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Postsecondary Educational Pathways of Low-Income Youth: An Analysis of Add Health Data

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Author note

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Abstract

This study used data from a recent longitudinal survey conducted over a 14-year period to compare the educational pathways of young adults from low-income backgrounds to their middle/high-income counterparts. Specifically, the study examined whether the effect of low-income status in adolescence on postsecondary pathways is better explained by early academic indicators and educational ambitions or higher education enrollment patterns and out-of-school responsibilities. The analysis showed that low-income youth are disadvantaged in terms of entry into higher education as well as degree attainment. Roughly half of young adults from low-income families do not complete any postsecondary schooling, and those who do enroll are less likely to earn bachelor's degrees, partly due to lower educational ambitions and lower academic achievement in adolescence. Post-high school experiences are most decisive, however: Nontraditional patterns of enrollment in two-year colleges, shaped by out-of-school responsibilities such as full-time labor force participation and family obligations, are a key mechanism through which low-income status in adolescence leads to lower likelihood of degree completion in young adulthood.

Postsecondary Educational Pathways of Low-Income Youth

In the last several decades, the United States has seen a massive expansion of the higher education system, mostly due to growth in two-year colleges (Rosenbaum, Deil-Amen, & Person 2006). Some argue that this expansion has greatly increased educational opportunities for students from disadvantaged backgrounds (Rouse, 1995) and that while access to higher education had previously been the main barrier to educational opportunity, college selectivity and degree completion are now greater obstacles (Astin & Oseguera, 2004; Hearn, 1991; Rosenbaum, Deil-Amen, & Person, 2006). Whether the focus is on entry or persistence, there is little disagreement that family income continues to have strong effects on college attendance and completion (Duncan, Yeung, Brooks-Gunn, & Smith, 1998). Researchers, policymakers, and the public have long been concerned with how to reconcile this disconnect between the ideal of an American educational system with ample opportunities for upward mobility and the reality that educational outcomes are strongly linked to one's socioeconomic background (Duncan, Featherman, & Duncan, 1972; Duncan, Yeung, Brooks-Gunn, & Smith, 1998; Mare, 1980; Teachman, Paasch, Day, & Carver, 1997). It remains one of our most enduring social problems.

This study provides a national portrait of the postsecondary educational (PSE) trajectories of young adults to examine whether socioeconomic background more powerfully shapes entry into higher education or the enrollment paths and degree attainment of those who attend. We consider the mechanisms that help explain the effects of low-income status in adolescence, specifically addressing whether early educational and family indicators predict lower outcomes, or whether we must place a greater focus on post high-school experiences and responsibilities. We explore whether these factors better explain entry into PSE or degree completion following enrollment.

Previous research examining these issues has been limited because of its narrow focus on one of three areas: the question of *access*, examining only the relationship between socioeconomic background and college enrollment, without considering degree attainment (Alexander, Pallas, & Holupka, 1987); *degree attainment* or years of schooling, without considering factors such as institutional choice (Duncan, Yeung, Brooks-Gunn, & Smith, 1998); or *enrollment trajectories* among those who initially attend some postsecondary schooling, without considering those who do not enroll shortly after high school (Alexander, Holupka, & Pallas, 1987; Goldrick-Rab, 2006; Goldrick-Rab & Pfeffer, 2009). This study extends prior research on the relationship between low-income background and postsecondary education outcomes by exploring all three of these areas. We use longitudinal data compiled over a 14-year period to examine multiple enrollment trajectories that may lead to the completion of either associate's or bachelor's degrees in order to understand

whether disparate higher education completion rates are a function of access, persistence, or path taken.

Low-Income Background and Postsecondary Schooling

There is a vast body of research that demonstrates the strong relationships between low-income status in adolescence and later college entry and degree attainment (Duncan, Featherman, & Duncan, 1972; Duncan, Yeung, Brooks-Gunn, & Smith, 1998; Mare, 1980; Sewell et al., 1969; Teachman et al., 1997). Indeed, the problem has been well established, though the mechanisms underlying the relationship are unclear. A host of potential factors have been identified, ranging from personal factors associated with family of origin, to experiences in primary and secondary school, to experiences and obligations that follow formal schooling. Below, we draw from the existing literature to consider the relevance of these factors to a broader understanding of postsecondary pathways.

Family Social and Cultural Capital

Traditionally, certain knowledge and behaviors have been valued and rewarded in educational institutions. These, together with the social relationships that provide access to them—cultural and social capital, respectively—have been seen as essential to success in higher education (Bourdieu & Passeron, 1977; Lareau & Weininger, 2008; MacLeod, 2008). Problematic, of course, is the fact that such forms of capital may not exist in every family or individual and may not be provided by schools (Conchas, 2006; Lewis, 2003). The result is the perpetuation of an inequitable class structure (Lareau, 2003; MacLeod, 2008).

Parents' educational background has been linked to social and cultural capital (Bourdieu & Passeron, 1977; Coleman, 1988). Specifically, having a parent with experience in higher education means that a student has a close relationship with someone who is more likely to be familiar with the system. Parents' higher educational attainment might function as a form of social capital that influences degree attainment after PSE enrollment by, for example, helping students to navigate the college process and set realistic goals. In contrast, students whose parents have never navigated the higher education system may not have the same access to information (Pallais & Turner, 2007). Dynarski and Scott-Clayton (2006) found, for example, that the complexity of the financial aid system is daunting for students without access to anyone who can assist with the process—something more likely to be true for those whose parents have not attended college. As a result, students from lower-income families—arguably, those most likely to need financial assistance—may be the least likely to be able to navigate the system set up to serve them.

Family structure may also influence the types and amounts of social and cultural capital available to students. For example, studies show that children who grow up without

two parents tend to have lower educational attainment (McLanahan & Percheski, 2008). One theory asserts that having two parents in the home may provide a form of family social capital that is less available to those who grow up with only one parent (Coleman, 1988). As Meier (1999) notes, "a two-parent family is not inherently preferable to a one-parent family, but two parents can provide more social support, social control, information, and greater access to resources outside the family than one parent working alone can" (p. 4). Because it is well-established that single-parent homes are more likely to be low-income (McLanahan & Percheski, 2008), this is one way that family structure can act as a mechanism through which low-income background shapes educational attainment.

Early Educational Expectations and Experiences

A large body of research has suggested that numerous processes that occur in adolescence and that are associated with growing up in poverty may shape individual educational trajectories. Specifically, it is during these critical years that youth develop educational expectations, have positive or negative schooling experiences, and learn (or fail to learn) important academic skills (see, for example, MacLeod, 2008; Hauser & Sweeney, 1997; Teachman et al., 1997). Educational expectations and aspirations are particularly important; some research in this tradition shows how youth from poor or working-class backgrounds are steered into jobs that do not require advanced education (MacLeod, 2008; Willis, 1977). Classic work in the area of status attainment views expectations as partly mediating the effects of social origins (Sewell, Haller, & Portes, 1969). Perceptions of parents' expectations, for example, influence children's educational drive, even apart from the parents' *actual* expectations (Davies & Kandel, 1981; Feliciano, 2006). Likewise, the role of beliefs in the educational attainment process has received renewed emphasis (Morgan, 2005), and recent research has explicitly argued that values and attitudes should be integrated into studies of low-income background and education, again suggesting that lower aspirations or expectations may explain the socioeconomic background-attainment link (Vaisey, 2010).

Early school experiences are closely related to educational expectations. Youth from more advantaged backgrounds are more likely to feel and be connected to their schools through activities and relationships with school personnel, and to have more positive experiences in school as adolescents (Lewis, 2003; Valenzuela, 1999). In contrast, youth from low-income families are more likely to feel alienated and less likely to have these sorts of connections (Crosnoe, Johnson, & Elder, 2004), in part because they are more likely to attend poor quality schools, which do not have characteristics conducive to integration (Conchas, 2006). This lack of integration in secondary schooling means students feel less at home within educational institutions in general, and this may inhibit transitions to college.

The lower school achievement of low-income youth beginning at very early ages is well documented, and this disparity can be traced—in part or in whole—to limited home resources, added stress, and other disadvantages (Farkas, 2008). Early academic achievement and skills not only decrease the likelihood of enrolling in college, but also shape educational trajectories among those who attend PSE. Rosenbaum (2001), for example, argues that open access to community colleges may be a detriment to students who are told they can enter such colleges but who have not been prepared to succeed (Deil-Amen & DeLuca, 2010; Rosenbaum, 2001). And while remediation courses can be useful and are necessary (Rosenbaum, Deil-Amen, & Person, 2006), they often have the unintended consequence of further stratifying students. Moreover, students are often not informed about the delays and costs that such courses will add to their degree timetables, leading to disillusionment and dropping out (Rosenbaum, Deil-Amen, & Person, 2006).

