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How Low-income Origins Affect Postsecondary Entry and Degree Completion

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Abstract

The enduring connection between socioeconomic background and educational attainment is uncontested. However, it is unclear whether the main barrier to educational opportunity is college access or degree attainment. Using data from a 14-year U.S. survey, this study shows that low-income youth remain disadvantaged in both entry into college and degree attainment. Nearly half of adults from low-income backgrounds do not complete any postsecondary schooling. For those who do enroll, young adults from low-income families are less likely to earn bachelor's degrees, partly due to their poorer academic achievement in adolescence, but also due to patterns of part-time enrollment in two-year colleges. While some argue that community colleges provide access to low-income youth who would not otherwise have gone to school, the findings here suggest that access is limited, since many with higher education goals still do not enroll at all, and most others who enroll fail to earn a degree.

Keywords: postsecondary education, college access, poverty, adolescence, stratification

One of our most enduring social problems involves the connection between socioeconomic background and educational attainment. Researchers, policymakers, and the public have long been concerned with how to reconcile the ideal of an American educational system that allows ample opportunities for upward mobility with the reality that educational outcomes are strongly linked to one's socioeconomic background (G. J. Duncan, Yeung, Brooks-Gunn, & Smith, 1998; O. D. Duncan, Featherman, & Duncan, 1972; Mare, 1980; Teachman, Paasch, Day, & Carver, 1997).

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 et al., 2006). Others argue that the poor remain severely disadvantaged in terms of entry into higher education (Roksa, Grodsky, Arum, & Gamaron, 2007).

This study sheds light on this debate by examining whether low-income origins more powerfully impede entry into higher education or degree attainment among those who attend. We also consider how low-income status in adolescence shapes college entry and degree attainment, addressing whether the same mechanisms, such as early educational and family characteristics, help explain the association between family income and both PSE entry and completion.

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 (G. J. Duncan et al., 1998); or enrollment trajectories among those who initially attend some postsecondary schooling, without considering those who do not enroll (Alexander, Holupka, & Pallas, 1987;

Dougherty & Kienzl, 2006; Goldrick-Rab, 2006; Goldrick-Rab & Pfeffer, 2009). In contrast, this study uses recent longitudinal data compiled over a 14-year period to examine and compare the relationship between low-income status during adolescence and both college entry and degree completion, and to determine whether the same mechanisms determine both outcomes.

Low-Income Background and Postsecondary Schooling

A vast body of research demonstrates the strong relationship between socioeconomic status in adolescence and later educational attainment (Duncan, Featherman, & Duncan, 1972; Duncan, Yeung, Brooks-Gunn, & Smith, 1998; Mare, 1980; Sewell et al 1969; Teachman et al. 1997). While the problem has been well established, whether socioeconomic background more strongly impacts college entry or degree attainment and the mechanisms underlying the relationships are unclear. Below, we consider some of the major factors that have been suggested by prior research.

Family Social and Cultural Capital

Prior research has clearly established that both cultural and social capital—the knowledge and behaviors that are rewarded in educational institutions and the social relationships that provide access to resources, respectively—are essential for both access to and success in higher education (Bourdieu & Passeron, 1977; Lareau & Weininger, 2008; MacLeod, 2008). Such forms of capital are often not provided by schools (Conchas, 2006; Lewis, 2003) and are limited in low-income families, perpetuating class reproduction (Lareau, 2003; MacLeod, 1995). Parents' educational backgrounds are an especially salient form of social and cultural capital (Bourdieu & Passeron, 1977; Coleman, 1988). Having a parent with higher education experience means that a student has a relationship with someone who understands the academic work and college application processes needed to plan and pursue postsecondary education (Noguera, 2001; Wimberly & Noeth, 2004). Parents' high educational attainment might also function as a form of social capital that influences degree attainment after PSE enrollment,

for example, helping students navigate the college experience itself. In contrast, having less educated parents who have never navigated the higher education system poses formidable obstacles in terms of information constraints (Pallais & Turner, 2007; Tierney & Venegas, 2009). A lack of social capital can exacerbate the effects of coming from a family with limited economic resources, because students from such backgrounds not only do not have help paying for college, but also do not know how to get financial assistance (Dynarski & Clayton, 2006). This suggests that the relationship between family income and both college entry and degree attainment may be partly driven by parents' educational level, and that having at least one parent who has (at the very least) attended college will facilitate college entry, and having a parent with a bachelor's degree will facilitate college completion.

Family structure may also influence the types and amounts of social and cultural capital available to students. Studies show that children who grow up without two parents tend to have lower educational attainment (McLanahan & Percheski 2008). One theory explaining this relationship is that the presence of two adults in the household provide a structure more conducive to the development of social capital (Coleman, 1988). Because it is a well-established finding that single-parent homes are more likely to be low-income (McLanahan & Percheski, 2008), family structure can also be a mechanism through which low-income background shapes college enrollment and completion.

