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Parent and teacher educational expectations and adolescents' academic performance: Mechanisms of influence

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Abstract

The current study investigated how parents' and teachers' educational expectations both directly and indirectly shaped young people's academic outcomes in a nationally-representative sample of high school students (Education Longitudinal Study; $N = 9{,}654$ adolescents). Higher parent and math teacher expectations in 10th grade were associated with better 12th grade math scores and higher GPAs, math course-taking sequence, and educational attainment two years post-high school. High parent expectations generally magnified the particularly strong positive effects of high math teacher expectations, and there was some evidence of variation in links between adult expectations and outcomes by both student race/ethnicity and SES. Parents' educational involvement at school, teacher-student relationships, and school-parent communication mediated the links between adult educational expectations and academic outcomes.

Keywords

teacher educational expectations; parent educational expectations; parental involvement; teacher-student relationships; academic achievement

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The U.S. has long struggled with racial/ethnic and socioeconomic achievement gaps that are observed as early as preschool and are stubbornly persistent across elementary and secondary school and into postsecondary education (National Center for Education Statistics, 2020; Reardon & Portilla, 2016). Lower educational attainment, in turn, is related to a host of negative outcomes across the life course, including higher rates of poverty and incarceration (Institute of Medicine 2014), and these persistent educational achievement gaps contribute to the intergenerational transmission of socioeconomic disadvantage (Bloomeet al., 2018). Understanding the processes that chip away at these disparities in achievement are of critical importance to educational practice. The current study investigates how a set of interpersonal processes among students, their parents, and their math teachers influence young people's educational success in high school and beyond (see conceptual model in Figure 1) and whether certain interpersonal processes tied to education are particularly important in promoting the academic success of low-income youth and youth of color.

How well young people do academically is strongly influenced by the adults with whom and the environments in which they spend most of their time (Rumberger and Lim

2008). Most parents have educational goals for their children, and teachers expect certain academic futures based on students' performance and interactions. Those expectations are strongly linked to later educational success (Benneret al., 2016; Zhan & Sherraden, 2011), yet parent and teacher expectations do not always align, resulting in dissonant or incongruent expectations (Benner & Mistry, 2007). Furthermore, although adults may directly communicate their educational expectations for young people, it is also quite likely that these expectations influence the interactions they have that can subsequently either promote or inhibit achievement.

Informed by the life course perspective and bioecological theory, we argue that adults in two key contexts of youth's lives—families and schools—have independent and conjoint influences on educational competencies and that these influences are both direct and indirect via proximal processes that unfold within these contexts. This study thus highlights expectations held by parents and math teachers (see Rubie-Davies et al., 2015) and interactions within these contexts as points of entree for policies aimed at improving academic progress and achievement.

Adult Educational Expectations and Youth's Educational Outcomes

The expectations held by adults for youth's educational futures have strong implications for short- and long-term academic progress and achievement. Low teacher expectations are linked to poorer grades, lower achievement test scores, and a decreased likelihood of high school completion (Friedrich et al., 2015; Hinnant,et al., 2009; Schoonet al., 2004). These negative effects of teacher expectations and bias—that is, teachers holding lower expectations than would be expected given a student's prior achievement levels—are persistent, having impacts both within and across school years (De Boeret al., 2010; Jamil et al., 2018; Sorhagen, 2013). Conversely, parents' high expectations are positively associated with youth's academic achievement, college attendance and completion, grades, and educational attainment both within and across time (Benner et al. 2016; Pinquart & Ebeling, 2020; Zhan & Sherraden, 2011).

While evidence suggests that both teacher and parent educational expectations are influential for students' educational outcomes, less is known about how adult expectations come together to influence young people's educational success—that is, the interactional effects. Two studies have attempted to unpack the effects of congruent versus dissonant adult expectations, revealing that mothers' high expectations seem to buffer some of the negative effects of low teachers' expectations (Benner & Mistry, 2007; Hauser-Cram et al., 2003). Each, however, had limited samples (kindergarten students in Hauser-Cram et al., 2003; low-income urban students in Benner & Mistry, 2007), limiting generalizability. The current study aims to expand on this prior work by examining the interactional effects of teacher and parent expectations on children's educational outcomes using a large, nationally representative sample of U.S. high school students. This focal population is understudied in the existing scholarship on congruence of adult expectations, yet it is critically important as SES and race/ethnic differences in who persists in high school and beyond become readily apparent at this juncture.

The life course perspective orients our examination of parents' and teachers' expectations, with the linked lives principle positing that individuals' experiences of life events are shaped by the important others in their social networks (Elder, 1998), consistent with bioecological theory's attention to microsystems, or the everyday contexts of individuals' lives (Bronfenbrenner & Morris, 2006). More broadly, life course theory identifies the importance of interactions between micro- and macro-level contexts that set youth on developmental, social, and institutional trajectories (Crosnoe & Johnson, 2011). This connection suggests the micro-level contexts of families and schools are interwoven, such that the expectations of adults in those contexts come together in ways that could promote or deter educational success. In the current study, we examined the extent to which parent and math teacher expectations independently and conjointly influenced high school students' educational outcomes. Our focus on mathematics teachers and mathematics-related outcomes was purposeful, as mathematics is a key marker and gatekeeper for higher academic tracks in the short-term and college readiness and success in the longer term (Frank et al., 2008), yet evidence consistently documents that U.S. students lag behind those in many OECD countries on international mathematics assessments such at the PISA (Schleicher, 2019).

Mechanisms Linking Adult Expectations and Youth's Educational Outcomes

Although there is mounting evidence that parent and teacher educational expectations matter for young people's academic success, the mechanisms by which this occurs are less clear. Certainly, important adults in students' lives may directly communicate their expectations, but it is likely that these expectations actually inform the interactions between young people and their environments, and it is the quality of these interactions that may be at least, in part, driving expectancy effects (Seginer, 1983; Jussim & Harber, 2005). Bioecological theory highlights the centrality of interactions within proximal contexts (Bronfenbrenner & Morris, 2006), suggesting that the interpersonal processes that unfold between young people and the important others in their lives have great repercussions for subsequent growth and development. During adolescence, two central proximal contexts are families and schools. In the current study, we were interested in how interactions in these contexts might be both the product of adults' educational expectations and a potential driver of expectancy effects.

In their review of the parent expectations literature, Yamamoto and Holloway (2010) contend that interactional processes between children and their parents—particularly parents' educational involvement—mediate the relation between parental expectations and youth's academic success. Parents' involvement in school includes activities such as volunteering in the classroom or school and participating in formal parent-teacher conferences and parent-teacher organizations (Hill & Tyson, 2009). Research with elementary school populations has found that parents' school-based involvement partially mediates the link between parents' educational expectations and children's academic achievement (Briley et al., 2014; Englund et al., 2004). Similarly, educational involvement at home—including provision of educational materials or homework assistance—may also be a mechanism by which educational expectations exert their influence. For example, higher

parental educational expectations have been associated with greater literacy support at home, and this home-based involvement, in turn, is linked to greater achievement for middle school students (Davis-Kean, 2005). In contrast, assistance with homework and home-school communication appear to be strategies parents employ when their children are struggling (Hoglund et al., 2015). A focus of the current study is whether parents' educational involvement at home and at school exerts a similar influence when adolescents are in high school and is exacted in response to academic concerns or instead high expectations.

It is also likely that the expectations that adults hold may influence the interactions and supports that they provide to young people. Much of the teacher expectancy literature suggests that high teacher expectations are likely manifested through various processes, such as the classroom climate they create and the feedback they provide to students (see Murdock-Perriera and Sedlacek 2018 for a literature review). In turn, research shows that teacher-student relationships influence the academic success of young people (Roorda et al. 2017). As such, these positive interactions represent another potential mechanism through which expectations may be linked to academic achievement.

Finally, both the life course perspective and bioecological theory suggests that human agency and self-system processes also matter for the effects that linked lives can exert on individuals' growth and development (Bronfenbrenner & Morris, 2006; Elder, 1998). Yamamoto and Holloway's (2010) theoretical model linking parental expectations to students' academic outcomes suggests that students' academic efficacy is an important mediator of this relation. Indeed, extant research has documented that the relation between adult expectations and youth achievement is mediated, at least in part, by young people's academic self-concept (Friedrich et al., 2015; Loughlin-Presnal & Bierman, 2017; Pinquart & Ebeling, 2020). As such, in addition to the potential mediating proximal processes under study, we also investigated whether students' academic self-concept was an intermediary mechanism linking adult educational expectations, interactions within linked lives, and young people's academic outcomes.

