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Socioeconomic Status, Schooling, and the Developmental Trajectories of Adolescents

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The socioeconomic stratification of American society profoundly influences how the life course unfolds by shaping various developmental pathways as well as the connections among these pathways. Drawing on a nationally representative sample of American adolescents, this study charted trajectories of personal control and parental consultation from middle school to the end of high school and then examined how various combinations of these trajectories were associated with math/science course taking in high school across socioeconomic strata. Results indicated that low and/or decreasing levels of personal control were associated with the accumulation of fewer math/science credits, as were declining levels of parental consultation no matter what the initial level. Mismatches between control and consultation trajectories (e.g., high, stable control with low, stable consultation) were also associated with fewer math/science credits. These patterns tended to be less predictive of math/science credit accumulation at the highest and lowest ends of the socioeconomic spectrum.

Keywords: education, socioeconomic status, academic achievement, parental involvement in education, personal control

The rigid stratification of American society has major implications for the life course (Kerckhoff, 1993; Wright, 1997). Sociologists, economists, and other macrooriented researchers have methodically delineated how differences in material resources and institutional opportunities link socioeconomic status (SES) to life course outcomes, and developmental scientists have filled in much of the unexplained portion of this linkage with an in-depth investigation of general maturation, psychological functioning, and personal relationships (Duncan, Yeung, Brooks-Gunn, & Smith, 1998; Huston, 1999; McLoyd, 1998). What is needed to complement this rich body of research is an equally careful consideration of how socioeconomic strata serve as contexts of individual adjustment and functioning in which multiple developmental trajectories intersect in qualitatively different ways. In other words, beyond affecting the different pieces of individuals' lives, how does SES influence how these pieces fit together?

In this study, we take such an approach by assessing how a key developmental task of adolescence—preparing for the transition into independent adult life (Steinberg & Morris, 2000)—varies across socioeconomic strata. With data from a national sample of American youth, we apply basic principles of Elder's (1998) life course perspective to three elements of adolescence—personal control, parental consultation, academic progress—that have been targeted by developmentalists as major components of this task. Emphasizing the dynamism of life course trajectories, we examine how adolescents at different points of the socioeconomic spectrum develop a sense of command over their own lives, how they negotiate decision making with their parents, and how both of these dynamic pathways contribute to their progress through curricula that are crucial to adult status attainment. Emphasizing the connections among life course trajectories, we then examine how, within and across socioeconomic strata, various combinations of these pathways of control and consultation factor into the all-important accumulation of academic credits. Our basic hypothesis is that pathways of personal control and parental consultation—both independently and interactively—will be more important ingredients in the curricular experiences of youth from more socioeconomically disadvantaged families.

By linking developmental theory to longitudinal, national data, this study demonstrates how different lenses provide fresh insights into the developmental process. The first insight comes from considering changes in, not just levels of, elements of adolescent life. For example, ample evidence confirms that high levels of both personal control and parental consultation promote academic progress, but longitudinal trends in these factors, regardless of the absolute level, often signal different, and even counterintuitive, kinds of success and failure in school. The second insight comes from considering configurations of developmental factors within the same person. For example, a pathway of personal control assumed to be a resource for schooling may actually be a risk, depending on the pathway of parental consultation with which it is matched. The third insight comes from considering how family SES is a setting in which development unfolds, not just a social origin from which it unfolds. For example, SES may predict trajectories of personal control and parental consultation in ex-

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pected ways, but it may also condition the academic significance of these trajectories—both separately and in combination—in ways that are more unexpected but no less telling.

Three Elements of Adolescent Life

The general purpose of this study was to use the life course perspective to demonstrate how dynamic connections among institutional progress, personal development, and interpersonal development vary by SES. The pieces of this model are operationalized by three specific factors that have been studied extensively in youth-focused research. Of note, the power with which any one of these factors forecasts the potential for a successful transition from adolescent to young adulthood is magnified by considering them in concert with each other.

First, institutional progress encompasses the stepwise navigation of formal organizations. The school is arguably the major formal organization of the early life course, and math/science course taking is a useful tool for gauging progress through school (Alexander & Entwisle, 1988; Kerckhoff, 1993). Like English, math and science are challenging core curricula, but, unlike English, they become largely voluntary over time. Consequently, math/science course taking, more than just about any other academic activity, powerfully forecasts future educational and socioeconomic attainment (Eccles, 1994; Stevenson, Schiller, & Schneider, 1994).

Second, personal development involves psychological and physiological maturation. One important aspect of personal development is adolescents' sense that they are the agents of their own lives (Bandura, 2000; Gecas & Burke, 1995). Young people with a healthy sense of personal control often have more success in the high-stakes world of education because they are more confident, open to challenges, and motivated (Catsambis, 1994; Wigfield, Eccles, Schiefele, Roeser, & Davis-Kean, 2006).

Third, interpersonal development covers evolving relationships with significant others or changing social networks. Although the significance of consultation with parents about life decisions varies across the life course, this aspect of intergenerational relations is a major component of adolescent development, a period in which young people need adult advice but not necessarily command (Furstenberg, Cook, Eccles, Elder, & Sameroff, 1999; Muller, 1998). Of note, consultation with parents appears to be especially relevant—even to the point of trumping peer influence—to making decisions with potential long-term impact, including major academic decisions (Steinberg, Brown, & Dornbusch, 1996).

Viewing Adolescence in Terms of Pathways

The life course perspective emphasizes that adolescent development should be studied in terms of change, not just state. This dynamic pathway approach provides leverage in attempts to understand personal control and parental consultation. As already discussed, high levels of both at any one point are widely assumed to be resources because they predict many positive life outcomes, including academic success (Bandura, 2000; Eccles, 1994). Yet, trajectories of control and consultation across various points—which encompass rates of change in addition to absolute level—more accurately reflect the patterns that best set up adolescents for successful transitions to adulthood (Shanahan, 2001). Gradually increasing personal control, for example, indicates young people who are learning to take responsibility for their lives as they age (Bandura, 1997; Dornbusch, 1989). Furthermore, Crosnoe (2001) demonstrated that high levels of parental consultation that remain steady or gradually decline most often indicate young people who are learning to make decisions about their own lives in an independent yet informed way. In both cases, a dynamic estimate provides more information than a point estimate.

The first objective of this study, therefore, was to map trajectories of personal control and parental consultation from middle school through the end of high school. On the basis of past research (Crosnoe, 2001; Eccles, 1994), we hypothesized that control will start at a moderate level and then increase over time and that consultation will start at a high level and then decrease.

Connecting Adolescent Pathways

Another priority of the life course perspective is the exploration of how various pathways converge and diverge over time to create one journey through adolescence. As stated above, we have general assumptions about what the developmental trajectories of personal control and parental consultation represent on their own, but considering combinations of these trajectories challenges such assumptions. For example, gradual increases in personal control are qualitatively different when they occur in tandem with low, decreasing levels of parental consultation than with steady, high levels of consultation (Crosnoe, 2001). In the former case, adolescents are on their own, less likely to make informed decisions about their lives in general and their math/science careers in particular; in the latter, efficacious adolescents draw on the guidance of others to chart out their present and future goals and experiences.

To consider such dynamic connections, we explore how the two focal developmental pathways (personal control, parental consultation) are related to the institutional pathway (math/science course taking). This exploration encompasses the next two objectives of the study. The second objective was to examine the contributions of trajectories of personal control and parental consultation, respectively, to math/science credit accumulation in high school. We hypothesized that adolescents with initially moderate but subsequently increasing levels of personal control will earn the most credits by the end of high school, as will those whose initially high level of consultation with their parents about academic decisions remains steady over time.

The third objective was to examine the contributions of various combinations of trajectories of personal control and parental consultation to math/science credit accumulation in high school. We hypothesized that three kinds of combinations will be adaptive and that another three will be maladaptive. By *adaptive* and *maladaptive*, we refer to the degree to which the combination of personal qualities and social supports enables students to meet the challenges of the high-stakes world of the modern high school, in which highly differentiated and stratified curricula simultaneously increase the likelihood that some students will be equipped for success in the modern economy and others will fall through the cracks (Schneider & Stevenson, 1999).

