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Marital Transitions, Parenting, and Schooling: Exploring the Link Between Family-Structure History and Adolescents' Academic Status

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Abstract

The linkage between family structure and adolescents' academic experiences is part of a larger, dynamic process unfolding over time. To investigate this phenomenon, this study drew on the National Longitudinal Study of Adolescent Health and the Adolescent Health and Academic Achievement Study. Logistic regressions revealed that family structure at birth predicted students' academic status in math in the ninth grade, and multinomial regressions revealed that family instability, along with curricular location in the ninth grade, parenting behaviors, and adolescents' adjustment and aspirations, distinguished those who completed higher-level math by the end of high school from those who did not but still graduated from high school and from those who dropped out of high school.

The life-course paradigm views human development as an interplay between individuals' developmental trajectories and the trajectories of their significant others (Elder 1998). One of the most intuitive examples of this linked-lives principle is the parentchild relationship. Parents, through the choices and decisions they make for themselves and their children, influence how their children grow and develop over time (Furstenberg et al. 1999).

This view of the linked lives of parents and children offers unique insights into a hotly contested issue in contemporary American society: the implications of changes in family structure for adolescents' well-being, including adolescents' academic experiences. A large, multidisciplinary literature has examined the association between family structure and adolescents' academic outcomes, documenting that young people who live in "alternative" families (i.e., reside with a single parent or a stepparent) have more problems in school than do those who live in two-biological-parent families (Astone and McLanahan 1991, 1994; Coleman 1988; DeLeire and Kalil 2002; Hill, Yeung, and Duncan 2001; McLanahan and Sandefur 1994; Schiller, Khmelkov, and Wang 2002; Wojtkiewicz 1993). The image that emerges from these snapshots of the effects of family structure suggests something more dynamic about family life and its role in education. Specifically, one of the most significant trajectories of parents' lives, their marital histories, is closely connected to one of the most significant trajectories of their children's lives, their academic careers.

Working from a life-course perspective, the general goal of the study presented here was to examine whether this dynamic aspect of linked lives exists and, if so, to explore the reasons why it does. We addressed this goal through four objectives. First, we constructed measures of family-structure history that reflect the number of family transitions that children experienced from birth through early adolescence, as well as the family structure at birth. Second, we identified key transition points in adolescents' educational careers that reflect adolescents' placement in math courses. Third, we investigated the dynamic association between family-structure history and adolescents' educational careers. Finally, we explored various mechanisms underlying this longitudinal association. Thus, we view the often-studied connection between family structure and adolescents' educational careers as one that unfolds over time.

The study drew on a new data source for educational research: the Adolescent Health and Academic Achievement Study (AHAA), which adds detailed educational data from high school transcripts to the National Longitudinal Study of Adolescent Health (Add Health). Matching a life-course perspective with this valuable new data set allowed us to address an enduring challenge of the American educational system: how to identify students who are less prepared for the increasingly credential-based labor force in a time of continued family instability and change.

THE FAMILY AS A DYNAMIC INSTITUTION

The structure of families is a crucial dimension of the family context, one that continues to be a visible aspect of public debate as the demography of American families evolves. Rising rates of divorce and nonmarital fertility, along with declining rates of marriage and remarriage, have created diversity in the structure of American families (Casper and Bianchi 2001). Such diversity has played a role in the political and cultural discourse on the government's role in strengthening marriage, welfare reform, and even gay marriage.

This diversity has also been implicated in the educational disparities among American youths. Although the magnitude and long-term implications of changes in family structure continue to be debated (e.g., Cherlin 1999; Hetherington and Kelly 2002; Wallerstein, Lewis, and Blakeslee 2000), scholars have generally agreed that those in alternative families are more likely to drop out of high school, complete fewer years of formal schooling, score lower on standardized tests, and report lower grades than others (Astone and McLanahan 1991; DeLeire and Kalil 2002; Hill et al. 2001; McLanahan and Sandefur 1994; Teachman et al. 1998; Wojtkiewicz 1993). These differences in academic achievement during high school often presage limited occupational opportunities and socioeconomic inequality during the transition to adulthood and beyond (Wilson 1990).

This body of work has typically taken a static view of family structure, capturing it at a specific point in parents' marital trajectories (i.e., the family situation at a given age or at the time of a survey). Family structure, however, often represents a dynamic set of parental relationships, including spells of marriage, cohabitation, singleness, divorce, or some combination of these statuses (Cavanagh and Huston 2006; Cherlin, Chase-Lansdale, and McRae 1998; Hill et al. 2001; Wu 1996; Wu and Martinson 1993). In other words, the level of stability in the home environment is also important to adolescents' academic careers. Consequently, family structure measured as a dynamic trajectory provides added value to our understanding of different family forms and their role in the well-being of children and adolescents.

Family instability can be operationalized in a number of ways—a count of changes in a resident parent's (or parents') marital status that a child experiences, a tally of the different family arrangements in which a child has resided, and the duration of time spent in different family-structure statuses. Each gets at the level of instability in the home. In our study, we focused on

the first, a count of the changes in a resident parent's marital trajectory. This indicator reflects the *cumulative* effect of the loss or addition of a parental figure in the home, a change that is repeatable and that may disrupt a child's sense of security; create ambiguity in household rules, family relationships, and parental expectations about behavior; and have negative implications for children's performance in school (Hill et al. 2001; Teachman 2003; Wu and Martinson 1993).

We also considered family structure at birth, a strong correlate of family instability (Bumpass and Lu 2000). Young people who were born to single mothers, for instance, experience more subsequent family change than do those who were born to married couples. Moreover, family structure at birth serves as a proxy for the different socialization and economic contexts into which a child is born, as well as unmeasured selection factors (e.g., the mother's and father's personal characteristics) that contribute to the likelihood of being born into a particular family-structure status (Hao and Xie 2002). To the extent that these factors are related to parental resources and support, they may also affect adolescents' academic status in high school (Schneider and Coleman 1993).

Thus, the first objective of our study was to map out children's family-structure histories. By combining information from past and present statuses, we could better capture the lived experience of young people, a necessary first step in investigating the potential academic consequences of family structure.

EDUCATION AS A CAREER

Students' academic experiences in a given year are one part of a larger trajectory that makes up their educational careers (Kerckhoff 1993; Pallas 2003). This trajectory is the clearest in subjects like math, in which courses are arranged in a hierarchical sequence, ranging from less advanced (e.g., Remedial Mathematics) to more advanced courses (e.g., Calculus), and where access to more advanced courses is contingent on the successful completion of earlier ones (Adelman 1999; Schneider, Swanson, and Riegler-Crumb 1998; Stevenson, Schiller, and Schneider 1994).

Yet even in this hierarchically structured subject, there is variation in individual progression. Students who begin high school in higher-level math can lose this advantage (Pallas 2003; Schiller 1999). In particular, by their junior year in high school, students often have completed much of their required courses and have the opportunity to take more elective courses and explore their interests. A consequence of this increased autonomy and agency is that some students may find it easier to get offtrack and opt out of advanced courses in core subjects, such as math, as the course work becomes more challenging and nonacademic domains of success become more important (Csikzentmihalyi and Schneider 2001; Lee, Smith, and Croninger 1997; Powell, Farrar, and Cohen 1985). A second objective of this study, therefore, was to identify students' academic status in math at the start and end points of high school as key markers of their academic careers.