In sum, this research suggests that family social and cultural capital influence both higher education entry and degree attainment, and that it is partly through these forms of capital that young adults from low-income backgrounds are disadvantaged in terms of both entry and degree attainment.

Early Educational Expectations, Experiences, and Achievement

Adolescence is a critical time shaping 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

(MacLeod, 2008; Hauser & Sweeney, 1997; Teachman et al., 1997). The development of educational expectations and aspirations is seen as particularly important for college enrollment (A.F. Cabrera, Burkum, & La Nasa, 2003). Unfortunately, prior research shows how youth from poor or working-class backgrounds often develop aspirations for and are steered into jobs that do not require advanced education (MacLeod, 1995; Willis, 1977). Classic work from a status attainment perspective views educational expectations, both on the part of individuals and as shaped by significant others, 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" 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). This research suggests that college expectations and perceptions of parents' expectations may mediate the links between family income and both college attendance and completion.

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, without the characteristics conducive to integration (Conchas, 2006). This means low-income students may feel less at home within educational institutions in general, inhibiting transitions to college. Therefore, we would expect a respondent's attachment to their secondary school and bonds with teachers to mediate the association between family income and college entry, but not necessarily college completion, where bonds during college may be more decisive.

The lower school achievement of low-income youth beginning at very early ages is well documented, and 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: studies show that the quality and intensity of academic preparation secured in high school is one of the most important determinants of completing a bachelor's degree (Adelman, 1999; Alberto F. Cabrera, La Nasa, & Burkum, 2001; Kinnick & Kempner, 1988). Advanced coursework, provides students with the academic skills to succeed in higher education (Adelman, 2006). Low-income youth tend to have lower achievement in high school and are much less likely to be in a rigorous high school track (Horn & Kojaku, 2001), suggesting a mechanism through which low-income background relates to degree attainment. Rosenbaum's (2001) work delineates this process, arguing that open access to community colleges leads to a misimpression among many disadvantaged students, who are told they can enter such colleges but who do not realize the level of academic preparation it takes to succeed (Deil-Amen & DeLuca, 2010; Rosenbaum, 2001). Poor academic preparation often necessitates remediation courses, adding delays and costs to degree timetables, which can lead to disillusionment and dropping out (Rosenbaum et al., 2006).

In sum, research suggests that early educational expectations and experiences primarily influence entry into postsecondary education, while academic achievement in middle and high schools influences both PSE entry and degree completion. These factors should help explain the effect of low-income background on enrollment in PSE and graduation for those who have enrolled.

Post-High School Experiences and Obligations

Recent research suggests that the factors discussed above do not fully explain the low-income/educational attainment link, especially when it comes to college degree completion. Today most undergraduates could be classified as non-traditional, meaning they delay enrollment,

attend school part time and/or work full-time (Choy, 2002). Students from low-income families are more likely to take non-traditional pathways, which are less likely to lead to degree attainment (Bozick & DeLuca, 2005; Goldrick-Rab, 2006; Goldrick-Rab & Han, 2011; Rowan-Kenyon, 2007). In addition, even if they are “traditional” students, degree attainment is mediated by the type of institution attended: those attending community colleges are less likely to eventually earn bachelor’s degrees than those who start out at four-year institutions (Alberto F. Cabrera et al., 2001; Carroll, 1989; Long & Kurlaender, 2009; Rosenbaum et al., 2006; Velez, 1985). However, because those in two-year colleges are also more likely to enroll part-time (Handel, 2009), it is unclear whether institutional type, enrollment status, or both help explain the lower rates of degree completion of low-income students.

Related to institutional type and enrollment status, outside responsibilities inhibit efforts to pursue college degrees, especially for students from low-income backgrounds (Bozick, 2007; Brint & Karabel, 1989; Rosenbaum et al., 2006; Weis, 1985). Financial constraints can necessitate full-time labor force participation, which can mean forgoing college altogether, but can also contribute to attrition among those who do enroll (Engle & Tinto, 2008; McDonough & Calderone, 2006). Further, for those who find themselves struggling in PSE, full-time employment can be an attractive alternative (MacLeod, 2008). Early family formation is yet another factor that is more common among those from impoverished backgrounds (Attewell & Lavin, 2007) and 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. Full time employment, early family formation, and military enlistment may be mechanisms through which low-income origins impact both college entry and degree completion.