Beginning with the hypothesized adaptive combinations, the first represents the combination of two "good" trajectories; for example, moderate and increasing levels of personal control cou-

pled with high and steady levels of parental consultation (double positive). The second combination is adaptive because it represents a combination in which an apparently "bad" trajectory" is not problematic when coupled with a good trajectory; for example, moderate and declining levels of consultation coupled with moderate and increasing levels of personal control (parents giving space to well-equipped adolescents). In the third adaptive combination, a good trajectory picks up or improves a bad trajectory; for example, high and stable levels of personal control coupled with low but increasing levels of parental consultation (adolescents pulling in their parents), or high and stable levels of parental consultation coupled with low but increasing levels of personal control (parents supporting their adolescents).

Turning to the hypothesized maladaptive combinations, the first represents the combination of two bad trajectories; for example, moderate but decreasing levels of personal control coupled with low, stable levels of parental consultation (double negative). In the second, good starting points in both trajectories are followed by matching downward trends; for example, high but decreasing control and consultation (mutual decline). The third maladaptive combination is the clear mismatch between trajectories moving in opposite directions; for example, high and stable levels of personal control coupled with low and stable levels of consultation (all adolescent) or the reverse (all parent). These mismatches tap different sides of Elder's (1998) agency/constraints dichotomy—too much independence, too much command.

Contextualizing Adolescent Pathways

Yet another component of the life course perspective is its emphasis on context. In short, historical, structural, and cultural contexts direct adolescent pathways, give them meaning and status, and, importantly, determine the ways in which they connect to each other (Elder, 1998). The context of interest in this study is SES, which locates families in particular segments of a system of stratification that have unique opportunities, norms, expectations, and standards of treatment and evaluation (Flanagan, 1990; Mayer, 1997; McLoyd, 1998).

To borrow Bourdieu's term (Bourdieu & Wacquant, 1992), a *socioeconomic stratum* provides a habitus—a regular, taken-for-granted set of dispositions, rituals, and knowledge that captures a way of life. As demonstrated by Lareau (2004), habitus involves philosophical and behavioral approaches to the rearing of youth that become ingrained, unspoken, and understandable only within the particular opportunities and constraints put in place by the socioeconomic circumstances associated with that habitus. In this way, a socioeconomic strata is a context of adolescent development. More than just a social origin or social address (e.g., a predictor of an outcome), it is an element of the adolescent ecology that moderates or conditions transactions in this ecology. In other words, it is a setting in which the different aspects of development play out in connection to each other, so that this playing out looks different across socioeconomic strata.

As an illustration, consider race. Typically, race has been viewed as a predictor of family processes and key developmental outcomes like emotional well-being. Families from various racial populations often demonstrate divergent patterns of family interaction and, partially as a result, young people from these populations often differ in well-being. A related approach advocated by many developmental scientists (García Coll et al., 1996; Gutman & Eccles, 1999; McLoyd, 1990) adds value to this standard approach by considering race as a setting in which family processes are linked to emotional well-being. Even if two racial populations are similar in family processes and youth outcomes, they may differ in the degree to which family processes and youth outcomes are linked. Alternatively, even if two populations differ in family processes and youth outcomes, they may resemble each other in the degree to which family processes and youth outcomes are linked. Combining both approaches, then, gives the fullest picture of racial differences in the developmental process.

This approach, which is both conceptual and methodological, also applies to SES. Thus, the fourth, overarching objective of this study is to examine how the investigations involved in each of the first three objectives might benefit from a careful consideration of family SES. Specifically, we examined socioeconomic variability in the two developmental pathways and then in their independent and interactive connections to the institutional pathway.

First, given evidence that the development of personal control is disrupted by constrained opportunities (e.g., bad schools), life stressors (e.g., deaths), and other obstacles (e.g., low access to information/service channels), we hypothesized that young people from lower socioeconomic strata will have lower overall levels of personal control and smaller increases in personal control over time than their peers (Furstenberg et al., 1999). At the same time, we hypothesized that parental consultation about schoolwork will follow the same socioeconomic pattern documented by Crosnoe (2001) for parents' general involvement in their adolescents' educations—high and gradually declining in higher socioeconomic strata, low but stable in lower socioeconomic strata.

Second, we hypothesized that these two pathways—and their combinations—will be most predictive of math/science course taking during high school at the low end of the socioeconomic spectrum. A good deal of evidence suggests that socioeconomically advantaged students are much harder to get off track in their schoolwork. In other words, they are less vulnerable to academic risks. The flipside of this is that socioeconomically disadvantaged students are more reactive in positive ways to academic resources (Lareau, 2004; Lucas, 1999). Thus, both maladaptive and adaptive pathways of personal control and parental consultation, and various combinations of these pathways, are hypothesized to do much more to differentiate—in positive and negative ways—the math/science careers of socioeconomically disadvantaged youth.

Method

Data and Sample

The data source for this study, the National Educational Longitudinal Study (NELS), is a nationally representative sample of American youth created by the National Center for Education Statistics (NCES). A two-stage sampling frame led to the random selection of 24,599 students within 1,052 schools (NCES, 1994). In the base year (1988, when all sample members were in 8th grade), NCES interviewed parents, teachers, school administrators, and students and administered diagnostic tests to the latter. This data collection was repeated in 1990 (first follow-up; 10th grade for most sample members), 1992 (second follow-up; 12th grade), and 1994 (third follow-up; 2 years out of high school). A fourth

follow-up (2000) will not be analyzed here nor will the dropout or freshened samples because of the secondary school focus and longitudinal nature of this study.

To be eligible for the analytical sample of this study (N = 10,601), all students had to have a valid transcript file and had to have taken achievement tests during the base year. Because variables were constructed with data from the first and second follow-up and because the transcripts were collected during the third follow-up, they also had to have participated in the base year and the first three follow-ups. In addition to eliminating cases, these selection filters altered the basic characteristics of the sample. An analysis of the potential bias introduced by this selection process will be presented after the description of study measures.

Measures

Math/science course taking. All course credits earned in math and science were listed on the final high school transcript. NCES standardized different methods of counting these credits into Carnegie units. One unit is equivalent to one period per day, 5 days a week for an entire school year. On average, NELS sample members earned three credits in both math and science during high school (see Appendix A for descriptive statistics on all study variables).

These outcome variables count credits irrespective of the level of math or science course taking or the proficiency of students. Thus, this study examined these outcomes only when controlling for two other measures: initial high school math/science course taking level and pre-high school math/science test performance. First, following NELS conventions (see Schneider, Swanson, & Riegle-Crumb, 1999; Stevenson et al., 1994), students' enrollment patterns were organized into hierarchical course taking sequences. For math, the sequence had nine points: 0 = none, 1 = Remedial Math, 2 = General Math, 3 = Prealgebra, 4 = Algebra I, 5 = Geometry, 6 = Algebra II, 7 = Advanced Math (Precalculus, Trigonometry), 8 = Calculus. For science, the sequence had four points: 0 = none, 1 = noncore science (e.g., Earth Science), 2 = core science (Biology, Chemistry), 3 = advanced science (Chemistry II, Biology II, Physics). To capture initial course taking level, we recorded the point that students had reached on each sequence by 10th grade. Second, in 1988 (8th grade), each student completed standardized tests designed by the Educational Testing Service for math (including items on computation, equations, and word problems) and science (including items on life science, earth science, and chemistry). To reduce floor and ceiling effects, NCES created item response theory scores that took into account the difficulty of each test item. These scores, which approximately ranged from 15 to 66 for math and 9 to 33 for science, were used to measure pre-high school test performance.

