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**Socioeconomic Origin, Future Expectations, and Educational Achievement:
A Longitudinal Three-Generation Study of the Persistence of Family Advantage**

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Abstract

Expectations about the future direct effort in goal-oriented action and may influence a range of life course outcomes, including educational attainment. Here we investigate whether such expectations are implicated in the dynamics underlying the persistence of educational advantage across family generations, and whether such dynamics have changed in recent decades in view of historical change. Focusing on the role of domain-specific (educational) and general (optimism and control) expectations, we examine parallels across parent-child cohorts in (1) the relationships between parental socioeconomic status and children's future expectations and (2) the associations between children's future expectations and their academic achievement. We estimate structural equation models using data from the prospective multigenerational Youth Development Study ($N = 422$ three-generation triads [G1-G2-G3]; G1 mean age in 1988 = 41.0 years, G2 mean age in 1989 = 14.7 years, G3 mean age in 2011 = 15.8 years; G2 white in 1989 = 66.4%, G3 white in 2011 = 64.4%; G1 mean annual household income, converted to 2008 equivalents = \$41,687, G2 mean annual household income in 2008 dollars = \$42,962; G1 mode of educational attainment = high school, G2 mode of educational attainment = some college). We find intergenerational similarity in the relationships between parental educational attainment and children's future expectations. Children's educational expectations strongly predicted their academic achievement in the second generation, but not in the third generation. With educational expansion, the more recent cohort had higher educational expectations that were less strongly related to achievement. Overall, the findings reveal dynamics underlying the persistence of educational success across generations. The role of future expectations in this intergenerational process varies across historical time, confirming a central conclusion of life-span developmental psychology and life-course sociological research that individual functioning is influenced by sociocultural contexts.

Keywords: intergenerational transmission; human development in context; life course; prospective cohort study; optimism; academic achievement and attainment

Socioeconomic Origin, Future Expectations, and Educational Achievement: A Longitudinal Three-Generation Study of the Persistence of Family Advantage

Expectations about the future are powerful inner forces that guide individuals through life. They influence what people can achieve and what they can become, shaping appraisals of future opportunities and, consequently, behavior. Individuals who hold positive views about the future are likely to persevere when encountering obstacles. They set high goals for themselves, put much effort into goal-driven action, expect that their actions will lead to success, and are unlikely to give up in the face of adversity. Because they constitute essential ingredients of personal worldviews, future expectations predict a range of important life course outcomes (Hitlin & Johnson, 2015; Johnson & Hitlin, 2017a; Oettingen & Mayer, 2002). Positive future orientations can also buffer tendencies that contribute to poor long-term outcomes, such as maladaptive impulses or dwelling on what might go wrong in life; they strengthen the perception that one can be a self-determined actor (Bandura, 2001; Bozick et al., 2010). Positive future expectations foster motivation and successful performance, thereby giving direction to the subsequent life course and having a range of consequences including educational and occupational attainment (Ashby & Schoon, 2010; Beal & Crockett, 2010; Vuolo et al., 2012).

Important questions remain, however, about the role of future expectations in social class reproduction, that is, the persistence of inequality across generations. In this study, we examine both domain-general, that is, optimistic and control expectations, and domain-specific, educational future expectations. Both general and domain-specific future expectations affect the level of effort that individuals invest in goal-oriented behaviors (Cunningham et al., 2009; Shrira & Palgi, 2014). We investigate the dynamics underlying the intergenerational persistence of educational advantage that may implicate these central achievement-related future orientations. We assess parallels across generations and historical time in the relationships between parental socioeconomic status and adolescent future orientations, and in the extent to which positive future orientations in adolescence predict achievement in school. Focusing on the earlier, more distal generation, we also investigate the relationships between future expectations and educational attainment. Finally, we examine the role that parental future expectations play for the future expectations and academic achievements of children in the most recent generation. We utilize prospective longitudinal data from the Youth Development Study (YDS; Mortimer, 2003), obtained from three generations (henceforth designated as G1, G2, and G3) over more than two decades (1987-2011).