The transition to high school is a key marker in students' educational careers (Roderick 1993; Schiller 1999). During the initial year of high school, the courses that students take, the grades that they receive, and their scores on standardized tests set the stage for later success in taking advanced courses, mastering difficult curricula, and scoring well on examinations (Stevenson et al. 1994). Just as those who begin by taking more advanced courses and earning higher grades have greater opportunities to excel academically across the high school years, those who begin high school earning low grades and taking lower-level courses have few opportunities to recover and excel over time (Alexander, Entwistle, and Horsey 1997; Roderick 1993). Thus, getting ontrack early is particularly important for a subject like math, in which

students who begin high school taking a core course like Algebra I have less difficulty reaching key college preparatory courses, such as Algebra II, by the end of high school.

Students' achievement by the end of high school is another key point in their academic careers. At this point, students could have dropped out of high school, graduated without having completed college preparatory work, or graduated having completed college preparatory work. Math course taking, in particular, is one of the strongest predictors of college matriculation (Schneider et al. 1998; Stevenson, Kochanek, and Schneider 1998). Specifically, Algebra II is generally considered a key preparation for college entrance examinations, such as the SAT (Schiller and Hunt 2003; Wells and Oakes 1996), and students who take this course are significantly more likely than are those who do not to attend four-year colleges (Adelman 1999; Schneider et al. 1998). Thus, students' academic status in math at the end of high school represents far more than students' interest and ability in a specific subject; rather, it captures a more general picture of students' cumulative academic careers in high school, with some students leaving high school prepared to continue their studies in a four-year college or university, others prepared only to attend a two-year college, and others failing to obtain even the most basic educational credential of a high school diploma.

FAMILY INSTABILITY AND EDUCATIONAL CAREERS

Up to this point, we have focused on how the life-course perspective provides a lens for understanding family structure and academic status as individual trajectories for both parents and adolescents. Now, we turn to another aspect of the life-course perspective—linked lives, or how the trajectories of parents and adolescents are related to each other. Exploring this linkage was the third objective of this study.

Starting with *family instability*, we expect that students who reside in less stable families will be less likely to complete Algebra I in the ninth grade than will all other students. Given the cumulative nature of schooling, we expect that this difference in academic status in math will become more pronounced by the end of high school as students who were born into less stable families are more likely to take advantage of the more loosely organized structure of high schools and to disengage from academic pursuits during these years at a greater rate (Crosnoe 2002; Lee et al. 1997). Turning to *family structure at birth*, we expect that students who were born into single-parent families will be less likely to complete Algebra I in the ninth grade and to complete Algebra II by the end of high school than will those who were born into families with two biological parents.

Why may this linkage between parents' marital histories and adolescents' educational careers exist? In our study, we posited two possible explanations for this association: parenting behaviors and adolescents' adjustment and aspirations. Testing these potential explanations for the link between family instability and adolescents' academic status at the end of high school was the fourth objective of this study.

Beginning with parenting behaviors, changes in family structure can disrupt relationships between parents and adolescents (Amato 2000; McLanahan and Sandefur 1994). Because of time constraints, lack of help, new obligations, and the possible strain introduced to the parent-child relationship by divorce or the start of a parent's new romantic relationships, single parents and those who are married to or are cohabiting with new partners may experience less closeness with their adolescents, and despite their best efforts, may be less involved in their adolescents' educational careers (Amato 2000; Astone and McLanahan 1991; Hetherington 1989; McLanahan and Sandefur 1994; Schneider and Coleman 1993). If children do not feel close to their parents or if parents are not able to supervise their children's lives, parents' influence on adolescents' school achievement and course-taking decisions may be undermined (Baker

and Stevenson 1986; Kelly 2004; Useem 1991). Therefore, differences in parenting practices may explain why adolescents in less stable families fail to advance in the math course sequence.

With regard to the characteristics of adolescents, ample evidence suggests that young people in alternative families have lower socioemotional adjustment and academic aspirations (Chase-Lansdale, Cherlin, and Kiernan 1995; Cherlin and Furstenberg 1994; Hetherington 1989). Conflict, instability, and ambiguity in family relationships, rules, and responsibilities may trigger emotional distress, an effect that can be exacerbated with each change in the family (Amato 2000; Wu and Martinson 1993). Family disruptions may also cause adolescents to be less optimistic about their future, including their prospects of attending college (McLanahan and Sandefur 1994). Thus, the increased depression and lower aspirations that may co-occur in families that are marked by multiple transitions may be academic risk factors, leading adolescents to drop out of math or out of school all together before they have accrued advantages from these experiences (Kelly 2004; McLeod and Kaiser 2004).

RESEARCH DESIGN AND METHODS

Data

The data for this study came from Add Health, a nationally representative sample of adolescents who were in Grades 7–12 in 1995, and the AHAA transcript study. Add Health was designed to explore the effects of multiple contexts of adolescents' lives on health and health behavior (see Bearman, Jones, and Udry 1997). It used a multistage, stratified, school-based, cluster sampling design to select 80 high schools in 80 communities and then to select an additional 52 schools (typically middle schools) that fed into these high schools. In each study school, Add Health collected in-school questionnaires from every student who attended on the day of administration (approximately 90,000 young people). About one year later, Add Health selected a nationally representative sample from this pool of students to participate in three in-home interviews. Wave I ($n = 20,475$) was conducted between April and December 1995. All Wave I respondents, except those in the 12th grade, were reinter-viewed at Wave II, between April and September 1996 ($n = 14,738$). The Wave III interview, conducted between August 2001 and April 2002, captured respondents aged 18–26 ($n = 15,170$). Approximately 74 percent of the original Wave I sample completed this questionnaire.

Up to this point, Add Health has been more valuable for studies of adolescents' health and well-being than for education. The AHAA transcript study supplements Add Health with detailed information on educational careers. All Wave III respondents were asked to complete a high school Transcript Release Form that authorized the study personnel to collect transcripts from the last schools the respondents attended. Approximately 91 percent of the Wave III respondents signed a valid Transcript Release Form and had transcript data collected. These data provide official grades, indicators of course-taking patterns at the student- and school level, and educational contexts within and among schools that can be linked to the data from the Add Health survey.

This study used a subsample of Add Health created with two sets of filters. The first encompassed several criteria that are typically used in longitudinal research with Add Health. The analytic sample was restricted to young people who completed the Wave I, Wave II, and Wave III in-home interviews, resulting in a sample of 11,620 youths.

The second set of filters was specific to the needs of this study. First, a grade filter was applied, restricting the sample to young people in the 7th, 8th, or 9th grade at Wave I. This restriction was applied as a way to address the different time frames covered by the Add Health and AHAA studies. As we mentioned earlier, Add Health conducted the Wave I in-home interviews on a sample of 7th–12th graders. AHAA collected transcripts across the high school years. So, for

example, the high school transcripts of an 8th grader at Wave I would *begin* in the next academic year. On the other hand, the high school transcript of a 12th grader at Wave I would *end* just as Wave I began. Although necessary, this disconnected time frame affects the temporal direction of planned analyses and thus requires the selection of special grade-related subsamples for different research questions. For this study, we selected the Wave I junior high school cohorts to ensure that most of the data that were used to create family-structure histories and the theoretical mediators occurred before or at the same time as the start of the students' high school careers. This filter resulted in a sample of 5,875 adolescents. Second, only young people with valid transcript data (a loss of 1,120 adolescents), with sampling weights (a loss of 375 adolescents), and who resided with at least one biological or adoptive parent in the first year of life (a loss of 145 adolescents) were included in the study, resulting in a final sample of 4,217 students.