Together, the issues outlined above paint a complex picture of the postsecondary pathways of young people who grow up in low-income homes. Clearly, there are many issues at play and one of our goals in this paper is to begin to tease them apart, with the intention of delineating which factors help explain the negative association between growing up economically disadvantaged for both college entry and bachelor's degree completion. A second goal is to ascertain whether low-income status in adolescence is more strongly associated with college entry or degree attainment among those who enroll. Thus, we use data from a recent longitudinal national survey over a 14-year period to address these research questions:

- Does low-income background more powerfully shape entry into higher education or degree attainment among those who attend?
- Through what mechanisms does low-income background shape college entry and degree attainment?
 - Do the same mechanisms help explain how low-income origins relate to each outcome?

Methods

Data and Sample

This study uses data from the National Longitudinal Survey of Adolescent Health (Add Health), a four-wave, nationally representative study of American adolescents. Multistage stratified sampling included 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, selected from a larger sample of 90,000 students chosen for an in-school survey. A third survey¹ was conducted seven years later (2001-2002), when most respondents were young adults (ages 18-26); the follow-up included 15,197 (73%) of the original respondents. A fourth survey was conducted in 2007-2008, when the respondents were aged 24-32, and included 15,701 (76%) of the original participants. The research described in this article drew from a sample of respondents who participated in all three waves mentioned.

The Add Health data is the largest nationally representative dataset with the necessary indicators for this study and the 14-year timespan is the longest available. It is preferable to the National Longitudinal Survey of Youth (NLSY), which has a much smaller sample and currently does not follow youth into their early thirties. Other educationally-focused longitudinal datasets are either outdated (e.g., National Education Longitudinal Study of 1988) or do not follow youth for a long enough period of time to assess PSE degree attainment outcomes (e.g., Education Longitudinal Study). Finally, the Beginning Postsecondary Survey is limited to those who enrolled in PSE for the first time in 2003-2004, which, as we shall see, misses the large portion of the low-income population who never enroll in higher education.

This study used also used data from the Adolescent Health and Academic Achievement Study (AHAA), which contains official transcript information, and the Parent Data Set, a survey of either the mother or father of Wave 1 respondents. We used multiple imputation to deal with missing values on independent variables using the ICE command in STATA. 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, however, were only provided for 9,368 of the total 15,197 respondents (please see Chantala & Tabor, 1999, for more information on weights and design effects in Add Health).³

Measures

We focus on two key binomial outcomes for this study, created from the highest level of postsecondary education attained by Wave 4 (2007-2008) of the study, when respondents were 24-32 years old. The first outcome, college entry, includes respondents who had at the very least attended some college (including those who did or did not go on to earn a degree) as compared with those who did not ever enroll in PSE. The second outcome, B.A. degree attainment, limits the sample to those who have attended at least some PSE, and compares respondents who earned a bachelor's degree or higher to those who attended college but did not earn a bachelor's degree.⁴

The key independent variable, low-income background, was measured based on family income and household size at Wave 1, and was coded as low-income if it was below 185% of the federal poverty line. The official US Census poverty threshold has long been criticized as being too low (Beverly, 2000; Citro & Michael, 1995). We placed our threshold at 1.85 times the poverty line as 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 crude, this measure has been used in multiple studies, and provides an adequate approximation of economic disadvantage (Entwisle & Alexander, 1995; Heflin & Pattillo, 2006).

We also included several demographic factors (measured in Wave 1) in our analysis: Measures for age and gender were included as controls. Race/ethnicity was measured as non-Latino White, Asian American, Native American, Latino, non-Latino Black, and other race or ethnicity. Immigrant generation was measured as first generation (foreign born), second generation (native born with at least one foreign born parent), and third generation (native born with two native born parents). To capture some of the potential cultural and social capital from respondents' parents, we included parents' educational attainment, measured with dummy variables for the highest level of education achieved between either parent, and a variable indicating whether respondents lived with two parents at Wave 1 (vs. single-parent household).

Two variables reflected respondents' expectations at Wave 1, when respondents were in grades 7-12. First, we included a 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. Second, we included a measure for respondents' perceptions of their parents' educational expectations at Wave 1.

Respondents were asked separately for their mothers and fathers (if they were in contact with both parents), "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?"⁵⁵ The highest expectation reported for either parent was captured by this measure. Respondents who reported a 4 or 5 (high parental disappointment) were coded as high expectations to graduate from college.

Several school-related factors, measured at the first wave, were also included in the analysis. A composite for school attachment and integration was created by averaging responses reflecting the extent to which respondents agreed, in the past school year, that they felt close to people at their schools, felt a part of their schools, and were happy to be at their schools ($\alpha = .77$). Responses ranged from 1 to 5, with high values indicating stronger levels of attachment.⁶ The teacher-student bonding scale was created by averaging 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 ($\alpha = .61$).⁷ 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. Responses ranged from 1 (weak teacher/student bond) to 5 (strong teacher/student bond).

