Disruptive Events during the High School Years and Educational Attainment

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Abstract

We use data from the National Education Longitudinal Survey to examine the effects of family structure and school changing on attendance during high school and educational continuation through college entry. We find that both family structure and changing schools are associated with more attendance problems during high school and with school continuation decisions after high school. The results also show that family structure, changing schools, and attendance patterns play important roles in shaping the educational attainment of individuals, including their postsecondary educational experiences.

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INTRODUCTION

The number of children who will not live with both of their parents throughout their childhood and adolescent years has been rapidly increasing. Researchers estimate that more than 50 percent of children born since 1980 will live some part of their childhood with only one (or neither) biological parent (Hernandez, 1993). In analyzing the effects of family structure on various outcomes—including achievement, years of school completed, and behavior—it is important for social scientists to consider both short-term and long-term effects. Research should examine, for example, the association of family structure with school engagement, and how engagement in high school may affect a child's future.

Research on the short-term effects of family structure has shown that children from one-parent families tend to experience more behavioral problems in school (Astone and McLanahan, 1991; Hernandez, 1993; McLanahan and Sandefur, 1994). Research on the long-term effects of family structure has shown that children who do not live with both of their parents throughout their childhood are more likely to drop out of high school (Astone and McLanahan, 1991; Hernandez, 1993; Manski et al., 1992; McLanahan and Sandefur, 1994; Sandefur, McLanahan, and Wojtkiewicz, 1992).

Prior research into family structure or changes in family structure has also shown that certain types of families move and change schools more frequently (Hagan, MacMillan, and Wheaton, 1996; McLanahan and Sandefur, 1994; Speare and Goldscheider, 1987). Changing schools adversely affects student achievement and engagement in school, i.e., students who change schools are more likely to have behavioral problems and are less likely to graduate from high school than those who do not change schools (Astone and McLanahan, 1994; Haveman, Wolfe, and Spaulding, 1991; McLanahan and Sandefur, 1994).

We examine some of the ways in which family structure and school changing can affect the short-term and long-term educational engagement and attainment of individuals. We are particularly

interested in whether the short-run effects of these disruptive events on school engagement help to explain their long-run effects on educational attainment. We address three research issues.

First, we use data from the National Education Longitudinal Study of 1988–1994 to investigate whether twelfth-grade students who do not live with both of their parents, and/or who have changed schools, are more likely to miss school, to be late for school, and to cut classes. Second, we investigate whether school attendance helps to explain the effects of family structure and changing schools on education beyond high school. We use a logistic response model in a manner suggested by Mare (1980) to determine the log odds of making the transition from high school graduation to postsecondary education. Third, we examine whether family structure, school changing, and attendance are associated with whether students enter a 2-year associate's degree or certificate program rather than a 4-year bachelor's degree program. Individuals with college degrees are more likely to obtain higher status and better-paying jobs. Students who enroll in 2-year programs may have less secure economic futures than those who enroll in 4-year programs.

THEORETICAL RATIONALE

We are interested in the short-run effects of family structure and changing schools on engagement in school and whether these short-run effects of family structure help to explain the long-run effects of family structure on educational attainment. The long-run effects that we examine include graduation from high school, postsecondary school attendance, and the type of postsecondary school attended.

A number of theoretical perspectives suggest why family structure, defined very specifically here as the presence of a parent or parents in the home, might affect school engagement and educational attainment. Some theoretical perspectives, including social capital theory and social control theory, suggest that the presence of parents is paramount in determining how well a child will do. Coleman

(1990) argues that parents represent social capital and that the absence of a parent or parents dramatically reduces the contact with the absent parent and deprives the child of many of the benefits of the social networks and relationships of the absent parent. Further, the presence of two parents strengthens social control; it creates a system in which the parents provide more supervision and support for the children, but also serves as a check on each other's tendency to be too permissive or too authoritarian (McLanahan and Sandefur, 1994).

Other theoretical perspectives suggest that stress caused by the disruption in family structure is pivotal to the well-being of children (McLanahan and Sandefur, 1994). Disruptions, including divorces and remarriages, can create stress for parents and their children. This stress may lead not only to less effective parenting but also to changes in the behavior of the child. According to this perspective, it is not so much with whom one lives, but how often and how intensely one must deal with the stress of family disruption, that is the critical influence on the child.

School changing may also lead to reductions in social capital and produce stress in a child's life. When a child has just changed schools, the school's teachers and administrators have no history or knowledge of the student or his/her family. When a history is present, teachers may make more of an effort to find out why the student is not present and doing his/her work. Also, parents may not have the same kinds of connections with the school or with other parents in the new school. Connections with other parents can be an additional way of monitoring students' activities. Finally, students attending a new school may experience stress and feel socially isolated from other students. Consequently, they may become involved with other disconnected students who may be disengaged from the educational process (Astone and McLanahan, 1994; McLanahan and Sandefur, 1994).

The increased likelihood of student disengagement among children whose families have always included only one parent or whose families have experienced major changes may play a role in educational attainment. In this research, we investigate whether early signs of student misbehavior are

part of a process of student disengagement that ultimately contributes to a student's educational continuation decisions.

DATA AND METHODS

Data

The data for this study are from the National Education Longitudinal Study of 1988 (NELS:88), and the follow-up studies of 1990, 1992, and 1994. The base year sample was drawn using a two-stage stratified probability design. First a random sample of 1,032 eighth-grade schools in the United States was selected. Of these, 698 schools participated; the remaining schools were either ineligible for participation (30) or refused to participate (304). An additional 359 schools were added to the sample from a replacement pool of 1,032 schools that was drawn using the same method.[1] Therefore, after the first stage of sampling, 1,057 schools were selected for the study.

From these schools a random sample of 26,432 eighth-grade students was selected. Of these, 24,599 participated in the base-year study (Ingels et al., 1994). Students surveyed in the base year were surveyed again, if eligible, for the first and second follow-ups, regardless of the school they were then attending. Each wave was "freshened" in order to represent a valid probability sample of all tenth-grade students enrolled in the 1989–90 school year and all twelfth-grade students in the 1991–92 school year (Ingels et al., 1994). For this research, we have used the students from the eighth-grade cohort who participated in the third follow-up to take advantage of the longitudinal aspects of the survey.

The third follow-up survey (1994) collected information on postsecondary education participation, employment, earnings, family formation, and other activities and experiences relevant to individuals as they were about to enter their adult lives. "The sample was created by dividing the second follow-up sample into 18 groups based on their response history, dropout status, eligibility status, school sector type, race, test scores, socioeconomic status, and freshened status. Each sampling group was

assigned an overall selection probability. Cases within a group were selected such that the overall group probability was met, but the probability of selection within the group was proportional to each sample member's second follow-up design weight. The overall unweighted response rate was 94 percent and the weighted response rate was 91 percent. NORC [National Opinion Research Center] achieved an 85 percent weighted response rate for all sampling strata except three" ("nonresponders," "poor responders," and "other") (Haggerty et al., 1996).