This research suggests that early expectations, experiences, and achievement in middle and high school should help explain the effect of low-income background on higher education outcomes. Such factors likely predict whether young adults enroll in PSE and, if they do, whether they ultimately graduate with associate's or bachelor's degrees.

Post-High School Experiences and Obligations

Recent research suggests that the factors discussed above—parental social and cultural capital, early educational experiences and indicators, and ambitions and early achievement—do not fully explain the low-income/attainment link. Options and choices that exist after high school also make a difference. We know, for example, that institutional choice is important, and that students attending community colleges are less likely to eventually earn bachelor's degrees than those who start out at four-year institutions (Long & Kurlaender, 2009; Rosenbaum, Deil-Amen, & Person, 2006). But there are also other, more subtle factors at play.

Goldrick-Rab (2006), for example, found that among young people who attend college, those from lower-income backgrounds are more likely to interrupt their schooling, and that such pathways are less likely to lead to four-year degrees. Likewise, Bozick and DeLuca (2005) found that low-SES students are more likely to delay postsecondary enrollment after high school. In fact, research has shown that *most* undergraduates, especially those at two-year colleges, could be classified as non-traditional—including those who delay enrollment, have children, and who attend school part time and/or work full-time (Choy, 2002). Nevertheless, much of the research continues to discuss higher education as if most individuals follow a traditional pathway of transitioning directly from high school to postsecondary institutions, and then to full-time work.

Financial constraints can make full-time labor force participation a necessity for many students. Previous research has suggested that outside responsibilities may inhibit efforts to pursue college degrees, especially for students from low-income backgrounds (Bozick, 2007; Brint & Karabel, 1989; Rosenbaum, Deil-Amen, & Person, 2006; Weis, 1985). We know that for some students, these obligations may mean forgoing college altogether; they may also contribute to attrition among those who do enroll (Engle & Tinto, 2008; McDonough & Calderone, 2006). Further, for those who find themselves struggling in PSE or unable to navigate the "educational maze" of community college, full-time employment can be an attractive alternative (MacLeod, 2008). Likewise, early family formation, yet another factor that is more common among those from impoverished backgrounds (Attewell & Lavin, 2007), may derail educational paths, particularly for women (Feliciano & Rumbaut, 2005; Marini, 1984). Finally, although limited research has examined the relationship between the military and postsecondary pathways (see Teachman & Call, 1996, for an exception), the armed forces may be viewed as an alternative to higher education, and enlistment may facilitate or impede the attainment of postsecondary degrees.

Together, the issues outlined above paint a complex picture of the postsecondary pathways of young people who grow up in poverty. Clearly, there are many issues at play and, as scholars, it is our imperative to continue teasing them apart, with the intention of discovering more precisely why it is that students who grow up in poverty do not enroll in or graduate from higher education as often as their more affluent counterparts. With this obligation in mind, we used data from the National Longitudinal Survey of Adolescent Health (Add Health) to address several related research questions:

- What are the most common postsecondary enrollment trajectories of young adults from low-income backgrounds? How do these trajectories differ from those of young adults from middle/high-income backgrounds?
- To what extent can differences in postsecondary outcomes between individuals from low-income and middle/high-income backgrounds be predicted by early expectations and achievement, and to what extent are they driven by later life experiences and approaches to schooling and work?
- Do the same factors that predict non-enrollment in PSE also predict failure to complete degrees among those who do enroll?

Methods

Data and Sample

This study used data from the National Longitudinal Survey of Adolescent Health (Add Health), a four-wave, nationally representative study of American youth. The sample was the result of a multistage stratified sampling of 134 middle and high schools in 80 communities nationwide. The first in-home survey, conducted in 1994 and 1995, included 20,745 seventh- through twelfth-grade students. A second, follow-up survey was conducted in 1996,[1] and a third survey was conducted seven years later (2001–2002), when most respondents were young adults (ages 18–26); this sample included 73% of the original respondents. A fourth survey was conducted in 2007–2008, when the respondents were aged 24–32, and included 76% of the original participants. The research described in this article drew from the sample of respondents who participated in Wave 1, Wave 3, and Wave 4, for a total initial sample size of 15,197.

The Add Health data offers the largest nationally representative dataset with the necessary indicators; the 14-year timespan, the longest available, offers a more accurate gauge of higher education trajectories than studies conducted over shorter spans of time. The National Longitudinal Survey of Youth (NLSY), for example, has a much smaller sample and currently does not follow youth into their early thirties. Other longitudinal datasets focused on educational issues are either outdated (e.g., the National Education Longitudinal Study of 1988) or have not followed youth for a long enough period of time to assess PSE degree attainment outcomes (e.g., Education Longitudinal Study of 2002). And while the Beginning Postsecondary Survey contains detailed information about educational trajectories, it is limited to those who have actually attended PSE, which misses the large portion of the low-income population who never enroll in higher education.

In addition to limiting the Add Health sample to respondents who participated in Waves 1, 3, and 4, we also imposed several sample constraints by drawing information from two supplemental sources. First, this study used the Adolescent Health and Academic Achievement Study (AHAA), which contains official transcript information for 12,160 of the total 15,197 respondents. We also drew information from the Parent Data Set, a survey of parents and guardians of Wave 1 respondents. Only 13,268 of the total respondents were included in the parent survey. We included Add Health's grand sample weights to address the oversampling of certain groups in the study design and to provide nationally representative estimates.[2] Assigned weights were only provided for 9,368 of the total 15,197 respondents, however.[3] We used multiple imputation—using the ICE command in STATA—to deal with missing values on independent variables. The final analytic sample included 9,368 respondents.[4]

Measures

The key outcome for this study was the highest level of postsecondary education attained by Wave 4 (2007–2008), when respondents were 24–32 years old.[5] Each respondent was assigned to one of five categories: no postsecondary education (PSE) or vocational/job training; no formal PSE but had completed a job training or vocational program; some college, but no associate or bachelor's degree;[6] associate degree; or bachelor's degree or higher (see Appendix A).

The key independent variable, low-income background, was based on family income and household size at Wave 1. The official U.S. Census poverty threshold has long been criticized for being too low (Beverly, 2000; Citro & Michael, 1995); as such, and in keeping with many others, we placed our threshold at 1.85 times the federal poverty line. Households at this level and below qualify for a number of means-tested benefits, such as Medicaid, food stamps, and reduced price school lunch programs. Although somewhat imprecise, this measure has been used in numerous studies, and provides an adequate approximation of economic disadvantage (Entwisle & Alexander, 1995; Heflin & Pattillo, 2006).

We included several demographic factors in our analysis, all measured in Wave 1: age and gender were included as basic controls; race/ethnicity was measured with dummy variables for non-Latino White, Asian American, Latino, non-Latino Black, and other race or ethnicity; immigrant generation was measured as a series of dummy variables for first generation (foreign born), second generation (native born with at least one foreign born parent), and third generation or higher (native born with two native born parents). We used dummy variables for the highest level of education achieved by either parent, and to indicate whether respondents lived with one or two parents at Wave 1.

We also included two variables reflecting respondents' educational expectations at Wave 1, when they were in grades 7–12. First, we included a dummy measure of college expectations ("On a scale of 1 to 5, where 1 is low and 5 is high, how likely is it that you will go to college?"). Respondents who reported a 4 or 5 were coded as having high expectations to attend college; those who reported a 1, 2, or 3, were coded as having low expectations to attend college. Second, we included a dummy measure for respondents' perceptions of their parents' expectations at Wave 1. Respondents' were asked this question separately for each parent with whom they were in contact ("On a scale of 1 to 5, where 1 is low and 5 is high, how disappointed would your parent be if you did not graduate from college?").[7] Respondents who reported a 4 or 5 were coded as having high parent expectations to graduate from college; respondents who reported a 1, 2, or 3 were coded as having low parent expectations. While responses to both of these questions were used, only the highest expectation reported for either parent was captured by this measure.