The positive effects of parental education and other indicators of family socioeconomic status on adolescent educational expectations and adult educational, occupational, and income attainments have been well documented through decades of research (Bozick et al., 2010; Fergusson et al., 2008; Hauser et al., 1983; Sewell & Hauser, 1975, 1980). It is also clear that high school grade point average often predicts adult educational attainments and earnings (French et al., 2015). Moreover, adolescent educational expectations influence educational achievement and attainment (Ashby & Schoon, 2010; Eccles, 2007). Finally, albeit less studied, locus of control and optimism have positive effects on adolescent academic achievement (Bahena, 2020; Ross & Broh, 2000). To our knowledge,

however, how these factors influence educational achievement and attainment has not been examined in a three-generational context. In this study, two parent-child pairs, separated by more than two decades, are used to examine the set of relationships between parental socioeconomic status and children's expectations, on the one hand, and educational achievement on the other. Data from three generations are required to assess the stability of the linkages between parental socioeconomic status and children's expectations and educational achievement across rapidly changing historical contexts.

We investigate whether similar dynamics, implicating socioeconomic origins, future expectations and academic achievement, contribute to the intergenerational persistence of educational achievement, and ultimately to socioeconomic advantage and disadvantage, in both parent-child pairs. It is plausible to anticipate that these relationships change across generations as each comes of age in distinct historical times. The principle of "time and place," a key tenet of life course analysis (Elder et al., 2011) that is increasingly recognized in developmental psychology (Drewelies et al., 2018; Elder, 1998; Lerner, 2008; Lerner & Damon, 2006), alerts us to the possibility that the interrelations of social origin, psychological orientations, academic achievement, and attainment differ historically.

The present multigenerational study design extends across a long period of time (1989 – 2011), covering an historical period characterized by important societal transformations. Globalization, technological advancements, and economic changes—including recessions in 1991, 2001 and 2008-2009—have brought about more precarious work and more complicated school-to-work transitions (Bell & Blanchflower, 2011; Kalleberg, 2011). Poor economic conditions could dampen adolescents' future expectations, especially among those previously advantaged, thereby lessening differences by parental socioeconomic level. During the same historical period, however, opportunities for higher education expanded, parental educational expectations for children increased, children's educational aspirations rose, and some gender-based "glass ceilings" in the occupational structure were shattered (Mortimer et al., 2020). These changes may have heightened adolescents' future expectations across the board and may have altered their associations with socioeconomic origins. These variegated and potentially countervailing influences raise the question as to whether parental educational attainment and income have had stable implications for adolescent future expectations during this period of rapid social change. The shifting societal context may have also led to altered relationships among future expectations, academic achievement, and educational attainment. If so, this would challenge assumptions about the universality of the links between socioeconomic origins, future expectations, achievement and attainment, indicating that historical change can bring about variation in life-span developmental processes (cf., Brock, 2016; Norenzayan & Heine, 2005).

The present three-generation study draws on second-generation future expectations measured in relatively good economic times (1989), when these respondents were adolescents, and in post-recession years 2009-2011 when they were adults, alongside their third-generation adolescent children's expectations, also assessed in 2009-2011. Though the Great Recession was technically over by 2009, its effects lingered on for many families. In addition to investigating patterns of linkages between parent socioeconomic status and child future expectations across generations, this design also enables us to compare the role of

future expectations, measured in both economically prosperous and depressed historical periods and across a long period of educational expansion, in educational achievement.

Future Expectations

As noted earlier, we use a multidimensional assessment of future expectations, focusing on general future expectations that capture individuals' optimism or sense of whether their lives will work out well across multiple life domains, and their overall sense of control over their futures, as well as a more narrowly circumscribed expectation surrounding educational attainment. We focus on these three types of expectations because each is thought to motivate behavior, increasing individuals' chances of achieving their goals in life and propelling them toward more or less successful futures. By focusing on these psychological dimensions, we also extend much sociological three-generation research which has sought to determine whether a person's status is directly influenced by the status of their grandparents, once the effect of parental status is controlled (Breen, 2018). Let us now examine each of the future expectations of interest in turn.