This analytic sample is smaller than the full Wave I sample. The important question is whether the exclusions that led to this sub-sample introduced bias. To examine this issue, we performed a set of *t*-tests that compared the key analytic variables (e.g., family-structure history, the potential mediators, and sociodemographic characteristics) across the different samples produced by these selection criteria. We also compared the self-reported overall grade point average (GPA) and the math GPA at Wave I as a proxy for academic achievement, indicators that all who met at least the first set of filters had. Specifically, we compared the full Wave I sample to the longitudinal sample that resulted from the first set of filters to get a sense of the potential attrition bias introduced with longitudinal data. Next, we compared the longitudinal sample to the younger-cohort sample and then compared the younger-cohort sample to the analytic sample to get a sense of the potential bias associated with transcript data, sample weights, and other factors.

The results, shown in Table 1, indicate that these filters introduce some attrition bias to the analytic sample. Except for the grade filter, each filter biased the sample to include adolescents who were raised in more stable family environments and who were more advantaged socioeconomically. For instance, restricting the sample to those with complete longitudinal in-home interviews reduced the proportion of adolescents who lived in less stable homes and who lived in a single- or stepparent family at birth. In addition, excluding those without transcript information or weights and those who lived with no biological or adoptive parent in the first year of life further narrowed the sample to include students who were more academically advantaged and from more stable homes. Restricting the sample to those who were in the younger cohort considerably reduced the size of the analytic sample, but because grade in school is exogenous to the focal relationship, these differences did not introduce selection bias to the analytic sample.

These biases, which likely underestimate family instability, overestimate academic success, and underestimate the link between family instability and students' academic careers during high school, must be kept in mind when interpreting results, although they are arguably offset by the many benefits of Add Health and AHAA, such as their large sample size and longitudinal family and educational data, all of which we used in this study. Again, the final analytic sample included 4,217 adolescents.

Measures

Table 2 presents descriptive statistics on all the variables in the study.

Academic status in mathematics at the start and end of high school was identified with data collected from official high school transcripts. Because the math course sequence in American high schools is largely standardized and follows a hierarchical structure, the AHAA transcript data were used to create math course sequences similar to those previously designed for

research on the National Education Longitudinal Study of 1988 (Schiller and Hunt 2003; Schneider et al. 1998). Each math class was assigned a CSSC (Classification of Secondary School Courses) code to create standardized classifications across schools. These multiple classifications were then collapsed into 10 hierarchically ordered categories (0 = No Math; 1 = Remedial Math; 2 = General Math; 3 = Prealgebra; 4 = Algebra I; 5 = Geometry; 6 = Algebra II; 7 = Advanced Math, including Algebra III, Statistics and Probability, and Pure Math; 8 = Precalculus; and 9 = Calculus) for each academic year. An additional indicator was also created to identify the highest math course taken within the sequence by the end of high school.

A second version of each of these indicators was constructed that reflected only math courses for which students' received credit, meaning that the students generally passed the courses (for additional information, see Riegle-Crumb et al. 2005). Using this second set of measures, we used students' values on the course-sequence variable from the first year of high school to construct a binary variable that reflected whether adolescents completed Algebra I or a higher course in the ninth grade (0 or 1). Students' values on the course-sequence variable that measured the highest math completed by the end of high school, plus self-reports in the Wave III interview of whether the students dropped out of high school, were used to construct a three-level variable that reflected whether adolescents had (1) dropped out of high school, (2) graduated but did not complete at least Algebra II by the end of high school, or (3) graduated and completed Algebra II or a higher course by the end of high school.¹

Family structure change was indexed with a set of measures that reflected family structure at birth and the number of parental divorces, remarriages, or cohabitations that adolescents experienced from birth through early adolescence. Programmed by the project staff at the University of North Carolina, three sources of data from the Wave I in-home interviews were used to construct these measures: youths' reports of their current family structure; youths' reports of the duration of life spent with current household members, including resident parents, a stepparent, and a parent's partner; and whether and for how long a youth lived with a nonresident biological parent. These data were combined to create indicators of resident parents' composition for each year in an adolescent's life up through Wave I (Heard and Harris 2001).

For each year in an adolescent's life, family structure was operationalized as eight mutually exclusive categories: (1) two biological parents, (2) biological mother and stepfather, (3) biological father and stepmother, (4) two adoptive parents, (5) surrogate parents (foster, relative, or other type of parent), (6) single-mother family, (7) single-father family, and (8) no parent or person acting in the parental role. The adolescents also reported on their current family structure during the Wave II in-home interviews that were conducted the following year. Using the same operationalizations of family structure as were just listed, we included family structure at Wave II in the array, representing the last year of valid data on family structure. For all the constructed measures, those in families with two adoptive parents were combined with those in families with two biological parents.

From this array, we created three indicators of family-structure history: a count of the changes in the resident parent or parents' marital trajectory from birth through the Wave I in-home interview, a second count of the changes from birth through the Wave II interview, and family structure during the first year of life. The first measure, family instability from birth to Wave I, was used when predicting academic status in the ninth grade, and the second, family instability from birth to Wave II, was used when predicting academic status at the end of high school. Both measures of family instability are counts that increase by 1 for each transition

¹Thirty-three students in the analytic sample completed at least Algebra II but eventually dropped out of high school. They were coded as high school dropouts.

from one family-structure status to another. For example, an adolescent who was born into a family with two biological parents who then resided with her single mother at age 5 and then lived with her single father from age 8 through Wave II would have a family-instability score of 2. Likewise, an adolescent who resided in a mother-only family and an adolescent who resided in a family with two biological parents up through Wave II would each have a family-instability score of 0.

Turning to family structure at birth, adolescents who resided with two adoptive parents ($n = 35$) or with a biological parent and his or her partner ($n = 44$) in the first year of life were combined with those who resided with two biological parents ($n = 3,455$), the reference category.² Adolescents who spent their first year of life living in a mother-only ($n = 651$) or father-only ($n = 67$) family constituted the category, single-parent family at birth.

We should note that no distinction between formal (marriage) and informal (cohabitation) unions was made in the construction of these measures, meaning that for this study, a transition from cohabitation to marriage for a given couple was not included in measures of family instability. Moreover, if members of the sample experienced multiple family structures in a given year, only one of the statuses is reflected in these measures. Finally, transitions that a child experienced that are separate from her or his resident parent's transitions (e.g., a child of divorced parents might have lived for a time with one parent and experienced the parent's remarriage but, at the time of Wave I, was living with the other parent) are not included. These limitations likely underestimate family instability and should be kept in mind when interpreting results.