A composite for school attachment and integration was created by averaging Wave 1 responses reflecting the extent to which respondents agreed, in the past school year, they felt close to people at their schools, felt part of their schools, and were happy to be at their schools (alpha = .77). Responses ranged from 1 to 5, with higher values indicating stronger levels of attachment.[8] The teacher/student bonding scale was created by combining adolescents' reports of the extent to which they agreed, in the past school year, that teachers treated students fairly, that they had trouble getting along with teachers, and that they felt teachers cared about them (alpha = .61).[9] The first two items refer to the quality of students' relationships with teachers, and the third refers to whether students' assessments of teachers were positive or negative. The teacher/student bond ranged from weak (1) to strong (5).

Using the AHAA study, we were able to gather official transcript data for the overall high school GPA measure (ranging from 0 to 4.0) and course sequence variables, which we used to create a scale of academic tracking in high school. The course sequence variables indicate the trajectories or strands of courses taken by students in different school subjects. We chose mathematics because math courses are typically organized into hierarchical, linear sequences—i.e., successive courses are recognized as being more advanced and generally requiring more prerequisites. The measure captured students' locations within this subject's course hierarchy by the end of high school.[10] Put simply, the tracking scale reflects the highest level and difficulty of respondents' math course sequences taken throughout high school, ranging from 0 (no math) to 9 (calculus).[11]

We also included several life experience measures from Wave 3 of the survey, when respondents were aged 18–26. Few respondents had earned degrees at this point, but many were still enrolled in school. The school enrollment pattern dummy variables measured two things: whether respondents were enrolled in two-year or four-year postsecondary schools or not at all, and whether those enrolled were in school part-time or full-time. These dummies were coded directly from questions in the in-home survey, which asked each respondent to indicate the type of school he or she was attending as well as his or her school enrollment status. A set of dummies indicating whether respondents had ever been married, had ever had a child (or children), both, or neither were created based on self-reports from the survey. Respondents were coded as married if they were previously or currently married. A dummy measure for military participation indicates respondents who had ever served or were currently serving in the military at Wave 3. Finally, we included a set of dummies indicating the age of respondents when they obtained their first full-time jobs.

Analysis Plan

We calculated descriptive statistics to demonstrate the educational pathways of youth over time. We then used multinomial logistic regression analysis to examine the relationship between low-income status in adolescence and postsecondary educational attainment, and

to determine whether this relationship can be explained by demographics, early educational achievement and expectations, or later life experiences. We used multinomial logistic analysis because we consider our five educational attainment outcomes to be nominal variables that are not necessarily ordered in a clear manner. That is, it is not clear that the educational outcomes we considered (such as attending some college without earning a degree vs. completing a job training/vocational certificate) lead to successively more value in the labor market. Moreover, using a multinomial analysis rather than an ordered analysis introduces less measurement error because, had we assumed a clear order, some individuals would have fewer years of schooling than others who were ranked lower in the order (i.e., associate's degrees vs. some college with no degree). This method corresponds to previous research that has also simultaneously analyzed multiple educational attainment outcomes (e.g., Goldsmith, 2009).

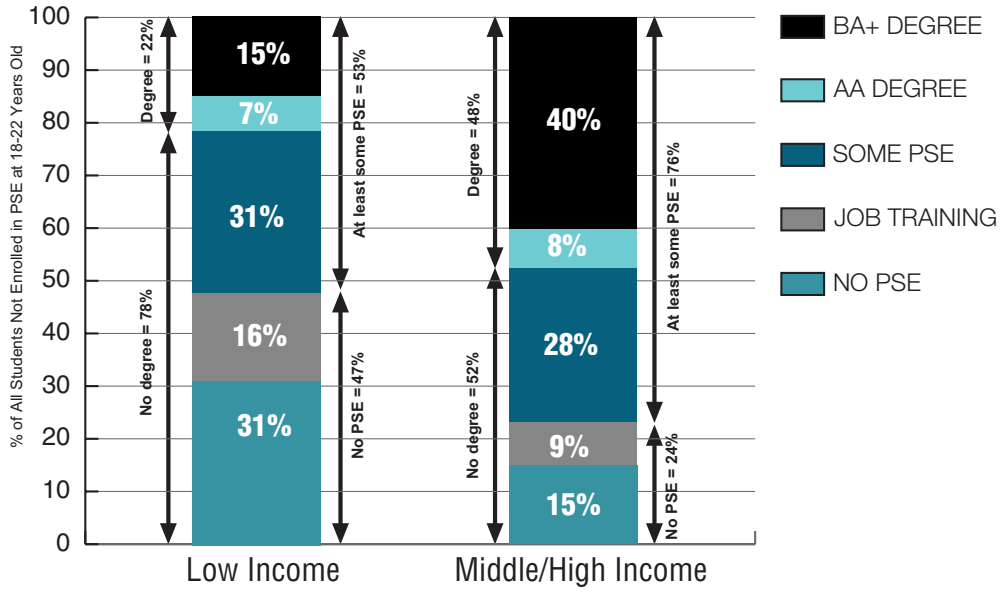
Results

PSE Outcomes by Class Background

Figure 1 shows the differences in postsecondary educational outcomes for the last wave of the survey, for all respondents.[12] The differences between those from middle/high-income families versus low-income families were most striking at the high and low ends of the educational distribution. For example, about 31% of young adults from low-income backgrounds had not completed any PSE or job/vocational training and 15% had earned bachelor's degrees. In contrast, only 15% of young adults from middle/high-income backgrounds had not completed any PSE or job/vocational training, but 40% had earned bachelor's degrees. Young adults from low-income backgrounds were also more likely to have completed job or vocational training programs (16%) than those from middle/high-income backgrounds (9%).

The striking differences in educational outcomes by socioeconomic origins naturally lead to the question of why the differences exist. Specifically, it is important that we understand whether the issue is one of access to higher education in the first place, or of the pathways traveled after entry. And beyond that, we must determine what additional factors might explain these differences. Since young adults from low-income versus middle/high-income backgrounds differed along a number of dimensions in addition to family economic resources—including race/ethnicity, gender, early educational expectations, school experiences, and achievement (see Appendix A)—educational differences may be driven by these factors. Before considering these questions, we turn to a more detailed analysis of the differences in the pathways toward Wave 4 outcomes.

Figure 1. Postsecondary Educational Outcomes at Wave 4 by Family Income at Wave 1 (Respondents Aged 24–32 at Wave 4)



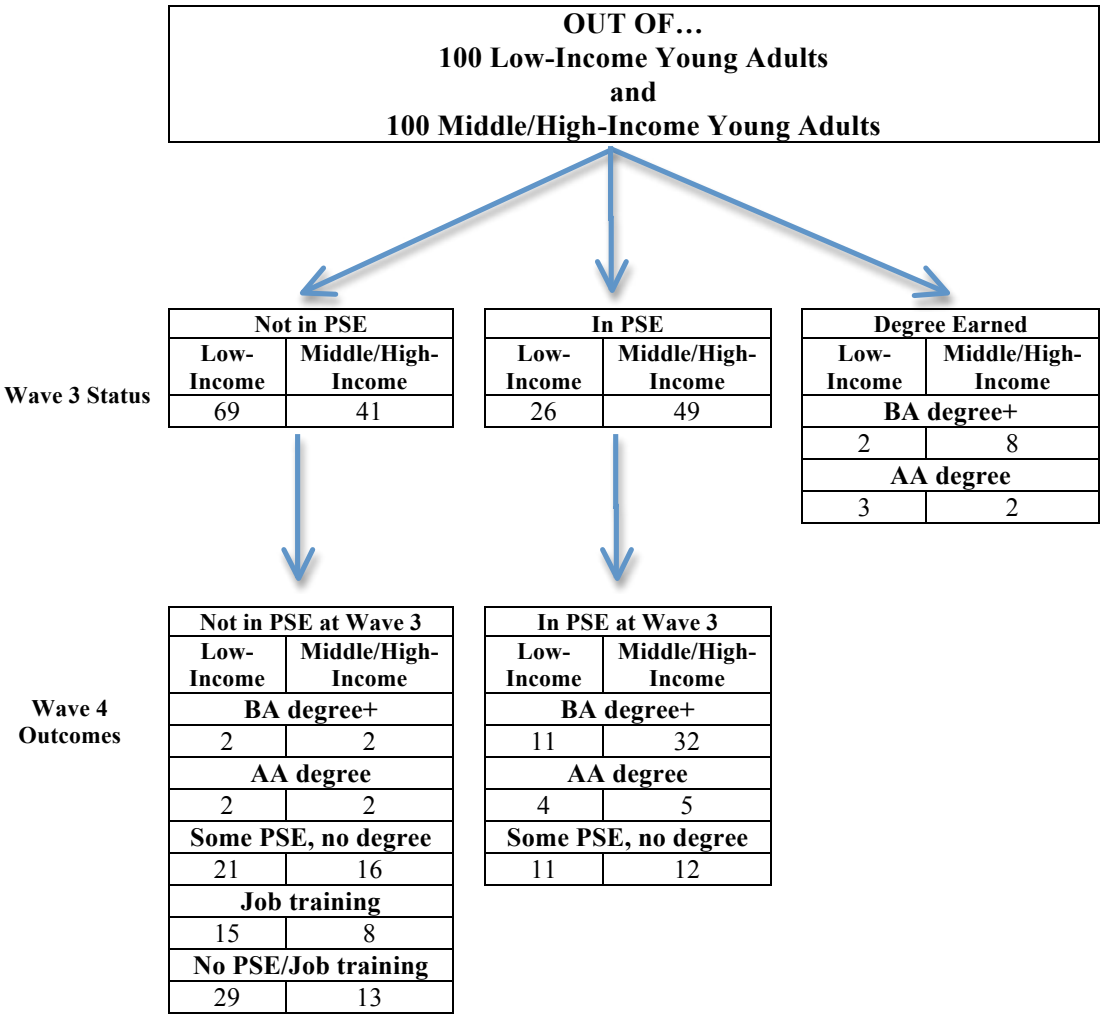
Notes: Unweighted N totals: Low-Income=1,807, Middle/High Income=5,017. Data are weighted and adjusted for sampling clustering.