<u>Characteristics of the Sample</u>

Table 1 presents an overview of the weighted characteristics of the respondents. Approximately 70 percent of the students are white, 70 percent have not changed schools in the 4 preceding years, and 50 percent live in a household with both their father and mother present at the time of the second follow-up. To measure family structure, we used the NELS:88 composite variable. The original variable as shown in Table 1 was recoded in our study to the categories mother and father present in the household, parent and another adult, single parent, and other household arrangement.

As shown in Table 1, the majority of students were not likely to be late for school, to cut classes or to miss more than 1 or 2 days of school during a semester. Nevertheless, some students were prone to absenteeism or exhibited behaviors such as frequently being late for class or cutting class.

While the majority of students never changed schools, 16 percent of students in the sample changed schools at least once. Finally, Table 1 presents the highest grade completed for this sample of students. Approximately 88 percent of the students graduated from high school.[2] Of these, 31 percent enrolled in a 2-year program[3] and 32 percent enrolled in a 4-year bachelor's degree program.

<u>Methods</u>

<u>School Attendance</u>. In looking at the effects of family structure on twelfth-grade behavior, we assume that it is the student's current family structure that is most salient to his/her current behavior.

TABLE 1
Descriptive Statistics: NELS:88 Second and Third Follow-Up Participants

	Number	Percentage
Sex		
Male	7,040	50.1%
Female	7,001	49.9%
Race		
Asian, Pacific Islander	481	3.4%
Hispanic	1,450	10.3%
African American	1,856	13.2%
White	9,930	70.7%
Native American, Alaskan	170	1.2%
Missing	153	1.1%
Socioeconomic status by quartile		
1st (low)	3,306	22.0%
2nd	3,490	25.3%
3rd	3,571	25.5%
4th (high)	3,673	27.2%
Family composition		
Mother and father	7,130	50.8%
Mother and other male	1,435	10.2%
Father and other female	293	2.1%
Mother/other female	2,198	15.6%
Father/other male	324	2.3%
Independent teen	376	2.7%
Other	180	1.3%
Missing	2,105	15.0%
Number of times changed schools		
None	9,800	69.8%
Once	1,464	10.4%
Twice	421	3.0%
Three or more times	367	2.6%
Missing	1,989	14.2%
How many times was student late for school?		
Never	2,518	17.9%
1–2 times	4,353	31.0%
3–6 times	3,428	24.5%
7–9 times	1,382	9.8%
10–15 times	803	5.7%
Over 15 times	1,254	8.9%
Missing	303	2.2%

(table continues)

TABLE 1, continued

	Number	Percentage
How many times did student cut/skip classes?		
Never	6,356	45.3%
1–2 times	3,361	23.9%
3–6 times	1,824	13.0%
7–9 times	723	5.1%
10–15 times	506	3.6%
Over 15 times	927	6.6%
Missing	344	2.5%
How many times did student miss school?		
Never	1,144	8.2%
1–2 times	3,865	27.5%
3–6 times	4,441	31.6%
7–9 times	1,783	12.7%
10–15 times	1,123	8.0%
Over 15 times	1,287	9.2%
Missing	398	2.8%
Highest grade completed		
Grade 9	224	1.6%
Grade 10	333	2.4%
Grade 11	673	4.8%
Grade 12	3,502	24.9%
Enrolled in 2-year program	4,341	30.9%
Enrolled in 4-year program	4,486	32.0%
Missing	482	3.4%
Eighth-grade achievement standardized reading and math score	mean = 50.59	s.d. = 10.04

Source: Weighted statistics derived from NELS:88 second and third follow-up data.

Therefore, we use the student's twelfth-grade family structure for these analyses. The coding for the three response variables—times late, times missed, times skipped—suggests that they may have an ordinal nature. That is, the outcomes "never," "1–2 times," "3–6 times," "7–9 times," "10–15 times," and "over 15 times" may be ordered in such a way as to indicate increasingly deviant behavior. The ordering of the lower categories is not as clear as that of the upper categories, because many students who are engaged in school may miss a few days due to sickness or for some other personal reason. Students who respond in the upper categories of times missed, times late, or classes skipped, however, may be experiencing progressive disengagement from school. Therefore, the assumption of ordering may be more valid for the upper categories of each variable. By twelfth grade, some students have become completely disengaged and have already dropped out of high school. Since similar questions were asked on both the student and dropout questionnaires, the questions were combined in order not to bias the results by excluding the dropouts.[4] As would be expected, dropouts were more likely to be late for school, miss school, and skip classes than were students who were still enrolled.

We conducted preliminary analyses using both an ordered logit model and a multinomial logit model. The predicted probabilities for both methods showed a similar pattern related to missing school, being late for school, and cutting class—that is, students who did not live with either of their parents were more likely to engage in deviant behaviors while students from two-parent families were the least likely to exhibit deviant behavior. Because the ordered logit is computationally more efficient and the coefficients easier to interpret, we used only the ordered logit for the final analyses.

Educational Continuation. Following Mare (1980), we use a continuation odds logit model to examine which students successfully completed various school transitions. We focus on the transition from high school graduation to some form of postsecondary education since the majority of U.S. students graduate from high school. We use the student's twelfth-grade family structure for the analyses because we assume a student's current family structure will be the most salient for this transition.

The effects of family structure on students' school continuation rates are assessed with a logistic response model that models a series of dichotomous variables representing each of the four transitions. Students who do not successfully complete the first transition are assigned a value of 0 for the first dichotomous transition variable; students who complete the transition are assigned a value of 1. Given that a student completes a transition, he/she is eligible for assignment to the second dichotomous transition variable. The log odds of making a transition is given by the log odds of students who make a transition compared to those who do not make the transition given that all of them made the previous transition. The equation for the model takes the form "$\log_e (p_{ij}/1 - p_{ij}) = \beta_{j0} + \Sigma_k \beta_{jk} X_{ijk}$, where p_{ij} is the probability that the *i*th individual will make the *j*th school transition, X_{ijk} is the value for the *i*th individual deciding whether to make the *j*th transition on the *k*th independent variable, and the β_{jk} are parameters to be estimated from the data" (Mare, 1980, p. 297).