Using the AHAA study, we gathered official transcript data for the overall high school GPA (ranging from 0 to 4.0). We also created a scale of academic tracking in high school based on math course sequence variables: we chose mat courses because they are typically organized into hierarchical, linear sequences—meaning successive courses are recognized as more advanced and requiring more prerequisites. Moreover, the taking of high-level mathematics courses during high school has been shown to be an extremely important predictor of both college enrollment and completion (Adelman, 1999). Our measure captured students' location within this subject's course hierarchies by the end of high school.⁸ Put simply, the tracking scale reflects the highest level and difficulty of respondents' math course sequences taken throughout high school, which ranged from 0 (no math) to 9 (calculus).⁹

We also included several life experience measures from the third wave of the survey, when respondents were aged 18-26. Few respondents had completed postsecondary schooling at this point, but many were still enrolled in school. The school enrollment pattern variables measure whether respondents were 1) enrolled in a two-year or four-year postsecondary school or not at all, and 2) whether those enrolled were in school part-time or full-time. We only include these variables for the bachelor's degree completion models. A set of dummies indicating whether respondents had ever been married, had

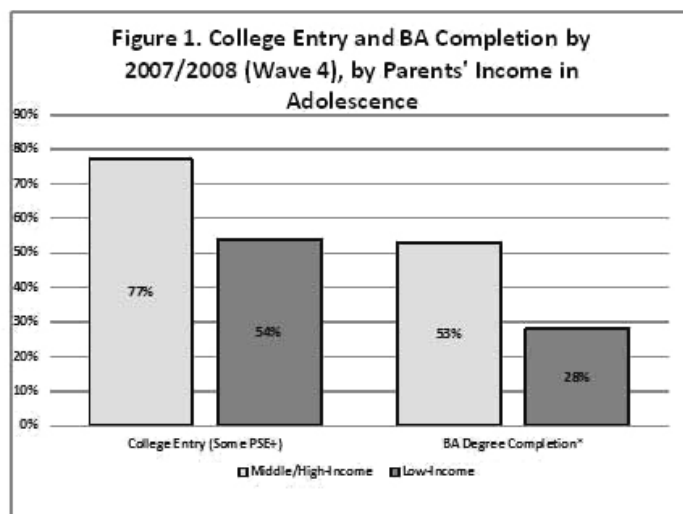
ever had a child (or children), both, or neither were created based on self-reports from the survey. Respondents were coded as married if they were previously or currently married. A dummy measure for military participation indicates respondents who had ever served or were currently serving in the military at Wave 3. Finally, we included a set of dummies indicating the age of respondents when they obtained their first full-time job.

Analysis Plan

To address the key questions regarding the effects of growing up in low-income versus middle/high-income families, we examine descriptive statistics and then use logistic regression analysis to examine the relationship between low-income status in adolescence and postsecondary educational attainment, comparing associations with college entry and completion, and whether these relationships are explained by demographic, early educational achievement and expectations, or later life experience factors.

Results

Figure 1 shows the differences in postsecondary educational outcomes for the last wave of the survey, in 2007-2008.¹⁰ Differences between those from a middle/high-income family versus a low-income family were striking for both college entry and degree completion. About 77% of young adults from middle/high-income backgrounds had enrolled in college, compared with only 54% of low-income-background young adults. Among those who enrolled in college, only about 28% of low-SES adults who enter college earn bachelor's degrees, compared to 53% of middle/high-income-background adults.



While such differences in educational outcomes by socioeconomic origins have been shown in previous research (A.F. Cabrera et al., 2003; Terenzini, Cabrera, & Bernal, 2001), this finding as of 2007-8 that only about half of low-income youth attend college, calls into question notions of an “open access” higher education system in which degree completion and college selectivity are now the only inequalities. While 46% of those from low-income backgrounds do not attend college (completing only a high school diploma or less or only vocational training), this is only the case for 23% of those from middle/high-income backgrounds, a difference of 23%. Still, differences by income-background in degree attainment are also substantial: only 28% of those from low-income backgrounds who attend college earn bachelor’s degrees, compared to 53% of those from middle/high-income origins, a difference of 25%. Thus, the gaps between low-income and middle/high income youth in both college entry and bachelor’s degree completion are very similar. This suggests that low-income status is not more strongly related to either college entry or degree attainment, but rather is powerfully associated with both outcomes.

The question remains as to whether socioeconomic origins affect enrollment and degree attainment through different mechanisms. Since adults from low-income versus middle/high-income backgrounds differ along a number of dimensions in addition to family economic resources—such as demographic characteristics (race/ethnicity, gender), early educational expectations, school experiences, and achievement (see Appendix A)—college enrollment and completion differences may be driven by these factors.