The Educational Pipeline

Figures 2 and **3** combine data from Wave 3 and Wave 4 to present educational pipelines for youth from low-income and middle/high-income backgrounds over a span of six years. We chose to focus this set of analyses on the younger respondents who were aged 18–22 during the third wave of the study, since this is the traditional age range of college students. **Figure 2** represents the trajectories of 100 young adults from low-income backgrounds and 100 young adults from middle/high-income backgrounds as they aged from 18–22 years old to 24–28 years old. One of the most striking differences in these educational trajectories is the fact that out of 100 low-income youth ages 18–22, 69 were not in school and only five had completed a bachelor's or associate degree. In contrast, 41 out of 100 middle/high-income youth were not in school, and 10 had already completed degrees.

Looking more closely at young adults who were not in PSE at Wave 3, we see important differences by income level. Of the 69 low-income youth who were not in PSE at Wave 3, 29 (42%) had still not completed any PSE or job training six years later; 21 (30%) had completed some PSE and 15 (22%) had completed some job training (**Figure 2**). This compares to 13 out of 41 (32%) middle/high-income youth who had not completed any PSE or job training at this point, 16 (39%) who had completed some PSE and eight (20%)

Figure 2. PSE Pathways of Students from Wave 3 to Wave 4 by Family Income at Wave 1 (Respondents Aged 18–22 at Wave 3 Only)



who had received some job training. Only a handful of low-income youth (6%, or 4 of 69) or middle/high-income youth (10%, or 4 of 41) who were not in school at Wave 3 went on to earn associate's or bachelor's degrees by Wave 4.

Turning our attention to those young adults who were enrolled in PSE at Wave 3, we see another striking difference between the trajectories of low-income versus middle/high-income youth: bachelor's degree attainment by Wave 4. Of 26 young adults from low-income backgrounds who were enrolled in PSE at Wave 3, only 11 (42%) had earned a bachelor's degree six years later; in contrast, 32 of the 49 middle/high-income youth (65%) had done so. Low-income youth were more likely to have earned associate's degrees by Wave 4—four of 26 (15%) had done so, compared to five of 49 (10%) middle/high-income youth. Importantly, low-income youth who were enrolled in PSE at ages 18–22 were also

more likely not to have earned *any* degree six years later (11 of 26, or 42%) than were their higher-income counterparts (12 of 49, or 25%).

Figure 3 sheds light on how educational outcomes vary by the postsecondary institutional types of those young adults who were in school at Wave 3. As is clear from the figure, while low-income and middle/high-income background young adults were similarly represented in two-year colleges, over twice as many middle/high-income background young adults were in four-year institutions (34 out of 100 vs. 13 out of 100). **Figure 3** further shows that very few individuals who were enrolled in two-year colleges at Wave 3 had earned bachelor's degrees six years later, although this was more common for middle/high-income youth (4 of 15, or 27%) than for lower-income youth (2 of 13, or 15%). Another 23% of low-income young adults and 20% of middle/high-income young adults who were enrolled in two-year colleges at Wave 3 had earned associate degrees six years later (3 out of 13 and 3 out of 15, respectively). However, for both low-income and middle/high-income youth enrolled in two-year colleges at Wave 3, it was most common not to have earned *any* degree six years later.

Figure 3. Educational Outcomes of Students by Institutional Type at Wave 3 and Family Income at Wave 1 (Respondents Age 18–22 and in PSE at Wave 3 Only)

OUT OF…
100 Low-Income Young Adults
and
100 Middle/High-Income Young Adults

Wave 3 Status

In 2-Year PSE		In 4-Year PSE	
Low-Income	Middle/High-Income	Low-Income	Middle/High-Income
13	15	13	34

Wave 4 Outcomes

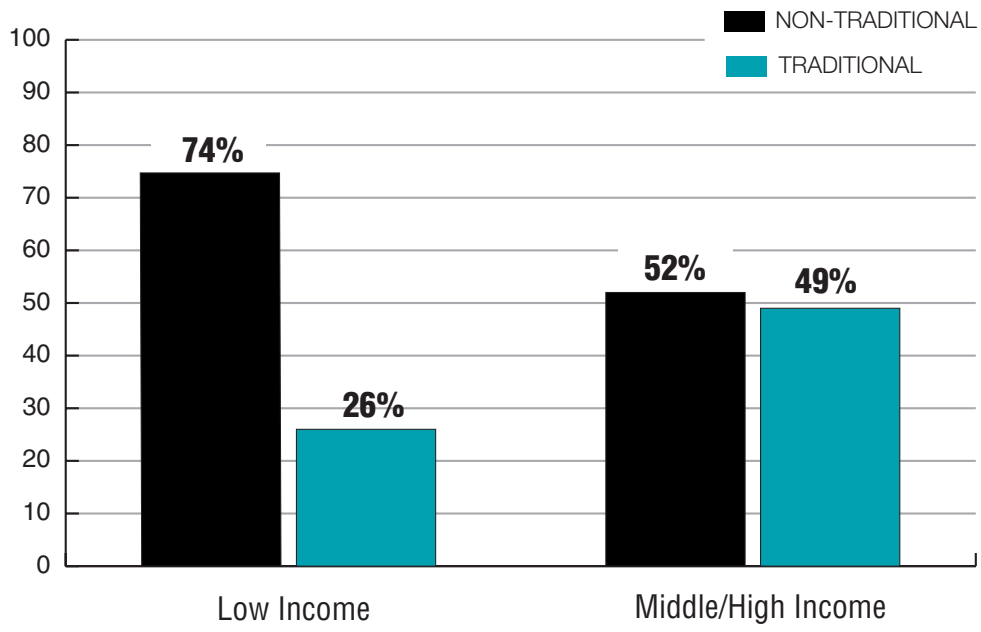
In 2-Year at Wave 3		In 4-Year at Wave 3	
Low Income	Middle/High Income	Low Income	Middle/High Income
BA degree+		BA degree+	
2	4	9	28
AA degree		AA degree	
3	3	1	1
In PSE, no degree		In PSE, no degree	
3	2	1	1
Not in PSE, no degree		Not in PSE, no degree	
5	6	2	4

Not surprisingly, both low- and middle/high-income youth who were enrolled in four-year colleges at Wave 3 were much more likely to have earned bachelor's degrees six years later. However, bachelor's degree completion was still much more common among middle/high-income youth, even when we examine only those were who were enrolled in four-year institutions in Wave 3. While nine of the 13 low-income youth who had enrolled in four-year colleges had earned bachelor's degrees (69%) by Wave 4, 28 of the 34 middle/high-income youth (82%) in the same category had done so. These descriptive findings suggest not only that institutional type is an important factor shaping degree attainment, but also that coming from a low-income family is negatively related to degree attainment, even for those students who attend four-year institutions. One possible mechanism not considered in this particular educational pipeline relates to other factors surrounding enrollment in PSE, which we consider next.