Educational Expectations, Linked Lives, Academic Outcomes, and Inequality

The life course perspective posits that individuals create their lives within broader structural opportunities and constraints (Elder, 1998). Thus, although youth exert agency over their educational trajectories, their experiences of adult expectations and interactions with adults at the micro-level of school and family are further shaped by macro-level structures and the social inequalities therein. Low-income and racial/ethnic minority students are often faced with macro-level social inequalities, such as stigma and discrimination, that may limit their cultural capital, and thus they may be differentially impacted by adult expectations. Additionally, cultural mobility theory (DiMaggio, 1982) suggests cultural capital is especially important for youth from disadvantaged backgrounds; because marginalized youth are more likely to lack financial resources and social connections, cultural capital represents a central means of achieving upward mobility through education. Yet access to such capital is limited for marginalized youth who are often educated in schools

dominated by White middle class educational norms that are silent to culturally relevant pedagogy (Chambers & Huggins, 2014). Taken together, these theoretical models suggest that adults' educational expectations and youth's academic outcomes—and the direct and indirect mechanisms linking them—should be conditioned by markers of structural and social inequalities, including socioeconomic status and race/ethnicity.

Initial research documents this theoretically-informed variation. On average, teachers have poorer perceptions and expectations of low-income students as well as students who are racial and ethnic minorities (Cherng, 2017; Glock, 2016; Krolak-Schwerdt et al., 2013; Ready & Wright, 2011), which teachers communicate to students through direct converstaions and more subtle instructional choices (Chambers & Huggins, 2014; Ford & Moore, 2013). Furthermore, research suggests that students who are most at risk educationally (racial/ethnic minority students, low-income students) can be particularly susceptible to the negative effects of low teacher expectations and teacher expectancy biases (Cherng, 2017; Jamil et al., 2018; Sorhagen 2013), and the positive association between teacher-student relationships and student academic achievement tends to be stronger for both racial/ethnic minorities and low-income students (Roorda et al., 2011). Evidence of demographic variation in parents' educational expectations is more mixed. African American and Hispanic parents are shown to hold higher educational expectations for their children compared White parents, while Asian parents' expectations did not significantly differ from White parents (Lawrence, 2015); however, the effect of parent expectations on youth's academic outcomes tends to be weaker among racial/ethnic minority families (Pinquart & Ebeling, 2020). In contrast, various indicators of family socioeconomic status are positively associated with youth's academic success and parents' educational expectations (Carolan & Wasserman, 2015; Davis-Kean, 2005; Zhan & Sherraden, 2011), and evidence suggest that the links between parents' expectations and both achievement test scores and educational attainment may be stronger among children from higher SES families (Benner et al. 2016; Lee and Bowen 2006). In the current study, we examine whether the relations under study differed by student SES and race/ethnicity.

Current Study

The current study used data from a large, nationally-representative dataset—the Educational Longitudinal Study of 2002—to examine the processes by which adult expectations influenced young people's educational success (see conceptual model in Figure 1). The first research question examined the extent to which the congruence or dissonance of parents' and teachers' educational expectations was associated with students' academic outcomes (i.e., math course-taking sequence, math achievement test scores, grade point average, educational attainment). Based on previous empirical research on parent and teacher expectations and youth's academic performance, we hypothesized congruently high adult expectations would be most beneficial for youth's academic outcomes, whereas congruently low adult expectations would be particularly harmful. Furthermore, given the unique role that within-context interactions play for development (Bronfenbrenner, 1979), we hypothesized youth with dissonant high teacher but low parent expectations would have better academic outcomes than youth with dissonant high parent but low teacher

expectations because teachers drive both how education plays out in the classroom and how students are evaluated.

For research question two, we examined the mechanisms by which parent and math teacher educational expectations influenced later educational success. Here, we focused on linked lives within the family and school contexts that best reflected the pathways by which expectations are communicated and acted upon. Consistent with the theoretical model proposed by Yamamoto and Holloway (2010), we hypothesized that parent and teacher expectations would be related to processes within families (i.e., parents' home-based educational involvement, parent-youth relationships) and within schools (i.e., teacher-student relationships), as well as the connections between these contexts (i.e., parents' school-based involvement, parent-teacher communication). In turn, we expected these interactional aspects of linked lives to influence young people's subsequent academic outcomes. Furthermore, taking into account the role of youth's personal agency as suggested by the life course perspective and consistent with prior research (Benner & Mistry, 2007), we hypothesized that adult expectations and proximal processes within the home and school would be related to young people's academic self-concept, which in turn was expected to be associated with their subsequent academic outcomes.

Our third and final research question examined potential variation in the relations between adult expectations, linked lives, and academic outcomes by markers of social disadvantage. Based on the empirical research presented above and following a mobility model of cultural capital (DiMaggio, 1982), we expected adults' educational expectations and the interactions between young people and the important adults in their lives would matter more for the academic outcomes of youth who were socially marginalized and disadvantaged (i.e., low-income youth, racial and ethnic minorities), with positive expectations being particularly promotive and negative expectations being particularly deleterious for these populations.

Method

Data and Sample

The Education Longitudinal Study (ELS), conducted by the National Center for Education Statistics (NCES), is a nationally representative, longitudinal sample of adolescents who were in 10th grade in 2002. NCES used a two-stage sampling design applying a stratified probability proportional to size criterion, resulting in 17,591 10^{th} grade students in 752 schools (Ingels et al. 2004). Student survey data were collected during 10^{th} grade (Wave 1) and two years later in 2004 (Wave 2). Wave 3 (W3) data were collected in 2006 and included approximately 14,200 participants. In addition to student survey data from W1 to W3, we also included data from math achievement tests (W1, W2), parent surveys (W1), teacher surveys (W1), and school records (secondary school academic transcripts). Given our central focus on the intersection of adult expectations for young people's educational attainment, 6,365 adolescents without data on parent and math teacher expectations were excluded. Our final analytic sample included 9,654 adolescents from 730 schools in the ELS public use dataset. Table 1 provides descriptive information on adolescents and their families and schools.

Measures

This multi-informant study included student-, parent-, and teacher-level data, school records, and direct assessments. Adult expectations and parent, teacher, home-school, and student mediators were measured at W1, and educational outcomes were drawn from W2 and W3. Table 2 provides descriptive statistics and bivariate correlations for the focal constructs.

Adult expectations.—At W1, parents and math teachers reported the highest level of education they expected the student to complete on a seven-point continuum ranging from 1 (*less than a high school degree*) to 7 (*PhD, MD, or other advanced degree*).

Family processes.—Parents' educational involvement at home was modeled as a latent variable using parent reports of checking homework and discussing report cards (1 = *never*, 4 = *always*) and adolescent reports of their parents checking and helping with homework (1 = *never*, 4 = *often*). Higher scores indicated greater educational involvement at home.

Home-school connections.—We included two measures of home-school connections at W1. First, *parents' involvement at school* was a sum of four dichotomous indicators assessing whether parents were members of school organizations, attended school organization meetings, participated in school activities, and volunteered at the school (1 = *yes*, 0 = *no*). Second, for *parents' communication with school*, parents reported the frequency with which themselves or their spouse/partner had initiated contact with school personnel since the beginning of the school year (1 = *none*, 4 = *more than four times*) about the student (e.g., student's poor performance, post-high school plans). We created dichotomous indicators capturing whether parents ever engaged in each of the ten communication topics (coded as 1) or not (coded as 0) and then summed these indicators to determine the total number of communication topics discussed.

School processes.—Students' math teachers answered the following question about their interactions with the target student: "Does this student talk with you outside class about school work, plans after high school, or personal matters?" Responses were yes (1) or no (0). This item was utilized as a proxy of the extent to which the students made connections with their math teachers outside of class.

Student academic self-concept.—Student academic self-concept was modeled as a latent variable indicated by three measures assessed at W1. Students reported their *educational expectations* (1 = *less than high school degree*, 7 = *PhD, MD, or other advanced degree*). Two scales tapped into different aspects of students' self-competency beliefs; all items were rated using a 4-point scale (1 = *applies never*, 4 = *applies almost always*). First, the 5-item *math self-efficacy* subscale assessed students' perceptions of their math abilities (e.g., "I am confident I can do an excellent job on math tests"). Higher mean scores reflected more positive perceptions of ability in mathematics (α = .94). Second, the 5-item action control subscale assessed students' *effort and persistence* when studying (e.g., "When studying, I put forth my best effort"). Higher mean scores indicated greater effort and task persistence (α = .89).

