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Do plans really matter?: Re-assessing the role of adolescent expectations in educational attainment

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ABSTRACT

Stratification research in the status attainment tradition contends that adolescent educational expectations are a central determinant of educational attainment. Little research, however, has assessed the robustness of the powerful expectations-attainment associations revealed in cross-sectional models. Using data from the National Longitudinal Study of Adolescent to Adult Health to estimate OLS, school fixed effects, and sibling fixed effects models, this study examines the association between adolescent expectations and educational attainment. The analysis reveals that adolescent expectations may play a much smaller role in predicting educational attainment than revealed in cross-sectional models. Point estimates of the association between adolescent expectations and educational attainment from sibling fixed effects models are over 50 percent lower than OLS estimates, suggesting that family-level characteristics confound this relationship. Results from these analyses demonstrate that respondents' educational expectations likely exert less influence on educational attainment than status attainment research would suggest.

1. Introduction

A large body of stratification literature in the US has found that adolescent educational expectations are a consistent and influential predictor of educational attainment (Andrew & Hauser, 2011; Sewell, Hauser, Springer, & Hauser, 2003). Some research even utilized educational expectations as an outcome, assuming that adolescent expectations had a strong link with long-term academic outcomes (Andrew & Flashman, 2017; Bozick, Alexander, Entwisle, Dauber, & Kerr, 2010; Feliciano & Lanuza, 2016; Karlson, 2015; Roth, 2017). Although some classic studies contended that educational expectations have no independent effect on educational attainment (Alexander & Cook, 1979; Bourdieu, 1974), little research has formally evaluated the robustness of the expectations-attainment association (Morgan, 2004, 2005).

The relationship between adolescent expectations and educational attainment is important because the expectation to complete a college degree has become a norm in recent decades (Goyette, 2008). Much scholarship attributed this trend to the "college for all" ethos, which encourages adolescents—regardless of social background and academic performance—to attend college (Baird, Burge, & Reynolds, 2008; Domina, Conley, & Farkas, 2011; Goyette, 2008; Reynolds, Stewart, MacDonald, & Sischo, 2006; Rosenbaum, 2001). Federal and state programs using large sums of public funds, such as GEAR UP, aim to increase educational expectations among high school students (Morgan, 2005). For example, GEAR UP's second indicator of performance is "increasing educational expectations of participating students and their parents, guardians, or family members" (Department of Education, 2018, p. 3). Consequently, if adolescent educational expectations' relationship with educational attainment is overstated, this policy goal of increasing expectations may be misplaced.

Assessing the accuracy of educational expectations-attainment models requires techniques which account for omitted variable bias. Morgan's (2004) study of black-white differences in the association between adolescent expectations and educational attainment addressed the problem of omitted variables using several causal estimation techniques. Although some methods found a robust relationship, this study could not dismiss the possibility of a non-causal relationship between adolescent expectations and educational attainment. Morgan's work, however, did not assess potential sources of omitted variable bias. In addition, Morgan's bounds models—which suggested the possibility of a non-causal relationship—relied on a series of untestable assumptions.

Extending Morgan's study, this paper uses iterative fixed effects models to assess the relationship between educational expectations and educational attainment. These models control for potential omitted variables at two social levels, the family and school/neighborhood. In

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turn, these models may provide more consistent estimates of the relationship between educational expectations and educational attainment than cross-sectional models from prior status attainment research without heavily relying on untestable assumptions.

This paper assesses the relationship between adolescent expectations and educational attainment using several techniques to obtain accurate estimates. The manuscript first explores competing hypotheses on the nature of the relationship between educational expectations and educational attainment and potential sources of omitted variable bias. Next, the analysis uses data from the National Longitudinal of Adolescent to Adult Health to estimate hierarchical models which control for sources of unobserved background characteristics: OLS, school fixed effects, and sibling fixed effects models. Last, the discussion section addresses the findings' relevance for future research.

2. Literature review

2.1. Educational expectations as a determinant of educational attainment

Most stratification research on educational expectations can trace its roots to status attainment theory, and specifically to the Wisconsin Model (Morgan, 2005; Sewell, Haller, & Portes, 1969, Sewell et al. 2003). Foundational status attainment research argued that educational expectations are the "strategic center" of the educational attainment process, as they reflect latent educational ambition (Andrew & Hauser, 2011; Baird et al., 2008; Haller & Portes, 1973, p. 68). Thus, educational expectations were proposed to be a mediator between family background and educational attainment and an individual-level predictor of educational attainment (Baird et al., 2008; Morgan, 2005).

Educational expectations are influenced by resources related to family socioeconomic status (parental education, income, and occupation) (Sewell et al., 2003), and individual-level factors, such as cognitive ability, parental influence, and academic achievement (Andrew & Hauser, 2011; Bozick et al., 2010; Sewell et al., 2003), characteristics which also influence educational attainment (Sewell et al., 2003). Although changes in academic achievement result in small fluctuations in expectations, educational expectations are largely stable during adolescence (Andrew & Hauser, 2011). Using longitudinal fixed effects models, Bozick et al. (2010) found academic achievement to be a robust predictor of educational expectations. In addition, previous research has not found evidence of reverse causality—that educational expectations predict academic achievement (Andrew & Hauser, 2011).

Utilizing longitudinal fixed effects and OLS models, recent literature found that increases in educational expectations were associated with increases in middle and high school students' perceptions of the utility of high school mathematics and academic efforts (Domina et al., 2011). This finding supports the status attainment model, demonstrating that adolescent educational expectations influence educational behavior, which in turn, influences educational attainment (Haller & Portes, 1973; Sewell et al., 2003).

Although prior status attainment literature argued that educational expectations mediated the relationship between family background and educational attainment (Sewell et al., 1969; 2003), recent research demonstrated that the association between parental education and income with educational expectations had become weaker (Goyette, 2008). This change has been attributed to secular increases in adolescents' expectation of college degree completion (Baird et al., 2008; Goyette, 2008) associated with the "college-for-all" ethos (Domina et al., 2011; Rosenbaum, 2001). Thus, educational expectations may no longer serve as one of the primary mediators between family socioeconomic background and educational attainment. More recent research has focused on expectations' role as an independent predictor of educational attainment (Andrew & Hauser, 2011; Baird et al., 2008; Domina et al., 2011; Goyette, 2008; Morgan, 2004; Reynolds et al., 2006).

In sum, secular increases in educational expectations, which outpaced increases in educational attainment, weakened expectations' relationship with educational attainment in recent decades (Baird et al., 2008; Reynolds et al., 2006). Yet, numerous studies still found robust associations between educational expectations and educational attainment using current data (Andrew & Hauser, 2011), and many recent studies continued to assume that expectations are important for educational attainment, treating the variable as an outcome (Andrew & Flashman, 2017; Bozick et al., 2010; Feliciano & Lanuza, 2016; Karlson, 2015; Roth, 2017). Thus, a large body of literature assumes that adolescent expectations play an integral role in educational attainment.

2.2. An alternative perspective: Neighborhood/School and family-level selection

This paper proposes an alternative perspective, that adolescent expectations' relationship with educational attainment was mis-specified in prior status attainment research because of the omission of important social resources (Morgan, 2004). Classic studies, such as Bourdieu (1974); Alexander and Cook (1979); Bowles and Gintis (2011), and MacLeod's (1987) work, argued that social structural characteristics—such as schools, neighborhoods, or family background—, rather than individual-level factors, drive educational stratification. Educational expectations—alongside cognitive ability and academic performance—is an individual-level factor which social structuralists have treated with skepticism. Morgan (2004) operationalized this perspective using quantitative terminology, stating that educational expectations may only capture the propensity for educational attainment, with no independent influence on educational attainment. Therefore, thoroughly controlling for omitted variables responsible for the association between educational expectations and educational attainment would yield a weakened relationship.