Traditional versus Non-Traditional PSE Pathways

Figure 4 compares low- and middle/high-income background young adults who had completed at least some postsecondary education by Wave 4. The figure specifically focuses on whether their enrollment patterns were traditional or non-traditional, following definitions from previous research (Choy, 2002).[13] Traditional patterns include only those who attended PSE full-time immediately after high school while working part-time or not at all. Delaying enrollment, enrolling only part-time, or working full-time while enrolled

Figure 4. Wave 3 Enrollment Category by Family Income at Wave 1 (Respondents With At Least Some PSE at Wave 4 Only)

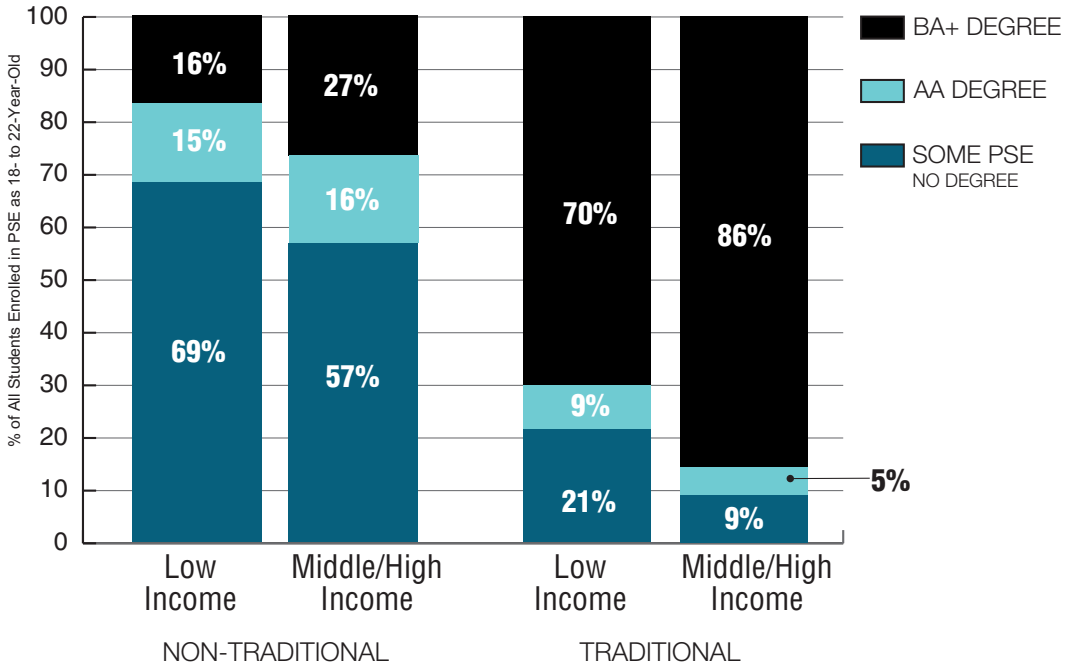


constitute non-traditional pathways. Since results did not differ significantly by age cohort, this figure combines all ages. As **Figure 4** illustrates, among those who did enroll in PSE, young adults from low-income backgrounds were much more likely to enroll in non-traditional ways: About half (52%) of those from middle/high-income backgrounds versus 74% of those from low-income backgrounds enrolled in college in nontraditional ways.

It is noteworthy that, across income categories, a majority of all young adults who enrolled in college exhibited non-traditional enrollment patterns, especially given that the data further show that traditional college enrollment patterns were much more likely to lead to bachelor's degrees or higher among both low- and middle/high-income young adults (**Figure 5**). Seventy percent of young adults from low-income families and 86% of those from middle/high-income families who took traditional PSE pathways had earned bachelor's degrees or higher by Wave 4.

Among those who took non-traditional PSE routes, only 16% of low-income students and 27% of middle/high-income students had earned bachelor's degrees by Wave 4. Associate degree completion was just about as likely as bachelor's degree completion

Figure 5. Degree Attainment at Wave 4 by Family Income at Wave 1 and Enrollment Category at Wave 3 (Respondents With At Least Some PSE Completed at Wave 4 Only)



Notes: Non-Traditional, Low-Income N=837; Non-Traditional Middle/High-Income N=21; Traditional, Low-Income N=335; Traditional Middle/High-Income N=935

for low-income young adults who enrolled in a non-traditional manner (15% and 16%, respectively). Among middle/high-income youth who enrolled non-traditionally, Associates degree completion was less likely than bachelor's completion (16% and 27%, respectively). By far the most common outcome for those who took a non-traditional PSE route was not to have earned any degree six years later—this was true for 69% of low-income youth and 57% of middle/high-income youth in this category.

The similarities in degree attainment for those from low- and middle/high-income backgrounds by enrollment pattern suggest that the overall lower levels of degree attainment among those from low-income backgrounds may be partially driven by a greater likelihood of non-traditional enrollment. Differences in PSE outcomes may also be determined by differences in educational aspirations or by early academic achievement. To consider these and other possibilities, we turn to multivariate regression analyses.

Explaining the Negative Effect of Low-income Background

Table 1 shows whether various factors help explain the relationship between low-income status in adolescence and postsecondary educational attainment in adulthood by comparing the relative risk ratios for the effect of low-income background from various multinomial regression models. The reference group for this analysis was those who completed some PSE but did not earn a degree. Thus, we were able to compare factors that might explain the effect of low-income background on PSE entry (no PSE or job training only vs. PSE/no degree) and factors that might explain the effect of low-income background on degree completion (associate or bachelor's degree vs. PSE/no degree).

The first model shows that, overall, young adults from low-income families were 1.9 times as likely not to have enrolled in PSE at all and 1.6 times as likely to have completed job/vocational training (vs. enrolled but not earned a degree) compared to those from middle/high-income families. As suggested by the descriptive findings, young adults from low-income backgrounds were not significantly more or less likely than those from middle/high-income families to earn associate degrees versus completing some college with no degree. However, low-income adults were much less likely than middle/high-income adults to earn bachelor's degrees than to attend college with no degree. The magnitude of these effects suggests that young people who enroll in PSE from low-income families are at a substantial disadvantage in terms of both *access* to postsecondary education and *completion* of bachelor's degrees.

Black and Latino youth and youth from immigrant families were more likely to grow up in low-income households (see Appendix A). Model 2 adds these demographic factors, as well as age and gender, and shows that the effect of low-income background does not change significantly by demographic subgroup.

Table 1. Effects of Low-Income Status in Adolescence on Postsecondary Educational Attainment

	Model 1:		Model 2:		Model 3:		Model 4:		Model 5:	
No PSE (vs. some PSE, no degree)	1.937	***	1.937	***	1.543	***	1.367	**	1.272	*
Job/vocational training, no degree (vs. some PSE, no degree)	1.604	***	1.602	***	1.341	**	1.192		1.136	
AA degree (vs. some PSE, no degree)	0.807		0.872		0.654		0.963		1.063	
Bachelor's Degree+ (vs. some PSE, no degree)	0.335	***	0.358	***	0.486	***	0.576	***	0.831	
Total N = 9368										
*Relative Risk Ratios from Multinomial Regressions										
*** p<0.001, ** p<0.01, * p<0.05										
Model 1: No controls										
Model 2: Demographic factors: age, gender, race/ethnicity, immigrant generation										
Model 3: Model 2 + parents' education, lived w/2 parents in Wave 1										
Model 4: Model 3 + adolescent educational expectations, adolescent perceptions of parent expectations, school attachment, teacher-student bond, GPA, college track										
Model 5: Model 5 + 2yr/4yr & ft/pt school enrollment in Wave 3, marital status and/or children in Wave 3, military in Wave 3, age at first full-time job										

Model 3 adds two indicators of parental resources: parents' educational attainment and whether both parents lived at home with the respondent during childhood. These factors moderated the effect of low-income background on access to PSE, since once they were included we saw a decline in the effect of low-income background from 1.9 (Model 2) to 1.5 (Model 3). Still, young adults from low-income backgrounds remained less likely to have completed any PSE compared with those from middle/high-income families, even controlling for parents' education and family structure. Moreover, while parents' education and family structure slightly moderated the effect of low-income background, the strong positive effect of low-income background on no PSE or job/vocational training and its negative effect on bachelor's degree attainment remained. These findings suggest that more limited access to the types of social capital that can facilitate PSE pathways may provide one mechanism through which low-income status in adolescence shapes college access, but it is by no means the only mechanism.