Academic outcomes.—We included four measures of academic outcomes. First, ELS designed, conducted, and collected data on a *standardized math achievement test* for high school students using questions from previous standardized tests such as NELS. We used the standardized t-scores of these test scores in W2 to measure math achievement relative to the standardized 12th grade population. Second, an ELS-constructed composite measured *math course-taking* using student reports of years in math courses (1 = *no or other math course*, 6 = *trigonometry, pre-calculus, or calculus*) to determine highest level of math course taken by the end of 12th grade. Third, a categorical variable created from high school transcripts captured *cumulative grade point average* (GPA) for 9th through 12th grades (0 = *F (0.00 – 1.00)*, 6 = *A (3.51 – 4.00)*). Finally, at W3, individuals reported on their highest level of educational attainment from 1 (*less than a high school credential*) to 7 (*doctoral degree*).

Sociodemographic moderators and study covariates.—All analyses controlled for sociodemographic covariates (assessed at W1). Students reported their *race/ethnicity* as White, African American, Hispanic, Asian American, or some other race/ethnicity. Students also self-reported their gender. Parents reported their own and their child's nativity, which resulted in the ELS-constructed immigrant generational status (first, second, or third-plus generations). Parents reported family structure (recoded into a dichotomous variable: 1 = s*tudent lives with both biological parents*, 0 = *other family structure*) as well as whether the adolescent had ever been retained in grade (1 = *yes*, 0 = *no*) or had a learning disability (1 = *yes*, 0 = *no*). An ELS constructed socioeconomic status (SES) composite was created based on family income, parents' highest education level, and parents' occupations. A standardized continuous SES score was used as a covariate in the main model, but when SES was tested as a moderator, we recoded it into a binary variable, such that the low SES group had a composite score smaller than 0, and the high SES group had a composite score equal to or greater than 0. Additional individual-level control variables included students' prior academic achievement, as measured by the ELS math achievement test in W1 (10th grade) as well as the survey respondent's relationship to the focal student (1 = *biological mother*, 0 = *any other relation*). We also included two school-level covariates: geographic region (Northeast, Midwest, South, West) and urbanicity (urban, suburban, rural).

Plan of Analyses

We conducted path analyses in a structural equation modeling (SEM) framework to examine the magnitude and significance of associations between the predictors (expectations), mediators (family and school processes, home-school connections, and student academic self-concept), and academic outcomes (see conceptual model, Figure 1). The analyses included five steps. As an initial step, we conducted a measurement model to determine fit of the latent variables to be used in the path analyses (i.e., parents' educational involvement at home, student academic self-concept). Overall, the measurement model fit the data well (χ^2 (12) = 239.65, $p < .001$; CFI = .95; RMSEA = .044 [CI: .040 - .049]. The standardized coefficients and standardized errors for all loadings are presented in Table 3. All loadings were significant at $p < .001$.

We then analyzed a structural equation model examining the direct associations between adult expectations and adolescent outcomes (Model 1). Next, we added the parent

expectations X math teacher expectations interaction term to the model (Model 2). This was followed by a model (Model 3) that examined whether the direct or interaction effects varied by race/ethnicity or SES using multiple group analyses; chi-square difference tests with Satorra-Bentler corrections were conducted to identify where exactly paths differed across groups. Model 4 introduced the mediators; here, we examined the indirect effects from predictors to outcomes via the family, school, home-school connections, and adolescent self-concept mediators, with the standard error of indirect effects caluculated through the Delta method in Mplus. All models included a host of covariates outlined in the measures section.

All analyses were conducted using Mplus 8.2 (Muthén & Muthén, 1998–2019). The CLUSTER function was used to account for the nesting of ELS participants within schools to produce correctly adjusted standard errors in model estimations; a standard weight was used to correct for oversampling and differential attrition for the longitudinal data. Missing data for our analytic sample were handled through full-information maximum likelihood (FIML), which enabled inclusion of all available data in the analyses (Enders 2011). In the path analyses, both direct and indirect effects were estimated simultaneously, and inferences for the indirect effects were estimated using the delta method (Muthén & Muthén, 1998–2015).

Results

Parent-Teacher Expectations Congruence/Dissonance and Academic Outcomes

For the main effects model investigating the association between adult expectations and adolescents' academic outcomes (Model 1), as shown in the upper portion of Table 4, parent and math teacher expectations were significantly and positively linked to all adolescent academic outcomes under consideration at the $p < .001$ level. The effect size for math teacher expectations was approximately two times the size of that of parent expectations for both math course-taking sequence and educational attainment, more than three times as strong for cumulative high school grade point average, and five times as strong for math achievement test scores.

Model 2, which introduced the interaction term between parent and math teacher expectations documented significant interactions for all four outcomes under study (see lower portion of Table 4). A similar pattern of effects was observed for three of the four academic outcomes under study—math achievement test scores, cumulative GPA, and educational attainment (see Figure 2). Specifically, the positive effects of higher math teacher expectations on these academic outcomes were maximized when parents also held higher expectations for youth, particularly for cumulative GPA and educational attainment. In contrast, for math course-taking sequence, higher parent expectations buffered the negative effects of lower math teacher expectations. Overall, adolescents performed best academically across all four domains when both math teacher and parent expectations were high, and they had the worst academic outcomes when both math teacher and parent expectations were low. When adult expectations were dissonant, adolescents with high teacher but low parent expectations had slightly better GPAs and educational attainment than adolescents with low teacher but high parent expectations. In contrast, for math achievement

test scores and math course-taking sequence, there appeared to be little difference in the two discrepancy groups.

We then examined whether the links between adult expectations and their interaction with the academic outcomes varied by students' race/ethnicity or SES. Here, we first compared a model where all parameters were free to vary across groups to a model where the central paths of interest were fixed across groups. For both race/ethnicity and SES, we found that the fully constrained model fit the data significantly worse that the unconstrained model (see Table 5). We then tested individual pathways to identify exactly where group differences existed. As shown in the upper panel of Table 5, we observed variations across race/ethnicity for the links between parent expectations and both GPA and math course-taking sequence and between parent-by-teacher expectations and math course-taking sequence. Specifically, parent expectations were significantly related to GPA for White ($B = .17$, $p < .001$), African American ($B = .11$, $p < .01$), and Asian American students ($B = .11$, $p < .01$), but not for Latinx students ($B = .04$, $p = .39$). In contrast, the link between parent expectations and math course-taking sequence was significant for White students ($B = .12$, $p < .001$) but not for Black ($B = .05$, $p = .18$), Latinx ($B = .02$, $p = .69$), or Asian American students ($B = .03$, $p = .42$). Additionally, the interaction between parent and math teacher expectations was significantly related to math course-taking sequence for White ($B = -.06$, $p < .01$) and Asian American students ($B = -.16$, $p < .01$) but not for African American ($B = .04$, $p = .23$) or Latinx students ($B = -.03$, $p = .44$). As shown in Figure 3, for White students, higher parent expectations seemed to buffer the negative effects of low math teacher expectations on math course-taking sequence, consistent with the overall pattern observed for the full sample. For Asian American students, in contrast, high math teacher expectations seemed to buffer the negative effects of low parent expectations on math course-taking sequence, yet math teacher expectations were unrelated to math course-taking sequence for students whose parent held high expectations for them.

Moving to potential variation by SES (lower panel of Table 5), group differences were observed for the link between parent expectations and both educational attainment and math achievement test scores and between parent-by-teacher expectations and students' math course-taking sequence and GPA. Specifically, higher parent expectations were associated with higher educational attainment for both low-SES ($B = .16$, $p < .001$) and high-SES students ($B = .17$, $p < .001$), but this link was slightly stronger for high-SES students. Parallel to these findings, higher parent expectations were related to higher math achievement scores for high-SES ($B = .05$, $p < .001$) but not low-SES students ($B = .01$, $p = .24$).

The interaction between parent and math teacher expectations was significantly related to math course-taking sequence for high-SES ($B = -.08$, $p < .01$) but not low-SES students ($B = -.00$, $p = .96$), whereas this interaction was related to GPA for low-SES ($B = .06$, $p < .01$) but not high-SES students ($B = .01$, $p = .62$). As shown in Figure 4, high parent expectations seem to buffer the negative impact of low math teacher expectations on math course-taking sequence for high-SES but not low-SES students. For GPA, the positive effects of high math teacher expectations on GPA were maximized when parents also held higher expectations for students, but only for low-SES students.