Personal control. NCES created a composite variable comparable with the locus of control scales in the High School and Beyond surveys. In the base year, adolescents reported their agreement (1 = *strongly agree*, 2 = *agree*, 3 = *disagree*, 4 = *strongly disagree*) with three statements: "In my life, good luck is more important than hard work for success," "Every time I try to get ahead, something or somebody stops me," and "My plans hardly ever work out, so planning only makes me unhappy." These responses were converted to z scores and then averaged to create a composite ranging from –3.01 to 1.52 (higher values corresponding to higher levels of control). This measure of personal control was replicated in the 10th- and 12th-grade follow-ups.

Parental consultation. In this study, parental consultation taps the degree to which adolescents sought the advice of their parents when making course-taking decisions. In 8th, 10th, and 12th grades, students reported how often they discussed their course-taking decisions with their parents (for 8th grade: 1 = *not at all*, 2 = *once or twice*, 3 = *three or more times*; for 10th and 12th grades: 1 = *never*, 2 = *sometimes*, 3 = *often*).[1]

Family SES. NCES created for public use a composite measure of SES based on parent reports. Specifically, NCES standardized and then averaged five factors: educational attainment of father/male guardian, occupational prestige of father/male guardian, educational attainment of mother/female guardian, occupational prestige of mother/female guardian, and family income. The values of this measure have no intuitive meaning except that larger, positive numbers represent higher status. Also made available was a categorical measure in which this SES was broken up into quartiles.

Sociodemographic factors. Included in all analyses were controls for gender (1 = female, 0 = male), race/ethnicity (dummy variables for White, African American, Latino/a, Asian American, other), family structure (dummy variables for two-parent family, stepfamily, single-parent family, other family form), region (Northeast, North Central, South, West), urbanicity (rural, urban, suburban), and school sector (public vs. private).

Assessment of Study Sample

To assess any bias introduced by the sample selection filters, we compared two samples. Sample 1 represents the core sample of the NCES data release in 1994—all base year sample members who participated in the third follow-up. These 14,915 adolescents did not necessarily participate in all data collections between 1998 and 1994; some were dropouts, and some were added to the sampling frame as a part of the "freshening" process. Sample 2 represents the analytical sample of 10,601 adolescents. The filters (primarily the longitudinal filter) shifted the sample toward slightly higher socioeconomic advantage. For example, the SES composite rose by about 15% of a standard deviation, and the proportion of Whites in the sample rose from 62% to 69%. Although balanced by the many advantages of using national, longitudinal, multisource data, this bias was not ideal and must be remembered when interpreting results.

Plan of Analyses

This study had four main objectives. The first involved the estimation of trajectories of personal control and parental consultation, which was pursued with latent growth curve modeling. This type of random coefficient modeling assesses change in a behavior by using multiple time-specific measures to estimate an underlying growth trajectory—a single line that best fits all measures. As in a

[1] More comprehensive measures of personal control and parental consultation were available in NELS. The current items were chosen because of face validity, consistency with past NELS research, and evidence from side analyses that they did not substantially alter the pattern of results compared with other measurement strategies.

general structural equation modeling framework, this trajectory can be characterized by unobserved latent factors; in this case, the intercept and slope. Figure 1 depicts such a model, in which measures at three time points (8th grade, 10th grade, 12th grade) estimate the trajectory of personal control. The intercept latent factor captures the trajectory's average starting point. Factor loadings are set to 1 to represent the starting point of the trajectory in 8th grade. The slope latent factor represents the trajectory's average rate of change between 8th and 12th grades. To define the slope as linear, we set the factor loadings to 0, 1, and 2 (Curran, 2000; Willet & Sayer, 1994). We estimated models for both personal control and parental consultation in Mplus (Muthén & Muthén, 1999), which employs a maximum-likelihood estimator that uses information from all observations to estimate missing data.

The second objective of this study involved the estimation of the independent contributions of trajectories of personal control and parental consultation to math/science credit accumulation by the end of high school. We pursued this objective with linear regressions predicting the math/science credit outcomes by sets of dummy variables cataloging different combinations or initial level and overtime change in personal control and parental consultation.

As an illustration, consider models predicting math credit accumulation by personal control. We first divided 8th-grade personal control into three categories: low (1 standard deviation below the mean or lower), medium (between 1 standard deviation above the mean and 1 standard deviation below the mean), and high (1 standard deviation above the mean or higher). Next, we divided change scores between the 8th-grade and 12th-grade indicators of personal control into three categories: substantial decrease (1 standard deviation or greater decrease between 8th and 12th grades), stability (less than 1 standard deviation increase or decrease between 8th and 12th grades), and substantial increase (1 standard deviation or greater increase between 8th and 12th grades). We then combined these two sets of dummy variables into a set of nine dummy variables representing all possible combinations between the two. Of note is that two categories (low and decreasing personal control, high and increasing personal control) contained no cases, leaving seven total. Finally, the credit outcomes were regressed on this set of personal control pathway variables, sociodemographic factors, and two indicators of prior math/science progress (initial high school level, middle school test score). Estimating these models with the STATA survey procedure (Stata Corporation, 2007) allowed weighting and robust standard error estimation to account for NELS design effects and school-based clustering.

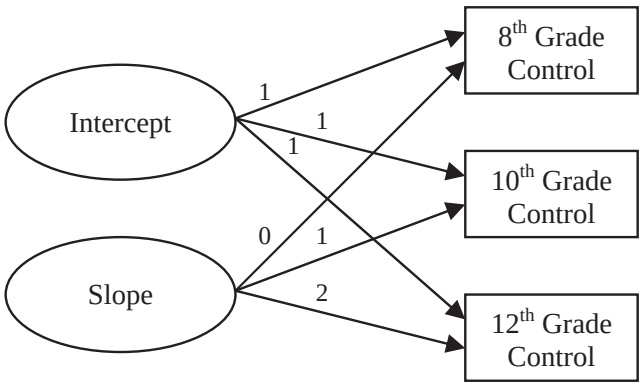

Figure 1. Latent growth curve model of personal control. Factor loadings are represented by 0, 1, and 2.

The third objective of this study involved the interactive contributions of trajectories of personal control and parental consultation to math/science credit accumulation by the end of high school. To pursue this objective, we combined the personal control dummy variables just described with the corresponding parental consultation dummy variables to create longitudinal profiles of control/consultation pathways and then used these profiles to predict the credit outcomes. Combining these two sets of dummy variables, however, would have resulted in 49 profiles, many with small cell counts. Rather than pursue this exhaustive strategy, we instead focused on a specific set of eight profiles that best captured the a priori theoretical predictions laid out earlier (these focal profiles will be discussed in the Results section). Next, the math and science credit outcomes were each regressed on this set of combined control/consultation dummy variables, the sociodemographic factors, and the two indicators of prior math/science progress (initial high school level, middle school test performance) in STATA.

Finally, the fourth objective of this study involved the examination of the degree to which the results of the first three objectives varied by SES. We pursued this objective in tandem with the first three objectives. For each modeling step, we estimated the model for the full sample and then within each SES quartile. To test the significance of any observed differences by SES quartile in the latent growth curve models, we used group modeling techniques that calculated a change in chi-square value between models that constrained focal coefficients (e.g., the intercept of personal control) to be equal across quartiles and those that allowed them to be freely estimated. For the regression models, we conducted *t* tests comparisons for focal coefficients across quartiles.

Results

Family SES and Two Developmental Pathways Through Adolescence

Recall that the first objective of this study was to map out dynamic trajectories of two developmental pathways—one personal, one interpersonal—over the course of adolescence. Table 1 presents the results from the unconditional latent growth curve models that describe the basic parameters of these trajectories. The first column contains the results for the full sample.

Beginning with the personal pathway,[2] young people scored, on average, a .08 on the personal control scale in 8th grade. Because this scale ranged from –3.01 to 1.52, this value indicates a moderately high average starting point. Personal control did not tend to increase or decline from this point in the years after 8th grade (see nonsignificant slope mean). Turning to the interpersonal pathway, the average 8th-grade level of parental consultation was 2.29 on a scale ranging from 1 to 3. Moreover, consultation tended to decline over time, as evidenced by a significant negative slope mean

[2] By convention, root-mean-square error of approximation fit statistic values less than .05, especially .03 or lower, indicate good model fit. Other fit statistics yielded a similar picture.