Model 4 considers whether early educational expectations, experiences, and achievements explain these differences. This model tested whether young adults from low-income families who enrolled in college failed to earn bachelor's degrees because they did not have that goal to begin with, because they perceived their parents did not have high expectations of them, because they had negative early school experiences, or because they were less academically prepared (see Appendix A).[14] Recall that some existing theories suggest that these factors should fully explain the differences in PSE outcomes by socioeconomic background; here we see that this is partially true. Including these factors explains differences in pursuing job/vocational training versus enrolling in PSE between young adults from different socioeconomic backgrounds.[15] However, while these factors did moderate effects somewhat, they failed to fully explain differences in PSE entry (vs. no PSE) and also, why those from low-income backgrounds who attended college often failed to graduate with bachelor's degrees. This suggests that while early expectations and academic achievements shape enrollment in PSE to some extent, they do not fully explain the differences in PSE entry and bachelor's completion between low- and middle/high-income youth.

Model 5 is the first to add post-high school experiences (measured at Wave 3) to the factors under consideration. Here, we explored whether the remaining effects of low-income background can be explained by school enrollment and institution type, work, and military enlistment patterns of individuals from low-income families, as well as the potentially competing responsibilities of marriage and/or children. Once these factors were added to the model, we saw that the effect of low-income background on PSE enrollment (vs. no PSE) was slightly moderated and differences in bachelor's degree attainment between young adults from low-income and middle/high-income backgrounds were no longer statistically significant. In fact, the disadvantage of coming from a low-income family in terms of bachelor's degree attainment was completely explained by school type and enrollment, work, military, and family patterns.

Young adults from low-income backgrounds were more likely to join the military, more likely to start working full-time at an earlier age, and more likely to enroll only part-time in higher education than their middle/high-income counterparts. These behaviors were presumably a result of accumulated obstacles, including financial constraints and limited knowledge of the best strategies for achieving educational goals. Moreover, young adults from low-income families were less likely to delay marriage and childbearing, resulting in responsibilities that could compete with the demands of schooling. In the next section, we describe the effects of these and other predictors of PSE outcomes.

Table 2. Relative Risk Ratios from Multinomial Regressions of Postsecondary Educational Attainment in Adulthood (Wave 4)[a]

Independent Variables	No PSE (vs. some PSE, no degree)		Job/Vocational Training (vs. some PSE, no degree)		AA degree (vs. some PSE, no degree)		BA Degree+ (vs. some PSE, no degree)	
Below 185% Poverty Line, Wave 1	**1.272**	*	**1.136**		**1.063**		**0.831**	
Female	0.740	*	0.734	*	1.144		1.088	
Age	0.936		0.917	*	1.197	***	1.326	***
Self-Identified Race/Ethnicity:								
Black	1.036		1.218		0.595	**	0.758	
Native-American	1.388		0.886		1.023		0.880	
Asian	1.944	*	0.867		1.652		0.957	
Hispanic	1.142		0.846		0.895		1.292	
Other	3.670		5.556	*	2.968		2.455	
(White)								
Immigrant Generation:								
2nd Generation	0.692		1.265		1.183		0.753	
3rd Generation	0.944		1.016		1.498		0.893	
(1st Generation)								
Lived w/2 Parents, Wave 1	1.003		1.104		1.175		0.935	
Parents' Education Level:								
High school degree/GED	0.648	**	0.743		0.998		1.381	
Some college	0.421	***	0.550	**	1.066		1.581	
Bachelor's degree or higher	0.345	***	0.423	***	0.998		2.052	**
(less than high school degree)								
Expectations for Bachelor's Degree, Wave 1	0.521	***	0.545	***	1.010		1.326	
Perception of Parents' Expectations for B.A., Wave 1	0.848		0.790	*	0.872		1.121	
School Attachment, Wave 1	0.958		0.946		1.058		0.962	
Teacher-Student Bond, Wave 1	1.004		1.076		0.985		0.995	
Cumulative GPA, High School	0.664	***	0.802	*	1.386	**	2.193	***
College Track, High School (based on math course)	0.836	***	0.823	***	0.923	*	1.112	*
Marriage Status/Children, Wave 3:								
Married, no children	1.315		1.047		1.334		0.788	
Never married, children	1.131		0.997		0.726		0.507	**
Married and children	1.609	**	1.277		1.078		0.587	*
(Never married, no children)								
Ever in Military, Wave 3	0.312	***	0.984		0.575	*	0.497	**
Age at First Full-Time Job:								
17 or younger	0.706		0.948		0.790		0.546	*
18–19	0.538	*	0.792		0.728		0.372	***
20–21	0.406	**	0.513	*	1.253		0.691	
22 or older	0.481	*	0.690		1.243		2.348	***
(Never worked full-time)								
School Enrollment, Wave 3:								
In 2yr-college, part-time	0.000	***	0.000	***	2.784	***	1.128	
In 2yr-college, full-time	0.000	***	0.000	***	4.451	***	3.101	***
In 4yr-college, part-time	0.000	***	0.000		3.329	***	3.468	***
In 4yr-college, full-time	0.000	***	0.000	**	2.575	***	12.496	***
(Not in school)								
Total N = 9,368								
[a]Table 3 Model 5 (full model)								
*** p<0.001, ** p<0.01, * p<0.05								

Predicting PSE Outcomes

Do the same factors predict both PSE enrollment and associate's or bachelor's degree attainment? **Table 2** presents the full model (Model 5 from **Table 1**).

Demographic Controls. When compared to men, and net of the other factors in the model, women were more likely to enroll in PSE, but not necessarily more likely to obtain associate or bachelor's degrees. Additional analyses (not shown) reveal that women had higher educational attainment than men, but this was explained by higher early educational expectations and achievement. We also see that older respondents were more likely to enroll in PSE (vs. job/vocational training) and more likely to have earned associate and bachelor's degrees.

Although racial and ethnic differences in educational attainment outcomes were pronounced, the *net* effect of race/ethnicity on most of the educational outcomes was minimal because those differences were, with a few exceptions, explained by early family income and structure and by early academic achievement. More specifically, net of the other factors in the model, blacks were significantly less likely than whites to earn associate's degrees (vs. completing some college without earning any degree). Asians, perhaps surprisingly, were more likely not to have any PSE than to have some PSE without earning a degree. We note that this finding is a net effect; that is, without the controls, Asians were descriptively more likely to have enrolled in PSE than whites. The significant effects of belonging to any other race on PSE outcomes are difficult to interpret due to the small and heterogeneous nature of this group. Immigrant generation appears to have had no net effect on these educational outcomes.

Parental Resources. Living in a two-parent home had no net effect on PSE access or degree attainment. Respondents whose parents had graduated from high school, completed some college, or earned bachelor's degrees were more likely than those whose parents did not have high school diplomas to have completed some PSE versus none. Young adults whose parents had gone to college or earned bachelor's degrees were also more likely to have completed some PSE than to have completed job training programs. Moreover, respondents whose parents had bachelor's degrees were also more likely to obtain bachelor's degrees themselves. The significant effects of parents' education, net of family income, supports the notion that parental education functions as a form of social capital in promoting college attendance and completion.

Early Educational Experiences & Indicators. Leveled aspirations and expectations, more negative school experiences (often in poor-quality schools—see footnote 14), and lower achievement have all been considered mechanisms through which low-income status in adolescence can influence later educational attainment. **Table 2** confirms

the strong influence of students' own college aspirations and their perceptions of parents' expectations on college entry; those who expected to go to college and who reported that their parents would be disappointed if they did not earn bachelor's degrees were far more likely to attend college without earning degrees versus not attending or only completing job/vocational training. Expectations, net of other factors, appear to have had no effect on degree attainment among those who attended, however.

Early school experiences, net of other factors, also had no effect on eventual attainment, but educational achievement or academic readiness, as indicated by higher high school GPAs and college preparatory course-taking had strong effects on all outcomes. A higher GPA predicted a greater likelihood of enrolling in PSE without earning a degree versus not enrolling at all or completing only job training. Those who were not on a college track were also less likely to have enrolled in PSE than not to have enrolled or to have completed only job training. These academic indicators also led to a far greater likelihood of earning an associate's or bachelor's degree (vs. attending PSE without earning a degree). These findings provide strong evidence that it is lack of college preparedness, much more than lack of ambition or parental expectations, that distinguishes those who earn associate or bachelor's degrees from those who enroll but fail to earn degrees.