Mechanisms Linking Adult Expectations and Adolescents' Academic Outcomes

The mediation model fit the data well, χ^2 (253) = 3,114.27, $p < .001$; CFI = .89; RMSEA = .034 [CI: .033 - .035]. The standardized path coefficients for the model are presented in Figure 5. Parents expressing higher educational expectations were more involved in their adolescents' education at home and at school and had children with higher academic self-concepts; however, higher parental educational expectations were associated with less parent-school communication. Math teacher expectations were linked to all central constructs, such that higher math teacher expectations were associated with more teacher-student connections, greater parental educational involvement at school, and higher student academic self-concept but lower levels of parent educational involvement at home and parent-school communication.

Of the home, school, and home-school connection mediators, only parental educational involvement at school was related to students' academic self-concept, with greater involvement linked to higher self-concept. For youth academic outcomes, we observed some variation. Greater parent-school communication was linked to lower student GPAs, whereas greater teacher-student connections were linked to higher GPAs. Further, greater parent educational involvement at school was related to lower math achievement scores. Parent educational involvement at home was not significantly related to any of the outcomes under study. Students' academic self-concept was also positively related to all youth academic outcomes. Of the three intermediate academic outcomes, only GPA was related to educational attainment, with higher GPA's associated with greater educational attainment two years after high school.

Formal tests of the indirect effects of adult expectations on youth academic outcomes were observed. Parameters for all indirect pathways are presented in the Appendix. There were two common indirect pathways from parents' and math teachers' educational expectations to youth academic outcomes: a) via students' academic self-concept b) through parents' communication with the school, and c) through parents' involvement at school and students' academic self-concept. For parent educational expectations, we observed an additional mediated pathway for educational attainment via students' GPA's, and for math teacher educational expectations, we observed additional mediated pathways via both teacher-student connections and parent communication with the school.

Discussion

Academic success is shaped by youth themselves as well as parents and teachers, who represent two of the most influential groups of adults in adolescents' linked lives. Understanding how parent and teacher expectations come together thus provides a more comprehensive picture of the academic socialization that young people receive. The main goal of this study was to investigate how adult educational expectations both directly and indirectly shape young people's academic outcomes in a nationally representative sample of high school students. Because prior research suggests that adult expectations and academic outcomes differ across sociodemographic groups (Yamamoto & Holloway, 2010), the second goal of this study was to determine whether the links between those expectations

and academic outcomes varied by important markers of social disadvantage including race/ethnicity and social class.

Prior research focused on the independent effects of parent and teacher educational expectations has consistently identified the particularly strong role that teacher expectations play in the achievement of youth across their educational careers (Gregory & Huang, 2013; Lee et al., 2015). The current study replicated these findings, highlighting the critical nature of parents and teachers in the academic lives of youth. In particular, high parent expectations seemed to magnify high teacher expectations, although for math course-taking sequence, we did observe a buffering effect wherein high parent expectations seemed to be protective in the face of low teacher expectations, more consistent with prior research (Benner & Mistry, 2007).

Results of the current study, however, revealed high teacher expectations were even *more* protective against low parent expectations, with the effect size for teacher expectations varying between two and five times that of parental expectations. These findings support a particularly strong "linked lives" connection between teachers and students. Although parents hold influence over how their children do in school, there is wide variation in exactly what this looks like across families (Lareau, 2003). Teachers, however, interact daily with students' academic progress and achievement and, based on our findings, have more influence over how they perform and progress through school. From a cultural capital perspective (Bourdieu, 1977), youth may "inherit" cultural capital from their parents, but how their teachers reward them for it matters for their academic progress and achievement. This study thus suggests that strong teacher expectations are crucial for improving youth academic achievement.

Turning to mechanisms of influence, we relied on both life course theory and Yamamoto and Holloway's model of adult expectation effects (2010) to inform our study. To this end, we proposed that adult expectations would influence interactions within linked lives spanning family and school as well as home-school connections. These interactions, in turn, were expected to drive students' self-concept and their academic success. In general, these hypotheses were meted out in our findings. When parents and teachers held high educational expectations for youth, these were related to high levels of parental school involvement, which in turn were linked to higher academic self-concept, that were then related to better student academic outcomes. However, contrary to hypotheses, higher levels of parental school involvement were associated with poorer math achievement scores and unrelated to all other academic outcomes of interest.

Parent-school communication occurred more frequently when both parents and teachers held low expectations for youth, and higher communication levels were associated with poorer subsequent GPA. We suspect that these negative links reflect underlying mechanisms that are informing these processes—specifically, parents are likely engaging in educational activities at home and communicating with their children's schools in response to academic challenges their children are displaying, and these academic challenges are likely reflected in the educational expectations that both parents and teachers are expressing for these students. Educational activities such as these, however, have been found to exact an effect

opposite of what is intended, leading to poorer academic achievement (Pomerantz & Eaton, 2001; Robinson & Harris, 2014). Future research should examine the mechanisms underlying the negative connections observed and investigate ways that home-based activities and parent-school communications might be structured to better promote student engagement and achievement.

As for teacher-student connections, we observed that higher teacher educational expectations were related to more teacher and student connections, which was, in turn, associated with higher student GPAs. Meta-analytic research has identified a consistent association between positive relationships with teachers and students' engagement and achievement, particularly for secondary school students (Roorda et al., 2011). Given that prior research has highlighted the compensatory role of positive teacher-student relationships for the academic achievement of young children who struggled with academic-related tasks (Liew et al., 2010), identifying ways to promote positive teacher-students relationships for educationally at-risk students may help promote academic success for this vulnerable population.

We observed some variation across students' SES and race/ethnicity; however, our results generally run counter to DiMaggio's (1982) theory of cultural mobility with some exceptions. Overall, we did not find that cultural capital was especially important to youth from disadvantaged backgrounds, which goes against the theory of cultural mobility. Instead, moderation analyses revealed that the positive link between parent expectations and math course-taking sequence was only significant for White students, and parent expectations appeared to be more beneficial for high-SES students' educational attainment and math achievement scores than low-SES students. These findings are more consistent with Bourdieu's social capital theory (1977), which suggests that more advantaged families are able to transmit to their children the types of cultural capital that are expected and valued by institutions such as schools. It is also likely that parents are able to maximize their cultural capital to advocate and provide the resources necessary to connect their adolescents to educators who can inform and support course selection and academic tracking that is advantageous for high school and postsecondary pursuits.

In contrast, the links between teacher expectations and educational outcomes were consistent across student race/ethnicity and SES. That is not to say, however, that educational opportunities and support from teachers to students are uniform across diverse groups of students. Indeed, ancillary analyses showed that, on average, teachers had lower educational expectations of students of color and of low-income students, in line with previous research (Auwarter & Aruguete, 2008; Ready & Wright, 2011). In other words, teachers may have lower expectations and their expectations may matter most for educational outcomes, but the link between those expectations and outcomes is neither stronger nor weaker across sociodemographic groups above and beyond the cultural capital with which students' parents equip them (Bourdieu, 1977; Lareau, 2003).

Strengths, Caveats, and Limitations

The current study used a large, nationally representative sample to conduct robust tests of a comprehensive set of mechanisms linking adult educational expectation and adolescent academic achievement. Moreover, we included multiple indicators of academic achievement,

ranging from short-term to long-term achievement outcomes. The current study thus extends the literature on adults' educational expectations and youth self-concept and outcomes by considering multiple mechanisms that could be at play. Whereas much of the literature has focused on direct relationships for students, we studied direct and indirect associations as well as mediational processes and potential sociodemographic moderators to provide a more holistic picture of how adults' expectations matter for the academic outcomes of youth toward the end of their secondary educations.

Although the current study contributes to our understanding of adult educational expectations and young people's academic achievement, the study is not without limitations. Because data are drawn from a national study, some measures include only one or two items; although we benefit from breadth of the measures included, which allowed us to investigate several potential mechanisms, the limited depth of measurement must be acknowledged. Future research with more multi-item measures could provide further validation for our study findings. Likewise, inclusion of more diverse aspects of parents' involvement at home and at school that are less culturally and socioeconomically biased (Lareau, 2003) would provide greater illumination into the ways in which adult expectations are shaped by and manifested in parents' academic interactions with their children and with the larger educational system. Additionally, given that peers are increasingly important socializing agents during adolescence (Brown, 2004) and that peer groups often exhibit homophily in terms of educational expectations (Kiuru et al., 2007), future research should also integrate attention to peers when considering mechanisms of influence for young people's educational success.