Table 1
Results of Unconditional Latent Growth Curve Models for Personal Control and Parental Consultation, Total Sample and by Socioeconomic Status (SES)

Statistic for latent factors	Total sample (N = 9,058)	Lowest SES quartile (n = 1,907)	Low SES quartile (n = 2,187)	High SES quartile (n = 2,370)	Highest SES quartile (n = 2,594)
			Model 1: Personal control		
Intercept factor					
M	.08***	−.07***$_{d}$	.01***$_{c}$	.10***$_{b}$	.22***$_{a}$
Variance	.21***	.19***$_{d}$	.21***$_{c}$	.20***$_{b}$	.19***$_{a}$
Slope factor					
M	.01	.01$_{a}$	.01$_{a}$	−.02*$_{b}$	.01
Variance	.04***	.03***$_{d}$	.04***$_{c}$	.05***$_{b}$	.04***$_{a}$
Fit statistic: RMSEA	.01	.02	.02	.02	.02
			Model 2: Parental consultation		
Intercept factor					
M	2.29***	2.12***$_{d}$	2.23***$_{c}$	2.33***$_{b}$	2.41***$_{a}$
Variance	.12***	.12***$_{d}$	.12***$_{c}$	.09***$_{b}$	.11***$_{a}$
Slope factor					
M	−.20***	−.18***$_{c}$	−.21***$_{ab}$	−.22***$_{a}$	−.20***$_{bc}$
Variance	.03***	.03***$_{c}$	.03***$_{ab}$	.03***$_{a}$	.03***$_{bc}$
Fit statistic: RMSEA	.05	.05	.05	.05	.05

Note. Significant differences in coefficients by SES are noted by subscripts. Within the same row, coefficients with different subscripts differed at the .05 level, as determined by group modeling techniques with chi-square tests. RMSEA = root-mean-square error of approximation.
*** $p < .001$.

representing about one third of a standard deviation in the initial level of consultation. According to the significant variances, adolescents varied considerably in their control/consultation levels in middle school and in changes in both through high school. The normative pathways during this period, therefore, were moderately high, steady levels of personal control and moderately high, gradually declining levels of parental consultation.

Perhaps the significant variation in both normative pathways was socioeconomic in nature. The remaining columns in Table 1 contain the results for the same model within each SES quartile. The starting levels of each pathway clearly differed by SES. Each increase in family SES was coupled with a corresponding increase in 8th-grade level of personal control and parental consultation (note the subscripts in the two intercept mean rows). The personal control intercept difference between the lowest and highest SES quartiles equaled nearly one half a standard deviation in this variable. The same pattern held for parental consultation. The slopes of the two pathways did not differ substantially by family SES. In both pathways, the slope mean for the high SES quartile differed from the other quartiles (the only negative slope for control, the strongest negative slope for consultation). These differences, however, were small.

In sum, adolescents from different socioeconomic strata had different levels of personal control and parental consultation, with higher levels found in more advantaged strata, but they tended to show similar trends in both as they grew up. Thus, pathways were at different levels but mostly parallel. Adolescents from high SES, but not the highest SES, families were a very slight exception to this pattern.

Developmental Pathways' Independent Connections to Institutional Pathways

The second objective of this study was to assess the contributions of these developmental pathways to the institutional pathway of interest. To do so, we examined the number of math credits accumulated by adolescents following different pathways of personal control and parental consultation. Again, in line with our overarching interest in studying socioeconomic variability, we conducted this examination with the full sample and then within each family SES quartile.

To capture these different types of developmental pathways, we broke down the sample into nine mutually exclusive categories based on the combination of starting points and overtime change. First, we categorized adolescents according to whether they had low, medium, and high personal control in middle school (see the plan of analyses for break points). Second, we categorized adolescents according to whether they had substantial decreases in personal control between middle school and the end of high school, stability in personal control during this period, and substantial increases in personal control during this period (again, see the plan of analyses). Third, we cross-tabulated these two sets of categories to create our final group of nine categories representing pathways of personal control. Two categories—low decreasing and high increasing—contained no cases and were dropped. Fourth, we repeated these same steps for parental consultation. Appendix B contains a complete list of these pathway types as well as their distribution across the SES quartiles. In general, adolescents in the more advantaged SES quartiles made up larger percentages of the higher level, stable and increasing pathways.

Next, we regressed end-of-high school math credit accumulation on the seven personal control pathways, the sociodemographic factors, 8th-grade math test score performance, and initial high school math course-taking level. Because these models controlled for initial course-taking level, they essentially captured how far up the math curriculum adolescents progressed by the end of high school.

In Table 2, two different comparisons can be made. Within-column comparisons reveal which pathways of personal control

Table 2
Results From Regression Models Predicting End of High School Math Credits by Personal Control Pathways, for the Total Sample and Each Socioeconomic Status (SES) Quartile

	All quartiles (N = 9,058)		Lowest SES quartile (n = 1,907)		Low SES quartile (n = 2,187)		High SES quartile (n = 2,370)		Highest SES quartile (n = 2,594)	
Predictor	*b*	*SE*	*b*	*SE*	*b*	*SE*	*b*	*SE*	*b*	*SE*
Prior math progress										
Math test score in middle school	.02***	.00	.02***	.00	.02***	.00	.02***	.00	.02***	.00
Initial math course-taking level	.08***	.01	.09***	.02	.11***	.00	.12***	.01	.03	.02
Personal control pathways										
Low, stable[a]	−.25$^{***}_{4}$	.06	.01	.13	−.22$^{*}_{3}$	.11	−.28$^{*}_{4}$	.13	−.57$^{***}_{2}$	.15
Low, increasing[b]	−.14$^{**}_{3}$	.05	.04	.11	−.16$_{2}$	.10	−.25$^{**}_{2}$	.08	−.14$_{1}$	.10
Medium, decreasing[c]	−.14$^{**}_{3}$	.05	.02	.10	−.23$^{**}_{3}$	.08	−.26$^{**}_{3}$	.08	.01$_{1}$	.08
Medium, stable	−.05$^{\dagger}_{2}$	.03	.01	.09	−.03$_{12}$	.07	−.05$_{1}$	.05	−.07$_{1}$	.04
Medium, increasing	−.05$_{12}$	.04	.10	.11	−.01$_{12}$	.09	−.09$_{1}$	.08	−.05$_{1}$	.06
High, decreasing	−.05$_{12}$	.04	.04	.11	−.08$_{12}$	.09	−.02$_{1}$	.07	−.08$_{1}$	.06
High, stable	—$_{1}$		—$_{1}$		—$_{1}$		—$_{1}$		—$_{1}$	
R^2	.22		.16		.20		.20		.17	

Note. All models also controlled for gender, age, race/ethnicity, family structure, region, urbanicity, and school sector. Within each column, coefficients with different subscripts differ significantly ($p < .05$) from each other, as determined by rotating the reference category for the dummy variables. Any two coefficients with the same subscript were not significantly different from one another. Dashes indicate that data were not applicable.
[a]Coefficient for highest SES quartile significantly different ($p < .05$) from the coefficient for the lowest SES quartile, as determined by *t* tests. The coefficients for the low and high SES quartiles not significantly different from coefficients for any other SES quartile. [b]Coefficient for high SES quartile significantly different from the coefficient for the lowest SES quartile. The coefficients for the low and highest SES quartiles not significantly different from coefficients for any other SES quartile. [c]Coefficient for low/high SES quartiles significantly different from the coefficients for the lowest/highest SES quartiles.
$^{\dagger}p < .10$. $^{*}p < .05$. $^{**}p < .01$. $^{***}p < .001$.

best predicted the math outcome in the full sample (first column) and then in each family SES quartile (remaining four columns). Because the test statistic procedure in STATA identified significant differences between any pair in this set of seven profiles in the model, we can give a rank ordering in the full sample or within each family SES quartile of all seven personal control pathways in terms of their contributions to the outcome. Significant differences between coefficients in each column are marked by subscripted numbers. Worth noting is that this analysis effectively rotates the omitted reference category across the full set of dummy variables, so that all possible comparisons can be made. Thus, two nonsignificant coefficients in the table may actually be significantly different from one another, as revealed by results not shown in the table from models in which one or more other reference categories were used. Across-column comparisons reveal the family SES quartile in which any given personal control pathway best predicted math credit accumulation. The *t* tests between each coefficient pair within a row revealed significant differences (noted in the subtext of the table).