We considered two sets of factors that may help to explain the association between family instability and adolescents' educational careers. First, we explored three dimensions of parent-adolescent relationships, each based on the adolescents' reports at Wave I. *Parent-adolescent closeness* was the mean response (0 = low to 4 = high) on the level of closeness, satisfaction, warmth, and satisfaction with communication in the parent-adolescent relationship ($\alpha = .89$). *Parental supervision* was an index variable, ranging from 0 to 4, that indicated whether a parent was present in the home most or all of the time (when the adolescent went to school in the morning, came home from school in the afternoon, ate evening meals (five to seven dinners a week), and went to bed at night ($\alpha = .31$). *Parental involvement in education* was also an index variable, ranging from 0 to 3, that indicated whether, in the past four weeks, a parent talked with the adolescent about schoolwork or grades, helped her or him work on a project for school, or talked about other things that she or he was doing in school. Adolescents reported their mothers' and fathers' involvement in school separately. For two-parent families, this count was based on reports for the more involved parent ($\alpha = .61$).

Second, *adolescents' adjustment* was based on the adolescents' responses to 20 items on symptoms of depression at Wave I. Most (18 of the 20) items were taken from the Center for Epidemiologic Studies Depression Scale (CES-D) (Radloff 1977) and asked about behaviors and feelings in the past week, including talking less than usual, feeling depressed, and feeling disliked by others (see the Appendix for a complete list of items). The other two questions (frequent crying and sleeplessness) refer to behaviors in the past year. Because responses to some questions range from 0 to 3 and others from 0 to 4, all weighted items were standardized with a mean of 0 and a standard deviation of 1. The depression index reflects the mean score of the 20 standardized items ($\alpha = .88$). We measured *adolescents' aspirations* with a single item that asked the respondents how much they wanted to go to college (range: 1 to 5).

²Separate analyses estimated each model with biological parents and their partners as a separate category. No significant differences were identified between adolescents in these families and those in families with two biological parents. Tables are available upon request.

Three individual-level controls, all measured at Wave I, were included in our analyses. The first was *self-reported age*, the average age of the sample was about 14. The second was gender, with the sample about evenly split between boys and girls. *Race and ethnicity* (dummy variables for Latina/Latino, African American, Asian American, white (the reference category), and other) were also included.

Parents' educational attainment, a family-level control measured at Wave I, was also included in the analyses because it affects the risk of both a change in family structure and of being offtrack in the math course sequence (Baker and Stevenson 1986; Martin and Bumpass 1989; Sewell and Hauser 1980). This item was based on the adolescents' reports of their parents' highest level of completed schooling. Responses were coded into four dummy variables: college graduation or more, some post-high school education, high school graduation or a general equivalency diploma (the reference category), or less than high school graduation. Those who did not know their parents' level of education were included in the reference category, with a binary variable indicating missing data included in the analysis (Astone and McLanahan 1994). For two-parent families, this measure was based on the more educated parent's level of education.

Two school context characteristics, *type of school* (public or private) and *urbanicity* (e.g., rural, urban, and suburban), were also included in all the multivariate analyses. These items, each measured at the in-school interview, were included to control for differences in the relative electivity of advanced courses (Jones, Vanfossen, and Ensminger 1995; Lee and Smith 1995). We should note, however, that all the high schools in the Add Health sample offered at least Algebra I and II.

Analytic Techniques

The first two objectives of the study involved creating measures that represented parents' marital histories and adolescents' academic status in math at the start and end of high school. Descriptive analyses explored aspects of family-structure history, as well as the links between family instability and key analytic variables. The means of the dependent variables and explanatory variables across levels of family instability are presented, with the statistical significance of differences established with regression estimates, controlling for family structure at birth.

For the third objective (establishing the association between family-structure history and academic outcomes), we estimated logistic (academic status in the ninth grade) and multinomial regressions (academic status at the end of high school) in which each academic outcome was predicted by family-structure history and the full set of control variables. The results of multinomial logistic regressions can be unwieldy because each category of the dependent variable can serve as a reference category. We estimated each model with all the reference categories, but to maximize clarity, we discuss models in which students who graduated and completed at least Algebra II are in the category of interest, not the reference category, and note important differences when useful. Also, to make the text less cumbersome, we refer to those who graduated and completed at least Algebra II or a higher course as *Algebra II-plus graduates*, those who graduated but did not complete at least Algebra II as *non-Algebra II graduates*, and those who dropped out of high school as *dropouts*.

For the fourth objective (examining mechanisms that explain the links between family-structure history and academic status at the end of high school), we added each set of explanatory factors (i.e., parenting practices and adolescent adjustment measures) to the base model. These explanatory analyses were estimated only on the end-of-high school measure of academic status to sort out the temporal direction of cause and effect by placing mediating mechanisms, measured at Wave I, in their proper chronological order.

All the analyses used sampling weights to adjust for the complex sampling design of Add Health. Because the respondents were clustered within schools, standard errors may be underestimated in standard regression models. To account for this problem, we estimated all the models with a robust cluster estimator in Stata (StataCorp 2001).

RESULTS

Family-Structure Histories in Adolescence

We begin by exploring family-structure history in depth (see Table 2). Using family structure in the first year of life as a starting point, we found that most children were born into married-couple families (82 percent) and that the balance were born into single-parent families (16 percent). Furthermore, most children experienced *no* change in family structure from birth through Wave II, but 38 percent of the sample did experience the exit or entrance of a parent or a parent's romantic partner at least once, with about 18 percent experiencing one family transition, 14 percent experiencing two transitions, 5 percent experiencing three transitions, and 2 percent experiencing four or more transitions from birth through early adolescence.

Across the period during which family structure was recorded, more than a third of the sample (39 percent) spent time living in an alternative family (i.e., not with two biological parents). The most common type of alternative family was a single-mother family (about 30 percent of the children spent some time in this type of family). About 18 percent spent some time living in a stepparent family, another 4 percent spent some time living with their single father only, and about 2 percent spent time living with a surrogate parent or no biological parent.

Associations between aspects of children's living arrangements across childhood and early adolescence are presented in Table 3. Family instability was related to family structure at birth, with adolescents who were born into single-parent families experiencing about three times as many transitions as those who were born into married-couple families. More than two-thirds of those who were born into single-parent families experienced some family instability, compared to less than a third of those who were born into married-couple families. Adolescents who were born into single-parent families spent some time residing with two parents—either both biological parents (22 percent) or a biological parent and his or her partner (48 percent). Among those who were born into married-couple families, the most common form of alternative family that they experienced was a mother-only family (18 percent), followed by a stepparent family (12 percent). Recall that these percentages are not mutually exclusive and hence do not sum to 100, but instead reflect experiences in different family-structure statuses across childhood and early adolescence.

Next, we examined mean differences in the adolescents' academic status at the start and end of high school across levels of family instability, net of family structure at birth (see Table 4). In the ninth grade, young people in unstable families were significantly less likely to complete Algebra I. Family instability was also linked with academic status at the end of high school. Those who experienced more family instability had a lower likelihood of being Algebra II-plus graduates by the end of high school than being non-Algebra II graduates or high school dropouts.