Additionally, although nationally representative, the majority of the analytical sample was White (62%), with racial/ethnic minority groups making up much smaller shares of the sample. Future research should further investigate the links between adult expectations and academic outcomes across students from comparably-sized racial/ethnic groups, particularly given the shifting demographic landscape of American schools wherein White students are now the numeric minority (Hussar et al., 2020). Given the continued diversification of U.S. society coupled with the increasing sociodemographic segregation of U.S. schools, cross-school comparisons could be one avenue for comparing the adult expectations and academic outcomes of students in majority white schools compared to those of students in majority African American or majority Hispanic schools, for example.

Finally, in the current study, we proposed directional pathways linking adult educational expectations to interpersonal processes to students' academic self-concept and academic success. Such work was based on prior theoretical models; however, the life course perspective suggests that linked lives are bidirectional, wherein key social agents influence young people's growth and development, but the characteristics, strengths, and challenges that young people face also influence their subsequent interactions with these important others in their lives. Indeed, prior research has shown that teacher expectations both influence and are influenced by children's academic achievement (Mistry et al., 2009). Future research should unpack longitudinally the complex bidirectional influences that may be at play, particularly given that academic tracking begins early in students educational careers, thus potentially setting the stage for adults' educational expectations early in

students' lives (Oakes, 2005). Finally, the current study focused on math teachers' expectations and the linked lives students have with those social agents. In U.S. secondary schools, students interact with a variety of teachers across the school day, and thus math teachers represent only one of many educators adolescents are encountering in their school lives. In the curriculum, however, mathematics is often a marker and gatekeeper for higher academic tracks in high school, and success in mathematics is linked to both college readiness and postsecondary success (Crosnoe & Benner, 2015; Frank et al., 2008). This motivated our focus on the expectations of math teachers' expectations in particular, although it should also be noted that the educational expectations espoused by students' math and English/language arts teachers were highly correlated in the ELS ($r = .66$, $p < .001$).

The findings presented here clearly indicate the direct and indirect ways that adult expectations influence students' academic success. Our study has practical implications for assisting disadvantaged youth through improving educational expectations that teachers hold for all students. Randomized-group trials have been effective in providing teachers tools to emulate classrooms where high expectations are the norm for all (Rubie-Davies et al., 2015). Given our findings of the direct importance of teacher expectations and the benefits of strong student-teacher relationships for students' academic self-concept, teacher-focused interventions are likely a crucial point of entrée for improving student achievement. This intervention work could also integrate methods for encouraging parents to enact more effective home-based involvement strategies. Such work is crucial for ensuring the educational well-being of all students.

Appendix: Significant indirect effects from adult expectations to youth academic outcomes

	From parent expectations to academic outcomes	From teacher expectations to academic outcomes
Indirect pathways through…	***B* (*SE*)**	***B* (*SE*)**
Math Achievement Test Scores		
Parents' educational involvement at home	−.001 (.001)	.004 (.002)
Teacher-student connections	.000 (.000)	−.003 (.002)
Parents' involvement at school	**−.005 (.001)*** **	**−.004 (.001)** **
Parent-school communication	.000 (.000)	−.001 (.001)
Student academic self-concept	**.440 (.074)*** **	**.347 (.061)*** **
Parents' educational involvement at home → Student academic self-concept	.000 (.001)	.001 (.002)
Teacher-student connections → Student academic self-concept	.000 (.000)	.001 (.002)
Parents' involvement at school → Student academic self-concept	**.004 (.001)*** **	**.003 (.001)*** **
Parent-school communication → Student academic self-concept	.000 (.000)	.001 (.001)
Math Course-taking Sequence		

Parents' educational involvement at home	.000 (.001)	.001 (.003)
Teacher-student connections	.000 (.000)	−.002 (.003)
Parents' involvement at school	−.003 (.002)	−.002 (.002)
Parent-school communication	.000 (.001)	.000 (.002)
Student academic self-concept	**.771 (.128)*** **	**.608 (.104)*** **
Parents' educational involvement at home → Student academic self-concept	−.001 (.001)	.001 (.003)
Teacher-student connections → Student academic self-concept	.000 (.000)	.002 (.003)
Parents' involvement at school → Student academic self-concept	**.007 (.002)** **	**.006 (.002)** **
Parent-school communication → Student academic self-concept	.001 (.001)	.002 (.002)
Cumulative High School Grade Point Average		
Parents' educational involvement at home	.000 (.001)	.001 (.002)
Teacher-student connections	.000 (.001)	**.007 (.003)***
Parents' involvement at school	.002 (.002)	.002 (.002)
Parent-school communication	**.003 (.001)***	**.010 (.002)*** **
Student academic self-concept	**.548 (.082)*** **	**.433 (.069)*** **
Parents' educational involvement at home → Student academic self-concept	.000 (.001)	.001 (.002)
Teacher-student connections → Student academic self-concept	.000 (.000)	.002 (.002)
Parents' involvement at school → Student academic self-concept	**.005 (.001)** **	**.004 (.001)** **
Parent-school communication → Student academic self-concept	.000 (.000)	.002 (.001)

	From parent expectations to academic outcomes	**From math teacher expectations to academic outcomes**
Indirect pathways through…	***B* (*SE*)**	***B* (*SE*)**
Educational Attainment		
Math achievement test scores	.033 (.043)	.016 (.022)
Math course-taking sequence	.037 (.039)	.018 (.020)
Cumulative high school grade point average	**−.077 (.017)*****	−.003 (.012)
Student academic self-concept	**.588 (.277)***	**.464 (.220)***
Parents' educational involvement at home → math scores	.000 (.000)	.000 (.000)
Teacher-student connections → math scores	.000 (.000)	.000 (.000)
Parents' involvement at school → math scores	.000 (.000)	.000 (.000)
Parent-school communication → math scores	.000 (.000)	.000 (.000)
Student academic self-concept → math scores	−.036 (.047)	−.028 (.037)
Parents' educational involvement at home → math sequence	.000 (.000)	.000 (.000)
Teacher-student connections → math sequence	.000 (.000)	.000 (.000)
Parents' involvement at school → math sequence	.000 (.000)	.000 (.000)
Parent-school communication → math sequence	.000 (.000)	.000 (.000)
Student academic self-concept → math sequence	−.043 (.044)	−.034 (.035)

Parents' educational involvement at home → GPA	.000 (.000)	.000 (.000)
Teacher-student connections → GPA	.000 (.000)	**.001 (.000)****
Parents' involvement at school → GPA	.000 (.000)	.000 (.000)
Parent-school communication → GPA	.001 (.000)	**.002 (.001)****
Student academic self-concept → GPA	**.101 (.020)*****	**.080 (.016)*****
Parents' educational involvement at home → Student academic self-concept	.000 (.001)	.001 (.003)
Teacher-student connections → Student academic self-concept	.000 (.000)	.002 (.002)
Parents' involvement at school → Student academic self-concept	**.005 (.002)****	**.004 (.002)***
Parent-school communication → Student academic self-concept	.000 (.001)	.002 (.001)
Parents' educational involvement at home → Student academic self-concept → math scores	.000 (.000)	.000 (.000)
Teacher-student connections → Student academic self-concept → math scores	.000 (.000)	.000 (.000)
Parents' involvement at school → Student academic self-concept → math scores	.000 (.000)	.000 (.000)
Parent-school communication → Student academic self-concept → math scores	.000 (.000)	.000 (.000)
Parents' educational involvement at home → Student academic self-concept → math sequence	.000 (.000)	.000 (.000)
Teacher-student connections → Student academic self-concept → math sequence	.000 (.000)	.000 (.000)
Parents' involvement at school → Student academic self-concept → math sequence	.000 (.000)	.000 (.000)
Parent-school communication → Student academic self-concept → math sequence	.000 (.000)	.000 (.000)
Parents' educational involvement at home → Student academic self-concept → GPA	.000 (.000)	.000 (.000)
Teacher-student connections → Student academic self-concept → GPA	.000 (.000)	.000 (.000)
Parents' involvement at school → Student academic self-concept → GPA	**.001 (.000)***	**.001 (.000)***
Parent-school communication → Student academic self-concept → GPA	.000 (.000)	.000 (.000)