For the full sample (first column in Table 2), the rank ordering, determined by test statistics, of the personal control pathways on eventual math credits accumulated by the end of high school included four broad categories. Adolescents with high, stable pathways of personal control accumulated the most math credits (see subscripted 1); followed by those with medium, stable pathways (2); followed by those with medium, decreasing and low, increasing pathways (3). Adolescents with low, stable pathways accumulated the fewest math credits in the sample (4). Two pathways (high, decreasing and medium, decreasing) did not fit neatly into this ranking system (12). They fell in between the first and second ranks, significantly different from neither.

This ranking did vary by family SES but not dramatically (see remaining columns in Table 2). The key distinction was between the lowest quartile and all other quartiles. In the lowest quartile, none of the seven pathways significantly differentiated adolescents on math credit accumulation by the end of high school (note the lack of subscripts in that column). These pathways did differentiate adolescents within the other three SES quartiles in ways similar to the pattern for the full sample. Among these three SES quartiles, the major distinction was the strong, negative association between the medium, decreasing pathway and the math outcome in the two middle SES quartiles that did not extend to the highest SES quartile (see subscripted numbers by the coefficients and subscripted letters by the pathway names).

Table 3 contains results for the same set of models, with pathways of personal control replaced by the corresponding pathways of parental consultation. For the full sample (first column), test statistics revealed that the various pathways fell into three general rank orderings, from most math credits to least: (a) high, stable; medium, increasing; medium, stable; low, stable; low, increasing; (b) high, decreasing; and (c) medium, decreasing.

The SES-specific patterns revealed that the key distinction was between the lowest, low, and highest SES quartiles on one hand and the high SES quartile on the other. The pathways did not differentiate adolescents within the lowest or low quartiles. Moreover, although two pathways (medium, decreasing and high, decreasing) did slightly differentiate adolescents within the highest quartile (see subscripted numbers by coefficients), they did not do so in a way that created significant differences between this quartile and the two lower quartiles (note the lack of subscripted letters by these pathway names). The pathways did more to differentiate adolescents within the high SES quartile. Moreover, the

Table 3
Results From Regression Models Predicting End of High School Math Credits by Parental Consultation Pathways, for the Total Sample and Each SES Quartile

Predictor	All quartiles (N = 9,058)		Lowest SES quartile (n = 1,907)		Low SES quartile (n = 2,187)		High SES quartile (n = 2,370)		Highest SES quartile (n = 2,594)	
	b	*SE*	*b*	*SE*	*b*	*SE*	*b*	*SE*	*b*	*SE*
Prior math progress										
Math test score in middle school	$.02^{***}$	.00	$.02^{***}$	.00	$.02^{***}$	.00	$.02^{***}$	.00	$.02^{***}$	.00
Initial math course-taking level	$.09^{***}$	.01	$.09^{***}$	.01	$.11^{***}$	.01	$.12^{***}$	.01	$.03^{\dagger}$	.01
Parental consultation pathways										
Low, stable[a]	$-.02_{1}$	.06	.06	.12	.05	.12	$-.26^{*}{}_{3}$	.10	$-.02_{1}$	.09
Low, increasing	$-.05_{1}$	.05	$-.14$	.13	$-.01$	.10	$-.08_{12}$	.08	$-.08_{12}$	.10
Medium, decreasing[b]	$-.13^{**}{}_{3}$	.04	$-.09$	.11	$-.01$	.10	$-.26^{**}{}_{3}$	.07	$-.11^{\dagger}{}_{2}$	.07
Medium, stable	$-.04_{1}$	.03	$-.11$	.10	.07	.08	$-.06_{12}$	.05	$-.07_{1}$	.05
Medium, increasing	$.05_{1}$	.05	.05	.13	.20	.11	$.07_{1}$	.09	$-.10_{12}$	.08
High, decreasing	$-.06^{\dagger}{}_{2}$	.03	$-.06$	.11	.02	.08	$-.09_{2}$	.05	$-.10^{*}{}_{2}$	.04
High, stable	—$_{1}$		—$_{1}$		—$_{12}$		—$_{12}$		—$_{1}$	
R^2	.22		.15		.18		.20		.16	

Note. All models also controlled for gender, age, race/ethnicity, family structure, region, urbanicity, and school sector. Within each column, coefficients with different subscripts differ significantly ($p < .05$) from each other, as determined by rotating the reference category for the dummy variables. Any two coefficients with the same subscript were not significantly different from one another. Dashes indicate that data were not applicable.
[a]Coefficient for the high SES quartile significantly different ($p < .05$) from the coefficients for the low/lowest SES quartiles, as determined by *t* tests. The coefficients for the highest SES quartiles not significantly different from coefficients for any other SES quartile. [b]Coefficient for the high SES quartile significantly different from the coefficient for the low SES quartile. The coefficients for the lowest and highest SES quartiles not significantly different from coefficients for any other SES quartile.
$^{\dagger}p < .10$. $^{*}p < .05$. $^{**}p < .01$. $^{***}p < .001$.

low, stable and medium, decreasing pathways did so in a way that created significant differences between this quartile and the other three.

Thus, at the least advanced end of the math spectrum were adolescents who had low-level pathways of personal control or generally declining pathways of personal control. As for parental consultation, adolescents with decreasing levels of consultation—no matter what the level—tended to accumulate the fewest math credits during high school. Various pathways of personal control and parental consultation from middle school to high school did not differentiate math credit accumulation during high school among adolescents from the lowest end of the socioeconomic spectrum. They did more among those on the higher side of this spectrum, especially those in the high, but not highest, part.

Developmental Pathways' Interactive Connections to Institutional Pathways

The third objective of this study was to assess the contributions of various combinations of the two developmental pathways to the institutional pathway. To do so, we created categories of adolescents based on the configuration of their pathways of personal control and parental consultation from middle school through high school and then compared them on the number of math credits accumulated by the end of high school. Following the overarching objective of this study, we conducted this investigation with a special interest in socioeconomic variability.

The analyses in the previous section considered seven pathways each of personal control and parental consultation, resulting in a total of 49 possible combinations of the two. Because examining so many different combinations would be incredibly unwieldy, we instead focused on eight combinations highlighted by our theoretical predictions. The four adaptive and four maladaptive combined pathways of personal control and parental consultation are described in Table 4. Adolescents whose combination of pathways did not fit these a priori categories were put into a ninth catch-all category.

Next, we regressed end of high school math credits on these combined pathways, the sociodemographic factors, 8th-grade math test score, and initial high school math course taking level (see Table 5). For the full sample, the combined pathways fell into three ranks according to their associations with math credit accumulation (as determined by test statistics between all coefficients in the first column). The differences among these ranks, however, were quite weak. In reality, the main distinction was between two profiles (double negative, all parent) and all other profiles. Adolescents who matched problematic pathways of personal control and parental consultation and adolescents in a mismatch of personal control and parental consultation weighted toward parents accumulated the fewest math credits during high school.

Finally, this same model was reestimated within each SES quartile. In this comparison, the highest SES quartile stood out from the others, in terms of its complete lack of differentiation by the combined control/consultation pathways. The problematic nature of the double negative and all parent profiles mentioned above was fairly consistent across the SES quartiles, except for the highest. Furthermore, another mismatch profile (all adolescent) differentiated adolescents within the high SES quartile and had a negative (if nonsignificant) coefficient within the two low SES quartiles. Again, the highest SES quartile was the outlier.