Optimistic Future Expectations

Optimistic future expectations refer to a subjective belief that one's life will turn out well (Johnson & Hitlin, 2017a). They reflect a favorable evaluative attitude about one's future, a positive judgment about the probability of occurrence of desirable outcomes (Oettingen & Mayer, 2002). Individuals with optimistic future expectations generally anticipate that good things will be abundant in the future and bad things, scarce (Peterson, 2000). This global anticipation of positive life outcomes motivates behavior. To the extent that people believe their lives will turn out well, they will seek to achieve the goals they set for themselves. Those who expect positive outcomes will continue to strive toward these outcomes in the face of difficulties. In contrast, those with low expectations will withdraw their effort and disengage from goals they have set even if the consequences of such disengagement may be severe (Bandura, 1977; Scheier & Carver, 1992).¹

Control Expectations

Control expectations, sometimes called mastery or locus of control, reflect a general judgment, extending across life domains, about one's capacity to affect important life outcomes. Control expectations constitute a critical psychological resource facilitating successful action (Reynolds et al., 2007). A sense of control is vital in guiding goal-directed behavior as it reflects the belief that one can influence future events, rather than being cast about by external forces (Hitlin & Johnson, 2015; Pearlin & Schooler, 1978). Control expectations promote positive functioning, with a greater sense of control enabling individuals to cope with complicated life situations and adversity. Control expectations are key to understanding how effectively people respond to the challenges they face in their lives

¹ Note, however, that optimism is not always associated with positive outcomes. For instance, individuals who overestimate their future selves in the social and physical domains have been found to exhibit lower well-being subsequently than those who underestimate their future selves (Cheng et al., 2009). Optimism bias, the overestimation of positive future events, may lead to frustration and promote less adaptive behaviors because unwanted future outcomes are more likely to materialize for exceedingly optimistic individuals (Sharot, 2011).

(Burger & Walk, 2016; Conger et al., 2009), promoting adaptive human development (Heckhausen et al., 2010).

Educational Expectations

Educational expectations are the beliefs about future educational attainment. They motivate student effort (Domina et al., 2011) and may ultimately influence educational attainment (Schoon et al., 2021). Educational expectations can be conceptualized either as idealistic expectations (hopes) or as more realistic anticipations of future educational attainment; the former being what an individual hopes to attain if all went well, the latter what they think they might actually be able to attain given their circumstances (cf., Beal & Crockett, 2010; Lee et al., 2012). Some studies refer to these variables as educational aspirations and educational plans, respectively. We conceive of educational aspirations and educational plans as key facets of educational expectations – reflecting what individuals hope to attain without taking into account potential constraints and barriers, or what they can reasonably plan for in a given context. Both facets may influence educational attainment; hence, we include measures of both as indicators of a latent construct in this study. In a sensitivity analysis, we replicate our analysis using an observed composite as proxy for educational expectations (see Supplement 4, Tables S8 and S9, in the Supplemental Materials).

Future Expectations and Educational Achievement

Because both general and domain-specific future expectations are associated with affect regulation, psychosocial adjustment, and active coping mechanisms (cf., Dubow et al., 2001; Israelashvili, 1997; Wyman et al., 1993), they may influence subsequent accomplishments, including academic achievement, educational trajectories (Burger, in press; Johnson & Reynolds, 2013) and attainments (Beal & Crockett, 2010; May & Witherspoon, 2019). However, prior studies typically have not distinguished between various facets of individuals' future expectations, such as domain-general future expectations (optimism and control orientation) and domain-specific (educational) expectations, nor examined their unique explanatory power. Neither have prior studies examined whether, or how, future orientations contribute to the persistence of educational inequality across generations. This study will address those gaps in the literature.

Incorporating these three types of expectations in a single study allows us to bridge closely related but often disconnected discussions about the influence of various dimensions of future orientation on life course outcomes. Considering them in tandem enables us to compare their relationships to socioeconomic origin and to academic achievement across generations. Whereas considerable attention in the status attainment literature has been directed to the impacts of educational aspirations and plans on educational attainment (Bozick et al., 2010; Sewell et al., 1969), incorporating three dimensions of future expectations in a single study enables us to disentangle the unique contribution of each of these dimensions to educational achievement. Moreover, we gauge these relationships in distinct historical contexts, thereby extending life-span developmental psychology and life course social psychology, which note the significance of sociocultural and historical contexts for individual functioning and attainments (Baltes, 1987; Burger et al., 2020; Drewelies et al., 2018; Elder et

al., 2011; Hülür et al., 2015). Such contexts are dynamic and hence future expectations and academic achievements, and their interlinkages, may not be constant across historical time (see also Greenfield, 2009).