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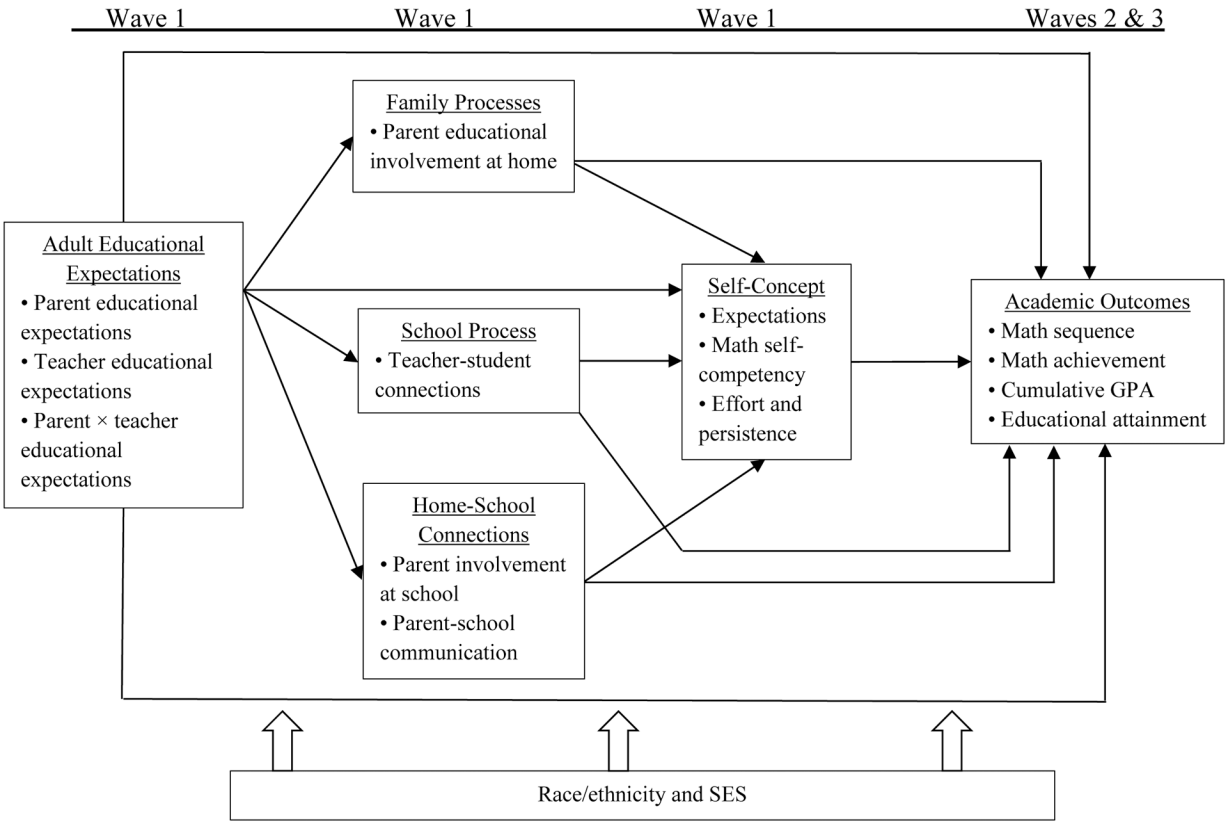

Figure 1.

Conceptual model linking adult expectations, family/school processes, home-school connections, self-concept, and academic outcomes.

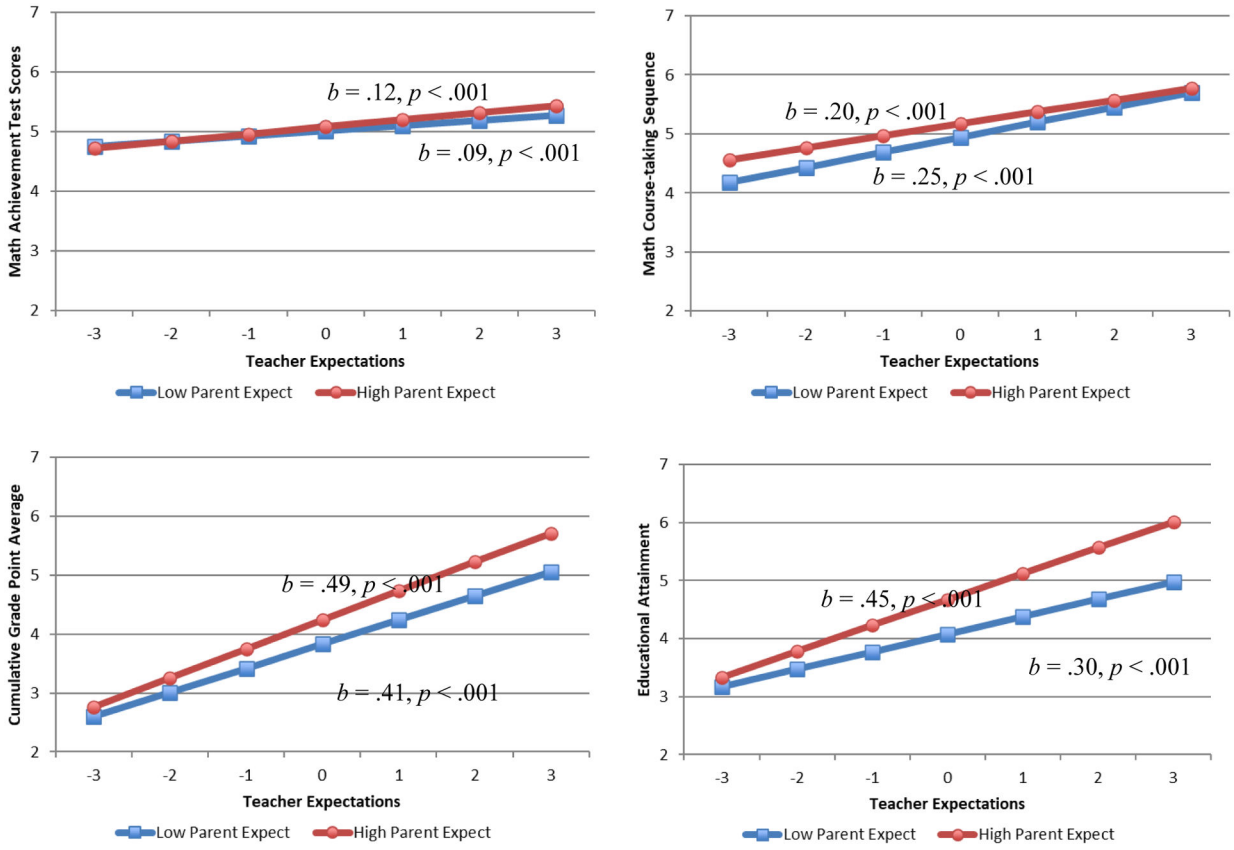

Figure 2.

Interaction effects between teacher and parent educational expectations on adolescent academic outcomes for math achievement test scores, math course-taking sequence, cumulative high school grade point average, and educational attainment. *Note*. Parent expectations are presented for the range of actual values (−4 to 2); teacher expectations are presented for +/−1 *SD* beyond the mean. Both variables were grand-mean centered. *N* = 9,654.