Table 4
Description of Eight Focal Combined Control/Consultation Pathways

Combined pathway group	*n*	Constituent control pathways	Constituent consultation pathways
Maladaptive combined pathways			
Double negative	113	Low stable or medium decreasing	Low stable
Mutual decline	583	High decreasing	High decreasing or medium decreasing
All adolescent	287	High stable, medium increasing, or medium stable	Low stable
All parent	399	Low stable or medium decreasing	High stable or medium stable
Adaptive combined pathways			
Double positive	2,531	High stable, medium increasing, or medium stable	High stable or medium stable
Parents giving space	3,067	High stable, medium increasing, or medium stable	High decreasing or medium decreasing
Adolescents pulling in parents	801	High stable, medium increasing, or medium stable	Low increasing or medium increasing
Parents supporting adolescents	265	Low increasing or medium increasing	High stable or medium stable

Note. A ninth catch-all category contained 1,769 adolescents with nonmissing data whose combination of control and consultation profiles did not fit any of the categories in the table. A 10th category contained 1,661 adolescents missing on either the control or consultation profile.

As expected, adolescents in two of the combined pathways of personal control and parental consultation that we considered maladaptive (and, in one quartile, three) tended to earn fewer math credits than adolescents in combined pathways that we considered adaptive. Not surprisingly, the group of adolescents who demonstrated problematic pathways of both personal control and parental consultation advanced the least far in math. Yet, a group of adolescents with at least one seemingly positive pathway (all parent) did the same, primarily because a positive pathway of parental consultation was matched with a more problematic pathway of personal control. Among high SES adolescents, a similar pattern held for the mirror-image combined pathway (all adolescent). These patterns were, for the most part, stable across family SES quartiles, with the highest SES quartile the primary exception.

Shifting the Focus to Science

Having focused up to this point on the accumulation of math credits, we reestimated all of these regression models, replacing math test score, initial math course-taking level, and eventual math credit accumulation with the corresponding science measures. Compared with the math models, the science models had lower R^2

Table 5
Results From Regression Models Predicting End of High School Math Credits by Combined Control/Consultation Pathways, for the Total Sample and Each Socioeconomic Status (SES) Quartile

	Unstandardized *b* coefficient (standard error)									
	All quartiles (N = 9,058)		Lowest SES quartile (n = 1,907)		Low SES quartile (n = 2,187)		High SES quartile (n = 2,370)		Highest SES quartile (n = 2,594)	
Variable	*b*	*SE*	*b*	*SE*	*b*	*SE*	*b*	*SE*	*b*	*SE*
Prior math progress										
Math test score in middle school	$.02^{***}$	.00	$.02^{***}$	.00	$.02^{***}$	.00	$.02^{***}$	.00	$.02^{***}$	.00
Initial math course-taking level	$.09^{***}$	.01	$.09^{***}$	.01	$.11^{***}$	.01	$.12^{***}$	.01	$.03^{\dagger}$	.01
Combined pathways										
Double negative	$-.15^{\dagger}{}_{3}$	.08	$-.27^{\dagger}{}_{2}$	.15	$-.15_{12}$	.15	$-.32^{\dagger}{}_{2}$	.19	$-.14_{1}$	.16
All parent[a]	$-.12^{*}{}_{3}$	.06	$-.26^{*}{}_{2}$	.11	$-.17^{\dagger}{}_{2}$	$-.25^{**}{}_{2}$	.09	$.19_{1}$	.13	
All adolescent[b]	$-.06_{2}$	.07	$-.08_{12}$	.13	$-.17_{12}$	.14	$-.21^{*}{}_{2}$	.10	$.10_{1}$	.10
Mutual decline	$-.06_{2}$	.05	$.03_{1}$	.11	$-.06_{12}$	.11	$-.07_{12}$	.07	$-.10_{1}$	.07
Parents supporting adolescents	$-.06_{2}$	.09	$.17_{1}$	.13	$-.03_{12}$	.16	$-.11_{12}$	.12	$-.20_{1}$	.18
Parents giving space	$-.05_{12}$	.05	$.04_{1}$	.11	$.08_{1}$	.09	$.02_{1}$	.07	$-.01_{1}$	.08
Adolescents pulling in parents	$-.01_{1}$	.03	$.00_{1}$	.06	$.00_{1}$	.06	$-.06_{1}$	.05	$.00_{1}$	.05
Double positive	—$_{1}$		—$_{1}$		—$_{1}$		—$_{1}$		—$_{1}$	
R^2	.22		.16		.19		.20		.16	

Note. All models also controlled for gender, age, race/ethnicity, family structure, region, urbanicity, and school sector. The profiles are presented in rank order according to the significant differences between them for the model on the full sample. Significant differences ($p < .05$) between coefficients within each column are noted by subscripts. Any two coefficients with the same subscript were not significantly different from one another. Dashes indicate data were not applicable.
[a]Coefficient for the highest SES quartile significantly different ($p < .05$) from the coefficients for all other SES quartiles, as determined by *t* tests. [b]Coefficient for the high SES quartile significantly different from the coefficient for the highest SES quartile. The coefficients for the low and lowest SES quartiles not significantly different from coefficients for any other SES quartile.
$^{\dagger}p < .10$. $^{*}p < .05$. $^{**}p < .01$. $^{***}p < .001$.

values and revealed fewer significant distinctions in science outcomes among the personal control and parental consultation pathways. Yet, the overall pattern of results—both in the general rank orderings of pathways and in SES differences in these pathways—was essentially the same for the science models as for the math models. For the sake of brevity, therefore, the results from the science models have not been presented in tabular form. The consistency of the science and math results boosts confidence in the robustness of the patterns identified here.

Discussion

Viewing the socioeconomic strata of American society as contexts in which different aspects of development fit together is inherently integrative. It links the demography of the United States (and disciplines associated with it) to the unfolding experiences of individual lives (and disciplines associated with them), and it links together the personal, interpersonal, and institutional elements of development as well as the scientific fields associated with each. In this study, we took such a view with a focus on adolescence. Connections among developmental pathways capture the primary "dance" of this transitional stage of the life course—the negotiation of independence and autonomy between young people and their parents and its role in the accumulation of credentials that are powerful predictors of marriage, fertility, health, and earnings in adulthood (Dornbusch, 1989; Steinberg & Morris, 2000).

This study was organized around several objectives, each with its own hypotheses. Because of the complex nature of our analyses, a rundown of the evidence for each hypothesis is in order. We should note here that our findings were neither as strong or as consistent as we would have liked or expected, but they were often quite telling.

The first objective involved the examination of two developmental pathways. We hypothesized that adolescents would have moderate levels of personal control in middle school that increased through high school and that they would have high, decreasing levels of parental consultation. These hypotheses had some empirical support. In this sample, the control pathway was generally moderate and stable, and the consultation pathway was high and gradually declining.

The second objective involved the examination of the contributions of developmental pathways to an institutional pathway. We hypothesized that adolescents with initially moderate but subsequently increasing levels of personal control would earn the most credits by the end of high school, as would those whose initially high levels of parental consultation remained steady over time. Indeed, both types of adolescents did well. Yet, what really stood out was not who did best but who did worst. Adolescents who had low levels of personal control that did not increase over time accumulated the fewest credits by the end of high school, as did adolescents whose consultation with parents about course taking declined during high school regardless of level. In other words, level mattered for control, and change mattered for consultation.

Reflecting the value of simultaneously considering level of and change in developmental factors, these results demonstrate that the development of personal control is not primarily an adolescent activity but instead something that is largely set by the start of adolescence. They also demonstrate that the decline in consultation with parents that has long characterized high school occurs within a relatively narrow bandwidth that belies notions of parents/adolescent disengagement. At the same time, change in, more than level of, parental consultation really mattered most academically. Of course, developmental scientists have long recognized the risks of using one point of adolescence as a barometer for the entire period, and so a dynamic approach is not groundbreaking. Yet, the findings of this study drive home the fact that studying pathways does more than simply add information. It provides different information too.