RESULTS

School Attendance

Models 1 and 2 in Table 2 show the effect of twelfth-grade family structure on twelfth-grade behavior. Model 1 shows that, after controlling for respondents' sex, race, socioeconomic status, prior achievement and eighth-grade behavioral characteristics, students from non-two-parent families miss school more often, are late for school more often, and skip class more often. Students who do not live with both of their parents are more likely to engage in these behaviors than their peers from two-parent families. For students living in stepparent families, the β coefficient of 0.284 in Model 1 for the "Times Missed" outcome implies that 0.284 is subtracted from each of the cut points shown at the bottom of the table. Accordingly, the cut points for these students decrease by 0.284, implying a shift in the predicted probability distribution across the categories to the right, or more deviant categories.

TABLE 2
Ordered Logit Results: Effect of Family Structure on Times Missed, Late, and Skipped

| | Times Missed | | | | Times Late | | | |
| | Model 1 | | Model 2 | | Model 1 | | Model 2 | |
	β	s.e.	β	s.e.	β	s.e.	β	s.e.
Step	0.284	0.052	0.250	0.052	0.247	0.052	0.211	0.052
Single	0.418	0.045	0.404	0.045	0.325	0.044	0.306	0.044
Other	0.876	0.093	0.824	0.093	0.464	0.090	0.407	0.090
Family - missing	0.277	0.048	0.755	0.103	0.290	0.047	0.319	0.098
Female	0.237	0.032	0.238	0.032	-0.183	0.031	-0.184	0.031
Black	-0.453	0.056	-0.461	0.056	0.130	0.053	0.127	0.053
Other	-0.167	0.040	-0.165	0.040	0.354	0.040	0.349	0.040
Race - missing	-0.038	0.118	-0.063	0.118	0.492	0.120	0.459	0.120
SES 2nd quartile	-0.092	0.045	-0.081	0.045	0.139	0.045	0.140	0.045
SES 3rd	-0.255	0.046	-0.247	0.046	0.174	0.046	0.170	0.046
SES 4th	-0.358	0.050	-0.357	0.050	0.292	0.049	0.288	0.050
8th grade achievement 2nd quartile	-0.191	0.048	-0.173	0.048	0.068	0.047	0.078	0.047
8th grade achievement 3rd	-0.242	0.049	-0.219	0.049	-0.020	0.048	-0.005	0.048
8th grade achievement 4th	-0.359	0.051	-0.332	0.051	-0.085	0.051	-0.063	0.051
Achievement-missing	-0.082	0.086	-0.062	0.086	-0.080	0.086	-0.064	0.086
8th grade miss/late - 1 or 2 days	0.563	0.037	0.557	0.037	0.722	0.037	0.716	0.037
8th grade miss/late - 3 or 4 days	0.936	0.052	0.919	0.052	1.159	0.064	1.145	0.064
8th grade miss/late - 5 to 10 days	1.089	0.077	1.057	0.077	1.546	0.108	1.529	0.108
8th grade miss/late - >10 days	1.126	0.114	1.064	0.115	1.593	0.134	1.577	0.134
8th grade miss/late - missing	0.455	0.073	0.450	0.073	0.503	0.077	0.499	0.077
Changed schools once			0.270	0.058			0.222	0.056
Changed schools twice			0.407	0.100			0.465	0.097
Changed schools three or more times			0.554	0.140			0.515	0.134
Changed schools - missing			-0.552	0.109			-0.022	0.104
Estimated logit cut points:								
Never	-2.261		-2.218		-0.943		-0.911	
1–2 times	-0.355		-0.310		0.610		0.644	
3–6 times	1.117		1.168		1.807		1.844	
7–9 times	1.914		1.970		2.467		2.507	
10–15 times	2.693		2.754		3.084		3.125	
Log likelihood	-21146.565		-21102.615		-21590.756		-21566.052	

(table continues)

TABLE 2, continued

| | Times Skipped | | | |
| | Model 1 | | Model 2 | |
	β	s.e.	β	s.e.
Step	0.289	0.053	0.251	0.053
Single	0.306	0.046	0.284	0.046
Other	0.486	0.092	0.427	0.093
Family - missing	0.232	0.049	0.572	0.104
Female	-0.297	0.032	-0.301	0.033
Black	-0.226	0.057	-0.229	0.057
Other	0.376	0.041	0.376	0.041
Race - missing	0.320	0.122	0.281	0.122
SES 2nd quartile	0.066	0.046	0.075	0.046
SES 3rd	0.078	0.048	0.080	0.048
SES 4th	0.113	0.051	0.113	0.052
8th grade achievement 2nd quartile	-0.021	0.049	-0.002	0.049
8th grade achievement 3rd	-0.161	0.050	-0.136	0.050
8th grade achievement 4th	-0.274	0.053	-0.243	0.053
Achievement- missing	0.025	0.088	0.044	0.088
8th grade skip - < weekly	1.093	0.066	1.084	0.066
8th grade skip - weekly	1.391	0.136	1.344	0.137
8th grade skip - daily	0.905	0.218	0.846	0.218
8th grade skip - missing	0.058	0.078	0.063	0.078
Changed schools once			0.172	0.059
Changed schools twice			0.511	0.097
Changed schools three or more times			0.687	0.141
Changed schools - missing			-0.394	0.110
Estimated logit cut points:				
Never	-0.049		-0.005	
1–2 times	1.032		1.079	
3–6 times	1.887		1.938	
7–9 times	2.411		2.465	
10–15 times	2.943		2.999	
Log likelihood	-18740.732		-18702.769	

Source: Calculations derived from NELS:88 second follow-up data.

For a given characterization of a student, the cut points change by adding or subtracting all of the coefficients that characterize that student. For students living in single-parent families, their cut points decrease by a coefficient of 0.418, which indicates that students from single-parent families are more likely than students from stepparent families to miss school. Students whose family structure is coded as "other" have a coefficient of 0.876, twice that of students from single-parent families. This means that they are the most likely to miss school.

Table 2 shows similar results for the outcome variable "Times Late," but the differences between the various coefficients are not as great. The coefficient for students from stepparent families is 0.247 versus 0.325 for students from single-parent families and 0.464 for students who live in "other" family arrangements (with neither biological parent or independently). The coefficients related to "Times Skipped" are comparable to those for the "Times Late" outcome. Students from stepparent families have a coefficient of 0.289 while the coefficient for students from single-parent families is 0.306 and that for students from "other" family arrangements is 0.486. The consistently positive coefficients across the three response variables indicate that students who do not live with either of their biological parents are the most likely to exhibit the most deviant forms of behavior with respect to missing school, being late for school, and cutting classes. They are followed by students from single-parent families, students from stepparent families and, finally, by students from two-parent families.