Genetic and Social Sources of Future Expectations, Academic Achievement, and Educational Attainment

Given our intent to examine the influences of parental socioeconomic status on children's future expectations, and those of future expectations on academic achievement and educational attainment, we need to consider various mechanisms that may explain those influences. To simplify, both genetic (heritability) and social mechanisms (socialization) may be at play.

Heritability

The persistent effect of parental educational attainment on children's educational attainment, for instance, is most likely due not only to parental expectations and support (socialization), but also to heritable genetic traits that foster both educational achievement (Krapohl et al., 2014; Rimfeld et al., 2016; Selzam et al., 2017; Shakeshaft et al., 2013) and attainment (Ayorech et al., 2017; Donnellan et al., 2021; Okbay et al., 2016; Rimfeld et al., 2018). Estimates of the effects of genetic inheritance on educational attainment vary significantly, ranging from small to medium (Ayorech et al., 2017; Cesarini & Visscher, 2017; Lee et al., 2018), depending on the samples and the contexts investigated (e.g., Domingue et al., 2015; Liu, 2018). Although the current study does not use genetically informative data and cannot establish the relative importance of genetic and environmental influences, considerable evidence indicates that the future expectations under study here are at least partially genetically determined.

Several studies suggest comparatively low heritability of *optimism* (e.g., Caprara et al., 2009; Plomin et al., 1992; Zuckerman, 2001), but some indicate that additive genetic factors explain up to about 36 percent (Mosing et al., 2009) or even 48 percent (Schulman et al., 1993) of variation in optimism. Researchers caution, however, that the mechanism of transmission may be largely indirect, that is, mediated through a variety of environmental factors (Seligman et al., 1995; Schulman et al., 1993). Thus, optimism seems to be heritable, but the lower heritability of optimism relative to other factors, such as life satisfaction, may be due to the uncertainty that the future always involves, especially during adolescence (Caprara et al., 2009). This uncertainty might make optimistic future expectations prone to fluctuations associated with experiences, such as the establishment of supportive relationships, the (un)successful completion of studies, the start of a profession, or a promotion at work (Carver et al., 2010; Segerstrom, 2007).

Control expectations (or mastery) are also to some extent heritable (Zheng et al., 2019), with genetic factors accounting for about a third of the observed variance (Kiecolt et al., 2013). However, control expectations might be quite sensitive to historical contexts. For instance, during economic recessions, individuals might perceive less control over their futures as a result of rising rates of unemployment and generally more bleak labor market opportunities and future prospects (Kalleberg, 2011). Similarly, we know from observational research that *educational expectations* differ significantly across cohorts, with more recent

cohorts displaying higher educational expectations likely as a result of educational expansion in many countries during the 20th century (e.g., Schoon, 2012). This variation in educational expectations across historical periods suggests that environmental influences are manifest. At the same time, there is evidence suggesting that genetic influences play a significant role as well. Although to our knowledge there are no studies specifically assessing the heritability of educational expectations, one study focused on parental expectations for their children's educational attainment and found that these expectations were approximately 20 percent heritable (Briley et al., 2014). That is, a significant proportion of the variance in parental educational expectations for their children was related to child-genotypic differences. This indicates that parents are responsive to genetically influenced differences in their children (as reflected, for instance, in variation in children's educational achievements) or that children actively influence their parents' expectations. Taken together, this suggests that gene-environment interplay is at work in the formation of educational expectations.