Post-High School Life Experiences. In addition to characteristics and early experiences in adolescence, the longitudinal nature of our data allowed us to consider the post-high school factors present in Wave 3 that shaped PSE attainment in Wave 4. As we saw in **Table 1**, post-high school experiences fully explained the negative effect of low-income background on bachelor's degree attainment. One potentially important experience in post-high school young adulthood is family formation. As expected, we see that respondents (married or single) who had children were less likely to obtain bachelor's degrees than they were to attend PSE without earning degrees. Those who were married with children were also less likely to have enrolled in PSE at all.

Joining the military was a more common post-high school path among low-income youth (see Appendix A), but how did this affect educational attainment? On the one hand, those with military experience were more likely to have completed some PSE as opposed to none. On the other hand, military experience led to a *lower* likelihood of earning an associate or bachelor's degree among those who attended PSE. Therefore, the military seems helpful for providing access to postsecondary entry, but not for degree completion.

The age at which one starts his or her first full-time job also has some significant effects on educational attainment. Those who were 18 years of age or older when they first worked full-time were more likely to have completed some PSE with no degree than not to enroll in PSE at all. This suggests that these individuals may have been pulled away

from PSE before earning degrees in order to work full-time, perhaps because of financial obligations. Those who began full-time work before age 19 were far less likely to earn bachelor's degrees as compared to attending PSE without earning degrees, even net of all the factors in the model, including enrollment patterns. Finally, delaying full-time work until age 22 or higher was associated with bachelor's degree attainment.

Perhaps the most important predictors of degree attainment by Wave 4 were captured by enrollment patterns in Wave 3, including institutional type (two-year vs. four-year) and whether the respondent was enrolled part-time or full-time. These factors, by definition, would only pertain to degree attainment, and not entry. We found that 72% of respondents who were enrolled part-time in Wave 3 were enrolled in community colleges (not shown). As such, we combined both sets of factors in order to disentangle whether it was institutional type or part-time or full-time enrollment that was most determinant of degree attainment. Not surprisingly, those who reported having completed some PSE but who were not enrolled in PSE in Wave 3 of the study were less likely than nearly all other groups of respondents to earn degrees (**Table 2**). These are individuals who perhaps had taken only a few courses and then dropped out of PSE or who drifted in and out of enrollment statuses. However, there is one exception to the nearly uniform negative effect of non-enrollment: Those who enrolled *part-time* in *two-year* colleges did not significantly differ from those not enrolled at all in their likelihood of having earned bachelor's degrees six years later.

Among those who were enrolled, we further found that institutional type and enrollment status interacted to strongly influence degree attainment. For instance, we saw that full-time enrollment in a community college was more likely to lead to an associate degree than was part-time enrollment in a community college or full-time enrollment in a four-year college. Those who were enrolled part-time in four-year colleges did not significantly differ from those enrolled full-time in two-year colleges in associate degree attainment (tests not shown; available upon request).

Focusing on bachelor's degree attainment, it is not surprising that those enrolled full-time in four-year institutions were far more likely than any others to graduate. Not only were these students over 12 times more likely to earn bachelor's degrees than others who were not enrolled at all, they were seven times as likely as those who were enrolled part-time in two-year colleges, four times as likely as those who were enrolled full-time in two-year colleges, and nearly four times as likely as those who were enrolled part-time in four-year colleges. In addition, enrolling in two-year colleges full-time *or* four-year colleges part-time were both significantly more likely to lead to bachelor's degree attainment six years later than was part-time enrollment at a community college. Enrollment full-time in

a two-year college or part-time in a four-year college were about equally likely to lead to bachelor's degree attainment. While one might argue that those who chose to enroll part-time or in two-year institutions did not have bachelor's degrees as their goal, additional analyses suggest this was not often the case, as most of the respondents who were enrolled in two-year colleges and/or part-time in Wave 3 still indicated in Wave 4 that they expected to earn bachelor's degrees in the future.[16]

Discussion and Conclusion

This study advances prior research on the connections between socioeconomic background and education by examining longitudinally some mechanisms that help explain the relationship between family income in adolescence and higher education attainment in adulthood. Several findings are especially noteworthy. First, contrary to more optimistic assertions that access to higher education is now relatively open, leaving retention and degree attainment as the major issues facing disadvantaged youth (Rosenbaum, 2001; Rosenbaum, Deil-Amen, & Person, 2006), this study found that almost half (47%) of low-SES young adults ages 24–32 had not enrolled in college at all, and a sizeable portion of these young adults (66%) had also not completed any sort of job training or vocational program (see **Figure 1**). While the growth in community colleges may mean that more low-income youth attend college than ever before, college entry nevertheless remains an important issue. These findings suggest that, despite massive expansion in higher education in the last few decades, serious obstacles remain for young adults from low-income families who hope to attend college.

Our analyses provide some insight into a number of these obstacles. Although a direct effect of low-income status in adolescence remains for PSE enrollment, it appears that low-income background operates through several other mechanisms. Focusing first on PSE enrollment, we found that while some of the effect of low-income background on PSE enrollment could be explained by lower levels of social capital related to parents' education and family structure, lower educational ambitions and academic preparation in adolescence were more decisive factors in shaping enrollment in PSE. Lower educational expectations and lower perceptions of parents' expectations explained a portion of the significant effect of low-income background on PSE enrollment, as did GPA and academic tracking in adolescence (see **Table 1**). However, these factors reinforced one another and we were unable to disentangle their effects. Future studies should examine these factors more closely so that their individual effects can be more clearly understood.

Low-income status in adolescence also shaped PSE enrollment through its association with entering the full-time labor force at an early age, joining the military, and/

or childbearing. Future research should more fully investigate young adults' decision-making processes in choosing to forgo PSE for work, the military, or childbearing. Our findings do show that such decisions were *not* primarily driven by educational expectations or achievement in high school. This suggests that decisions to participate fully in the labor market or the military may ultimately reflect financial constraints, which play a major role in limiting college access for low-income students (McDonough & Calderone, 2006). The fact that none of the factors we examined fully explained the link between low-income status in adolescence and PSE entry is also consistent with this view.

Another major finding emerging from this study is that institutional type and enrollment patterns strongly mediated the effect of low-income background on adult postsecondary degree attainment. In comparing the educational trajectories of low-income versus middle/high-income youth in young adulthood, we note that both groups were about equally likely to be found in two-year colleges (**Figure 3**). However, this follows from the finding that young adults from low-income backgrounds were very likely not to enroll in PSE at all, forgoing college for the labor market, the military or parenting responsibilities.

Among those who did enroll in PSE, low-income youth were more likely to enroll in two-year colleges. Moreover, as we saw in **Figure 4**, young adults from low-income backgrounds were more likely to be non-traditional students, enrolled part-time and/or working full-time. Institutional type and enrollment patterns intersected to strongly influence degree attainment and were a primary mechanism through which low-income status in adolescence shaped adult attainment. For instance, while full-time enrollment in four-year institutions was the most common enrollment pattern for middle/high-income young adults, low-income youth were most likely to be enrolled either part-time or full-time in two-year colleges, paths far less likely to lead to bachelor's degrees.

Our findings are consistent with previous research (Long & Kurlaender, 2009; Rosenbaum, Deil-Amen, & Person, 2006) showing that only a small percentage of students from two-year colleges earn either associate or bachelor's degrees six years after enrollment. The findings are also consistent with research suggesting that community colleges do not "cool out" ambitions, since these students continue to have high expectations (not shown). However, the transfer mission of community colleges is often not realized, perhaps because occupational goals are emphasized over academic goals (Brint & Karabel, 1989), because the schools are overextended (Dougherty, 1992), or because of factors pulling students away from school (e.g., financial strains, family obligations, etc.).

One hopeful finding is that low-income and middle/high-income youth were about equally likely to earn associate degrees. However, the attainment of an associate degree was the least common postsecondary outcome for all young adults. Low-income respondents,

as **Figure 1** showed, were more likely to have been enrolled in PSE without earning any degree at all than to have earned associate degrees by Wave 4 of the study. This is especially troubling given that there are far fewer labor force benefits to higher education if a degree is not earned (Marcotte, Bailey, Borkoski, & Kienzl, 2005). Overall, while some argue that community colleges provide access to those who would not otherwise continue their schooling (Rouse, 1995), the findings here suggest that access is limited, since many from low-income backgrounds with higher education goals still do not enroll at all. Moreover, the low levels of degree completion at community colleges reveal that the outcomes for students with divergent socioeconomic backgrounds remain unequal.