The Association between Low-Income Background and College Entry and B.A. Completion

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 odds ratios for the effect of low-income background from various logistic regression models. Is parental income in adolescence directed associated with both college entry and degree completion? Or, are the effects of income mediated by demographic factors, social and cultural capital, educational expectations, and adolescents' school experiences and achievement?

First, we compare factors that might explain the association between low-income background on PSE entry (comparing those who completed some PSE or more to those with no PSE), and factors that might explain the effect of low-income background on degree completion (comparing those who earned a bachelor's degree to those who completed some PSE but did not earn this degree).

The first model with no controls shows that, overall, young adults from low-income families were about 65% less likely to enroll in PSE (v. no PSE) and 65% less likely to graduate with a bachelor's degree if they did enroll in college compared to those from middle/high-income families. The magnitude of these associations confirms the descriptive finding that young people who enroll in PSE from low-income families are at a substantial disadvantage in terms of both entry into postsecondary education and completion of bachelor's degrees, although it is not clear if income per se, or other related factors drive these relationships.

Black and Latino youth, and those 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.

Model 3 adds two indicators of parental resources: parents' educational attainment and whether both parents lived at home with respondents during childhood. These factors mediate the effect of low-income background on access to PSE: we see a decline in the effect of low-income background from 0.364 (Model 2) to 0.538 (Model 3). Still, young adults from low-income backgrounds remain less likely to have completed any PSE compared with those from middle/high-income families. Moreover, the strong negative effect of low-income background on college entry and bachelor's degree attainment remains. These findings suggest that less social capital within low-income families is one mechanism through which low-income status in adolescence shapes college access, and, to a lesser degree, BA completion.

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Table 1: Effects of Low-income Status in Adolescence on Post-Secondary Educational Attainment in Adulthood^a

	Model 1	Model 2	Model 3	Model 4	Model 5
College enrollment (Some PSE vs. No PSE)	0.348 ***	0.364 ****	0.538 ****	0.683 ****	0.735 ****
BA Degree Completion (Bachelor's Degree vs. Some PSE no Degree)	0.351 ****	0.367 ****	0.486 ****	0.581 ****	0.802

Total N=9368

^aRelative 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, adolescents' perception of parents expectations, school attachment, teacher student bond, GPA, college track

Model 5: Model 4 + 2yr/4yr & ft/pt school enrollment in Wave 3 (for BA completion only), marital status and/or children in Wave 3, military in Wave 3, age at first full-time job

Model 4 considers whether early educational expectations, experiences, and achievement explain the differences between low-income and middle/high-income youth. This model tests whether young adults from low-income families who enroll in college fail 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,¹¹ or because they were less academically prepared (see Appendix B). Recall that some existing theories suggest that these factors should fully explain the differences in PSE outcomes by socioeconomic background. We see that this is not completely true. While including these factors did mediate 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.¹² This suggests that while early expectations and academic achievements shape access and enrollment in PSE to some extent, they do not fully explain the differences in PSE entry and BA 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 (for bachelor's degree attainment only), work, and military 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 see that the magnitude of the effect of low-income background on PSE enrollment (vs. no PSE) declines slightly, but remains highly significant, and differences in bachelor's degree attainment between young adults from low-income and middle/high-income backgrounds are no longer statistically significant. In fact, the disadvantage of coming from a low-income family in terms of bachelor's degree attainment is completely explained by school type and enrollment, work, military, and family patterns.

Thus, despite accounting for the myriad of factors often used to explain the effect of low-income background on college access, there remains a highly significant negative association between low-income background and college entry. However, enrollment patterns and out of school responsibilities are key mechanisms through which low-income youth are disadvantaged in bachelor's degree attainment. These youth are more likely to join the military, more likely to start working full-time at an earlier age, more likely to attend community colleges, and more likely to enroll only part-time in higher education than their middle/high-income counterparts. These approaches are likely a result of accumulated disadvantages, including financial constraints, and limited social or cultural capital that might have diminished their knowledge of the best strategies for achieving their educational goals. Moreover, young adults from low-income families are less likely to delay marriage and childbearing, and such responsibilities may compete with the demands of schooling. In the next section, we describe the effects of these and the other predictors of PSE.

Predicting PSE Outcomes

In this section, we draw on Table 1, Model 5, to show the effects of various predictors of college entry and degree completion.