The significant, positive coefficients related to eighth-grade behaviors in each table indicate that prior behavioral patterns affect later behaviors. The effect of missing school, being late for school, or cutting class frequently in eighth grade is larger than the effects related to family structure. For example, students who missed 5 to 10 days or more than 10 days of school as eighth graders had significant coefficients of 1.089 and 1.126, respectively, compared to the highest coefficient for family structure of 0.876 for students who do not live with either of their parents. This suggests that prior behavior patterns have a greater effect on twelfth-grade behaviors than family structure. Therefore, early intervention when

a student begins to exhibit such behavior may be important for stopping or slowing the student's pattern of increasingly deviant behavior and likely disengagement from school.

The effects of student socioeconomic status (SES) appear mixed. The coefficients indicate that higher SES students are less likely to miss school (coefficient of −0.358 for the highest SES quartile) but more likely to be late for school (coefficient of 0.292 for the highest SES quartile). The SES coefficients related to skipping class are generally not significant and therefore are not conclusive regarding the effect of students' SES on skipping class.

The negative and significant coefficients related to prior achievement for the "Times Missed" and "Times Skipped" outcomes provide some support for the idea that higher-achieving students are more likely to be engaged in school and therefore less likely to miss school completely. Coefficients for students in the highest eighth-grade achievement quartile are −0.359 for "Times Missed" and −0.274 for "Times Skipped." The effect related to high achievement, then, is roughly enough to compensate for the negative effect associated with living in a stepparent family (0.284 for "Times Missed" and 0.289 for "Times Skipped").

Model 2 adds the number of times a student changed schools in the past 4 years. Two effects are related to the addition of this variable. First, the coefficients related to family structure did not change greatly between the two models. For example, the coefficient related to the effect of living in a single-parent family changed from 0.418 to 0.404 for the "Times Missed" outcome, from 0.325 to 0.306 for the "Times Late" outcome, and from 0.306 to 0.284 for the "Times Skipped" outcome. The second effect related to adding this variable was to improve the fit of the models. The log likelihood of -21146.565 for "Times Missed" in Model 1 changed to −21102.615 in Model 2 with the addition of four parameters (p = .0000). Similarly, the log likelihood for "Times Late" changed from −21590.756 for Model 1 to −21566.052 for Model 2 (p = .0000), and the log likelihood for "Times Skipped" changed from −18740.732 for Model 1 to −18702.769 for Model 2 (p = .0000). The variable for the number of school

changes was based on the responding parent's report of how many times the student changed schools for reasons other than promotion to another grade level or a move from a middle school to a high school during the preceding 4 years. As expected, students who changed schools more frequently were more likely to miss school, be late for school, or skip class.

With respect to missing class, the effect of changing schools three or more times in 4 years is 0.554. This coefficient is greater than either the stepparent coefficient (0.250) or the single-parent coefficient (0.404). Family disruption and school changing combined can have a sizable effect. For example, the combination of living in a single-parent family (0.404) and changing schools twice (0.407) results in a decrease in the cut points of 0.811. Therefore, children from non-intact families may experience a double threat—one from living without both of their parents and another associated effect related to the increased likelihood of non-intact families to move more frequently. The effect on "Times Late" of changing schools three or more times (0.515) is stronger than all of the family structure effects for this outcome (the highest of which is the effect of "other," 0.407). Similarly, the effect of changing schools three or more times on "Times Skipped" is 0.687, which is stronger than the effect associated with living with neither biological parent (0.427).

Educational Continuation

Table 3 presents results from the educational transition model. The constant term in Model 1 represents the log odds of making the transition from ninth to tenth grade for students from two-parent families. Coefficients for transitions two, three, and four (T2, T3, and T4) indicate the decrease in log odds associated with making each successive school transition. As expected, the log odds decrease for each successively more difficult transition. That is, while the log odds of making the transition from ninth to tenth grade for students from two-parent families is approximately 5.0 (meaning that students are approximately 148 times more likely to make the transition than not), the log odds of making the transition from tenth to eleventh grade is reduced by -0.592, from eleventh to twelfth grade the constant

TABLE 3

Log Odds of Making Transitions from Grade 9 to Postsecondary Education

	Model 1 log odds (s.e.)	Model 2 log odds (s.e.)	Model 3 log odds (s.e.)	Model 4 log odds (s.e.)	Model 5 log odds (s.e.)
Constant	4.999 (0.096)	5.223 (0.107)	-0.229 (0.173)	-0.126 (0.174)	0.552 (0.183)
T2 (10th to 11th grade)	-0.592 (0.117)	-0.595 (0.117)	-0.674 (0.126)	-0.697 (0.128)	-0.700 (0.133)
T3 (11th to 12th grade)	-1.344 (0.106)	-1.353 (0.106)	-1.531 (0.115)	-1.563 (0.116)	-1.621 (0.121)
T4 (12th grade to postsecondary)	-3.642 (0.096)	-3.919 (0.111)	-4.375 (0.121)	-4.420 (0.122)	-4.592 (0.128)
Step	-0.805 (0.054)	-1.116 (0.104)	-0.850 (0.111)	-0.759 (0.112)	-0.724 (0.116)
Single	-0.702 (0.047)	-1.118 (0.092)	-0.733 (0.099)	-0.673 (0.099)	-0.588 (0.104)
Other	-1.740 (0.086)	-2.053 (0.126)	-1.604 (0.134)	-1.435 (0.136)	-1.228 (0.143)
Step × T4		0.406 (0.123)	0.346 (0.133)	0.306 (0.134)	0.294 (0.138)
Single × T4		0.557 (0.107)	0.502 (0.117)	0.495 (0.117)	0.510 (0.122)
Other × T4		0.466 (0.172)	0.396 (0.190)	0.348 (0.192)	0.281 (0.200)
Sex (female)			0.267 (0.043)	0.270 (0.043)	0.271 (0.045)
Black			0.465 (0.068)	0.462 (0.068)	0.391 (0.071)
Other			0.310 (0.056)	0.320 (0.057)	0.362 (0.059)

(table continues)

TABLE 3, continued

	Model 1 log odds (s.e.)	Model 2 log odds (s.e.)	Model 3 log odds (s.e.)	Model 4 log odds (s.e.)	Model 5 log odds (s.e.)
SES quartile (1=low to 4=high)			0.517 (0.023)	0.531 (0.023)	0.544 (0.024)
8th-grade achievement			0.087 (0.003)	0.086 (0.003)	0.084 (0.003)
Number of times changed schools				-0.353 (.031)	-0.302 (0.033)
Late					0.001 (0.006)
Skip					-0.052 (0.006)
Miss					-0.063 (0.006)

Source: Derived from NELS:88 second and third follow-up data.

is reduced by ‑1.344, and from twelfth grade to postsecondary education by ‑3.642. The log odds of the final transition is then 1.357 (4.999 ‑ 3.642), which means that students living with both parents are almost four times as likely to make the transition from high school to postsecondary education as not.