Although status attainment research generally includes covariates for socioeconomic status (Andrew & Hauser, 2011; Goyette, 2008; Reynolds et al., 2006; Sewell et al., 2003), literature on educational expectations often does not account for important social resources, which—like resources connected to parental socioeconomic status—may influence educational expectations and attainment. Prior research outlines the important role of families and schools/neighborhoods in adolescents' development and well-being (Parcel & Dufur, 2001). Thus, key resources at the family and school/neighborhood-levels may be sources of omitted variable bias in the relationship between adolescent educational expectations and educational attainment.

The relationship between educational expectations and educational attainment could be driven by omitted family-level resources. This perspective is labeled family-level selection. For example, family socioeconomic status could be mis-specified in status attainment research. Most status attainment research omits information on parental wealth despite its strong relationship with academic outcomes (Killewald, Pfeffer, & Schachner, 2017; Pfeffer & Hällsten, 2012). Similarly, the socioeconomic characteristics of extended family members are also excluded in most status attainment literature on educational expectations. Grandparents' socioeconomic characteristics, for example, are robust predictors of adolescent academic achievement and socioeconomic attainment (Chan & Boliver, 2013; Hällsten & Pfeffer, 2017). Recent research also found that grandparents' socioeconomic status predicts the educational aspirations of their grandchildren, when holding their parents' socioeconomic characteristics constant (Moulton, Flouri, Joshi, & Sullivan, 2017). Similarly, accounting for parental socioeconomic status may only partially control for differences in parental knowledge about postsecondary education (Rosenbaum, 2001; 2011). Lastly, controlling for family socioeconomic status does not exhaustively account for differences in parental human capital and academic ability. For example, Parcel and Dufur (2001) observed an independent influence of maternal cognitive ability on children's math achievement and reading recognition. These family-level resources—like resources related to parental socioeconomic status—may impact

adolescent expectations and educational attainment, and their omission in status attainment research may lead to inconsistent estimates of the association between adolescent expectations and educational attainment.

Alternatively, omitted resources connected with schools and neighborhoods may influence educational expectations and attainment, giving the impression of a robust relationship (Bourdieu, 1974, 1984; Bowles & Gintis, 2011). This perspective is labeled school/neighborhood selection. Much current literature has observed schools and neighborhoods' impact on adolescent academic achievement (Crosnoe, 2004; Jargowsky & El Komi, 2011; Owens, 2010; Parcel, Dufur, & Cornell Zito, 2010; Rosenbaum, 2011). Contextual resources related to schools/neighborhoods, such as aggregate school/neighborhood socioeconomic deprivation, average school-level academic achievement, or knowledge about navigating postsecondary education, may influence long-term educational attainment. Like socioeconomic resources in status attainment research, these contextual resources may also affect educational expectations, driving the expectations-attainment association. For example, attending advantaged schools may confer students with high expectations and is associated with high levels of educational attainment. However, the knowledge conferred from peers, teachers, and school counselors on navigating the postsecondary education system (Rosenbaum, 2001, 2011)—rather than high expectations—may be driving long-term educational attainment. Thus, exclusion of these contextual characteristics from a large body of status attainment literature may yield inconsistent estimates of the relationship between educational expectations and attainment. Recent research, however, has found that family-level resources exert a more powerful influence on academic achievement than school resources (Dufur, Parcel, & Troutman, 2013), suggesting a higher likelihood of family-level selection than school/neighborhood-level selection.

Fixed effects models offer a solution for family and school/neighborhood-level confounding. Using information on social clusters—e.g., schools or families—fixed effects account for omitted variables (Allison, 2009).[1] School fixed effects models control for common characteristics of respondents who attend the same school, such as the student body, teachers, facilities, and neighborhood (e.g., Jargowsky & El Komi, 2011; Roth, 2017). Similarly, sibling fixed effects models control for characteristics shared among siblings, such as socioeconomic status, extended family, and parents' knowledge and human capital (Campbell & Horowitz, 2016; Fishman & Min, 2018; Kohler, Behrman, & Schnittker, 2011). Because families are nested within school districts and neighborhoods, the sibling fixed effects estimation strategy also accounts for school/neighborhood confounding. Unlike the instrumental variable and bounds models used in Morgan's (2004) research, fixed effects models make relatively modest assumptions (Allison, 2009). In sum, school and sibling models offer potential solutions for omitted variable bias at the school and family-levels in the relationship between educational expectations and educational attainment.

3. Other factors in the relationship between educational expectations and educational attainment

Consistent with prior status attainment research (Andrew & Hauser, 2011; Bozick et al., 2010; Domina et al., 2011; Sewell et al., 2003), this study accounts for other sociodemographic variables. Race is a determinant of differences in educational expectations and educational attainment in the US. For example, prior research found that blacks and Hispanics had less stable educational expectations than whites and Asian Americans (Cheng & Starks, 2002). In turn, Asian Americans had substantially higher levels of educational attainment than whites, and Hispanics and blacks had lower levels of education than whites. Most of these differences in educational attainment were due to socioeconomic background, but also could be attributed to other factors (Kao & Thompson, 2003).

Other factors related to educational expectations and educational attainment include age, family size, and gender. Age/grade is a key determinant of educational attainment not only because older individuals have more temporal opportunities to attain more school, but also because older adolescents have already passed key academic transitions. Thus, it may be more reasonable for older adolescents to assume that attaining higher levels of education is possible (assuming they have passed these hurdles). In addition, birth into later birth cohorts was associated with increased educational attainment (Barclay & Myrskylä, 2016). Similarly, family size was considered to be a predictor of educational expectations and attainment in status attainment research (Andrew & Hauser, 2011; Sewell et al., 2003). Gender also influences both educational expectations and educational attainment. Women's educational expectations vastly increased in recent years (Jacob & Wilder, 2011) to a point where they were higher than those among men (Mello, 2008), and women tended to complete more years of educational attainment than men (DiPrete & Buchmann, 2013).

4. Conceptual model

A traditional status attainment model contends that inequality in educational expectations causes differences in educational attainment (Sewell et al., 2003). The traditional model would be supported if the inclusion of school and sibling fixed effects resulted in no change in estimates relative to OLS models. This finding would indicate that cross-sectional models accurately specify the expectations-attainment association.

This paper proposes an alternative theory, family and school/neighborhood-level selection. The selection theory suggests that the relationship between adolescent expectations and educational attainment is mis-specified in cross-sectional models used in status attainment research (see Fig. 1). The school/neighborhood selection hypothesis would be supported if the relationship between adolescent expectations and educational attainment is reduced in school fixed effects models relative to OLS models, demonstrating model misspecification due to school/neighborhood-level confounding. The family-level selection hypothesis would be supported if the relationship between educational expectations and educational attainment is reduced in sibling fixed effects models relative to OLS models, revealing model misspecification due to family-level confounding. In sum, the selection theory argues that cross-sectional expectations-attainment models are mis-specified by omitting key social structural characteristics, leading to upward biased and inconsistent estimates.

The analysis also acknowledges the roles of cognitive ability, parental influence, and high school GPA in predicting educational attainment, independent of adolescent educational expectations. Firstly, it is important to establish that other individual-level factors predict educational attainment to validate that empirical models possess enough power to detect a potential relationship between adolescent expectations and educational attainment. Second, the inclusion of these variables allows for evaluation of the importance of adolescent educational expectations, relative to other individual-level factors.

4.1. Selection into educational expectations

The conceptual model treats expectations as a proximate predictor of educational attainment. The model controls for the selection into educational expectations via sociodemographic characteristics, and psycho-social characteristics specified in traditional status attainment models: cognitive ability, parental influence, and high school GPA (Sewell et al., 2003).

[1] Few studies contain enough covariates to exhaustively control for school/neighborhood or family-level omitted variables. In contrast, fixed effects exhaustively control for shared characteristics within the cluster-level.