Finally, we explored the associations between family instability and parent and adolescent factors. Beginning with parenting behaviors, parent-adolescent closeness and parental supervision were negatively associated with family instability, net of family structure at birth, but no association between parental involvement in school and family instability was detected. This finding suggests that greater family instability undermined young people's relationships with their parents and the ways in which the parents supervised their children. Next, we considered indicators of adolescents' adjustment and aspirations. Recall that the psychological

distress scale was based on standardized items, meaning that values less than zero indicate lower-than-average levels and those higher than zero indicate higher-than-average levels of depression. The bivariate association between family instability and adolescents' psychological distress was curvilinear, but when family structure at birth was taken into account, the association between these two factors was linear and positive. Thus, more instability was associated with higher levels of psychological distress. Adolescents' aspirations for college, however, were not related to family instability, net of family structure at birth.

Overall, these findings highlight the complexity of adolescents' living arrangements across childhood and early adolescence. Moreover, they suggest that family instability was associated with students' academic status at the start and end of high school. Family instability was also associated with the two sets of factors that were hypothesized to explain the focal relationships between family instability and the academic statuses of adolescents. The next set of analyses explored these associations in a multivariate framework.

Family Instability and Adolescents' Academic Status

The primary goal of this study was to explore the linked lives of parents and adolescents, focusing on how parents' marital histories affect the educational careers of their school-going adolescents. The first set of multivariate analyses pursued this goal by exploring the association between family-structure history and academic status at key points in time (see Table 5). The results of the logistic regression, the technique used to model academic status in the ninth grade, are presented as the odds of completing Algebra I or a higher course. The results of the multinomial logistic regression, the technique used to model academic status at the end of high school, are presented as relative risk ratios.

In the baseline model for ninth-grade math status (Model 1), adolescents in less stable families were somewhat less likely to complete Algebra I in the ninth grade than were others, but this association was not significant at conventional levels. Family structure at birth, however, was associated with this outcome, with adolescents born into single-parent families experiencing a 25 percent decrease in the odds of completing Algebra I in the ninth grade compared to those who were born into families with two biological parents (odds ratio = .75). As for the control variables, older adolescents and boys were less likely to complete Algebra I in the ninth grade, whereas adolescents whose parents had at least some college education were more likely to complete Algebra I, net of other factors. Students who attended private schools were also more likely to complete Algebra I in the ninth grade than were those in public schools.

The second set of models presented in Table 5 examined whether instability predicted students' academic status by the end of high school. Overall, these results suggest that family instability is a meaningful factor in understanding this outcome. Beginning with Model 1, more family instability was related to a lower likelihood of being an Algebra II-plus graduate than being either a non-Algebra II graduate or a high school dropout. Specifically, a one-unit increase in family instability was associated with a 16 percent decrease in the odds of being an Algebra II-plus graduate compared to a non-Algebra II graduate ($RRR = .82$), and a 23 percent decrease in the odds of being an Algebra II-plus graduate compared to a high school dropout ($RRR = .77$). Family structure at birth also distinguished academic status at the end of high school. This effect, however, was the strongest in distinguishing those who dropped out of high school from those who were Algebra II-plus graduates. Among the control variables, age, gender, and parents' educational attainment continued to distinguish the academic careers of students at the end of high school in expected ways.

Model 2 controlled for academic status in the ninth grade to test the degree to which adolescents' end point in math was a function of where they started or, instead, was an enduring effect of family-structure history. As expected, completing Algebra I in the ninth grade strongly

distinguished students' academic status by the end of high school. Moreover, this factor attenuated the effect of family structure at birth on the likelihood of being an Algebra II-plus graduate by the end of high school compared to being a dropout. The level of family instability continued to distinguish the math attainment of these young people. That family instability, net of family structure at birth and academic status in the ninth grade, continued to matter to students' academic status at the end of high school suggests that the educational consequences associated with unstable families are manifest and cumulate across high school.

Family Instability and Educational Careers

The results just described provide evidence of a link between instability in parents' marital histories and adolescents' educational status at the end of high school. Our final objective was to explore the mechanisms behind this link. The next set of models (see Table 6) addressed this objective by adding measures of parenting behaviors and adolescents' adjustment and aspirations, first separately and then together, to the final model in Table 5. Thus, the models in Table 6 should be interpreted in comparison to the final model in Table 5.

Model 1 tested the mediating role of parenting behaviors. Beginning with parent-adolescent closeness, adolescents who reported closer relationships with their parents at Wave I had a greater likelihood of being Algebra II-plus graduates by the end of high school than did all the others. Parental supervision did not distinguish students' academic status at the end of high school. Students who reported higher levels of parental involvement in school, however, had a greater likelihood of being non-Algebra II graduates than being either Algebra II-plus graduates or high school dropouts. This finding suggests that parents' involvement in schooling in early adolescence plays an important role in keeping children engaged in school and on track to graduate but has little added benefit in determining whether children complete the prerequisites necessary to attend college. In fact, a high level of involvement early on is associated with a lower likelihood of completing higher math than of just graduating high school, net of a host of individual and family control variables (predicted probabilities available on request). Parental involvement in school and its contribution to students' performance, then, is conditional on how students are doing in school (Crosnoe 2001). These parenting behaviors, however, did little to mediate the association between family instability and adolescents' educational careers.

Indicators of adolescents' adjustment and aspirations were explored in Model 2. Adolescents who reported higher levels of psychological distress and lower college aspirations displayed lower likelihoods of being Algebra II-plus graduates by the end of high school compared to being non-Algebra II graduates or high school dropouts. Lower college aspirations also distinguished those who dropped out of high school from those who were non-Algebra II graduates. Although these measures were related to academic status at the end of high school, they did not attenuate the observed association between family instability and academic status.

Model 3 examined the joint role of these mediators in the focal relationship. Aside from the attenuation of the effect of parent-adolescent closeness, all potential mechanisms remained largely unchanged when they were estimated simultaneously. Individually or in a group, these factors are important correlates of students' academic status in math and continued to distinguish those who completed higher-level math from other students, but they did not explain the link between family instability and academic status at the end of high school.

CONCLUSION

Family structure has long been of interest to social and behavioral scientists, and this interest has only increased in recent years. This study sought to contribute to this evolving literature by integrating a life-course perspective with a new, important data source that combines

educational data from high school transcripts with the detailed data on family history, family process, and adolescents' well-being from a national study of school-going adolescents. We used these data to capture, more dynamically, how families change over time and how young people navigate the educational system from year to year. We were interested in how these trajectories, the parents' and the adolescents', were connected over time. Four key themes, which map onto the four objectives that guided this study, emerged from this research.

The first theme relates to the measurement of family-structure history. Capturing the dynamic nature of children's living arrangements offers a valuable lens through which to view the role of the family in adolescents' education. The Add Health study allows for the construction of retrospective family-structure histories across adolescents' early life course. Although these histories likely under-report changes in family structure—adolescents may not know their family context during their earliest years or know enough about their mother's or father's partner to decide whether they were cohabiting or not (Raley and Wildsmith 2004), along with other data limitations discussed earlier—these measures highlight how change and instability define the family experience of a growing proportion of American youths (Bumpass and Lu 2000; Teachman 2003). About a third of the sample experienced a family transition by the ninth grade, with those who experienced at least one change reporting an average of nearly two family-structure transitions. Consequently, many adolescents spent time residing in and adjusting to different households with different family compositions and different rules and expectations about behaviors, including those that are linked with course-taking patterns and academic achievement.