Social Mechanisms

Social science research indicates that transmission of beliefs, values, and attitudes across generations also occurs in families through socialization processes (e.g., Bengtson et al., 2009; Burger, 2016; Grønhøj & Thøgersen, 2009; Min et al., 2012). More specifically, future expectations may run in families, that is, their salutary or problematic character may be repeated across generations because children may acquire certain styles of thinking about the future as a result of parents' modeling of such thinking and accompanying behaviors. Parents' optimism may matter for their children's optimism because it influences parents' goal-oriented activities, their reactions to obstacles and failure, and their ultimate attainments, which, in turn, provide examples from which children can learn through observation (Bandura, 1986). Parents' optimistic messages can instill confidence in their children, conveying their capacity to be successful in life (Johnson & Hitlin, 2017b), or pessimism about whether goals can be attained. Thus, socialization processes may partially explain parent-child similarity in future orientations, thereby contributing to the persistence of inequality across multiple generations.

The present long-term study enables assessment of parents' future expectations, as held both in adolescence and in adulthood. Parental future expectations might be relatively stable over time, in which case children would be exposed to their parents' orientations, the behaviors which they induce, and the outcomes of those behaviors throughout childhood and adolescence. Whereas almost all studies of parental impacts on children are limited to contemporaneous or close-in-time parental attitudes (cf., Mortimer & McLaughlin, 2014), we examine influences of parental future expectations (optimism and control orientation) on their children's future expectations and academic achievement, net of parental future expectations as exhibited in adolescence. We expect that parental future expectations, held as adults, will influence the future expectations of their children. We also expect positive effects of these adult parental expectations on children's academic achievement, both directly and indirectly, through their impacts on children's future expectations.

Variation in the Influences of Genetics and Environments

Estimates of the variance in a given characteristic accounted for genetically or environmentally must be interpreted cautiously because socialization effects can vary across

populations and because the heritability of a given characteristic differs across populations and environmental contexts. High heritability in a population does not signify that a characteristic is unaffected by environmental variation (Griffiths et al., 2000). A characteristic may be highly heritable in the population and still be subject to substantial changes resulting from environmental influences. In addition, there is evidence of gene-environment correlation, meaning that distinct genotypes are selectively exposed to distinct environments. Specifically, parents provide both genes and environments for their biological offspring. Hence a child's environment is necessarily correlated with the child's genes, because the child's genes are correlated with the parents' genes, and the parents' genes are correlated with the rearing environment they provide (Gage et al., 2016; Kong et al., 2018; Scarr & McCartney, 1983). Given this theoretical background, we will assume that inter- and intragenerational associations involving future expectations found in this study result from the influences of genetics, shifting environments across historical time, and the interplay between genes and environments.

The Present Study

We address the following research questions. First, are there intergenerational parallels or divergences across parent-child cohorts (and historical time) in the manner in which the family of origin's socioeconomic status predicts adolescent children's future orientations? Second, are there intergenerational similarities or differences in the ways these orientations predict adolescent school achievement? Third, although some research has examined the three orientations of interest separately, to what extent does each predict educational attainment when the two others are controlled? Finally, are the future orientations that parents hold as adults transmitted to children and do they predict children's academic achievement?

Prior research has revealed persistent effects of socioeconomic origin on status attainment and provided evidence of the important role of future expectations for academic achievement and attainment. However, recent historical change might have altered the links between socioeconomic origin, future expectations, and academic outcomes. Consequently, we expect significant, but weak intergenerational parallels in the manner in which socioeconomic status predicts adolescent children's future expectations and in the manner in which these expectations predict academic outcomes. Moreover, we expect that each of the future expectations under investigation here more strongly predicts educational achievement in economically prosperous historical times when predictions about the future might be easier to make. Finally, in light of prior research, we assume that adult parents transmit future expectations to their children and that children's expectations, in turn, predict their academic achievement.

Figure 1 depicts the conceptual causal model animating our study, from the first generation's socioeconomic status in adulthood; to the second generation's future expectations and educational achievement in adolescence, and adult socioeconomic status and future expectations; to the adolescent third generation's future expectations and educational achievement. Following Grosz and colleagues (2020), to acknowledge the potential effects of unobserved influences and the resulting limitations of our approach, these are also designated

in gray boxes. Each conveys a myriad of potential causes including environmental factors (e.g., neighborhood and school effects, influential persons outside the family such as teachers and peers, the media, etc.) and genetic inheritance. Inclusion of such factors could importantly moderate or mediate the effects of the purported observed influences, or account for them entirely.