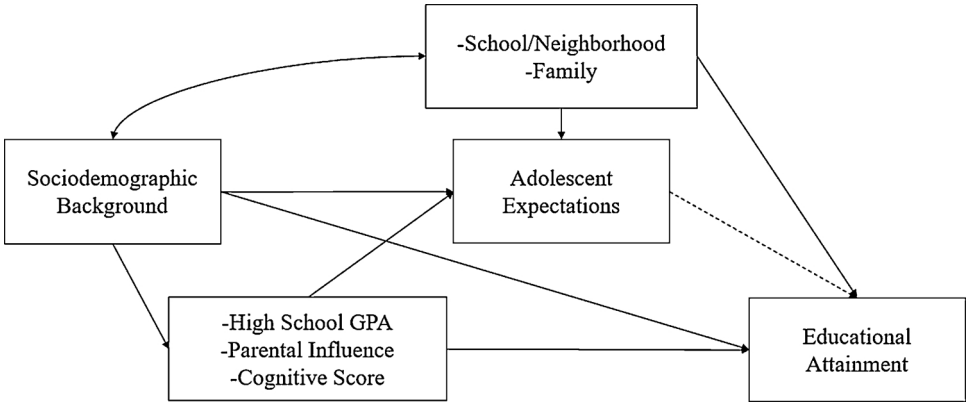

Fig. 1. Educational expectations' relationship with educational attainment: neighborhood/school or family-level selection. The dotted line denotes a mis-specified association, which would be weaker or non-significant in a correctly specified model. Black arrows denote robust relationships.

5. Data and methods

5.1. Data

This study utilized sibling-pair data from the National Longitudinal Study of Adolescent to Adult Health (Add Health) (Harris & Udry, 2013). Drawing on a school-design, Add Health collected data from US adolescents through young adulthood in Waves I (mean age 16) through IV (mean age 29). This study employed Add Health's rich information on sociodemographic background, families, and schools. In addition, Wave I of Add Health collected information on linked sibsets. These sibsets were classified by their familial relationship (e.g., identical twins, full siblings, half-siblings).

This paper utilized Add Health's full siblings and twins for the analysis. These sibling pairs were broadly representative of respondents from Add Health and share sociodemographic characteristics—such as parents' socioeconomic background, family environment through adolescence, and extended family. These siblings received the same questionnaires, shared the same household, and the majority attended the same schools (Harris, Halpern, Smolen, & Haberstick, 2006). There is modest variance in model assumptions by the type of sibling pair (Kohler et al., 2011). Twin models control for a broader range of environmental and genetic confounders than full-sibling models. The problem of systematic environmental differences experienced by full-siblings was addressed by controlling for age and grade. Similarly, monozygotic twin models share nearly all genetic characteristics, while dizygotic twin-pairs and full-siblings share a smaller proportion of genetic characteristics and can vary in sex. Sensitivity analyses using Add Health's polygenic scores (Braudt & Harris, 2018)—which account for the genetic propensity for educational attainment (Braudt, 2018)—revealed no meaningful influence of controlling for genetic differences on estimates (see Table A.19). Thus, aggregating full-siblings and twins is unproblematic.

Age/grade variation in the relationship between adolescent expectations and educational attainment was explored, revealing a significant interaction between 12th grade status and an increased association between educational expectations and educational attainment. This interaction is unsurprising; many 12th grade respondents may have submitted college applications or received acceptance into college by the time of the interview. This pattern is also consistent with Rosenbaum's (2011) work, which argued that 12th grade expectations may have a different impact on educational outcomes than expectations among younger high school and middle school students. For this reason, all 12th grade respondents and their sibling-pairs were dropped from the analysis.[2] Multiple imputation (10 rounds) was used to recover missing cases.[3] The final file included 2,125 complete cases, nested within 1,042 sibsets, which were further nested within 141 schools.[4]

5.2. Measures

This study's primary outcome variable was years of educational attainment in Wave IV. Individuals in Wave IV had an average of 29 years of age, and thus most had completed their education. A coding scheme from (Kane, Morgan, Harris, & Guilkey, 2013), which converted the ordinal variable for educational attainment into a linear variable for years of educational attainment, was used. A detailed measure of educational attainment—as opposed to a dichotomous measure—was used because educational attainment has a (generally) linear association with earnings (Carnevale, Rose, & Cheah, 2013). Alternative measures of educational attainment—bachelor's degree completion or degree completion (less than high school, high school, some college, bachelor's, and more than a bachelor's)—were used in sensitivity analyses, revealing similar patterns to the education years models (see Table 5). These outcomes were treated as linear for the ease of between-model comparisons. The normal distribution of degree completion and relatively normal distribution of bachelor's degree completion made the linear estimation strategy relatively unproblematic.

The primary predictor variable of interest was educational expectations from Wave I. This variable was obtained from the question: "On a scale of 1–5, where 1 is low and 5 is high, how likely is it that you will go to college?" The bottom two categories (1 and 2) were merged because of non-monotonicity in their relationship with educational attainment. The final scale had four values and was treated as linear. A wide variety of measures of educational expectations has been used in prior literature (Morgan, 2007), including expected degree completion

[2] Additional analyses revealed that the sibling-pairs of 12th grade respondents were representative of the rest of the sample, featuring similar expectations-attainment relationships (see Table A.8).

[3] Imputed cases had similar means and distributions to the observed data for all cases. Truncated regression models were used to model continuous outcomes with cut-points (e.g., GPA). To model covariates with high rates of missingness (parental income, parental educational pressure, and high school GPA), similar covariates (block-level median income, adolescents' perceived parental educational pressure, and coursework achievement in Wave I) with low missingness rates were included in the chained imputation.

[4] The file began with 3,689 linked siblings. Respondents in 12th grade (N = 3,175), missing educational attainment in Wave IV (N = 2,643), or missing a matched sibling pair (N = 2,125) were sequentially dropped. No cases were missing a school match. The final file had 443 twin and 600 full-sibling pairs. Because one family had a full-sibling and a twin-pair, there were a total of 1,042 sibsets. Additional analyses revealed no evidence of bias from panel unbalance.

(Andrew & Hauser, 2011) and plans to attend college (Andrew & Flashman, 2017). This measure of college attendance expectations reflects this paper's focus on the college-for-all setting. College-for-all heavily focuses on the bachelor's degree and does not necessarily make differentiations about different levels of college (4-year institution, masters, Ph.D., or professional degree) (Goyette, 2008). Second, supplemental analyses indicated that this measure of educational expectations reflects latent educational ambition. Preliminary analysis of models correcting for measurement error revealed similar patterns to those in the primary analysis (see Table A.16). Third, this measure of educational expectations has an advantage over degree-focused measures of educational expectations because it is less education-knowledge dependent. For example, Rosenbaum (2011) argued that expectation to complete a master's degree may reflect knowledge of postsecondary education, rather than solely educational plans. Lastly, this measure reflects the sequential nature of educational attainment. For high school students, college reflects the next potential stage in their academic careers. Similarly, the vast majority of 7th and 8th grade students will attend at least some high school and additional analyses suggest that adolescent expectations are not more predictive of educational attainment in 11th grade than in 7th grade.

Parental educational pressure—an indicator of parental influence (Sewell et al., 2003) closely related to educational aspirations—was obtained from Add Health's Wave I parent survey question: "How disappointed would you be if {NAME} did not graduate from college?" The answer was divided into three categories: very disappointed, somewhat disappointed, and not disappointed (referent). These categories were renamed: high pressure, medium pressure, and low pressure (referent).

Cumulative high school GPA was another important control variable. GPA was obtained from Add Health's high school transcripts from Wave III. Alternative measures of high school GPA were tested in equivalent regression models (see Table A.18). These models revealed little noticeable difference from the primary analyses.

Respondents' age and grade were also obtained from Wave I. Age was treated as continuous, while grade was treated as a categorical term. Sibsize was modified with a natural log transformation to account for right skew.

The measure of cognitive score was obtained from the Peabody Verbal Test (PVT) from Wave I. This score was standardized, with an average of 100.