Future research will advance our understanding of the association between family structure and adolescents' educational careers by investigating other aspects of family-structure history or by using more precise measures of it. For instance, using Add Health or other retrospectively reported data on family structure, one could examine whether the timing of the disruption—in early, middle, or late childhood, the duration in a particular family structure, or the amount of time adolescents have lived apart from a biological parent adds to our understanding of the linked lives of parents and their children. Another direction is to use longitudinal, prospective reports of family structure, collected in a similar way from both parents and children. Such an approach captures family change as it is happening and reduces problems that are associated with recall. These approaches will also improve our operationalizations of family-structure history and better illuminate the ways in which family structure and stability, together and in isolation, affect adolescents' academic outcomes.

The second theme is related to students' academic careers across the high school years. Focusing on students' location in the math course sequence at the beginning of high school offers an indication of their future academic prospects in high school. Our multivariate analyses revealed that students who take at least Algebra I as freshmen are much more likely than are others to graduate from high school having completed at least Algebra II, a key course for college matriculation. This finding highlights the importance of viewing adolescents' academic success not as a static measure, but as a trajectory that cumulates over time.

The beginning of high school is a key transition point, but students' academic careers begin long before then. Although Add Health includes middle school students, limited academic information is available on them until they begin high school. To capture more fully the complexity and diversity of students' academic careers, future studies should follow students across their academic careers, from primary through postsecondary school.

The third theme focuses on the interplay between changes in family structure and academic status during high school. We hypothesized that family instability was linked with academic status at both the start and end of high school and that the association would grow stronger

over time as students in less stable homes had more *freedom* to get off-track in the more loosely organized structure of American high schools. Our findings supported the general spirit of this hypothesis—family instability was associated with adolescents' academic status at the end of high school, and this link was stronger than the one observed at the start of high school. In fact, there was only a modest link between family instability and adolescents' academic status in the ninth grade. That family instability so clearly distinguished adolescents who were prepared to go to college from all others but, at the same time, had little effect on academic status in the early part of high school suggests that context, in this case the more loosely organized curricular structure of high schools, matters for how and when the effects of family instability are expressed. Thus, academic interventions that target young people in less stable families throughout high school should be instituted, keeping these students in school and engaged in more advanced curricula at a time when students' choice becomes more pronounced.

Family structure at birth, the other aspect of family-structure history that we considered, was related to adolescents' academic status at the start of high school. This finding suggests that socialization practices and economic factors that are experienced in early childhood, combined with unmeasured factors that both select young people into alternative families and are correlated with these family structures (e.g., neighborhood and school characteristics), are more salient to initial math status in high school. Given that academic status in the ninth grade was the strongest predictor of academic status at the end of high school, this finding illustrates how family-structure history has a longer-term cascading impact on academic careers.

Together, these findings highlight how family instability contributes to stratification in the United States. Our outcome at the end of high school captures not only students' academic status, but how young people are positioned for the transition to adulthood and beyond. Family instability across childhood and adolescence increases the likelihood that young people will either drop out of high school or graduate without completing course requirements that are generally needed to attend a four-year college. In our credential-based economy, graduating from a four-year college, not to mention high school, is a necessary, though not sufficient, ticket to better jobs, financial security, and better health and relationships. Again, identifying students in less stable families and ensuring that they remain engaged in school can help ensure that all students have a better chance of attaining these goals.

The fourth theme to emerge from this study is related to factors that link parents' marital trajectories to students' educational careers by the end of high school. Two mechanisms were considered here—adolescents' adjustment and aspirations and parenting behaviors. Each played a role in the academic status of young people, but neither offered leverage in explaining how family instability was related to students' academic status at the end of high school. These mechanisms, unlike our indicators of family instability, were measured at one point in time. It is possible that more dynamic measures of adolescents' stress and strain and their relationship with their parents may better mediate this relationship. Similarly, factors like income loss or instability, residential mobility, school transitions, or disrupted friendships, all changes set in motion by family change that were not investigated in this study, may better explain this link. Future research should continue to focus on this issue in an effort to gain a better understanding of why family instability negatively affects children's and adolescents' well-being.

This study attempted to look at an old problem—the effects of family structure on academic outcomes—in a fresh way by drawing on the dynamic, contextualized spirit of the life-course perspective. As the structure of American families continues to evolve, the way we study families must also change to offer the best lens through which to understand the role of the family in children's educational careers.

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Biographies

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Catherine Riegler-Crumb, Ph.D., is Research Assistant Professor, Her main fields of interest are gender and racial/ethnic inequality, high school achievement and the transition to postsecondary education, and adolescents. She is currently working on a project that examines how racial/ethnic gaps in achievement in high school differ according to gender and how social contexts can influence both racial/ethnic and gender disparities. In addition, she is researching the link between high school achievement and postsecondary matriculation and the factors that encourage minority and female students to pursue scientific, technology, engineering, and math fields in college.

APPENDIX

Items in Adolescent Adjustment

How often was each of the following true during the past week?

1. You were bothered by things that usually don't bother you.
2. You didn't feel like eating, your appetite was poor.
3. You felt that you couldn't shake off the blues, even with help from your family and friends.
4. You felt that you were just as good as other people.
5. You had trouble keeping your mind on what you were doing.
6. You felt depressed.
7. You felt that you were too tired to do things.
8. You felt hopeful about the future.
9. You thought your life had been a failure.

10. You felt fearful.
11. You were happy.
12. You talked less than usual.
13. You felt lonely.
14. People were unfriendly to you.
15. You enjoyed life.
16. You felt sad.
17. You felt that people disliked you.
18. It was hard to get started doing things.

Scale: 0 = never or rarely, 1 = sometimes, 2 = a lot of the time, 3 = most of the time or all the time.

Please tell me how often you have had each of the following conditions in the past 12 months:

1. Cried frequently?
2. Felt very tired for no reason?

Scale: 0 = never, 1 = just a few times, 2 = about once a week, 3 = almost every day, 4 = every day

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Table 1

Characteristics of the Sample Associated with Each Sample Selection Filter

	Wave 1 Sample (1) (n = 20,747)		Longitudinal Sample (2) (n = 11,620)		Younger Cohort Sample (3) (n = 5,875)		Analytic Sample (4) (n = 4,217)	
	M	SD	M	SD	M	SD	M	SD
<i>Academic Achievement at Wave 1</i>								
Overall GPA	2.75	(0.77)	2.79	(0.77)	2.84*	(0.78)	2.91	(0.76)
Math GPA	2.64	(1.04)	2.67	(1.04)	2.76	(1.03)	2.81	(1.02)
<i>Family-Structure History</i>								
Family instability	0.70*	(1.05)	0.64	(1.02)	0.61*	(1.01)	0.53	(0.92)
Family structure at birth								
Married	72.77*	(0.45)	76.20	(0.43)	76.44*	(0.42)	82.01	(0.38)
Single-parent family	20.09*	(0.40)	18.08	(0.38)	18.37	(0.39)	16.92	(0.38)
Stepparent family	1.29*	(0.11)	1.22*	(0.11)	1.12*	(0.11)	1.03	(0.10)
Nonbiological-parent family	5.85*	(0.23)	4.50*	(0.21)	4.07	(0.20)		
<i>Individual Characteristics</i>								
Age (in years)	15.67*	(1.75)	15.29*	(1.63)	14.06	(1.09)	14.03	(1.06)
Gender (male)	49.42	(0.50)	47.05	(0.50)	46.28	(0.50)	45.93	(0.50)
<i>Race and ethnicity</i>								
White	52.13	(0.50)	54.31	(0.50)	58.35*	(0.49)	62.20	(0.48)
African American	22.16	(0.42)	21.14	(0.41)	22.43*	(0.42)	19.60	(0.40)
Asian	6.82	(0.25)	6.83*	(0.25)	4.39*	(0.20)	4.82	(0.21)
Latina/Latino	16.99	(0.38)	15.97*	(0.37)	13.07*	(0.34)	11.87	(0.32)
Other	1.61*	(0.13)	1.48	(0.12)	1.40	(0.12)	1.12	(0.11)
<i>Parents' education</i>								
Less than high school	12.49	(0.33)	11.90*	(0.32)	10.33*	(0.30)	8.62	(0.28)
High school graduation	27.99	(0.45)	27.86	(0.45)	29.63	(0.46)	29.85	(0.46)
Some college education	19.85	(0.40)	19.68	(0.40)	18.71	(0.39)	18.66	(0.39)
At least college graduation	33.30	(0.47)	35.59	(0.48)	36.77	(0.48)	39.20	(0.49)