Family Social and Cultural Capital. Given the importance of family structure for educational attainment (McLanahan & Percheski, 2008; McLanahan & Sandefur, 1994), it is somewhat surprising that we find living in a two-parent home has no net effect on PSE access or degree

attainment. However, as expected, parents' education strongly influences whether or not young adults enroll in higher education at all. Respondents whose parents had graduated high school, completed some college, or earned a bachelor's degree were more likely than those whose parents do not have a high school diploma to have completed some PSE versus none. Moreover, respondents who enrolled in college and whose parents had a bachelor's degree were also more likely to obtain a bachelor's degree 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 both college attendance and completion, but seems to have a more pronounced effect on access. This is consistent with the plethora of research connecting parental education with the forms of capital needed to attend college (Bourdieu & Passeron, 1977; Coleman, 1988; Noguera, 2001; Pallais & Turner, 2007; Tierney & Venegas, 2009).

Early Educational Experiences & Indicators. Table 2 confirms the strong influence of college expectations and perceptions of parents' expectations on college entry; those who expected to go to college and who reported that their parents expected them to earn a bachelor's degree were far more likely to attend college (versus not attend). However, expectations, net of other factors, only influence college entry, and not degree attainment among those who enroll. Thus, while important, expectations are not driving the low BA attainment among low-income youth who enroll in college. This is because the overwhelming majority of students who enroll in college expect to earn a Bachelor's degree, suggesting that other obstacles derail plans. Early school experiences, contrary to our expectations, have no net effect on either PSE entry or degree attainment.

As anticipated, educational achievement and academic readiness have strong effects on all outcomes. Higher GPAs and college-track coursework predict a greater likelihood of enrolling in PSE versus not enrolling at all. These academic indicators also lead to a far greater likelihood of completing a bachelor's degree among those who attend college. These findings point to the important role of early academic achievement in predicting both college entry and degree completion.

Table 2. Odds ratios from Logistic Regressions of Postsecondary Educational Attainment in Adulthood

Independent variables	Some PSE vs. (No PSE)	BA Degree vs. (Some PSE, No degree)
Below 185% Poverty Line. Wave 1	0.735***	0.803
<u>Family Social and Cultural Capital</u>		
Live w/2 parents. Wave 1	0.985	0.877
Parents Education Level:		
High school degree/GED	1.648***	1.379
Some college	2.489***	1.555
Bachelor's degree or higher (Less than high school degree)	3.617***	2.080**
Adolescent Educational Expectations, Experiences and Achievement		
Expectations for bachelors degree. Wave 1	2.142***	1.233
Perception of parents' expectations for B.A. Wave 1	1.211*	1.190
School attachment. Wave 1	1.047	0.936
Teacher-Student Bond. Wave 1	0.980	0.996
Cumulative GPA, high school	1.906***	1.976***
College track, high school (based on math courses)	1.281***	1.135*
Post-High School Experiences and obligations		
Marriage status/Children. Wave 3:		
Married, no children	0.659**	0.900
Never married, children	0.691**	2.106**
Married and children (Never married, no children)	0.481***	2.543***
Ever in Military, Wave 3	1.139**	10.283***
Age at First Full-Time Job		
17 or younger	0.873	0.723*
18-19	1.053*	0.578***
20-21	2.057**	0.618
22 or older (Never worked full-time)	3.720***	2.054***
School Enrollment, Wave 3		
In 2yr-college part-time	-	1.103
In 2yr-college full-time	-	3.215***
In 4yr-college part-time	-	3.459*
In 4yr-college full-time (Not in school)	-	12.547***
N	9368	6532

Notes: Models also control gender, age, race/ethnicity, and immigrant generation. Full results available upon request.

***p<0.001, **p<0.01, *p<0.05

Post High-School Life Experiences. In addition to characteristics and early experiences in adolescence, the longitudinal nature of our data allow us to consider the post-high school factors present in 2001-2002 that shape PSE attainment in 2007-2008. As we saw in Table 1, post-high school experiences fully explain the negative association between low-income background and bachelor's degree attainment. One potentially important experience in post-high school young adulthood is family formation. As expected, we see that respondents who were married and/or had children were less likely to have enrolled in PSE. Because we are unable to disentangle the order of events, this could indicate a selection effect (i.e. choosing to start a family rather than go to college) or that early formation poses obstacles to college entry. Those who had children (whether married or single) were also less likely to obtain a bachelor's degree than they were to attend PSE without earning a degree. The role of the military in educational attainment is more complex. On the one hand, those with military experience are more likely to have completed some PSE as opposed to none. On the other hand, military experience leads to a lower likelihood of completing a bachelor's degree among those who attended PSE. Therefore, the military seems helpful only in providing access to postsecondary entry, but not BA degree completion.