Family socioeconomic background was captured using measures of parental education, family income, and parents' occupation. Parental education measured the highest level of parental educational attainment at the time of Wave I. This variable was divided into 5 categories: less than high school, high school, some college, bachelors, or more than bachelors. Income is obtained from Wave I's parent survey. Unfortunately, this variable had a large proportion of missing cases (around one fourth) because not all parents of Add Health's respondents replied to the parent survey. A cubed root transformation was used to account for income's skewness while maintaining cases with no income. Parents' occupation was divided into two categories: professional/manager and non-professional/manager. Last, a measure of respondents' race/ethnicity was included. This variable was divided into five categories: white, black, Hispanic, Asian, and other.

5.3. Methods

Pooled sibling models of education years were estimated using linear regression among individual, *i*, within family, *j*, which are further nested within school, *k*, such that

$$edyrs = \alpha + \beta_{0ijk} + \beta_1 aexp_{ijk} + \varepsilon_{ijk} \quad (1)$$

$$edyrs = \alpha + \beta_{0ijk} + \beta_1 aexp_{ijk} + \beta_2 \mathbf{X}_{ijk} + \beta_3 \mathbf{X}_{jk} + \varepsilon_{ijk} \quad (2)$$

$$edyrs = \alpha + \beta_{0ijk} + \beta_1 aexp_{ijk} + \beta_2 \mathbf{X}_{ijk} + \beta_3 \mathbf{X}_{jk} + \beta_4 pvt_{ijk} + \beta_5 press_{ijk} + \beta_6 gpa_{ijk} + \varepsilon_{ijk} \quad (3)$$

where Model 1 included a covariate for adolescent educational expectations. Model 2 added a matrix, $\mathbf{X}_{ijk}$, representing individual-level variables (gender, age, and grade) and a matrix, $\mathbf{X}_{jk}$, representing family-level variables (sibsize, race, parental education, parental income, and parental occupation). Model 3 added status attainment mediators: PVT score, parental educational pressure, and high school GPA. These OLS models assume no family and school/neighborhood-level confounding. The OLS models used sibset-cluster robust standard errors to account for family-clustering. Comparable sibling random effects models were also estimated (see Table A.2 for complete models). Like the pooled robust OLS models, the random effects models accounted for clustering, but assumed no family and school/neighborhood-level confounding. The sibling random effects models yielded slightly lower estimates than the pooled OLS models.

Next, pooled sibling models with school fixed effects, α_k, were estimated, such that

$$edyrs = \alpha_k + \beta_{0ijk} + \beta_1 aexp_{ijk} + \beta_2 \mathbf{X}_{ijk} + \beta_3 \mathbf{X}_{jk} + \beta_4 pvt_{ijk} + \beta_5 press_{ijk} + \beta_6 gpa_{ijk} + \varepsilon_{ijk} \quad (4)$$

where school-level variance was held constant. This model used the following counterfactual: if respondents attending the same school had different educational expectations, would they obtain different levels of educational attainment? If the inclusion of school fixed effects attenuates the association between educational expectations and educational attainment, then the school/neighborhood selection hypothesis would be supported. School random effects models were also estimated (see Table A.1 for complete models). The school models used school-cluster robust standard errors.

Lastly, models with sibling fixed effects, α_j, were estimated, such that

$$edyrs = \alpha_j + \beta_{0ijk} + \beta_1 aexp_{ijk} + \beta_2 \mathbf{X}_{ijk} + \beta_3 pvt_{ijk} + \beta_4 press_{ijk} + \beta_5 gpa_{ijk} + \varepsilon_{ijk} \quad (5)$$

where family-level variance was held constant, dropping family-level variables from the model. School fixed effects were also dropped because sibling fixed effects restricted school-level variation.[5] This model addressed the following counterfactual: if siblings had different adolescent educational expectations, would they complete different levels of educational attainment? This approach accounts for shared characteristics—observed and unobserved—between these siblings. If the inclusion of sibling fixed effects reduces the relationship between adolescent expectations and educational attainment relative to OLS models, then the family-selection hypothesis would be supported. The sibling fixed effects models used sibset-cluster robust standard errors. After the primary analyses, Hausman tests (1978) were used to formally evaluate model specification.

6. Results

6.1. Descriptive results

Table 1 displays descriptive results. The average years of education in Wave IV was 14.24, with 32 percent completing bachelor's degrees and an average of 3.00 degrees completed. The average educational expectations were 3.14 (1–4), demonstrating that most respondents expected to attend college. The average PVT score was 99.31, and respondents' average GPA was 2.58. Students had an average age of 15.67 years in Wave I and 28.66 years in Wave IV. The students were relatively evenly dispersed among grades, ranging from 17 percent in 8th

[5] The model assumes that siblings attended the same school during adolescence (Harris & Udry, 2013). Models which included sibling and school fixed effects were unable to be estimated, due to collinearity.

Table 1
Descriptive statistics from Add Health's linked full siblings (N = 2125).

	Mean/%	SD	% Complete
Education Years (8-26)	14.24	2.61	100.00
BA Completed (%)	32.28	0.47	100.00
Degrees Completed (1-5)	3.00	1.14	100.00
Adolescent Expect. (1-4)	3.14	1.03	99.58
PVT (15-146)	99.31	14.48	95.72
Parental Educ. Pressure (%)			89.36
Low	16.32		
Medium	41.76		
High	41.92		
High School GPA (0-4)	2.58	0.89	71.53
Female (%)	52.05		100.00
Age in Wave IV (Wave I)	28.66 (15.67)	1.52	99.95
Grade (%)			96.94
7	17.14		
8	16.89		
9	23.74		
10	21.80		
11	20.44		
Sibsize	3.28	1.54	100.00
Race (%)			100.00
White	60.00		
Black	20.47		
Hispanic	12.09		
Asian	5.93		
Other	1.51		
Parental Education (%)			99.15
< HS	12.10		
HS	33.18		
Some College	21.26		
BA	19.55		
> BA	13.91		
Parental Income	45.66	46.26	78.49
Parent Prof./Manag. (%)	35.35		96.24

grade and 24 percent in 9th grade. The plurality of parents had medium (42%) or high (42%) educational pressure for their children. Although the plurality of respondents' parents had a high school degree (33%), large percentages completed bachelor's degrees (20%) or more (14%). The mean parental income was 46 thousand dollars per year, and less than half (35%) of the respondents' parents had professional or managerial jobs.

6.2. Regression results

Results from the OLS regression of education years are displayed in Table 2. Model 1 only included information on adolescent expectations, revealing a strong, positive association. For each increase in one point of expectations, there was a 0.97 average increase in years of education completed. Model 2 included sociodemographic control variables (gender, age, grade, sibsize, race, parental education, parental income, and parental occupation) in the model. These additions led to an attenuation of the association between adolescent expectations and educational attainment. For every increase in one point of expectations, there was a 0.60 average increase in years of education completed, when holding other covariates constant. Lastly, PVT scores, parental educational pressure, and high school GPA were introduced in Model 3, further attenuating the association between educational expectations and educational attainment. In Model 3, for every increase in one point of adolescent educational expectations, there was a 0.28 average increase in years of education completed, net of other variables. In other words, individuals with the highest levels of adolescent educational expectations (4) completed 0.84 more years of education–on average–than those with the lowest level of educational expectations (1). Thus, results from OLS models suggest a strong relationship between adolescent expectations and educational attainment, consistent with status attainment theory.

Findings from school fixed effects models are displayed in Table 3.

Table 2
OLS Regression of education years completed on adolescent expectations and select covariates.