	Wave I Sample (1) (<i>n</i> = 20,747)		Longitudinal Sample (2) (<i>n</i> = 11,620)		Younger Cohort Sample (3) (<i>n</i> = 5,875)		Analytic Sample (4) (<i>n</i> = 4,217)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Missing education	6.37*	(0.24)	4.97*	(0.22)	4.56	(0.21)	3.65	(0.19)
<i>Explanatory Factors</i>								
Parenting behavior								
Parent-child closeness	3.41*	(0.66)	3.44*	(0.65)	3.52*	(0.59)	3.54	(0.57)
Parental supervision	2.79	(1.02)	2.83*	(1.02)	2.94	(0.98)	2.98	(0.97)
Parental involvement in school	1.42	(1.00)	1.45*	(1.00)	1.46*	(1.04)	1.47	(1.05)
Adolescents' adjustment and aspirations								
Psychological distress	0.01	(5.20)	-0.08*	(5.16)	-0.63*	(4.90)	-0.92	(4.78)
College aspirations	4.42	(1.04)	4.45*	(1.01)	4.52	(0.96)	4.56	(0.92)

Note: * indicates significant differences ($p < .001$) between the sample mean in the current column (e.g., 1) compared to the sample mean in the column to the right (e.g., 2).

Table 2Means and Standard Deviations of All the Variables ($n = 4,217$)

	Percentage	<i>M</i>	<i>SD</i>
<i>Math Outcomes</i>			
Academic status in the ninth grade			
Completed at least Algebra I	65.46	—	—
Did not completed at least Algebra I	34.54	—	—
Academic status at the end of high school			
Dropped out of high school	12.49	—	—
Graduated from high school but did not complete Algebra II	29.98	—	—
Graduated from high school and completed at least Algebra II	57.53	—	—
<i>Family-Structure History</i>			
Family instability: Birth through Wave I		0.56	(0.93)
0	66.28	—	—
1	17.17	—	—
2	12.43	—	—
3	2.62	—	—
4+	1.50	—	—
Family instability: Birth through Wave II		0.67	(1.03)
0	62.31	—	—
1	17.51	—	—
2	13.70	—	—
3	4.49	—	—
4	1.40	—	—
5+	0.59	—	—
Family structure at birth			
Married	82.64	—	—
Single-parent family	16.41	—	—
Ever lived in			
Biological-parent family	86.53	—	—
Single-mother family	30.37	—	—
Single-father family	4.37	—	—
Stepparent family	18.22	—	—
Nonbiological-parent family	2.07	—	—
<i>Explanatory Factors</i>			
Parenting behavior			
Parent-child closeness	—	3.55	(0.57)
Parental supervision	—	3.01	(0.97)
Parental involvement in school	—	1.45	(1.05)
Adolescents' adjustment and aspirations			
Psychological distress	—	-0.95	(4.77)

	Percentage	<i>M</i>	<i>SD</i>
College aspirations	—	4.55	(0.93)
<i>Individual Characteristics</i>			
Age (in years)	—	13.96	(1.08)
Gender (male)	50.75	—	—
Race and ethnicity			
White	70.24	—	—
African American	14.33	—	—
Latina/Latino	10.27	—	—
Other	4.05	—	—
Parents' education			
Less than high school	9.62	—	—
High school graduation	31.13	—	—
Some college education	20.04	—	—
At least college graduation	35.60	—	—
Missing education	3.62	—	—
<i>School Context</i>			
Urbanicity			
Suburban	58.23	—	—
Urban	25.35	—	—
Rural	16.42	—	—
Type of school			
Private	6.66	—	—
Public	93.34	—	—

Table 3

Associations Among Aspects of Family-Structure History ($n = 4,217$)

	Family Structure at Birth					
	Single-parent Family ($n = 762$)			Two-parent Family ($n = 3,455$)		
	Percentage	Mean	SD	Percentage	Mean	SD
<i>Family Instability from Birth Through Wave II</i>	—	1.40	(1.29)	—	0.52	(0.89)
0	28.07	—	—	69.1	—	—
1	29.14	—	—	15.28	—	—
2	24.36	—	—	11.52	—	—
3	10.1	—	—	3.36	—	—
4	5.74	—	—	0.54	—	—
5+	2.58	—	—	0.19	—	—
Ever lived in						
Biological-parent family	22.39	—	—	100.00	—	—
Single-mother family	88.32	—	—	18.19	—	—
Single-father family	15.27	—	—	2.08	—	—
Stepparent family	48.42	—	—	11.88	—	—
Nonbiological-parent family	6.83	—	—	1.07	—	—

Table 4

Associations Between Family-Structure History and Key Analytic Variables ($n = 4,217$)

	Family Instability from Birth Through Wave I ^a					
	0 ($n = 2,794$)	1 ($n = 737$)	2 ($n = 503$)	3 ($n = 133$)	4+ ($n = 50$)	
<i>Academic Status in the Ninth Grade</i>						
Completed at least Algebra I*	68.55	59.19	61.51	59.21	41.14	
Did not completed at least Algebra I	31.45	40.81	38.49	40.79	58.86	
<i>Family Instability from Birth Through Wave II^a</i>						
	0 ($n = 2,622$)	1 ($n = 747$)	2 ($n = 573$)	3 ($n = 197$)	4 ($n = 61$)	5+ ($n = 17$)
<i>Academic Status at the End of High School</i>						
Dropped out of high school (1)	9.36	16.52	17.64	19.94	21.11	21.11
Graduated from high school but did not complete Algebra II (2)	27.08	31.45	36.31	39.09	40.78	44.65
Graduated from high school and completed at least Algebra II (3) ^b ***	63.56	52.03	46.05	40.97	38.11	34.24
<i>Explanatory Factors</i>						
Parenting behavior						
Parent-child closeness***	3.62	3.50	3.35	3.34	3.54	3.20
Parental supervision***	3.17	2.72	2.76	2.67	2.96	2.33
Parental involvement in school	1.49	1.40	1.41	1.27	1.32	1.76
Adolescents' adjustment and aspirations						
Psychological distress***	-1.37	-0.47	0.00	-0.08	-0.39	-0.25
College aspirations	4.57	4.53	4.50	4.49	4.55	4.35

^aWeighted means are presented, but significance levels are derived from multivariate regressions that estimate the reliability of associations between family instability, measured as a continuous variable, and other key variables, net of family structure at birth.

