changed schools, shown in the bottom row of the table, is not significantly related to any of the four nonacademic outcomes. Moreover, inclusion of the interaction terms reveals only one significant relationship. Whites are signif-

icantly less likely to score highly on the delinquency measure as compared to adolescents of other races; however, whites who change schools in moving from eighth grade to ninth grade are significantly more likely to be delinquent than those who stay in the same school. Apart from this effect, these figures suggest that not only does the transition itself not prove significantly detrimental to students but that a change of schools does not exacerbate or reinforce the effects of other factors related to these nonacademic outcomes.

Table 4 shows evidence of differences related to making a transition between eighth grade and ninth grade; however, contrary to expectations and the findings of previous transition research, these differences show a benefit to students who change schools. The significant effects of the transition cluster around two sets of factors: the social world of peers and previous grade retention.

The measures related to the social world of peers show a benefit to changing schools. The model for grades, for example, shows that students who have strong ties to their peers (a high value on the variable indegree) and make a transition have significantly better grades than those who remain in the same school. Similarly, these same students also have higher levels of school integration as compared with their popular peers who remain in the same school. Transitions also appear to benefit students who had few or no social ties in eighth grade. Isolated students who make a school transition were significantly more connected to their school in ninth grade than those isolates who did not change schools. Similarly, although students who were isolated in eighth grade are significantly more likely than nonisolates to have high scores on the measure of trouble, isolates who changed schools were significantly less likely to have trouble than those who remained in the same school.

There is also a significant difference in the level of school integration among those ever retained between those who changed schools and those who did not. Those who have ever been held back a grade are less connected with their teachers and peers than those who have not. Yet the previously retained who switch schools between eighth grade and ninth grade show significantly higher levels of school integration than those who stay in the same school. Similarly, although students who have been previously retained are significantly less likely to aspire to postsecondary education, those who change schools between eighth grade and ninth grade are significantly more likely to hope to go to college than those who make no transition.

Taken together, these findings paint a fairly consistent picture of the effects of the transition to high school. Rather than serving as an additional detriment in the often difficult phase of adolescence, these results suggest that the transition to high school can serve as a fresh start for some adolescents. That is, these results show little evidence of transition-specific changes in ninth-grade outcomes. Rather, the changes that occur between eighth grade and ninth

TABLE 4

Hierarchical Regression Analysis of Ninth-Grade Outcomes: Interaction Models

	Fight	Alcohol, Drug, or Tobacco Use	Delinquency	Weapon to School	GPA	School Integration	Trouble	College Aspirations
Wave 1 measure	1.532***	2.171***	2.223***	2.237***	.640***	.533***	.472***	.600***
	(.267)	(.231)	(.236)	(.506)	(.041)	(.041)	(.042)	(.045)
Interaction wave 1 measure	−.101	.132	−.351	.206	−.008	−.108*	−.014	−.009
	(.314)	(.276)	(.276)	(.587)	(.048)	(.048)	(.049)	(.054)
Female	−.481	.063	.082	−.618	.062	−.105	.069	.122
	(.268)	(.216)	(.234)	(.469)	(.053)	(.068)	(.058)	(.076)
Interaction female	−.290	−.036	−.561*	−.669	.071	.059	−.122	.023
	(.317)	(.260)	(.275)	(.544)	(.063)	(.081)	(.070)	(.091)
White	−.124	.312	−.209	−.300	−.019	−.056	.114	−.165*
	(.288)	(.230)	(.247)	(.471)	(.063)	(.072)	(.062)	(.082)
Interaction white	.265	.205	.432	.047	−.002	.105	.008	.009
	(.346)	(.279)	(.293)	(.540)	(.076)	(.087)	(.075)	(.099)
Family in poverty	.026	−.455	−.803*	−.338	−.109	−.131	−.006	−.060
	(.364)	(.320)	(.361)	(.639)	(.077)	(.097)	(.083)	(.109)
Interaction family in poverty	.251	.332	.894*	.412	.091	.082	.056	−.019
	(.424)	(.379)	(.412)	(.721)	(.090)	(.115)	(.098)	(.128)