The age at which one starts their first full-time job also has some significant effects on both college entry and bachelor's degree attainment. We find that those who were 18 years of age or older when they first worked full-time are more likely to have completed some PSE. This suggests that these individuals were pulled away from PSE before earning a degree 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 than to attend PSE without earning a degree, even net of all the factors in the model, including enrollment patterns. Finally, delaying full-time work until age 22 or higher is positively associated with bachelor's degree attainment; this finding probably indicates that postponing full time work until after earning a BA degree is most conducive to college completion.

Perhaps the most important predictors of degree attainment by 2007-2008 are captured by enrollment patterns in 2001-2003, including institutional type (two-year vs. four-year) and whether enrolled part-time or full-time. We combined both sets of factors in order to disentangle whether it was institutional type or enrolling part-time or full-time that was most determinant of degree attainment, since we found that 72% of respondents who were attending school part-time in Wave 3 were enrolled in community colleges (not shown). Not surprisingly, Table 2 shows that those who reported having completed some PSE, but who were not enrolled in PSE in Wave 3 of the survey, were less likely than nearly all of the enrollment/institution types to earn a degree. These are individuals who perhaps had taken only a few courses and 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 enrolled part-time in two-year colleges did not significantly differ from those not enrolled at all in their likelihood of earning a bachelor's degree six years later.

Among those who were enrolled, we further find that both institutional type and enrollment status interact to strongly influence bachelor's degree attainment. It is not surprising that those enrolled full-time in four-year institutions are far more likely than any others to graduate. Not only were those who were in four-year full time programs over 12 times as likely to earn a BA as those 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, those who enroll in two-year colleges full-time or four-year colleges part-time are about equally as likely to lead to bachelor's degree attainment and both are significantly more likely to lead to bachelor's degree attainment six years later than part-time enrollment at a community college. Additional analyses show that most of the respondents who were enrolled in two-year colleges and/or part-time in Wave 3 still expected to earn bachelor's degrees in the future when asked in Wave 4,¹³ suggesting that this difference is not driven by differing educational goals. These findings highlight how the

disadvantages of low-income youth in their postsecondary patterns, including their higher enrollment at community colleges, especially part-time, provide an important link between low-income origins and low levels of bachelor's degree attainment.

Discussion and Conclusion

Overall, the findings here show that both access to higher education and bachelor's degree attainment continue to be critical issues facing those from low-income origins. Contrary to more optimistic assertions that access to higher education is now relatively open, and that retention and degree attainment are the major issues facing disadvantaged youth (Rosenbaum, 2001; Rosenbaum et al., 2006), this study finds that almost half (46%) of the low-SES young adults ages 24-32 had not enrolled in college by the time they have reached their mid- to late-twenties. While the massive expansion in higher education may mean that more low-income youth attend college than ever before, college entry nevertheless remains an important issue. The fact that none of the factors we examined fully explained the link between low-income status in adolescence and PSE entry suggests that financial constraints themselves play a pivotal role in restricting college access.

As for degree attainment, those from low-income backgrounds who remain in college also remain extremely disadvantaged in terms of bachelor's degree completion. We find that institutional type and enrollment patterns strongly mediate the effect of low-income background on adult bachelor's degree attainment. While low-income and middle/high-income youth are about equally likely to be found in two-year colleges (Appendix A), a much higher proportion of low-income youth enroll in two-year colleges (Terenzini et al., 2001). Building on existing research which has found that two-year college pathways are unlikely to lead to bachelor's degree attainment (Long & Kurlaender, 2009; Rosenbaum et al., 2006), we 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 institutional type and

enrollment patterns were important. Compared to full-time four-year college students, individuals enrolled part-time in four-year colleges or full-time at two-year colleges were far less likely to earn bachelor's degrees six years later. Partly because of both enrollment patterns and institutional type, middle/high-income youth were more likely than low-income youth to earn bachelor's degrees within six years.

While our findings show that low-income youth are highly disadvantaged in terms of both college entry and bachelor's degree completion, some of the mechanisms linking low-income origins to PSE entry vs. degree completion differ. Family social and cultural capital, in the form of parents' education, influences both college entry and degree completion. Adolescents' academic achievement also has a positive effect on both enrollment in college and a subsequent completion of a bachelor's degree.. However, educational expectations in adolescence are only associated with college entry, and do not help explain why low-income youth who do enroll are less likely to earn degrees. Thus, degree attainments among those who enroll do not reflect different ambitions.

Out of school experiences and responsibilities also influence college entry, sometimes in the same manner as degree attainment, but sometimes differently. For instance, marriage and child-bearing negatively impact both college entry and degree completion. Beginning full-time employment at age 18-21, however, is positively associated with completing some postsecondary schooling, but negatively associated with completing a degree, suggesting that low-income young adults often enter PSE, but drop out in order to work full-time. Interestingly, while military enrollment facilitates PSE access, it impedes bachelor's or degree completion after enrollment. 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 schools (Datnow, Solorzano, Watford, & Park, 2010). Future research should more fully investigate young adults' decision-making process in choosing to forgo PSE for work, the military, or childbearing.