The third objective involved the examination of the contributions of combined developmental pathways to the institutional pathway. We hypothesized that three combined control/consultation pathways would be adaptive—academically speaking—in the modern high school: two good pathways, a seemingly bad pathway that is actually good because of the other pathway with which it is matched, and a good pathway improving a bad one. Further, we hypothesized that three combinations would be maladaptive: two bad pathways, two initially good pathways that become problematic, and mismatched pathways.

The actual results were not quite so tidy. Again, what really stood out was what did not work rather than what did. Adolescents in most maladaptive pathway profiles demonstrated less progress in high-status curricula. Not surprisingly, the group of adolescents who demonstrated problematic pathways of both personal control and parental consultation advanced the least far. Yet, the other students who did poorly relative to their peers (all adolescent, all parent) had a least one positive pathway. The problem was that it was coupled with a negative one: a mismatch signaled risk. On one hand, adolescents who believe that they are in control of their own lives may not seek out, or may refuse, the help of parents, interfering with their ability to make informed decisions about coursework. On the other hand, parents who are heavily involved in their adolescents' decision making, however well intentioned, may actually delay or block the independence of their adolescents, which, in turn, interrupts the intrinsic motivation of those adolescents to achieve. Connecting theory on the major developmental tasks of adolescence (Steinberg & Morris, 2000) as well as the basic principle of Baumrind's (1991) classic parenting style framework to education, striking the right balance between parental and adolescent input matters in the "shopping mall high school" (Powell, Farrar, & Cohen, 1985).

Thus, considering the configuration of two developmental factors (e.g., comparing one pairing of pathways of personal control and parental consultation with another pairing) is not the same as studying two developmental factors simultaneously (e.g., examining control pathways while controlling for consultation pathways). The latter approach narrows in on the significance of one aspect of development while removing the "noise" of other developmental factors from the equation. The former, which identifies packages of developmental factors within young people, is, we argue, valuable for understanding major developmental tasks of adolescence.

Finally, the fourth objective involved the consideration of how all these patterns varied by family SES. We hypothesized that the moderate, increasing pathways of personal control and high, stable pathways of parental consultation would be less common in lower socioeconomic strata. At the same time, we hypothesized that the pathways of personal control and parental consultation—and combinations of the two—that we considered to be adaptive would do more to predict academic credit accumulation in these same lower

strata. For the most part, lower and higher SES families followed parallel pathways on different planes. In other words, they differed more in terms of level (with the higher SES adolescents higher in both control and consultation) than in rates of change. Contrary to our expectations, associations between each developmental pathway and math/science credit accumulation were nonexistent in the lowest SES quartile. More in line with our expectations, associations between combined developmental pathways and credit accumulation were nonexistent in the highest SES quartile. Thus, the "action" was more in the middle of the socioeconomic spectrum than at the extremes.

Worth stressing is that, overall, families from different socioeconomic strata were far more similar than different. Yet, the few, small differences that did arise were telling. First, the relatively fewer associations among pathways at either end of the socioeconomic spectrum indicate the need to adapt theoretical perspectives on risk and resilience to the academic realm. Although in other developmental domains the most at-risk youth tend to gain more from additional resources and the least at-risk gain less (Masten & Coatsworth, 1998), the same does not always apply to the educational system. The most disadvantaged youth face many stressors in life, have less access to networks of mentoring and information, and have parents with less understanding of and power in school. These academic risks are difficult to eradicate even with ample resources, such as a healthy sense of agency or involved parents. Alternatively, the most advantaged youth have fewer stressors, more opportunities, and parents who know how to work the system, all of which are cumulatively great enough to outweigh any one developmental risk. In other words, the extremes are hard to budge. Second, adolescents in the high, but not highest, stratum had more variable experiences than their peers at the SES extremes. Their parents' consultation declined slightly more, and their math/science progress appeared to be somewhat more vulnerable to these declines (and declines in control). Developmental risks and resources had a greater impact in this portion of the socioeconomic spectrum. These youth may occupy a unique position because their parents can give them status that offers benefits but not guarantees.

These findings indicate some important ways that socioeconomic strata act as contexts, not just origins, or development. In this way, they echo the arguments made by McLoyd (1990) and García Coll (1996) about the contextual nature of demographic statuses. They also echo the work of Lareau (2004), a sociologist interested in child development whose qualitative research has demonstrated that families of different SESs provide starkly different contexts for children's educational careers. Specifically, higher status parents engage in an active type of parenting (concerted cultivation) that teaches children to be goal-oriented and to "work the system," and their lower status counterparts engage in a more open type of parenting (natural growth) that encourages happiness but does not empower children in societal institutions. Among the most advantaged and most disadvantaged, then, success is often decoupled from ability. In tandem with Lareau's work, this study suggests a need to focus investigation, especially policy-oriented research, on the middle range of the socioeconomic spectrum.

In the future, these insights can be built on in three key ways. First, although its predictor/outcome model configuration suggests otherwise, this study did not, nor intend to, establish causality. Its results identified different kinds of adolescents—academic statuses that tended to go along with different pathways of personal control and parental consultation. Establishing causal effects among these pathways is certainly a next step. Second, NELS allows generalization to a national context and the comparison of internally heterogeneous socioeconomic groups. Yet, the measurement in NELS of many noneducational factors is certainly minimalist compared with many smaller scale developmental data sources. Injecting higher quality measurement, especially of family processes, is a necessary next step in this line of research. Third, this study did not account for the potentially important role of the school in students' academic experiences. Certainly, a wealth of evidence has documented how schools provide different amounts of support and opportunities for students from different socioeconomic backgrounds as they navigate core curricula (see Lucas, 1999). Consequently, one important extension of this study is to investigate cross-school and within-school variations in the connections among students' individual, interpersonal, and institutional pathways.

The study of child development has become increasingly contextualized in recent decades, and this contextualization has led to greater dialogue between disciplines and greater consideration of the linkages across units of analyses. In this particular study, we capitalized on this cross-pollination by using the dynamic lens of developmental science, the macrolevel approach to context of demography, and the detailed consideration of academic progress of educational research in order to understand how the adolescent period of the life course is stratified by the social and economic structure of American society in ways that affect the transition to adulthood. Such research is a pressing need if researchers are to understand how inequality works and, ultimately, how it can be combated.

References

Alexander, K. L., & Entwisle, D. R. (1988). Achievement in the first two years of school: Patterns and processes. *Monographs of the Society for Research in Child Development, 53*(2, Serial No. 218), 1–157.

Bandura, A. (1997). *Self-efficacy: The exercise of control.* New York: Freeman.

Bandura, A. (2000). Social cognitive theory: An agentic perspective. *Annual Review of Psychology, 52, 1–*26.

Baumrind, D. (1991). The influence of parenting style on adolescent competence and substance use. *Journal of Early Adolescence, 11,* 56–95.

Bourdieu, P., & Wacquant, L. J. D. (1992). *An invitation to reflexive sociology.* Chicago: University of Chicago Press.

Catsambis, S. (1994). The path to math: Gender and racial–ethnic differences in mathematics participation from middle school to high school. *Sociology of Education, 67,* 199–215.

Crosnoe, R. (2001). Academic orientation and parental involvement in education during high school. *Sociology of Education, 74,* 210–230.

Curran, P. J. (2000). A latent curve framework for studying developmental trajectories of adolescent substance use. In J. Rose, L. Chassin, C. Presson, & S. J. Sherman (Eds.), *Multivariate applications in substance use research* (pp. 1–42). Hillsdale, NJ: Erlbaum.

Dornbusch, S. (1989). The sociology of adolescence. *Annual Review of Sociology, 15,* 233–259.

Duncan, G., Yeung, J. W., Brooks-Gunn, J., & Smith, J. R. (1998). How much does childhood poverty affect the life chances of children? *American Sociological Review, 63,* 406–423.