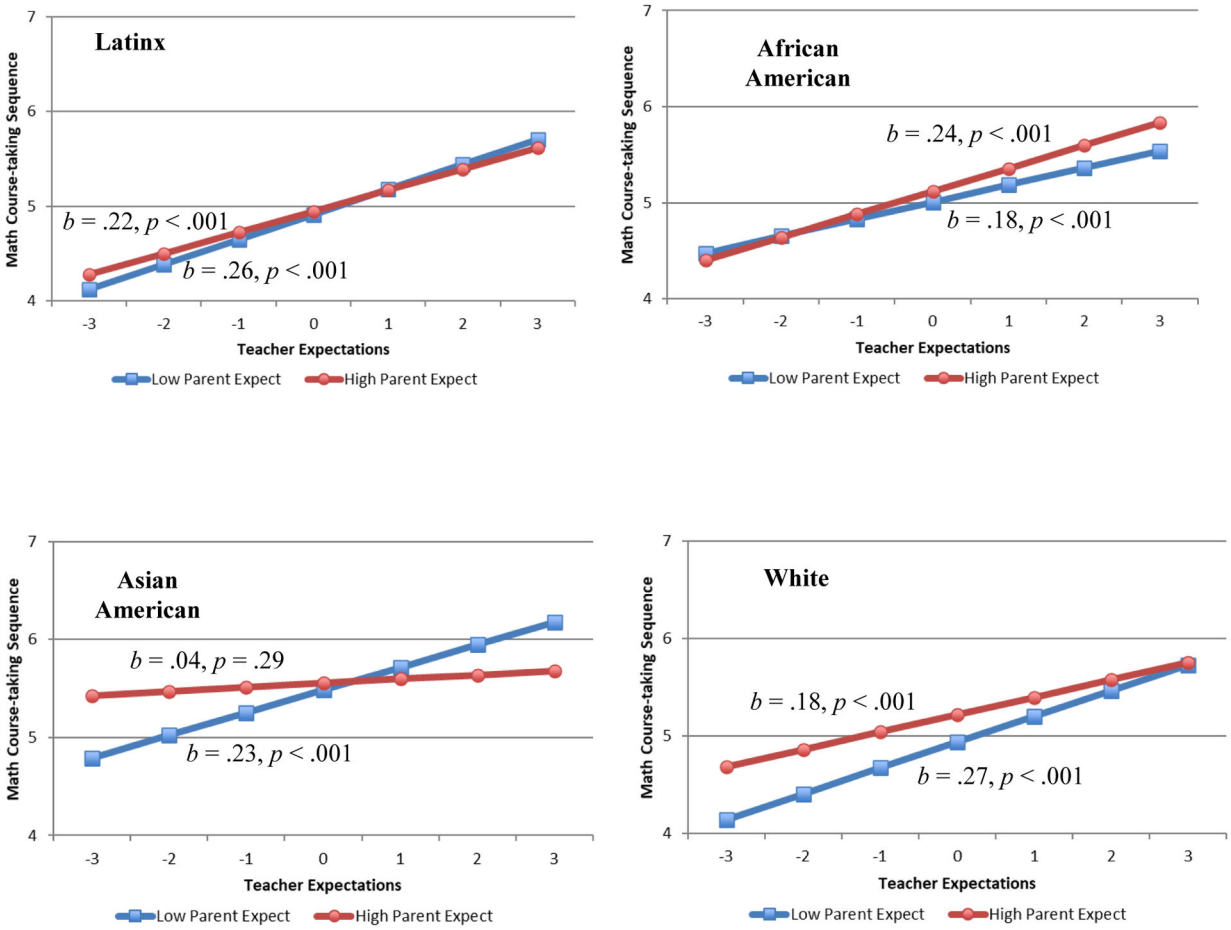

Figure 3.

Interaction effects between teacher and parent educational expectations on math course-taking sequence by race/ethnicity. *Note*. Parent expectations are presented for the range of actual values (−4 to 2); teacher expectations are presented for +/−1 *SD* beyond the mean. Both variables were grand-mean centered. Interactions were significant for Asian American and White students.

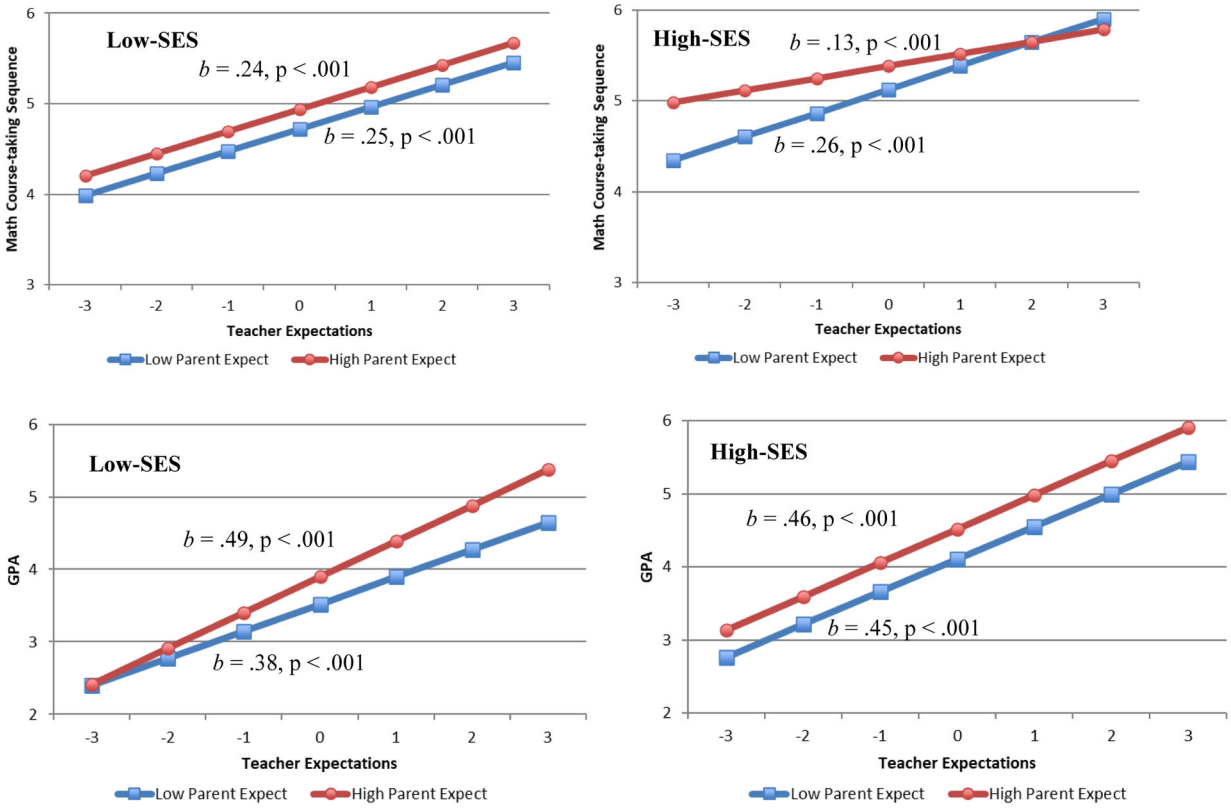

Figure 4.

Interaction effects between teacher and parent educational expectations on math course-taking sequence and GPA by SES. *Note*. Parent expectations are presented for the range of actual values (−4 to 2); teacher expectations are presented for +/−1 *SD* beyond the mean. Both variables were grand-mean centered. Interactions for math course-taking sequence were significant for high SES students. Interactions for GPA were significant for low SES students.

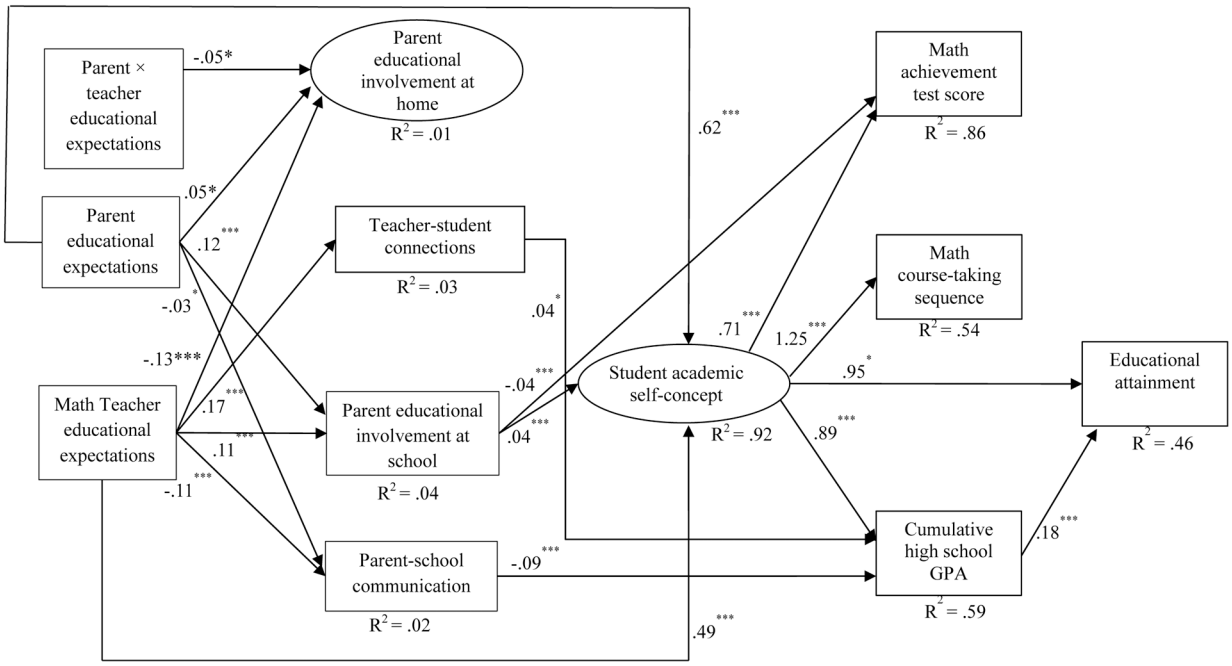

Figure 5.

Standardized coefficients for the path model linking adult expectations, interpersonal processes, and academic outcomes.