	Model 1			Model 2			Model 3		
	β	SE		β	SE		β	SE	
Adolescent Expect. (1-4)	0.97	0.05	**	0.60	0.05	**	0.28	0.05	**
Female (Male)				0.15	0.11		−0.01	0.10	
Age				−0.48	0.08	**	−0.20	0.07	**
Grade (7)									
8				0.66	0.19	**	0.42	0.17	*
9				1.25	0.22	**	0.74	0.20	**
10				1.93	0.28	**	0.98	0.24	**
11				2.78	0.35	**	1.57	0.31	**
LN (Sibsize)				−0.02	0.14		−0.01	0.13	
Race (White)									
Black				0.08	0.15		0.63	0.14	**
Hispanic				−0.23	0.18		0.21	0.16	
Asian				0.28	0.27		0.24	0.25	
Other				−1.15	0.37	**	−0.30	0.34	
Parental Education (< HS)									
HS				−0.06	0.19		−0.20	0.17	
Some College				0.44	0.22	*	0.18	0.19	
BA				0.81	0.24	**	0.45	0.21	*
> BA				1.49	0.28	**	0.82	0.26	**
Parental Income$^{1/3}$				0.42	0.08	**	0.30	0.07	**
Parent Prof./Manag. (Non-Prof./Manag.)				0.31	0.12	*	0.05	0.11	
PVT (15-146)							0.02	0.00	**
Parental Educ. Pressure (Low)									
Medium							0.26	0.13	+
High							0.55	0.15	**
High School GPA (0-4)							1.16	0.06	**
Intercept	11.21	0.15	**	16.43	1.12	**	9.00	1.12	**
Schools	141			141			141		
Sibsets	1042			1042			1042		
Observations	2125			2125			2125		

** < .01, * < .05, + < .10.
Note: Models use sibset-cluster robust standard errors.

Model 1 revealed modestly reduced point estimates relative to the equivalent OLS model (17% reduced). Model 2 introduced information on sociodemographic characteristics, attenuating the point estimates for the relationship between adolescent expectations and education years completed. This point estimate was 10 percent smaller than the equivalent OLS estimate. Model 3 included PVT scores, parental educational pressure, and high school GPA. These additions resulted in further attenuation of the association between adolescent expectations and educational attainment. For each increase in one point of expectations, a respondent completed an average of 0.24 more years of education, net of other covariates. Again, these estimates were somewhat reduced (13%) relative to the equivalent OLS estimate (see Table 5). In sum, the inclusion of school fixed effects only modestly reduced point estimates relative to OLS models.

Results from sibling fixed effects models are shown in Table 4. In these models, covariates for family-invariant characteristics—such as parental education and income—were dropped from the model. Model 1, the bivariate model, had considerably lower point estimates (63% reduced) than the equivalent OLS model. The introduction of sociodemographic controls in Model 2 led to further attenuation of the adolescent expectations-attainment relationship. Again, this estimate is considerably lower than that from the equivalent OLS model (51% reduced). Lastly, PVT scores, parental educational pressure, and high school GPA were introduced in Model 3, leading to additional attenuation of the expectations-attainment association. When holding these characteristics constant, each point increase in educational expectations was associated with a 0.13 average increase in years of

Table 3
School fixed effects models of educational years completed on adolescent expectations and select covariates.

	Model 1			Model 2			Model 3		
	β	SE		β	SE		β	SE	
Adolescent Expect. (1-4)	0.80	0.05	**	0.54	0.05	**	0.24	0.05	**
Female (Male)				0.16	0.11		0.00	0.09	
Age				−0.51	0.08	**	−0.23	0.07	**
Grade (7)									
8				0.73	0.18	**	0.48	0.17	**
9				1.54	0.27	**	0.80	0.25	**
10				2.30	0.33	**	1.10	0.30	**
11				3.15	0.40	**	1.71	0.37	**
LN (Sibsize)				−0.05	0.15		−0.02	0.13	
Race/Ethnicity (White)									
Black				0.17	0.18		0.57	0.17	**
Hispanic				−0.35	0.25		0.07	0.24	
Asian				0.34	0.38		0.14	0.27	
Other				−1.12	0.48	*	−0.30	0.41	
Parental Education (< HS)									
HS				−0.12	0.24		−0.26	0.21	
Some College				0.39	0.26		0.12	0.22	
BA				0.66	0.29	*	0.30	0.26	
> BA				1.28	0.29	**	0.60	0.28	*
Parental Income[1/3]				0.41	0.10	**	0.29	0.08	**
Parent Prof./Manag. (Non-Prof./Manag.)				0.27	0.13	*	0.05	0.13	
PVT (15-146)							0.02	0.00	**
Parental Educ. Pressure (Low)									
Medium							0.22	0.13	+
High							0.51	0.16	**
High School GPA (0-4)							1.19	0.07	**
Intercept	11.74	0.16	**	17.06	1.10	**	9.94	1.06	**
Schools	141			141			141		
Sibsets	1042			1042			1042		
Observations	2125			2125			2125		

** < .01, * < .05, + < .10.
Note: Models use school-cluster robust standard errors.

Table 4
Sibling fixed effects models of educational years completed on adolescent expectations and select covariates.

	Model 1			Model 2			Model 3		
	β	SE		β	SE		β	SE	
Adolescent Expect. (1-4)	0.35	0.06	**	0.29	0.06	**	0.13	0.06	*
Female (Male)				0.59	0.15	**	0.39	0.14	**
Age				−0.27	0.12	*	−0.15	0.11	
Grade (7)									
8				0.16	0.23		−0.01	0.21	
9				0.57	0.34	+	0.26	0.31	
10				1.14	0.41	**	0.63	0.38	+
11				1.86	0.53	**	1.12	0.49	*
PVT (15-146)							0.03	0.01	**
Parental Educ. Pressure (Low)									
Medium							0.18	0.29	
High							0.51	0.30	+
High School GPA (0-4)							0.83	0.10	**
Intercept	13.14	0.19	**	16.49	1.68	**	10.69	1.71	**
Schools	141			141			141		
Sibsets	1042			1042			1042		
Observations	2125			2125			2125		

** < .01, * < .05, + < .10.
Note: Models use sibset-cluster robust standard errors.

education. Thus, a respondent with high expectations (4) completed 0.39 more years of education–on average–than a respondent with low expectations (1). This sibling fixed effects point estimate was 56 percent lower than the equivalent OLS estimate (see Table 5), suggesting that family-level characteristics are confounding the adolescent expectations-attainment relationship. In contrast, the coefficient for PVT scores increased relative to the OLS estimate (22% increase). The GPA point estimate was reduced by a smaller percentage (29%) than adolescent expectations. Models using bachelor's degree completion and degree completion as outcomes were estimated (see Tables 5, A.1 through A.4). These analyses found similar levels of point estimate reduction (52–59%) in sibling fixed effects models relative to OLS models (see Table 5). In sum, these results revealed that the relationship between educational expectations and educational attainment—although robust in school fixed effects models—was reduced in sibling fixed effects models. This finding suggests that cross-sectional estimates of the expectations-attainment association in status attainment research may provide inconsistent and upward biased estimates.

6.3. Hausman tests of cluster-level confounding

Hausman tests (1978) were used to formally evaluate model specification by comparing expectation-attainment estimates from random and fixed effects models (see Table A.5). Random effects models—like the robust OLS techniques used above—account for clustering (see Table 5 for comparison). Unlike fixed effects models, OLS and random effects assume no cluster-level confounding. Comparison of school random and fixed effects models found no significant evidence of model misspecification from school/neighborhood-level confounding. In contrast, Hausman tests of sibling random and fixed effects models yielded significant test statistics, demonstrating model misspecification from omitting family-level characteristics.[6] Thus, sibling fixed effects models provided the most consistent and least biased estimates of the expectations-attainment relationship of the models estimated.