We further investigated whether community colleges, *per se*, were an unlikely path to degree attainment, or whether community college students were simply more likely to enroll part-time. We found that both were important. Compared to full-time students at four-year colleges, individuals enrolled part-time at four-year colleges or full-time at two-year colleges were far less likely to earn bachelor's degrees by Wave 4. Partly because of enrollment patterns and institutional types, middle/high-income youth were more likely than low-income youth to earn bachelor's degrees within six years. Moreover, because early marriage and/or childbearing, full-time labor market entry, and military experience were all associated with part-time enrollment, these were further mechanisms through which low-income status in adolescence negatively impacted adult degree attainment. These findings highlight the importance of examining the lives of young adults from low-income backgrounds holistically, as PSE access and degree attainment are not driven only by what happens within the confines of schools (Datnow, Solorzano, Watford, & Park, 2010).

While one might argue that enrollment trajectories are primarily shaped by educational goals and reflect individual preferences for and aspirations toward particular outcomes, the analysis here suggests that is not the case. Differences in enrollment pathways persist, even when we control for adolescent educational expectations and students' perceptions of their parents' expectations. Further, analyses of the educational goals of respondents in adulthood (Wave 4, not shown) demonstrate that the majority of low-income youth who ever enrolled in PSE still expected to earn bachelor's degrees in the future. This is consistent with prior research suggesting that American youth often have high ambitions that may seem unrealistic (Reynolds, Stewart, MacDonald, & Sischo, 2006; Schneider & Stevenson, 1999), and suggests that such high ambitions continue into adulthood, with perhaps little likelihood of being fulfilled.

Overall, the findings here indicate that in order to understand the influence of socioeconomic background on higher education attainment, we need to continue to focus attention on the process of schooling but we also need to recognize how competing obligations and life experiences outside of school can influence educational opportunities. It

is these forces, as mediated through enrollment at two-year colleges and in non-traditional ways, that explain how low-income status in adolescence powerfully shapes bachelor's degree attainment. Unfortunately for young adults from low-income backgrounds, these non-traditional educational trajectories are common—probably increasingly so, given the rise in on-line programs and community colleges that are, in many ways, designed to cater to these individuals. Many, if not most, low-income young adults maintain the goal of earning bachelor's degrees, even into their late twenties and early thirties. Additional research is needed to ensure they have every chance to do so.

Appendix A. Percentages or Means of All Variables in the Analysis (N=9,368)

	Parents' Income in 1994–1995 (Wave 1)	
	Middle/High-Income (68.4%)	Low-Income (31.6%)
Respondents' Parents' Income (Wave 1)	$64,481	$18,186
2007–2008 Postsecondary Educational Attainment		
(Dependent Variable)		
No PSE	14.75%	31.37%
Job/vocational training	8.98%	15.82%
Some PSE, no degree	27.78%	30.60%
AA degree	8.38%	7.44%
BA degree+	40.10%	14.77%
Gender (Female)	50.01%	49.89%
Age (Wave 1)	15.53	15.56
	(.116)	(.129)
Self-Identified Race/Ethnicity		
White	71.77%	54.01%
Black	11.46%	23.12%
Native-American	2.32%	2.69%
Asian	4.41%	2.37%
Hispanic	9.67%	17.61%
Other	0.38%	0.21%
Immigrant Generation		
1st Generation	4.58%	7.52%
2nd Generation	9.82%	10.90%
3rd Generation+	85.60%	81.58%
Lived with Two Parents (Wave 1)	78.29%	49.22%
Parents' Education Level		
Less than high school degree	7.51%	21.33%
High school degree/GED	27.20%	40.78%
Some college	21.70%	21.32%
Bachelor's degree or higher	43.60%	16.56%
Expects to attend college (Wave 1)	80.33%	63.18%
Perception that parents have high expectations for B.A. (Wave 1)	76.34%	64.41%
School Attachment (Wave 1; 1=low, 5=high) (Wave 1)	3.77	3.72
	(.021)	(.026)
Teacher-Student Bond (Wave 1; 1=low, 5=high) (Wave 1)	3.71	3.63
	(.020)	(.031)
Cumulative High School GPA	2.67	2.22
	(0.25)	(.039)
High School Coursework (Mathematics) (1=low, 9=high)	6.12	4.96
	(.080)	(.075)

Appendix A Continued

Marriage Status/Children (Wave 3)		
Never married, no children	77.71%	65.76%
Married, no children	7.59%	10.16%
Never married, children	8.17%	14.16%
Married and children	6.54%	9.93%
Ever in Military (Wave 3)	3.35%	3.92%
Age at First Full-Time Job		
Never worked full-time	5.34%	6.55%
17 or younger	12.56%	20.45%
18–19	33.58%	44.77%
20–21	15.96%	14.51%
22 or older	32.57%	13.72%
School Enrollment (Wave 3)		
Not in school	48.84%	74.90%
In 2-yr college, part-time	5.42%	5.56%
In 2-yr college, full-time	9.09%	6.64%
In 4-yr college, part-time	3.26%	1.58%
In 4-yr college, full-time	33.39%	11.32%
Sample Size	6,408	2,960
Note: Standard deviations for continuous variables in parentheses.		

Endnotes

1 Wave 2, conducted in 1996, was not used for this study. Please see Add Health study design for more details http://www.cpc.unc.edu/projects/addhealth/design.

2 Black students with highly educated parents (one or more parents with a college degree) were oversampled in the study design, as were Puerto Rican, Cuban, and Chinese students.

3 Please see Chantala & Tabor (1999) for more information on weights and design effects in Add Health.

4 Of the 20,813 individuals in the entire study, we lose 7,779 because of attrition (i.e., they did not participate in all four waves) and 3,666 because they lacked assigned weights. This brings the total sample to 9,368. Using the weights in all analyses is necessary because attrition is not random.

5 Appendix A shows basic descriptive statistics of our sample, as well as separately for low-income respondents (whose average family income at Wave 1 was $18,186) and for middle/high-income respondents (whose average family income at Wave 1 was $64,481).

6 Respondents who had job/vocational training in addition to attending college (but obtained no degree) were included in this category as well.

7 While Add Health asked about parents' expectations of *graduating* from college, it asked students about their own expectations for *going* to college. Unfortunately, respondents were not asked in the first wave about their own expectations for graduating from college.

8 For more details on the school attachment scale, please see M. K. Johnson, R. Crosnoe, & G. H. Elder (2001).

9 For more details on the teacher-student bond scale, please see R. Crosnoe, M. K. Johnson, and G. H. Elder (2004).

10 Students were placed at a given level in the math course sequence only if they received credit for courses taken.

11 Specifically, the high school tracking scale is as follows: 0=No Math; 1=Basic/Remedial Math; 2=General/Applied Math; 3=Pre-Algebra; 4=Algebra 1; 5=Geometry; 6=Algebra 2; 7=Advanced Math: Algebra 3, Finite Math, Statistics; 8=Pre-Calculus/Trigonometry; and 9=Calculus.

12 We ran this analysis separately for respondents who were 24–28 years old and 29–32 years old at the time of the last wave of the survey and found no major differences in the patterns presented here. One minor difference was that among respondents from both low- and middle/high-income backgrounds, the younger cohort was slightly more likely to have completed some PSE. This is consistent with an overall increase in educational attainment over time in the larger society. To simplify the presentation of the results, we present the findings in this figure for all respondents together.

13 Although rooted in Choy's (2002) work, our definitions of non-traditional and traditional differ somewhat because we focus only on enrollment patterns and because we do not consider students who are parents as necessarily non-traditional. We do this because we wish to distinguish analytically non-traditional patterns in school and work from family formation and other life experiences that may shape these patterns. We consider these factors in our next set of analyses (Tables 1 & 2).

14 We also considered whether school characteristics themselves help to explain the effects of family SES on PSE outcomes. The data have only limited school quality and climate indicators and do not reveal the percentage of students in poverty or on free/reduced lunch. We did, however, examine the percentage of students who tested below grade level as an indicator of school quality and it was consistently insignificant; it also did not mediate the effects of low-income background. In order to simplify the presentation of our results, we excluded these models and focused only on individual-level variables.

15 We also examined whether this effect was explained by early academic achievement or educational expectations and found that both sets of factors explained the effect of low-income background on PSE access. Because it is difficult to distinguish between the causal mechanisms, given that expectations and achievement are shaped by one another and measured simultaneously, we included both in the model at the same time.

16 Educational expectations were not measured in Wave 3.

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