Previously retained	.112	.131	.369	.803	−.157*	−.334***	.053	−.332***
	(.325)	(.286)	(.305)	(.496)	(.071)	(.089)	(.076)	(.099)
Interaction previously retained	−.024	−.370	−.673	−.934	.068	.303***	−.096	.286*
	(.386)	(.342)	(.358)	(.580)	(.084)	(.104)	(.091)	(.117)
IQ	.004	.002	.013	−.003	.006*	−.003	.003	.007*
	(.010)	(.008)	(.009)	(.017)	(.002)	(.003)	(.002)	(.003)
Interaction IQ	−.003	.006	−.009	.005	.001	−.000	−.004	−.002
	(.012)	(.010)	(.010)	(.020)	(.003)	(.003)	(.003)	(.004)
Social connectedness	.001	.043	.042	−.051	−.011	−.032***	.010	.004
	(.039)	(.034)	(.035)	(.077)	(.008)	(.012)	(.009)	(.011)
Interaction social connectedness	−.024	−.039	−.045	−.001	.019*	.040***	−.015	.011
	(.046)	(.040)	(.040)	(.085)	(.009)	(.012)	(.010)	(.013)
Missing network (flag)	−.013	.116	−.050	.472	−.004	−.065	.036	−.004
	(.305)	(.254)	(.280)	(.481)	(.063)	(.081)	(.070)	(.091)
Interaction missing network	−.463	.039	.195	−.271	−.009	.073	.031	.058
	(.362)	(.300)	(.321)	(.548)	(.075)	(.095)	(.082)	(.106)
Socially isolated	−.170	−.301	.640	. . .	.048	−.209	.168	−.027
	(.580)	(.502)	(.492)		(.113)	(.148)	(.127)	(.163)
Interaction socially isolated	−.334	.330	−.689	. . .	−.049	.347	−.367*	.085
	(.704)	(.610)	(.607)		(.141)	(.185)	(.158)	(.204)
Transition between schools	.636	−.405	1.627	.396	−.297	−.044	.551	.085
	(1.317)	(1.082)	(1.145)	(2.089)	(.279)	(.358)	(.290)	(.437)

NOTE.—Each of the predictor variables is being interacted with the transition variable. Numbers in parentheses are standard errors.
* $p \leq .05$.
*** $p \leq .001$.

grade appear to be the same for those who change schools as for those who do not.

Analysis of School-Level Factors

In the final stage of analysis, we examine whether and how the size of a student's ninth-grade school influences the transition to ninth grade. As noted earlier, much of the research on transition effects has posited that changes in the conditions of schooling—particularly school size—are responsible for transition effects. To examine whether this is the case, we estimated a set of hierarchical linear regression models that include a set of controls for student's ninth-grade school: school minority status (whether 40 percent or more of students are nonwhite), school sector (public or private), and the number of students in the school. The first two of these measures are dichotomous, while the third is categorical, operationalized in these models with two dummy variables: small (599 students or fewer), medium (600–900 students), and large (901 or more students), with medium the omitted category. These school-level variables are included as contextual controls to determine whether the relationships observed in table 3 persist after controlling for characteristics of ninth-grade schools.

A brief note about the construction of the school size measure is warranted. Although there is a sizable body of research on the effects of school size, previous studies offer inconsistent evidence about the preferred size for any outcome. The size categories reported here are drawn from Lee and Smith (1997), who find that student benefits are maximized in schools with 600–900 students. However, to examine the robustness of these results, we examined models using several different size thresholds, different numbers of categories, and a continuous measure of the number of students (results not shown). The effect of the school transition was consistently nonsignificant across all specifications of school size.

Table 5 presents a portion of the output from these models. Several of the characteristics of schools are significantly related to students' ninth-grade outcomes. However, the focus of these models is on whether the inclusion of these school-level variables reveals significant transition effects. The bottom row of the table contains the coefficients for the variable on school transition. As with the results of the models presented in earlier tables, only one of the outcomes (odds of carrying a weapon to school) has a significant transition effect once school size is controlled for. None of the other nonacademic outcomes are significantly related, nor are any of the academic outcomes.

In sum, having examined a number of different models for several ninth-grade outcomes, we find very few differences in transition effect. For the clear

TABLE 5

Hierarchical Regression Analysis of Ninth-Grade Outcomes: Effects of School Size

	Fight	Alcohol, Drug, or Tobacco Use	Delinquency	Weapon to School	GPA	School Integration	Trouble	College Aspirations
Size of ninth-grade school (medium size [600–900 students] omitted):								
Small (1–599 students)	−.033	.036	−.335	.592	−.101	−.185**	−.031	−.049
	(.269)	(.192)	(.213)	(.339)	(.070)	(.061)	(.054)	(.074)
Large (901+ students)	.126	−.126	−.034	.221	−.026	−.035	.003	.066
	(.206)	(.150)	(.160)	(.274)	(.055)	(.047)	(.041)	(.057)
School minority status (40%+ nonwhite)	.143	−.372*	.004	.132	−.050	.066	−.061	.065
	(.198)	(.152)	(.161)	(.272)	(.050)	(.048)	(.042)	(.057)
Private school	.089	−.514*	.015	−.850	.081	.194*	.066	.247**
	(.333)	(.243)	(.266)	(.506)	(.086)	(.077)	(.068)	(.093)
Transition between schools	.124	.169	.248	.587*	−.069	.045	−.025	−.008
	(.192)	(.139)	(.151)	(.275)	(.051)	(.043)	(.039)	(.053)

NOTE.—Models include controls for gender, race, poverty status, prior grade retention, IQ, social connectedness, social isolation, and level of outcome as measured at wave 1. Numbers in parentheses are standard errors.