6.4. Other robustness tests

Sensitivity analyses were performed to examine the robustness of these findings. First, the sibling sample was compared with the main sample. Formal tests comparing models from different groups (Paternoster, Brame, Mazerolle, & Piquero, 1998) revealed no significant evidence of differences in OLS estimates between these samples (see Table A.8). Next, the main sample was decomposed by sibsize to examine if results from siblings apply to respondents with no siblings. Again, no significant difference in expectations-attainment estimates were revealed (see Table A.9). A series of models which allowed adolescent expectations to interact with gender, race—retesting Morgan's (2004) earlier paper—, and parental socioeconomic status were estimated. Sibling models only revealed significant interactions between expectations and parental education (see Tables A.10 through A.13). However, these interactions were non-monotonic and suggested that expectations may benefit the children of parents with some college and college degrees more than those with less than a high school degree or those with more than a bachelor's degree. This finding suggests that increases in expectations offer the greatest benefits for relatively advantaged adolescents, conflicting with GEAR UP's aim to increase adolescent expectations among disadvantaged populations.

Next, different model specifications were explored. Models were estimated which treated expectations as categorical (see Table A.14), replaced expectations with aspirations (see Table A.15), and utilized a latent variable (see Table A.16) for underlying educational ambitions.

[6] Full model Hausman tests were also estimated, again revealing consistent evidence of misspecification in sibling random effects models in comparison with sibling fixed effects models (see Table A.6).

Table 5
Summary of adolescent expectation-educational attainment point estimates for OLS, school random and fixed effects, and sibling random and fixed effects models for different educational attainment outcomes.

	Education Years			BA			Degrees		
	β	SE		β	SE		β	SE	
OLS	0.28	0.05	**	0.06	0.01	**	0.13	0.02	**
School RE	0.27	0.05	**	0.06	0.01	**	0.13	0.02	**
Coefficient Change (%) from OLS	−4.82			−3.97			−4.75		
School FE	0.24	0.05	**	0.05	0.01	**	0.12	0.02	**
Coefficient Change (%) from OLS	−13.48			−9.50			−8.99		
Sibling RE	0.25	0.05	**	0.05	0.01	**	0.12	0.02	**
Coefficient Change (%) from OLS	−9.60			−12.22			−9.85		
Sibling FE	0.13	0.06	*	0.03	0.01	*	0.06	0.03	+
Coefficient Change (%) from OLS	−55.53			−51.66			−58.79		
Schools	141			141			141		
Sibsets	1042			1042			1042		
Observations	2125			2125			2125		

** < .01, * < .05, + < .10.
Note: OLS and school fixed effects models control for gender, age, grade, sibsize, race, parental education, parental income, parental occupation, PVT score, parental educational pressure, and high school GPA. Sibling fixed effects models control for gender, age, grade, PVT score, parental educational pressure, and high school GPA. The OLS and sibling models use sibset-cluster robust standard errors, while the school models use school-cluster robust standard errors.

These model comparisons suggested misspecification in OLS models. One potential pitfall of sibling fixed effects models is the decrease in the signal-to-noise ratio (Kohler et al., 2011). Models which adjusted the reliability (signal-to-noise ratio) of the expectations measure revealed nearly identical point estimates with small reductions in reliability (see Table A.17). It is possible, however, that reduction of reliability could account for a portion of the reduction in point estimates. Patterns revealed in models using a latent measure of educational ambitions suggest, however, suggest that the observed pattern is robust to an estimation strategy to reduce measurement error (see Table A.16). Models were estimated using measures of high school academic achievement matched to Wave I to address the potential of reverse causality and overcontrolling, revealing little difference in estimates (see Table A.18). One of these measures also had a considerably lower rate of missingness than the GPA measure used. The robustness of these findings suggests that the multiple imputation accurately modeled GPA's missingness. OLS and sibling fixed effects models were re-estimated with polygenic scores to account for the genetic propensity for educational attainment; these models revealed no impact of genetic selection (see Table A.19). Next, bachelor's completion models were estimated using logit and logit sibling fixed effects estimators. Similar patterns to those from the earlier analyses were revealed in these models (see Table A.20). Models were re-estimated to examine if the exclusion of block-level socioeconomic and family (mother's marital status, maternal age, and birth order) characteristics influenced estimates. Tests revealed that excluding these covariates did not impact expectations-attainment estimates. In sum, the analyses above revealed the robustness of the primary analyses, demonstrating that cross-sectional estimates of the relationship between adolescent expectations and educational attainment are inconsistent and upward biased.

6.5. Limitations

Although the analysis controlled for sources of unobserved heterogeneity, the models herein are still susceptible to some sources of bias. If these sibling fixed effects models did not account for all omitted variables, they may have provided upward biased estimates of the relationship between adolescent expectations and educational attainment. For example, this analysis did not address within-school peer-group selection or personality; controlling for these potential sources of bias may (further) reduce the association between adolescent expectations and educational attainment. Controlling for GPA, however, reduces the threat of omitted variable bias. Only omitted variables which directly impact expectations and educational attainment could bias estimates. In contrast, GPA-mediated effects would not bias estimates.

Alternative measures of educational expectations may yield different associations with educational attainment. For example, the National Educational Longitudinal Study (NELS) has a detailed measure of educational expectations, obtaining information on the expected highest educational degree (Andrew & Hauser, 2011; Feliciano & Lanuza, 2016; Reynolds et al., 2006). However, Add Health's expectations measure is consistent with other research on college-for-all, which dichotomized NELS's detailed expectation measure (expected bachelor's degree vs. no expected bachelor's degree) (Goyette, 2008). In addition, NELS's detailed degree expectations measures may also reflect knowledge in addition to educational plans (Rosenbaum, 2011). Lastly, changes to educational expectations measures in past research, however, yielded only modest improvements in empirical fit (Jencks, Crouse, & Mueser, 1983). Add Health's measure captured two dimensions of expectations—certainty and plans—, which should further reduce measurement error (Jencks et al., 1983).

Below several potential limitations of the sibling models are addressed. First, sibling models only include individuals who lived with a sibling during adolescence, excluding those with a sibsize of one. Robustness tests, however, revealed that the cross-sectional association between educational expectations and educational attainment did not meaningfully vary by respondent sibsize (see Table A.9). Second, sibling fixed effects models are limited by the degree of within-family variation in educational expectations and educational attainment. Yet, similar research has used sibling and twin fixed effects models with similar or smaller sample sizes and predictor variables with limited within-sibset variation (e.g., Amin, Behrman, & Kohler, 2015; Campbell & Horowitz, 2016; Fishman & Min, 2018) to assess model specification. For example, Campbell and Horowitz (2016) employed a sibling file from the General Social Survey and Study of American Families with 1534 observations from 767 sibling pairs to disconfirm the relationship between college completion and political ideology. College completion, a dichotomous predictor variable, offered less variation than the ordinal measure of educational expectations employed in this paper (see Table A.7). These papers, alongside other examples, suggest that the sibling fixed effects estimator is a sound technique for controlling for unobserved family background characteristics, even when employing relatively small sample sizes and variables with limited variation. Thus, prior research and the sensitivity analyses from this paper offer further support for the primary finding from this paper: model misspecification in cross-sectional estimates of the expectations-attainment association.

7. Discussion and conclusion

7.1. Discussion

Status attainment research (Andrew & Hauser, 2011; Sewell et al., 2003) and current education policy (GEAR UP) contend that adolescent educational expectations is a core predictor of educational attainment. Findings from this paper, however, demonstrated that this relationship may be overstated in prior research. Relative to results from OLS models, expectations-attainment point estimates were 52–59 percent reduced in sibling fixed effects models. Supplementary analyses demonstrated that sibling fixed effects was the preferred model specification, supporting the family-level selection hypothesis. The analysis, however, did not find clear evidence of school/neighborhood-level selection.

These results suggest that prior educational expectations-attainment models omitted, important family-level characteristics. For example, socioeconomic status may have been under-specified by excluding familial wealth or information on extended family members. Alternatively, models may have excluded family-level knowledge of navigating post-secondary education or various forms of parental human capital, such as maternal cognitive ability or academic achievement. This hypothesis is consistent with Rosenbaum's (2001, 2011) emphasis on the problem of high expectations accompanied by poor "articulation" and information on the transition from high school to college. Thus, a significant portion of the expectations-attainment association may be reflecting the relationship between parents' educational knowledge and educational attainment. In sum, the analysis demonstrates that cross-sectional expectations-attainment point estimates are inconsistent and upward biased. Sibling fixed effects models, in contrast, provide lower and more consistent estimates.