This study's findings have several implications. First, the importance of early academic achievement and coursework cannot be

understated. Performance in high school plays a powerful role in shaping not only why low-income youth are less likely to go to college, but also why those who enroll are less likely to graduate, even among those who enroll full time in four-year colleges. Second, however, even if low-income youths' educational achievement, expectations, and patterns of early marriage /childbearing or labor force participation were equivalent to their middle-income counterparts, low-income youth would remain less likely to complete any postsecondary school. This suggests that financial constraints themselves limit the opportunity for even enrollment at a community college. While some argue that community colleges provide access to those who would not otherwise have gone to school (Rouse, 1995), the findings here suggest that access is limited, since many of those from low-income backgrounds with higher education goals still do not enroll at all. Third, more attention should be focused on the process of schooling as well as how competing obligations, constraints, and life experiences outside of school influence educational opportunity. It is these forces, as mediated through part-time enrollment, especially at two-year colleges, which explain how low-income status in adolescence powerfully limits bachelor's degree attainment. Unfortunately, for those 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 still have the goal of earning bachelor's degrees, even into their late twenties and early thirties. Future research is needed to learn how these adults will be able to fulfill their ambitions.

Appendix Table. Percentages of Means of Independent Variables in the Analysis, by Parental Income
 Parents' Income in 1994-95 (Wave1)

	Middle/High Income (68.4)	Low Income (31.6)
Respondent's parents' income (1994)	64.481	18.186
Gender (female)	50.01	49.89
Age	15.53	15.56
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
Latino	9.67	17.61
Immigrant Generation		
1st Generation	4.58	7.52
2nd Generation	9.82	10.90
3rd Generation	85.60	81.58
Live w/2 parents, Wave 1	78.29	49.22
Parents Education Level:		
High school degree/GED	27.20	40.78
Some college	21.70	21.32
Bachelor's degree or higher	43.60	16.56
(Less than high school degree)	7.51	21.33
Expectations to attend college, Wave 1	80.33	63.18
Perception of parents' expectations for B.A. Wave 1	76.34	64.41
School attachment, Wave 1 (1-low, 5-high)	3.72 (.021)	3.72 (.026)
Teacher-Student Bond, Wave 1 (1-low, 5-high)	3.71 (.020)	3.63 (.031)
Cumulative GPA, high school	2.67 (0.25)	2.22 (.039)
College track, high school (based on math courses)	6.12 (0.80)	4.96 (.075)
Marriage status/Children, Wave 3:		
Married, no children	7.59	10.16
Never married, children	8.17	14.16
Married and children	6.54	9.93
(Never married, no children)	77.71	65.76
Ever in Military, Wave 3	3.35	3.92
Age at First Full-Time Job:		
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
(Never worked full-time)	5.34	6.55
School Enrollment, Wave 3		
In 2yr-college part-time	5.42	5.56
In 2yr-college full-time	9.09	6.64
In 4yr-college part-time	3.26	1.58
In 4yr-college full-time	33.39	11.32
Not in school	48.84	74.90
N	6408	2960

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Endnotes

1 Add Health also conducted an initial follow-up (Wave 2) in 1996, which 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 (either a father or mother with a college degree) were oversampled in the study design, as were Puerto Rican, Cuban, and Chinese students.

3 Of the 20,813 in the entire study, we lose 7,779 because of attrition (they didn't participate in all four waves) and 2,405 because they lacked assigned weights, bringing the total sample to 9,368. Using the weights in all analyses is necessary because attrition is not random.

4 We categorized associate's degree completion with some PSE, no Bachelor's degree completion. In our sample, low-income and middle/high-income youth were about equally likely to earn an associate's degree. Furthermore, the attainment of associate's degrees is the least common postsecondary outcome for all young adults (7%). Low-income respondents are more likely to be enrolled in PSE with no degree at all than to have earned an associate's degree by Wave 4 of the study (results not shown). Furthermore, because the labor market returns to associate degree completion do not compare to those from bachelor's degree attainment. Small sample sizes prohibited an analysis of associate's degree completion. Therefore, it made more sense to focus on bachelor's degree completion.

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

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

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

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

9 High School Tracking Scale: 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), (Calculus).

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10 We ran this analysis separately for respondents who were 24-28 years old or 29-32 years old at the time of the last wave of the survey and found no major differences in the patterns. The only 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, which 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 for all of the respondents together.

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

12 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 at the same time, we included both in the model at the same time.

13 Unfortunately, educational expectations were not asked in Wave 3 of the survey.

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