* $p \leq .05$.

** $p \leq .01$.

majority of outcomes, these models show no effect of changing schools between eighth grade and ninth grade.

Discussion

Given these findings, what can be said about the effects of the transition into high school? The most straightforward message is that student outcomes, whether academic or nonacademic, change between eighth grade and ninth grade; however, contrary to the conclusions of previous research on the topic, the degree of change is basically insensitive to the presence of a transition between schools. Outcomes do change between eighth grade and ninth grade; however, in most cases, the degree of change is roughly the same for students who change schools in changing grades as for those who change grades within the same school.

Moreover, these results suggest that, where there is sensitivity to changing schools, it is where it is least expected on the basis of previous research on school transitions—and in the opposite direction. Specifically, there seem to be benefits for some students to having a fresh start, and this is especially so for those students who have troubled histories with respect to peer integration, attachment to school, and prior history of grade retention. For these students, a change of school yields tangible benefits. Those who were isolated in eighth grade are significantly less likely to be isolated in ninth grade if they change schools.

These findings invite reexamination of the consequences of school transitions. Consistent with previous studies of the high school transition, we find that student outcomes change as the students move from eighth grade to ninth grade; however, our findings suggest that these changes are driven by factors other than changing schools. Although there are important changes in the levels of both school-related and nonacademic outcomes examined, the magnitude of changes is remarkably similar for students who change schools and for those who do not. That is to say, moving from eighth grade to ninth grade results in changes in outcomes for all students, regardless of whether the move is accompanied by a change of schools.

These results also speak to the importance of exploiting natural variation in the structures and practices of the American educational system. As Cook and Payne (2002) noted, there is general discontent with the current state of educational knowledge and research. While Cook and Payne call for increased use of experimental designs, the use of quasi-experimental designs should not be abandoned, particularly given the natural variation of educational contexts present in data sets such as Add Health. On a similar methodological note, these findings call attention to the benefits of directly examining some long-

held conclusions of previous research with new data and new analytical techniques. There have been few data sets that allow for comparison such as that examined in these analyses. Moreover, although these data do not allow for such an examination, it should be noted that we examine the effects of a single transition rather than multiple transitions. It may be that while one transition has little harmful effect, multiple transitions might. This is a question that should be addressed in future research.

One additional methodological note is required. These data contain no information that can help address a potential selection problem of whether students and parents choose to attend a particular type of school. That is, if parents and students have preferences for schools with a particular grade configuration (say, grades 9–12) or some characteristic believed to be associated with such configuration, then these results may confound school-form effects with unobserved differences in student and family characteristics. There is little evidence to suggest that families make school decisions based on such criteria; however, if they do, these results may be affected.

These results also suggest the need for a more expansive view of how transitions shape outcomes for particular groups of students. The benefits shown in table 4 to those who were socially isolated or stigmatized in eighth grade speak to the improvements that may come with a new environment. Future research should explore the mechanisms through which these processes operate, although most likely adolescents who were marginalized in eighth grade are able to craft new identities for themselves in the more diverse social worlds of high school. Understanding these mechanisms will greatly advance our understanding of how schools and adolescent peer groups operate. Further probing of these findings may also yield important understandings about the interplay of the personal and structural in adolescent identity formation.

These results suggest that things change for students as they move from eighth grade into ninth grade; however, surprisingly, the extent to which things change is not influenced by whether or not a student makes a transition between schools in changing grades. That is to say, transitions are of relatively little consequence in comparison with other features of life in school since those students who are in good shape will not suffer and those with more checkered social, academic, and behavioral pasts could benefit.

Notes

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1. The broadest line of argumentation is that transitions are difficult for adolescents. Simmons and Blyth (1987) suggest that the transition to junior high or middle school is particularly difficult because it occurs during puberty. Eccles and her colleagues (e.g., Eccles et al. 1991) argue that transitions are difficult because students are required to enter a social environment for which they are developmentally unprepared. Consequently, outcomes from such transitions tend to be negative.

2. Attesting to the diversity of schooling forms in the American public education system, particularly in the middle grades, eighth graders in Add Health attended school in an institution with one of the following grade spans: K–12, K–8, 5–8, 6–12, 6–8, 6–9, 7–8, 7–9, 7–12, and 8–12.

3. MLWin is a software package for fitting multilevel models. It was developed by the Centre for Multilevel Modelling team at the Institute of Education, University of London. See also Goldstein (1995) and Rabash et al. (2000).

4. We examined alternative operationalizations of outcome variables and found that results are robust across various operationalizations.

5. Because our sample is restricted to students in one particular grade at a particular point in time, most of the variation in age is captured by the measure of previous grade retention, in any case.

6. This variable is labeled "indegree" in the Add Health data set.

7. The threshold for minority status is based on previous work using this measure (e.g., Crosnoe et al. 2004; Lee and Smith 1997).

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