This study partially supports Morgan's (2004) operationalization of classic social structuralist theory (Alexander & Cook, 1979; Bourdieu, 1974), which argued that educational expectations reflect propensities for educational attainment, rather than serving as independent predictors of educational attainment. Analyses demonstrate that expectations are—in part—reflections of social structural inequality. The remaining expectations-attainment association, however, suggests that expectations exert a modest influence on educational attainment.

Findings from this study offer insights for stratification research. First, results from fixed effects models demonstrate that adolescent educational expectations are a weaker predictor of educational attainment than prior status attainment research would suggest (Sewell et al., 2003). These findings demonstrate that educational expectations are not likely the core of educational attainment processes (Haller & Portes, 1973). Although educational expectations may positively influence adolescents' efforts (Domina et al., 2011), these efforts may translate into only minor increases in educational attainment. In sum, the finding of an attenuated relationship between educational expectations and educational attainment suggests that classic status attainment theory overstated the role of educational expectations. At the same time, the analyses confirm other aspects of status attainment theory, demonstrating that high school GPA and cognitive ability have relatively robust associations with educational attainment.

In addition, this study provides important knowledge for education policymakers. The efforts of educational policy programs—such as GEAR UP—to increase educational expectations, may be misplaced. Although increasing expectations may offer some improvements in educational attainment, they may be smaller than expected. In addition, robustness tests suggested that the educational returns to increased expectations may be greatest for relatively advantaged adolescents (see Table A.13). These problems are consistent with Rosenbaum's (2001, 2011) work, which warned of the potential for unfulfilled plans among adolescents with high expectations, but limited knowledge of navigating postsecondary education. One promising alternative is increased focus on psycho-social characteristics which influence adolescents' academic achievement and intellectual development. For example, Dweck and colleagues (e.g., Yeager & Dweck, 2012) contended that growth mindsets towards learning and intelligence exert a powerful influence on academic outcomes and may even buffer the negative effects of poverty on academic achievement (Claro, Paunesku, & Dweck, 2016).

7.2. Conclusion

Findings from this paper reveal that educational expectations play a smaller role in stratification than previously suggested. These results contrast with status attainment theory, which contends that educational expectations are a central predictor of educational attainment. To further test if the relationship between educational expectations and educational attainment is spurious, future research should examine which omitted family-level variables are responsible for much of the association between expectations and educational attainment. Alternatively, this literature may benefit from replication using data from different studies with matched siblings.

In addition, this paper demonstrates potential pitfalls of the focus on adolescent educational expectations in the current college-for-all approach to educational attainment. Findings suggest that cross-sectional educational expectations-attainment models–on which most of status attainment research is based–may be mis-specified. Thus, treating adolescent expectations as an outcome variable, with the assumption that they will translate into educational attainment, may be erroneous. Future educational research and policy work should re-consider the salience of educational expectations for adolescents in the US. The increase in adolescent educational expectations from the college-for-all approach may have limited benefits for population-levels of educational attainment.

Conflict of interest

The author has no financial, general, and institutional competing interests.

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Appendix A. Supplementary data

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References

Alexander, K. L., & Cook, M. A. (1979). The motivational relevance of educational plans: Questioning the conventional wisdom. *Social Psychology Quarterly,* 202–213. https://doi.org/10.2307/3033763.

Allison, P. D. (2009). *Fixed effects regression models, Vol. 160*. Newberry Park, CA: SAGE Publications.

Amin, V., Behrman, J. R., & Kohler, H.-P. (2015). Schooling has smaller or insignificant effects on adult health in the US than suggested by cross-sectional associations: New estimates using relatively large samples of identical twins. *Social Science & Medicine, 127*, 181–189. https://doi.org/10.1016/j.socscimed.2014.07.065.

Andrew, M., & Flashman, J. (2017). School transitions, peer influence, and educational expectation formation: Girls and boys. *Social Science Research, 61*, 218–233. https://doi.org/10.1016/j.ssresearch.2016.06.016.

Andrew, M., & Hauser, R. M. (2011). Adoption? Adaptation? evaluating the formation of educational expectations. *Social Forces, 90*(2), 497–520. https://doi.org/10.1093/sf/sor005.

Baird, C. L., Burge, S. W., & Reynolds, J. R. (2008). Absurdly ambitious? Teenagers' expectations for the future and the realities of social structure. *Sociology Compass, 2*(3), 944–962. https://doi.org/10.1111/j.1751-9020.2008.00110.x.

Barclay, K., & Myrskylä, M. (2016). Advanced maternal age and offspring outcomes: Reproductive aging and counterbalancing period trends. *Population and Development Review, 42*(1), 69–94. https://doi.org/10.1111/j.1728-4457.2016.00105.x.

Bourdieu, P. (1974). Cultural reproduction and social reproduction. In R. Brown (Ed.). *Knowledge, education and social change* (pp. 71–84). London, UK: Taylor & Francis.

Bourdieu, P. (1984). *Distinction: A social critique of the judgement of taste.* Cambridge, MA: Harvard University Press.

Bowles, S., & Gintis, H. (2011). *Schooling in capitalist America: Educational reform and the contradictions of economic life.* Chicago, IL: Haymarket Books.

Bozick, R., Alexander, K., Entwisle, D., Dauber, S., & Kerr, K. (2010). Framing the future: Revisiting the place of educational expectations in status attainment. *Social Forces, 88*(5), 2027–2052. https://doi.org/10.1353/sof.2010.0033.

Braudt, D. B. (2018). Sociogenomics in the 21st century: An introduction to the history and potential of genetically informed social science. *Sociology Compass, 12*(10), e12626. https://doi.org/10.1111/soc4.12626.

Braudt, D. B., & Harris, K. M. (2018). *Polygenic scores (PGSs) in the national longitudinal study of adolescent to adult health (Add health)-Release 1.* Retrieved fromChapel Hill, NC: Carolina Population Center. https://www.cpc.unc.edu/projects/addhealth/documentation/guides/PGS_AH1_UserGuide.pdf.

Campbell, C., & Horowitz, J. (2016). Does college influence sociopolitical attitudes? *Sociology of Education, 89*(1), 40–58. https://doi.org/10.1177/0038040715617224.

Carnevale, A. P., Rose, S. J., & Cheah, B. (2013). *The college payoff: Education, occupations, lifetime earnings.* Washington, DC: Georgetown University Center on Education and the Workforce.

Chan, T. W., & Boliver, V. (2013). The grandparents effect in social mobility: Evidence from British birth cohort studies. *American Sociological Review, 78*(4), 662–678. https://doi.org/10.1177/0003122413489130.

Cheng, S., & Starks, B. (2002). Racial differences in the effects of significant others on students' educational expectations. *Sociology of Education, 75*(4), 306–327. https://doi.org/10.2307/3090281.

Claro, S., Paunesku, D., & Dweck, C. S. (2016). Growth mindset tempers the effects of poverty on academic achievement. *Proceedings of the National Academy of Sciences, 113*(31), 8664–8668. https://doi.org/10.1073/pnas.1608207113.

Crosnoe, R. (2004). Social capital and the interplay of families and schools. *Journal of Marriage and Family, 66*(2), 267–280. https://doi.org/10.1111/j.1741-3737.2004.00019.x.

Department of Education (2018). Washington, DC.Gaining Early Awareness and Readiness for Undergraduate Programs (GEAR UP) Annual Performance Report for Partnership and State Projects2018. *Gaining Early Awareness and Readiness for Undergraduate Programs (GEAR UP) Annual Performance Report for Partnership and State Projects*.

DiPrete, T. A., & Buchmann, C. (2013). *The rise of women: The growing gender gap in education and what it means for American schools.* New York, NY: Russell Sage Foundation.