Eccles, J. S. (1994). Understanding women's educational and occupational choices: Applying Eccles et al. model of achievement-related choices. *Psychology of Women Quarterly, 18,* 585–610.

Elder, G. H., Jr. (1998). Life course and human development. In W. Damon (Ed.), *Handbook of child psychology* (pp. 939–991). New York: Wiley.

Flanagan, C. (1990). Families and schools in hard times. *New Directions for Child Development, 46,* 49–69.

Furstenberg, F., Cook, T., Eccles, J., Elder, G. H., Jr., & Sameroff, A. (1999). *Managing to make it: Urban families and adolescent success.* Chicago: University of Chicago Press.

García Coll, C., Lambert, G., Jenkins, R., McAdoo, H. P., Crnic, K., Wasik, B. H., & Vázques García, H. (1996). An integrative model for the study of developmental competencies in minority children. *Child Development, 67,* 1891–1914.

Gecas, V., & Burke, P. J. (1995). Self and identity. In K. S. Cook, G. A. Fine, & J. S. House (Eds.), *Sociological perspectives on social psychology* (pp. 41–67). Boston: Allyn & Bacon.

Gutman, L. M., & Eccles, J. S. (1999). Financial strain, parenting behaviors, and adolescent achievement: Testing model equivalence between African-American and European-American single- and two-parent families. *Child Development, 70,* 1464–1476.

Huston, A. C. (1999). Effects of poverty on children. In L. Balter & C. S. Tamis-LeMonda (Eds.), *Child psychology: A handbook of contemporary issues* (pp. 391–411). Philadelphia: Psychology Press.

Kerckhoff, A. C. (1993). *Diverging pathways: Social structure and career deflections.* New York: Cambridge.

Lareau, A. (2004). *Unequal childhoods: Class, race, and family life.* Berkeley, CA: University of California.

Lucas, S. R. (1999). *Tracking inequality: Stratification in American high schools.* New York: Teacher's College Press.

Masten, A. S., & Coatsworth, J. D. (1998). The development of competence in favorable and unfavorable environments: Lessons from research on successful children. *American Psychologist, 53,* 205–220.

Mayer, S. E. (1997). *What money can't buy.* Cambridge, MA: Harvard University Press.

McLoyd, V. C. (1990). The impact of economic hardship on black families and children: Psychological distress, parenting, and socioemotional development. *Child Development, 61,* 311–346.

McLoyd, V. C. (1998). Socioeconomic disadvantage and child development. *American Psychologist, 53,* 185–204.

Muller, C. (1998). Gender differences in parental involvement and adolescents' mathematics achievement. *Sociology of Education, 71,* 336–356.

Muthén, L. K., & Muthén, B. O. (1999). *Mplus user's guide* [Computer software manual]. Los Angeles: Author.

National Center for Education Statistics. (1994). *NELS:88 second follow-up: Student component data file user's manual.* Washington, DC: U.S. Department of Education.

Powell, A. G., Farrar, E., & Cohen, D. K. (1985). *The shopping mall high school: Winners and losers in the educational marketplace.* Boston: Houghton-Mifflin.

Schneider, B., & Stevenson, D. (1999). *The ambitious generation: America's teenagers, motivated but directionless.* New Haven: Yale University Press.

Schneider, B., Swanson, C. B., & Riegle-Crumb, C. (1999). Opportunities for learning: Course sequences and positional advantages. *Social Psychology of Education, 2,* 25–53.

Shanahan, M. J. (2001). Pathways to adulthood in changing societies: Variability and mechanisms in life course perspective. *Annual Review of Sociology, 26,* 667–692.

Stata Corporation. (2007). *Stata Base reference manual* [Computer software manual]. College Station, TX: Stata Press.

Steinberg, L., Brown, B., & Dornbusch, S. (1996). *Beyond the classroom: Why school reform has failed and what parents need to do.* New York: Simon & Schuster.

Steinberg, L. D., & Morris, A. S. (2000). Adolescent development. *Annual Review of Psychology, 52,* 83–100.

Stevenson, D. L., Schiller, K. S., & Schneider, B. (1994). Sequences of opportunities for learning. *Sociology of Education, 67,* 184–198.

Wigfield, A., Eccles, J. S., Schiefele, U., Roeser, R., & Davis-Kean, P. (2006). Development of achievement motivation. In W. Damon & N. Eisenberg (Eds.), *Handbook of child psychology* (pp. 933–1002). New York: Wiley.

Willet, J. B., & Sayer, A. G. (1994). Using covariance structure analysis to detect correlates and predictors of individual change over time. *Psychological Bulletin, 116,* 363–381.

Wright, E. O. (1997). *Class counts: Comparative studies in class analysis.* Cambridge, England: Cambridge University Press.

Appendix A

Descriptive Statistics for Key Study Variables

Variable	Statistics for study sample (N = 10,601)		
	M	*SD*	%
Personal control			
8th grade	0.08	0.69	
10th grade	0.08	0.71	
12th grade	0.09	0.74	
Parental consultation			
8th grade	2.30	0.67	
10th grade	2.06	0.60	
12th grade	1.90	0.63	
Math/science progress			
Math credits by end of high school	3.19	0.83	
Initial math course-taking level	4.39	1.68	
Math test score in middle school	37.69	11.87	
Science credits by end of high school	2.91	0.87	
Initial science course-taking level	1.76	0.65	
Science test score in middle school	19.31	4.79	
Sociodemographic factors			
Family socioeconomic status	−0.01	0.76	
Age (years)	13.76	0.50	
Gender (female)			52.17
Non-Latino/a White			69.73
African American			9.20
Latino/a			11.48
Asian American			7.88
Other race/ethnicity			0.93
Two-parent family			71.21
Single-parent family			10.46
Stepfamily			14.89
Other family structure			2.08
Northeast			19.23
North central			27.72
South			33.37
West			19.67
Rural			31.27
Urban			24.79
Suburban			43.94
Public school			80.68

(*Appendixes continue*)

Appendix B

Socioeconomic Status (SES) Composition of Each Personal Control and Parental Consultation Pathway

Pathway group	% of change profile: Lowest SES quartile (n = 2,226)	Low SES quartile (n = 2,556)	High SES quartile (n = 2,754)	Highest SES quartile (n = 3,065)	n
Personal control pathways					
Low, stable	35.20	30.40	21.87	12.53	375
Low, increasing	27.51	28.57	23.41	20.50	756
Medium, decreasing	25.58	26.39	26.50	21.53	864
Medium, stable	19.60	23.80	26.78	29.82	4,484
Medium, increasing	20.13	22.67	25.42	31.78	944
High, decreasing	18.59	22.34	27.70	31.37	1,119
High, stable	14.27	21.05	24.57	40.11	1,107
Parental consultation pathways					
Low, stable	39.96	30.58	14.51	14.96	448
Low, increasing	24.84	23.86	24.35	26.96	612
Medium, decreasing	28.16	28.16	26.31	17.37	1,186
Medium, stable	20.26	23.83	26.50	29.41	2,547
Medium, increasing	18.11	24.66	24.28	32.95	519
High, decreasing	15.52	22.49	27.82	34.18	3,113
High, stable	11.64	19.61	27.45	41.30	816

Note. Row percentages do not always add up to 100% because of missing data. Low personal control includes values one standard deviation below the mean or lower on 8th-grade personal control. Medium includes values between one standard deviation below and one standard deviation above the mean on 8th-grade personal control. High includes scores one standard deviation above the mean or higher on 8th-grade personal control. Decreasing personal control includes values one standard deviation below the mean or lower on 8th- to 12th-grade difference in personal control. Stable includes values between one standard deviation below and one standard deviation above the mean on 8th- to 12th-grade difference in personal control. Increasing includes scores one standard deviation above the mean or higher on 8th- to 12th-grade difference in personal control. The same categorization scheme applies to parental consultation.

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