Model 1 indicates that making each of these transitions is more difficult for children who do not live with both of their parents. The log odds of making each transition decreases by ‑0.805 for students who live with a stepparent, by ‑0.702 for students who live with only one of their parents, and by ‑1.740 for students in other living arrangements. Previous research has indicated that children who live with stepparents may be less likely to graduate from high school than children from two-parent families or children living with only one parent (Astone and McLanahan, 1991; McLanahan and Sandefur, 1994). One proposed explanation is that stepparents may be either unwilling or unable to provide financial and emotional support to their stepchildren. Often stepparents are supporting children from a previous marriage and therefore may be unable to contribute financially to their stepchildren's postsecondary education. Since children who are not living with either of their parents may be living independently, they will have a more difficult time making the transition from high school to postsecondary education because they will need to provide their own resources to continue their education.

Because the results from Model 1 indicate that the log odds of making each of the four school transitions differ for students from different family structures, we considered whether the effect of family structure differs depending on which transition a student is making. Therefore, we interacted the family structure variables with the school transition variables. We found some evidence of a significant effect for the interaction of the final transition with family structure. Model 2 presents results including the interaction terms pertaining to the final transition to postsecondary education. The interaction terms indicate differential effects for entering postsecondary education based on a student's family structure. The log odds of making the first three transitions are approximately equal for students from stepparent and single-parent families (a decrease in the transition log odds of ‑1.116 and ‑1.118, respectively). On

the other hand, the log odds of making the transition to postsecondary education is 0.594 (5.223 − 3.919 − 1.116 + 0.406) for students living with a stepparent compared to 0.743 (5.223 − 3.919 − 1.118 + 0.557) for students living with only one parent.

In Model 3, we introduce student background characteristics to determine how much of the family structure effects indicated in Model 2 remain after considering students' sex, race, socioeconomic status, and eighth-grade achievement. By comparing the combined coefficients for each family structure and the family structure fourth transition interaction for Models 2 and 3, we find that almost 30 percent of the decrease in log odds for making the transition into postsecondary education for students from stepparent families is explained by the introduction of the students' personal background characteristics (see Table 4 for calculations of the combined effects). Therefore, the difference in the log odds of entering postsecondary education for students from two-parent families compared to students from stepparent families is not as great for students from similar socioeconomic and racial backgrounds with similar standardized test scores. Similarly, introduction of these control variables explains approximately 59 percent of the decrease in log odds of making the transition into postsecondary education for students from single parent families and approximately 24 percent for students living in other family arrangements.

Model 3 also indicates that the log odds of making the transition from high school to postsecondary education increases for high SES students. The coefficient of 0.517 reflects the increase in log odds associated with each SES quartile, controlling for the other variables in the model. For high SES students, quartile 4, there is an increase in the log odds of 2.068, all other factors equal. Similarly, the model indicates an increase in the log odds of enrolling in postsecondary education for students of increasing academic achievement. This is consistent with the expectation that higher-achieving students will be more likely to continue their education beyond high school.

The model also indicates that females, African Americans, and students from other racial/ethnic groups (Latino, Asian, Pacific Islander, and Native American) are more likely to make the transition to postsecondary education, after controlling for student SES and achievement.

The effect of changing schools on the log odds of making the four school transitions is introduced in Model 4. Each time a student changes schools, he or she experiences a 0.353 decrease in the log odds of completing each school transition. Since students from non-intact families are more likely to experience residential mobility and corresponding school changes (Hagan, MacMillan, and Wheaton, 1996), these students can be further disadvantaged as a result of such a change. The coefficients for family structure and family-structure-by-fourth-transition interaction terms become smaller, but remain significant. This suggests that the addition of a variable related to the number of school changes a student experiences during his/her high school years accounts for some of the decrease in the log odds of making school transitions associated with the three non-two-parent family structures.

We control for students' twelfth-grade reports of their class attendance patterns in Model 5. The coefficients related to skipping class and missing class are significant and indicate that engaging in higher levels of these activities reduces the log odds of making the transition into postsecondary education, after controlling for the other variables in the model. The coefficient for the number of times a student is late for class is not significant. Students who are late for class may still benefit from their ultimate attendance, while students who do not attend for reasons such as health or lack of desire do not benefit.

Addition of the school attendance variables does reduce the size of the family structure and family-structure-by-fourth-transition interactions. And the combination of adding the changing schools variable and the attendance variables explains a substantial portion of the effects of family structure on educational attainment. The combined effect of the coefficients for the stepparent category and the stepparent-by-fourth-transition interaction is -0.504 ($-0.850 + 0.346$) in Model 3, but is reduced to

−0.430 (−0.724 + 0.294) in Model 5. The addition of these variables changes the effect of being in a single-parent family on the transition to postsecondary education from −0.231 in Model 3 to −0.078 in Model 5.

The effects of family structure on successful school transitions are illustrated in Figure 1. After controlling for students' background characteristics, eighth-grade achievement, school attendance behaviors, and number of school changes, the probability of making the T4 transition from high school to postsecondary education for students from two-parent families is 0.747 compared to 0.732 for students from single-parent families, 0.658 for students from stepparent families, and 0.534 for students living without either parent. The figure illustrates that there is little difference in the probability of making the fourth transition for students from single-parent families compared to those from two-parent families, but that the models do not fully explain the differences for students living in stepparent families or other living arrangements.

Prior research has indicated that children in non-intact families are more likely to have lower socioeconomic backgrounds (both in terms of household income and education levels of their parents), that they are more likely to exhibit behavior problems in school, and that they are more likely to change schools. This analysis suggests that these variables account for more of the difference between students from single-parent families and students from two-parent families than they do for students from stepparent families or students who do not live with either of their parents. For these students, other factors such as relationships between stepchildren and their stepparents may be important.