Domina, T., Conley, A., & Farkas, G. (2011). The link between educational expectations and effort in the college-for-all era. *Sociology of Education, 84*(2), 93–112. https://doi.org/10.1177/1941406411401808.

Dufur, M. J., Parcel, T. L., & Troutman, K. P. (2013). Does capital at home matter more than capital at school? Social capital effects on academic achievement. *Research in Social Stratification and Mobility, 31*, 1–21. https://doi.org/10.1016/j.rssm.2012.08.002.

Feliciano, C., & Lanuza, Y. R. (2016). The immigrant advantage in adolescent educational expectations. *The International Migration Review, 50*(3), 758–792. https://doi.org/10.1111/imre.12183.

Fishman, S. H., & Min, S. (2018). Maternal age and offspring's educational attainment. *Journal of Marriage and Family, 80*(4), 853–870. https://doi.org/10.1111/jomf.12490.

Goyette, K. A. (2008). College for some to college for all: Social background, occupational expectations, and educational expectations over time. *Social Science Research, 37*(2), 461–484. https://doi.org/10.1016/j.ssresearch.2008.02.002.

Haller, A. O., & Portes, A. (1973). Status attainment processes. *Sociology of Education, 46*(1), 51–91. https://doi.org/www.jstor.org/stable/2112205.

Hällsten, M., & Pfeffer, F. T. (2017). Grand advantage: Family wealth and grandchildren's educational achievement in Sweden. *American Sociological Review, 82*(2), 328–360. https://doi.org/10.1177/0003122417695791.

Harris, K. M., & Udry, J. R. (2013). *National longitudinal study of adolescent to adult health [Restricted use].* Chapel Hill, NC: University of North Carolina1–17.

Harris, K. M., Halpern, C. T., Smolen, A., & Haberstick, B. C. (2006). The national longitudinal study of adolescent health (Add Health) twin data. *Twin Research and Human Genetics, 9*(06), 988–997. https://doi.org/10.1375/twin.9.6.988.

Hausman, J. A. (1978). Specification tests in econometrics. *Econometrica: Journal of the Econometric Society, 46*(6), 1251–1271. https://doi.org/10.2307/1913827.

Jacob, B. A., & Wilder, T. (2011). Educational expectations and attainment. In G. J. Duncan, & R. J. Murnane (Eds.). *In whither opportunity? Rising inequality and the uncertain life chances of Low-income children.* New York, NY: Russell Sage Press.

Jargowsky, P. A., & El Komi, M. (2011). Before or after the bell? School context and neighborhood effects on student achievement. In H. Newburger, E. Birch, & S. Wachter (Eds.). *Neighborhood and life chances: How place matters in modern America* (pp. 50–72). Philadelphia, PA: University of Pennsylvania Press.

Jencks, C., Crouse, J., & Mueser, P. (1983). The Wisconsin model of status attainment: A national replication with improved measures of ability and aspiration. *Sociology of Education, 56*(1), 3–19. https://doi.org/10.2307/2112300.

Kane, J. B., Morgan, S. P., Harris, K. M., & Guilkey, D. K. (2013). The educational consequences of teen childbearing. *Demography, 50*(6), 2129–2150. https://doi.org/10.1007/s13524-013-0238-9.

Kao, G., & Thompson, J. S. (2003). Racial and ethnic stratification in educational achievement and attainment. *Annual Review of Sociology, 29*, 417–442. https://doi.org/10.1146/annurev.soc.29.010202.100019.

Karlson, K. B. (2015). Expectations on track? High school tracking and adolescent educational expectations. *Social Forces, 94*(1), 115–141. https://doi.org/10.1093/sf/sov006.

Killewald, A., Pfeffer, F. T., & Schachner, J. N. (2017). Wealth inequality and accumulation. *Annual Review of Sociology, 43*, 379–404. https://doi.org/10.1146/annurev-soc-060116-053331.

Kohler, H.-P., Behrman, J. R., & Schnittker, J. (2011). Social science methods for twins data: Integrating causality, endowments, and heritability. *Biodemography and Social Biology, 57*(1), 88–141. https://doi.org/10.1080/19485565.2011.580619.

MacLeod, J. (1987). *Ain't no makin'it: Leveled aspirations in a low-income neighborhood.* Washington, DC: ERIC.

Mello, Z. R. (2008). Gender variation in developmental trajectories of educational and occupational expectations and attainment from adolescence to adulthood. *Developmental Psychology, 44*(4), 1069–1080. https://doi.org/10.1037/0012-1649.44.4.1069.

Morgan, S. L. (2004). Methodologist as arbitrator: Five models for Black-White differences in the causal effect of expectations on attainment. *Sociological Methods & Research, 33*(1), 3–53. https://doi.org/10.1177/0049124104263657.

Morgan, S. L. (2005). *On the edge of commitment: Educational attainment and race in the United States.* Palo Alto, CA: Stanford University Press.

Morgan, S. L. (2007). *Expectations and aspirations.* Hoboken, NJ: John Wiley & Sons.

Moulton, V., Flouri, E., Joshi, H., & Sullivan, A. (2017). The influence of grandparents' social class on children's aspirations. *British Journal of Sociology of Education, 38*(4), 500–517. https://doi.org/10.1080/01425692.2015.1093407.

Owens, A. (2010). Neighborhoods and schools as competing and reinforcing contexts for educational attainment. *Sociology of Education, 83*(4), 287–311. https://doi.org/10.1177/0038040710383519.

Parcel, T. L., & Dufur, M. J. (2001). Capital at home and at school: Effects on student achievement. *Social Forces, 79*(3), 881–911. https://doi.org/10.1353/sof.2001.0021.

Parcel, T. L., Dufur, M. J., & Cornell Zito, R. (2010). Capital at home and at school: A review and synthesis. *Journal of Marriage and Family, 72*(4), 828–846. https://doi.org/10.1111/j.1741-3737.2010.00733.x.

Paternoster, R., Brame, R., Mazerolle, P., & Piquero, A. (1998). Using the correct statistical test for the equality of regression coefficients. *Criminology, 36*(4), 859–866. https://doi.org/10.1111/j.1745-9125.1998.tb01268.x.

Pfeffer, F. T., & Hällsten, M. (2012). Mobility regimes and parental wealth: The United States, Germany, and Sweden in comparison. *SOEP,* 500. https://doi.org/10.2139/ssrn.2166784.

Reynolds, J., Stewart, M., MacDonald, R., & Sischo, L. (2006). Have adolescents become too ambitious? High school seniors' educational and occupational plans, 1976 to 2000. *Social Problems, 53*(2), 186–206. https://doi.org/10.1525/sp.2006.53.2.186.

Rosenbaum, J. E. (2001). *Beyond college for all: Career paths for the forgotten half.* New York, NY: Russell Sage Foundation.

Rosenbaum, J. E. (2011). The complexities of college for all: Beyond fairy-tale dreams. *Sociology of Education, 84*(2), 113–117. https://doi.org/10.1177/0038040711401809.

Roth, T. (2017). Interpersonal influences on educational expectations: New evidence for Germany. *Research in Social Stratification and Mobility, 48*, 68–84. https://doi.org/10.1016/j.rssm.2016.12.001.

Sewell, W. H., Haller, A. O., & Portes, A. (1969). The educational and early occupational attainment process. *American Sociological Review, 34*(1), 82–92. https://doi.org/10.2307/2092789.

Sewell, W. H., Hauser, R. M., Springer, K. W., & Hauser, T. S. (2003). As we age: A review of the Wisconsin Longitudinal Study, 1957–2001. *Research in Social Stratification and Mobility, 20*, 3–111. https://doi.org/10.1016/S0276-5624(03)20001-9.

Yeager, D. S., & Dweck, C. S. (2012). Mindsets that promote resilience: When students believe that personal characteristics can be developed. *Educational Psychologist, 47*(4), 302–314. https://doi.org/10.1080/00461520.2012.722805.