^bGroup 3 versus Groups 1 and 2.

* $p < .05$,

*** $p < .01$,

 $p < .001$.

Table 5
Regression Estimates Predicting Academic Status in the Ninth Grade and at the End of High School ($n = 4,217$)

	Academic Status in the Ninth Grade (Odds Ratio)	Academic Status at the End of High School (Relative Risk Ratios)					
		Model 1			Model 2		
		3 versus 2	2 versus 1	3 versus 1	3 versus 2	2 versus 1	3 versus 1
<i>Family-Structure History</i>							
Family instability							
Birth through Wave I	0.92 ⁺	—	—	—	—	—	—
Birth through Wave II	—	0.82 ^{***}	0.77 ^{***}	0.94	0.80 ^{***}	0.74 ^{***}	0.93
Family structure at birth							
Single-parent family	0.75 [*]	0.88	0.67 [*]	0.77	1.01	0.78	0.77
<i>Initial Academic Status</i>							
Completed Algebra I in the ninth grade		—	—	—	12.55 ^{***}	18.93 ^{***}	1.51 [*]
<i>Individual Characteristics</i>							
Age	0.81 ^{***}	0.80 ^{***}	0.67 ^{***}	0.84 ^{**}	0.81 ^{***}	0.71 [*]	0.87 [*]
Male	0.82 [*]	0.73 ^{***}	0.62 ^{***}	0.85	0.74 ^{***}	0.62 ^{**}	0.84
Race and ethnicity							
African American	0.73 ⁺	0.71 [*]	0.89	1.26	0.81	1.02	1.27
Latina/Latino	0.76	0.86	0.93	1.00	1.01	1.12	1.11
Other	1.84	1.81	3.10 [*]	1.71	1.62 ⁺	2.25 ⁺	1.39
Parents' educational attainment							
Less than high school	0.79	0.83	0.41 ^{***}	0.49 ^{***}	0.83	0.40 ^{***}	0.49 ^{***}
Some college education	1.65 ^{***}	1.81 ^{***}	0.21 ^{***}	1.13	1.64 ^{***}	1.79 ^{**}	1.09
At least college graduation	3.23 ^{***}	2.85 ^{***}	6.27 ^{***}	2.20 ^{***}	2.07 ^{***}	4.36 ^{***}	2.12 ^{***}
Missing education	0.86	1.08	0.50 [*]	0.46 ^{**}	1.06 ⁺	0.51 ⁺	0.48 ^{**}
<i>School Context</i>							
Urbanicity							
Urban	1.00	1.21	0.88	0.70	1.24	0.85	0.69
Rural	1.26	0.99	0.88	0.88	0.84	0.71	0.85

	Academic Status at the End of High School (Relative Risk Ratios)						
	Academic Status in the Ninth Grade (Odds Ratio)	Model 1			Model 2		
		3 versus 2	3 versus 1	2 versus 1	3 versus 2	3 versus 1	2 versus 1
Private school	2.81***	1.20	2.14*	1.78*	0.77	1.23	
-2 log likelihood	-2461.30	-3595.66			-2996.31	1.60	

Note: 1 = dropped out of high school, 2 = graduated from high school but did not complete Algebra II, and 3 = graduated from high school and completed at least Algebra II.

+ $p < .10$.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Table 6

Relative Risk Ratios Predicting Academic Status at the End of High School ($n = 4,217$)

Variable	Model 1: Parenting Behaviors			Model 2: Adolescents' Adjustment and Aspirations			Model 3: Full Model		
	3 versus 2	3 versus 1	2 versus 1	3 versus 2	3 versus 1	2 versus 1	3 versus 2	3 versus 1	2 versus 1
<i>Family-Structure History</i>									
Family instability									
Birth through Wave II	0.81***	0.76***	0.94	0.80***	0.74***	0.92	0.79***	0.74***	0.93
Family structure at birth									
Single-parent family	1.00	0.83	0.82	1.07	0.83	0.78	1.05	0.86	0.82
<i>Initial Academic Status</i>									
Completed Algebra I in the ninth grade	12.62***	18.93***	1.50*	11.48***	16.97***	1.48*	11.57***	17.04***	1.47*
<i>Individual Characteristics</i>									
Age	0.82**	0.72***	0.88*	0.85*	0.75***	0.88*	0.84*	0.75***	0.89*
Male	0.72**	0.59***	0.82	0.68***	0.56***	0.83	0.68***	0.56***	0.82
Race and ethnicity									
African American	0.81	0.96	1.18	0.81	0.99	1.23	0.82	0.95	1.16
Latina/Latino	0.97	1.11	1.10	1.04	1.10	1.06	1.03	1.09	1.06
Other	1.70 ⁺	2.17 ⁺	1.34	1.61 ⁺	2.17 ⁺	1.65	1.64 ⁺	2.14 ⁺	1.30
Parents' educational attainment									
Less than high school	0.83	0.42***	0.50***	0.90	0.44***	0.49***	0.89	0.44***	0.50***
Some college education	1.68***	1.78**	1.06	1.51**	1.60*	1.06	1.54**	1.58*	1.03
At least college graduation	2.12***	4.36***	2.06***	1.83***	3.59***	1.96**	1.87***	3.58***	1.92**
Missing education	1.06	0.54	0.51*	1.08	0.52	0.48**	1.05	0.53	0.51*
<i>School Context</i>									
Urbanicity									
Urban	1.26	0.83	0.66	1.23	0.85	0.69	1.25	0.84	0.67
Rural	0.82	0.70	0.85	0.85	0.72	0.85	0.84	0.72	0.86
Private school	0.76	1.23	1.63 ⁺	0.79	1.23	1.56	0.77	1.25	1.62 ⁺
<i>Explanatory Factors</i>									

Variable	Model 1: Parenting Behaviors			Model 2: Adolescents' Adjustment and Aspirations			Model 3: Full Model		
	3 versus 2	3 versus 1	2 versus 1	3 versus 2	3 versus 1	2 versus 1	3 versus 2	3 versus 1	2 versus 1
Parenting behavior									
Parent-child closeness	1.19 ⁺	1.38**	1.16	—	—	—	1.00	1.09	1.10
Parental supervision	1.02	1.02	1.00	—	—	—	0.99	0.99	1.00
Parental involvement in school	0.88*	1.08	1.20**	—	—	—	0.87*	1.06	1.22**
Adolescents' adjustment and aspirations									
Psychological distress	—	—	—	0.95***	0.94***	0.99	0.95***	0.94**	0.99
College aspirations	—	—	—	1.47***	1.68***	1.14**	1.49***	1.68***	1.13*
-2 log likelihood	-2979.8			-2922.9			-2911.2		

Note: 1 = dropped out of high school, 2 = failed or did not complete at least Algebra II, and 3 = passed at least Algebra II.

⁺ $p < .10$.

* $p < .05$.

** $p < .01$.

*** $p < .001$.