Table 4 shows that the log odds of making the fourth transition for students from single-parent families is only 0.078 less than that for students from two-parent families, all other things being equal (Model 5). But all else is not equal between students from two-parent families and students from single-parent families. Figure 2 compares the probability of making the final transition for these two groups of students with and without taking other characteristics into account. The first bar represents the

FIGURE 1
Probability of School Transitions for Model 5
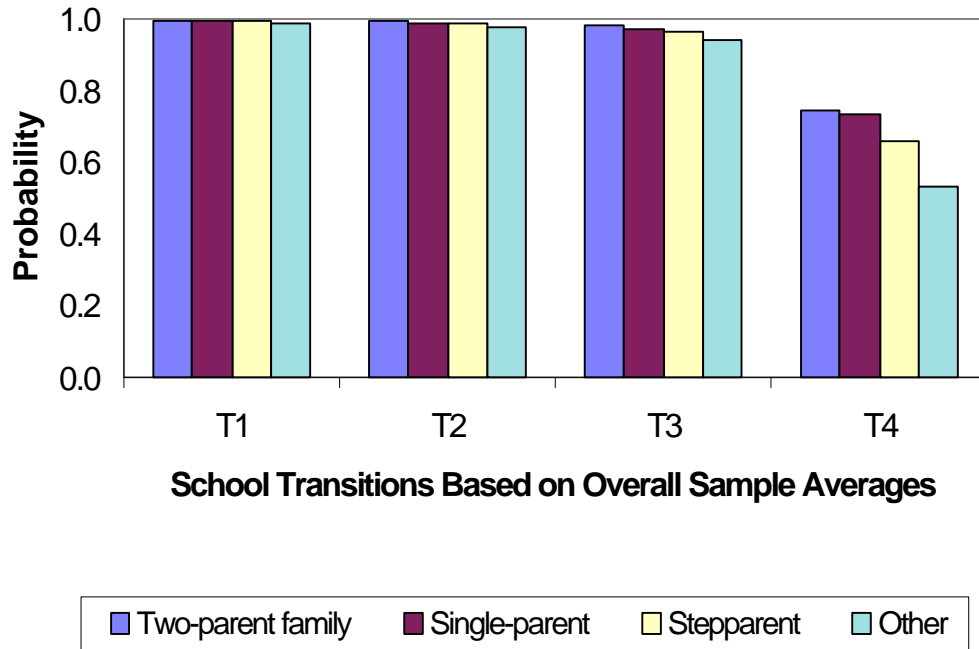
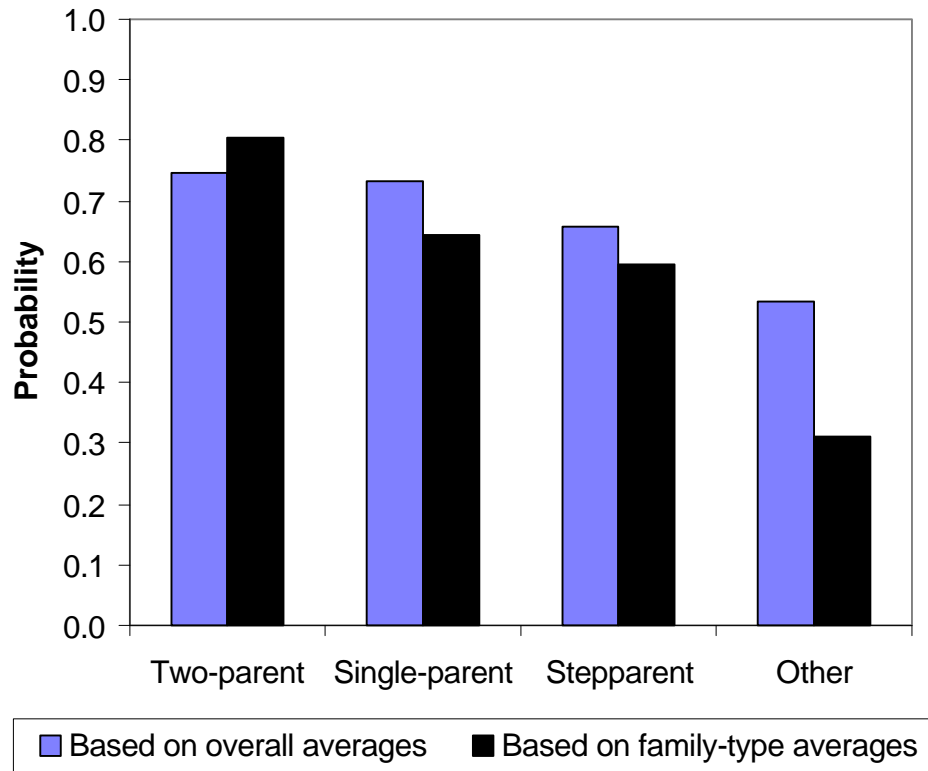**Source**: Derived from NELS:88 second and third follow-up data.

TABLE 4
Effect on Log Odds of School Transitions by Family Type after Addition of Control Variables

	Model 2	Model 3	% change Models 3 – Model 2	Model 4	% change Model 4 – Model 2	Model 5	% change Model 5 – Model 2
Step	-1.116	-0.850		-0.759		-0.724	
Step × T4	0.406	0.346		0.306		0.294	
Combined	**-0.710**	**-0.504**	**29.0%**	**-0.453**	**36.2%**	**-0.430**	**39.4%**
Single	-1.118	-0.733		-0.673		-0.588	
Single × T4	0.557	0.502		0.495		0.510	
Combined	**-0.561**	**-0.231**	**58.8%**	**-0.178**	**68.3%**	**-0.078**	**86.1%**
Other	-2.053	-1.604		-1.435		-1.228	
Other × T4	0.466	0.396		0.348		0.281	
Combined	**-1.587**	**-1.208**	**23.9%**	**-1.087**	**31.5%**	**-0.947**	**40.3%**

Source: Derived from NELS:88 second and third follow-up data.

FIGURE 2
Probability of Making Fourth Transition Based on Family-Type Averages

Source: Derived from NELS:88 second and third follow-up data.

probability of making the fourth transition based on the assumption that "all else is equal" (including average achievement, average SES, average attendance behaviors, and average number of school changes). The second bar represents the probability of making the fourth transition based on the averages associated with each family type for the various control variables.[5] Figure 2 illustrates that even though students from single-parent families are nearly as likely to make the fourth transition when the overall sample average characteristics are applied to both groups of students, when group-specific averages are applied, the probability of making the fourth transition for students from two-parent families is .805, compared to .643 for students from single-parent families, .595 for students from stepparent families, and .312 for students who do not live with either of their parents.