Note. Model fit: χ^2 (253) = 3,114.27, $p < .001$; CFI = .89; RMSEA = .034 [CI: .033 - .035]. N = 9,654. Only significant paths are shown. * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 1

Demographic and Socioeconomic Indicators of Sample Students (N = 9,654)

Variable	*n*	Frequency (%)	*M*	*SD*
Student gender				
Male	4,769	49.4		
Female	4,885	50.6		
Student race/ethnicity				
White	6,171	64.2		
African American	999	10.4		
Latinx	1,248	13.0		
Asian American	695	7.2		
Other race/ethnicity	504	5.2		
Student immigration status				
1st generation	843	8.8		
2nd generation	977	10.2		
3rd generation	7,745	81.0		
Family SES			.14	.74
Family structure intact				
No	3,597	37.3		
Yes	6,057	62.7		
Ever retained in grade				
No	8,476	88.8		
Yes	1,070	11.2		
Learning disability				
No	8,525	89.0		
Yes	1,054	11.0		
School urbanicity				
Urban	2,975	30.8		
Suburban	4,760	49.3		
Rural	1,919	19.9		
School geographic region				
Northeast	1,686	17.5		
Midwest	2,655	27.5		
South	3,592	37.2		
West	1,721	17.8		

Table 2

Correlations, Means, and Standard Deviations for Study Variables

Variable	1	2	3	4	5	6	7	8	9	10	11
1. P expectations	--										
2. T expectations	.47***	--									
3. P involvement at home	.00	−.10***	--								
4. P involvement at school	.18***	.19***	.19***	--							
5. P school communication	−.08***	−.11***	.22***	.28***	--						
6. T-Y connections	.06***	.15***	.03**	.05***	.04***	--					
7. Y academic self-concept	.55***	.70***	−.02	.21***	−.10***	.11***	--				
8. Y math test score	.39***	.63***	−.18***	.13***	−.08***	.06***	.83***	--			
9. Y math course sequence	.41***	.57***	−.12***	.16***	−.09***	.05***	.71***	.58***	--		
10. Y cumulative GPA	.40***	.63***	−.12***	.17***	−.17***	.13***	.72***	.57***	.50***	--	
11. Y educational attainment	.39***	.51***	−.05***	.18***	−.08***	.07***	.56***	.47***	.43***	.54***	--
Mean	5.01	4.26	−0.00	1.27	2.53	0.37	0.03	51.99	5.16	4.15	4.67
SD	1.39	1.44	0.36	1.37	2.23	0.48	0.69	9.95	1.11	1.46	1.95
N	9,654	9,654	9,654	9,181	8,780	9,542	9,654	8,544	9,085	9,018	8,216

Note. P = parent, T = teacher, Y = youth;

** p < .01,

*** p < .001. For variables that were modeled as a latent variable, factor scores were used in the correlational analyses. Academic outcomes were assessed at Wave 2 & 3. All other variables were assessed at Wave 1.

Table 3

Standardized Coefficients (B) and Standard Errors (SE) for Measurement Model

	***B* (*SE*)**	***p*-value**
Parents' educational involvement at home		
Homework help (parent report)	.59 (.05)	.000
Discuss grades and report cards (parent report)	.42 (.03)	.000
Homework help (student report)	.29 (.03)	.000
Discuss grades and report cards (student report)	.23 (.03)	.000
Student self-concept		
Educational expectations	.41 (.02)	.000
Math self-efficacy	.64 (.02)	.000
Effort and persistence	.83 (.02)	.000

Note. N = 9,653. χ^2 (12) = 239.65, p < .001; CFI = .95; RMSEA = .044 [CI: .040 - .049].

Table 4

Model linking adult expectations directly to youth academic outcomes

	Model 1			
	Math Test Scores *B (SE)*	**Math Course Sequence *B (SE)***	**High School Cumulative GPA *B (SE)***	**Educational Attainment *B (SE)***
Parent expectations	.03 (.01)***	.11 (.02)***	.12 (.01)***	.14 (.01)***
Math Teacher expectations	.15 (.01)***	.28 (.02)***	.44 (.01)***	.28 (.02)***
	Model 2			
	Math Test Scores *B (SE)*	**Math Course Sequence *B (SE)***	**High School Cumulative GPA *B (SE)***	**Educational Attainment *B (SE)***
Parent expectations	.03 (.01)***	.10 (.01)***	.14 (.01)***	.16 (.01)***
Teacher expectations	.15 (.01)***	.28 (.02)***	.44 (.01)***	.28 (.02)***
Parent-by-teacher expectations	.03 (.01)**	−.033 (.01)*	.04 (.01)***	.06 (.01)***
Female	−.05 (.01)***	.02 (.01)	.15 (.01)***	.09 (.01)***
African American	−.02 (.01)**	.05 (.01)***	−.10 (.01)***	.00 (.01)
Latinx	−.01 (.01)	.01 (.02)	−.05 (.02)***	−.03 (.02)*
Asian American	.01 (.01)	.02 (.01)*	.00 (.01)	.01 (.01)
Other race/ethnicity	.01 (.01)	−.01 (.01)	−.04 (.01)***	−.02 (.01)
First generation	−.00 (.01)	.01 (.01)	−.03 (.01)*	.00 (.01)
Second generation	.00 (.01)	.02 (.01)	−.03 (.01)**	.03 (.01)*
Suburban locale	−.01 (.01)	−.03 (.02)*	.06 (.02)**	−.00 (.01)
Rural locale	−.00 (.01)	−.04 (.02)*	.09 (.02)***	.00 (.02)
Northeast geographic region	.00 (.01)	.06 (.02)**	−.13 (.02)***	.05 (.02)**
Midwest geographic region	−.00 (.01)	.06 (.02)**	−.03 (.02)	.06 (.02)***
South geographic region	−.01 (.01)	.10 (.02)***	−.07 (.02)**	.02 (.02)
Prior retention in grade	−.04 (.01)***	−.06 (.02)***	−.03 (.01)**	−.02 (.01)*
Disability diagnosis	−.04 (.01)***	−.08 (.02)***	−0.00 (.01)	−.04 (.01)***
SES	.04 (.01)***	.05 (.01)**	−.00 (.01)	.15 (.01)***
Intact family status	.00 (.01)	.02 (.01)	.08 (.01)***	.06 (.01)***

Mother is interview respondent	.00 (.01)	.00 (.01)	−.00 (.01)	.01 (.01)
10th grade math achievement test score	.74 (.01)***	.28 (.01)***	.17 (.01)***	.12 (.02)***

Note. N = 9,654. *** p < .001. No fit statistics presented for Model 1 or Model 2 as they are just identified.

* p < .05

** p < ,01

*** p < .001. Covariate effects included but not tabled for Model

Table 5

Variation in the links between adult expectations and youth academic outcomes by race/ethnicity and SES

	S-B Scaled χ^2 Difference	*df*	*p*-value
Multiple Group: Race/ethnicity			
Fully constrained	**70.82**	**36**	**.000**
Parent expectations → math test scores	7.63	3	.054
Parent expectations → math course sequence	**12.30**	**3**	**.006**
Parent expectations → grade point average	**10.59**	**3**	**.014**
Parent expectations → educational attainment	3.28	3	.350
Teacher expectations → math test scores	6.89	3	.076
Teacher expectations → math course sequence	8.05	3	.045
Teacher expectations → grade point average	3.40	3	.334
Teacher expectations → educational attainment	4.00	3	.262
Interaction → math test scores	1.78	3	.620
Interaction → math course sequence	**11.69**	**3**	**.009**
Interaction → grade point average	2.50	3	.476
Interaction → educational attainment	3.59	3	.310
Multiple Group: SES			
Fully constrained	**38.32**	**12**	**.000**
Parent expectations → math test scores	**8.80**	**1**	**.003**
Parent expectations → math course sequence	0.47	1	.493
Parent expectations → grade point average	0.27	1	.601
Parent expectations → educational attainment	**6.55**	**1**	**.010**
Teacher expectations → math test scores	0.30	1	.585
Teacher expectations → math course sequence	3.73	1	.054
Teacher expectations → grade point average	0.59	1	.444
Teacher expectations → educational attainment	0.92	1	.336
Interaction → math test scores	0.02	1	.888
Interaction → math course sequence	**6.93**	**1**	**.008**
Interaction → grade point average	**4.97**	**1**	**.026**
Interaction → educational attainment	0.05	1	.820

Note. $N = 9{,}654$. Significant Satorra-Bentler scaled chi-square difference test results ($p < .05$) are bolded. Comparison model is the fully free model for all difference tests. Interaction = parent expectations-by-teacher expectations interaction.