Type of Postsecondary Education

To estimate whether family structure, school changing, and behavior affect which type of postsecondary education students attend, we use a multinomial logit model. The multinomial logit model estimates the log odds of enrolling in either a 2-year or a 4-year program compared to not enrolling in postsecondary education after high school graduation. The sample for these models consists of all students who graduated from high school (including students with a high school diploma and those who received a GED). The results from the multinomial logit are presented in Table 5. Table 6 presents the predicted probabilities obtained for each type of family by holding all other variables constant in each of the four models. In Model 1 the probability of enrolling in a 2-year program versus a 4-year program is .339 for students from two-parent families, .383 for students from stepparent families, .339 for students from single-parent families, and .283 for students not living with either of their parents. Similarly, the probability of enrolling in a 4-year program is .448 for students from two-parent families, .262 for students from stepparent families, .339 for students from single-parent families, and .147 for students not living with either of their parents. These results are consistent with those from the school continuation model discussed above. They indicate that students from non-intact families have a lower probability of

TABLE 5
Effect of Family Structure on Type of Postsecondary Education Attending

	Model 1		Model 2		Model 3		Model 4	
	2-Year Program	4-Year Program	2-Year Program	4-Year Program	2-Year Program	4-Year Program	2-Year Program	4-Year Program
Constant	0.461	0.741	-1.812	-5.858	-1.796	-5.774	-1.495	-5.205
	(0.033)	(0.031)	(0.177)	(0.200)	(0.177)	(0.201)	(0.183)	(0.208)
Step	-0.388	-1.048	-0.288	-0.828	-0.270	-0.745	-0.273	-0.697
	(0.072)	(0.077)	(0.077)	(0.092)	(0.078)	(0.093)	(0.079)	(0.095)
Single	-0.410	-0.691	-0.154	-0.251	-0.124	-0.176	-0.073	-0.037
	(0.063)	(0.063)	(0.070)	(0.078)	(0.071)	(0.079)	(0.073)	(0.082)
Other	-1.160	-2.100	-0.932	-1.636	-0.878	-1.441	-0.805	-1.252
	(0.134)	(0.168)	(0.144)	(0.197)	(0.145)	(0.198)	(0.149)	(0.206)
Sex (female)			0.318	0.371	0.317	0.370	0.324	0.402
			(0.054)	(0.060)	(0.054)	(0.060)	(0.056)	(0.062)
Black			0.264	1.056	0.260	1.066	0.231	0.969
			(0.091)	(0.101)	(0.091)	(0.102)	(0.093)	(0.105)
Other			0.464	0.597	0.467	0.618	0.488	0.675
			(0.071)	(0.081)	(0.072)	(0.081)	(0.074)	(0.084)
8th-grade achievement			0.043	0.119	0.043	0.118	0.042	0.117
			(0.003)	(0.004)	(0.003)	(0.004)	(0.004)	(0.004)
SES quartile			0.645	1.244	0.652	1.267	0.653	1.279
			(0.042)	(0.047)	(0.043)	(0.047)	(0.044)	(0.049)
Number of times changed schools					-0.153	-0.622	-0.138	-0.545
					(0.044)	(0.063)	(0.046)	(0.065)
Late							0.003	-0.003
							(0.007)	(0.008)
Skip							-0.024	-0.071
							(0.008)	(0.009)
Miss							-0.037	-0.079
							(0.007)	(0.008)

Source: Derived from NELS:88 second and third follow-up data.

TABLE 6
Predicted Probabilities of Postsecondary Enrollment

	2-year	4-year	No PSE
Model 1			
Two-parent	.339	.448	.213
Step-parent	.383	.262	.356
Single-parent	.339	.339	.322
Other	.283	.147	.570
Model 2			
Two-parent	.347	.397	.256
Step-parent	.374	.290	.335
Single-parent	.343	.371	.287
Other	.303	.230	.468
Model 3			
Two-parent	.344	.402	.254
Step-parent	.367	.308	.325
Single-parent	.338	.386	.276
Other	.299	.259	.443
Model 4			
Two-parent	.345	.397	.258
Step-parent	.361	.314	.325
Single-parent	.333	.399	.267
Other	.298	.280	.421

Source: Derived from NELS:88 second and third follow-up data.

attending 4-year programs and therefore may be at an educational disadvantage with respect to students from two-parent families.

In Model 2 (Table 5), we introduce several variables to control for students' background characteristics and their eighth-grade achievement. The log odds of black students attending 4-year programs (1.056) is 0.792 greater than the log odds of black students attending 2-year programs (0.264). By comparing the odds ratios (2.875 and 1.302 for 4-year and 2-year programs, respectively), we find that black students are 121 times more likely than white students to enter 4-year rather than 2-year programs after controlling for family structure, sex, prior achievement, and family SES.

The coefficients related to eighth-grade achievement indicate that students with higher prior achievement are more likely to enter 4-year rather than 2-year programs (odds of 1.126 and 1.044, respectively). Higher SES students are also more likely to enter 4-year rather than 2-year programs (odds of 3.469 and 1.906, respectively).

Model 2 in Table 6 shows that after controlling for family background characteristics and eighth-grade achievement, family structure has an effect on the type of postsecondary education a student attends. While the probability of students from two-parent families enrolling in a 4-year program is 0.397, the corresponding probabilities for students from stepparent families, single-parent families, and other living arrangements are .290, .371, and .230, respectively. Consistent with the findings in the section on school continuation rates, students from single-parent families are similar to students from two-parent families after controlling for family SES and students' prior achievement.

In Model 3 we introduce a control for the number of times a student changed schools during his/her high school years. The results in Table 5, Model 3, show that changing schools has a powerful effect on the likelihood of attending a 2-year or 4-year college. Further, this effect explains part of the family structure effects.

In Model 4 (Table 6), we introduce students' school attendance behaviors. After adding these variables, we find that students from single-parent families are as likely as students from two-parent families to enroll in a 4-year program (probability of enrolling in a 4-year program is .397 and .399 for students from two-parent and single-parent families, respectively). Controlling for these variables has little effect on the predicted probabilities of enrolling in a 4-year program for students from stepparent families and those who do not live with either of their parents. The probability of enrolling in a 4-year program for these students is 0.314 and 0.280, respectively.

Consistent with the results shown in Table 3, the school attendance variables related to the number of times a student misses or skips class are significant, while the variable for the number of times a student is late for class is not significant. Model 4 in Table 5 shows that the log odds of attending a 4-year program rather than a 2-year program decreases from −0.024 to −0.071 for each time a student skips class, and from −0.037 to −0.079 for each time a student misses class.

As seen in Figure 3, the final model that controls for students' background characteristics, their eighth-grade achievement, their school attendance behaviors, and the number of times students change schools during high school accounts for most of the difference in postsecondary education enrollment between students from single-parent families and students from two-parent families. Students who live with stepparents or in other living arrangements are more likely than students from two-parent families to enroll in a 2-year rather than a 4-year program, even after controlling for these variables. Since the future economic prospects for students who complete 4-year college programs are greater than those associated with an associate's degree or a certificate program, the economic futures of students from stepparent families and for those who do not live with either of their parents may be more at risk than those of students from two-parent families, and even those of students from single-parent families, all else being equal.

FIGURE 3
Predicted Probability of Postsecondary Enrollment by Family Type
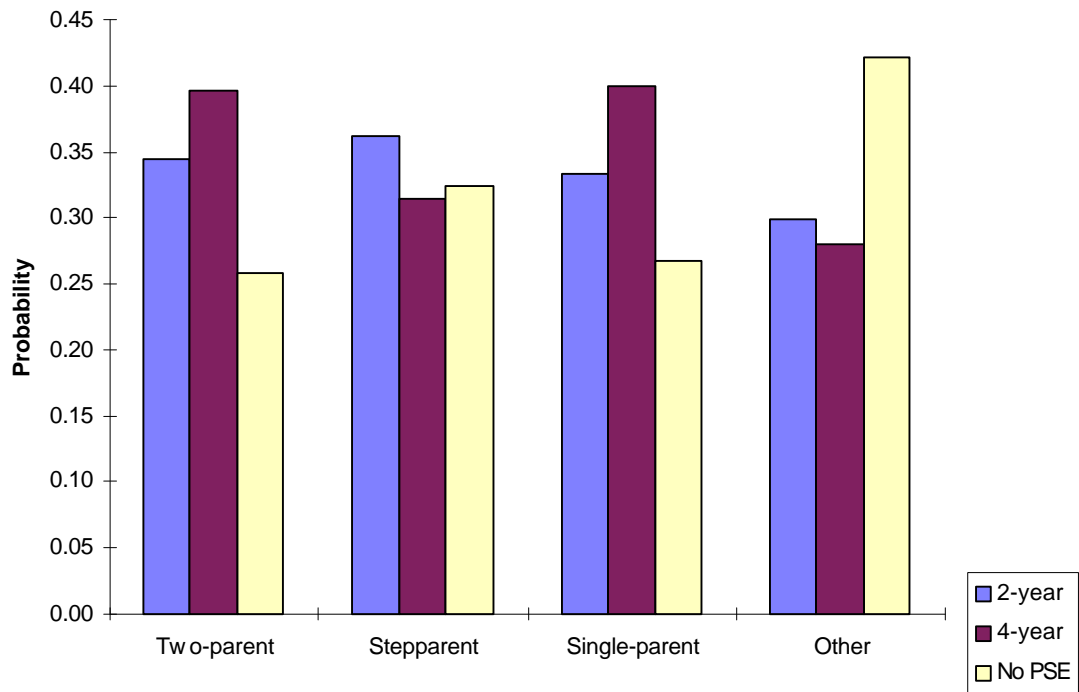
Source: Derived from NELS:88 second and third follow-up data.

CONCLUSION

In this research we investigated whether family structure and changing schools are associated with school attendance problems. Our results consistently indicate that adolescents who live with one parent, one parent and another adult, or neither parent are more likely to miss school, be late for school, and cut classes. Even after controlling for eighth-grade behavior and the number of school changes during the high school years, the coefficients related to non-two-parent families consistently indicate that students who do not live with either of their biological parents are more likely to miss school, be late for school, and cut class. Children who live in single-parent families are the next most likely to engage in deviant forms of these behaviors, followed by children who live in stepparent families and children who live with both of their parents. This suggests that the number of adults present in a household does affect student school attendance behaviors. Since these behaviors may lead to progressive disengagement from school and result in fewer years of education completed (even dropping out of high school for some), the economic futures of these students may be jeopardized because high school dropouts are more likely to obtain lower-status jobs with lower incomes as adults.

Another concern with these students relates to what they are doing when they are not in school. Some of these students may already live on their own and so may miss school in order to work. Others may miss school because they have children of their own to care for during the day. Still others may be involved in risky behavior when they are not in school.

We also investigated two research questions about school continuation decisions. Does family structure have an effect on whether students make the transition from high school to postsecondary education? Given that students make the transition to postsecondary education, does family structure have an effect on which type of program—2-year or 4-year—they select? The answer to both of these questions is yes. After controlling for student background characteristics, their prior academic achievement as measured by standardized test scores, their high school attendance patterns, and the

number of times they change schools during their high school years, students from stepparent families and students who do not live with either of their parents are less likely to make the transition to postsecondary education. When they do make the transition, they are more likely to enroll in a 2-year than a 4-year program. Since students with college degrees are likely to have more secure economic futures than those without such degrees, these results indicate that students from stepparent families and those who do not live with either of their parents may have less-secure economic futures as adults.

The various control variables introduced in these analyses explain the majority of the differences between students from two-parent and single-parent families in terms of making the transition to postsecondary education and enrolling in a 4-year degree program. Most of the difference between these two groups of students is explained after introducing variables to control for family SES and student academic achievement, which is consistent with prior research showing that students living in single-parent families are more likely to experience poverty and to have parents with lower educational levels (see, for example, McLanahan and Sandefur, 1994). Therefore, although students in single-parent families may be as likely to make the transition from high school to postsecondary education, all other things equal, their average characteristics are generally not the same as those of students from two-parent families. Comparing the average characteristics of students from two-parent families and those of students from single-parents families results in a probability of making the transition to postsecondary education of 0.805 for students from two-parent families and 0.643 for students from single-parent families. From these analyses, low family SES seems to be the primary reason why students from single-parent families are less likely than students from two-parent families to make the transition from high school graduation to postsecondary education, and why they are less likely to enroll in 4-year programs given that they make the transition.

The overall lesson of the results is that disruptive events during the high school years—living without both parents and changing schools—affect school attendance and participation in the short run

and educational attainment in the long run. Assisting kids who experience these disruptive events requires efforts to keep them engaged and active in school, and to insure that their families' financial situations do not prevent them from continuing their education beyond high school.

Notes

[1]The NELS:88 user's manual (Ingels et al., 1994) does not specify the refusal rate in the replacement pool.

[2]Students who received a high school diploma and students who received a GED are considered high school graduates for these analyses.

[3]The third follow-up NELS survey asked respondents for the highest postsecondary education they had achieved. Respondents who answered "no degree, working toward certificate or license," "no degree, working toward associate's," "some PSE other," "certificate or license," or "associate's degree" received a "highest grade completed" code of "2-year program" for these analyses.

[4]The wording for the dropout questions was, "How many times did the following things happen to you during the last semester or term you completed in school?" For the student questionnaire, the wording was how many times *during the last semester* an event such as missing school occurred.

[5]The overall and group-specific averages for each of the continuous control variables are indicated in the table below.

	Overall Average	Averages Based on Family Structure Type			
		Two-Parent	Stepparent	Single-Parent	Other
8th-grade achievement	51.109	52.887	49.824	49.294	47.018
SES quartile	2.519	2.727	2.376	2.193	1.993
Times late	4.402	4.005	4.715	4.828	5.286
Times skipped	2.664	2.294	3.048	2.996	3.804
Times missed	5.162	4.590	5.524	5.929	7.432
Number of times changed schools	0.204	0.134	0.334	0.269	0.522

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