But notwithstanding such limitations, answers to the questions raised here have the potential to illuminate the dynamics underlying the intergenerational persistence of educational advantage across two decades during the turn of the 21st century.

Method

Data

We use data from the Youth Development Study (YDS; Mortimer, 2015), which began in 1987 with a randomly selected cohort of 1139 adolescents attending the ninth grade in the St. Paul (Minnesota) Public School District (Mortimer, 2012). The study participants (64% of those invited) were surveyed annually in their classrooms until 1991. Subsequently, data were collected by mail nearly annually until 2011.

In the first study wave, most participants were 14 or 15 years old (6% were 16 or 17). They were mostly 37 or 38 years old in 2011. Most respondents were white (65%), the major minority groups being Hmong (11%) and African American (9%), mirroring the St. Paul public school population at the time. Because students from private or parochial schools were not recruited, higher-income families were likely underrepresented, with the median household income being between \$30,000 and \$39,000 (in 1987 dollars). The proportion of adolescents living in single-parent families (23%) reflected that of single-parent households in the St. Paul community overall.

Panel retention throughout the study was roughly two-thirds of the initial sample. Attrition was unrelated to a wide range of indicators of socioeconomic origin, achievement orientations, and behavioral and mental health. However, the likelihood of attrition was greater for non-white and male participants as well as for those whose parents were unemployed at the onset of the study.

The YDS not only followed this cohort over a long period of time, it also collected data from participants' parents as well as from their children, representing three generations: grandparents (first generation), parents (second generation), and grandchildren (third generation). The first-generation (G1) respondents were surveyed in 1988 and 1991. Thus, socioeconomic data from G1 grandparents, representing the socioeconomic family contexts for second-generation (G2) respondents, were obtained in relatively good economic times. The G2 respondents were surveyed nineteen times from 1988 until 2011, covering the period from mid-adolescence (age 14-15) to adulthood (age 37-38). Finally, in 2009, 2010 and 2011, third-generation respondents who were at least eleven years old were surveyed by mail. By 2011, 67% of eligible second-generation parents had consented to their (third-generation) children's participation in the study. In the analyses reported here, most third-generation data came from the 2011 data collection. When those data were unavailable, data from the 2010 or 2009 surveys were substituted.

By virtue of the study design, relatively early child-bearers are overrepresented in the current subsample (second-generation teens through age 27 at the time of third-generation members' birth). Consequently, this subsample is of lower socioeconomic status than the panel at large; just 21% of the second-generation participants in this parent-child study had a 4-year college degree, compared to roughly 35% of the entire panel.

The current study draws on data from 422 three-generation triads, representing 265 families with one or more third-generation children per family. Including all three generations, 1,041 individual participants contributed to the present study. While statistical power depends on various factors—including the distributions of the variables included in statistical models, the type of model estimated, proportions of missing data, and the number of indicators per latent construct (Wolf et al., 2013)—the detection of significant effects and tendencies toward low standard errors of model parameter estimates in several prior analyses using this three-generation panel or a subsample thereof (e.g., Johnson & Hitlin, 2017b; Mortimer et al., 2017; Vuolo & Staff, 2013) suggest that the current sample size is sufficient for a wide range of multivariate analyses. Here we will discuss parameter estimates which are significant at the conventional $p < .05$ level, but we also report p -values adjusted for multiple testing for all parameters, using the Benjamini and Hochberg (1995) correction (false discovery rate), as recommended for structural equation models (see Cribbie, 2007).

The data used here are publicly available (ICPSR 24881) and completely de-identified. The current study is part of a project that received approval of the Institutional Review Board of the University of Minnesota ([The YDS Second Generation Study], IRB ID: 0712S22301, 4/17/2019). The YDS is uniquely suited for our research. With more than two decades' worth of archived data extending across three generations, the YDS enables examination of the research questions we address here.

Measures

This section describes the measures used in the study. Figure 2 illustrates when and for which generation of respondents these measures were assessed.

Expectations in Adolescence

Second- and third-generation respondents' future expectations during adolescence were measured at approximately the same ages, using identical items, with measurements separated by up to 22 years. The second-generation measures were collected in 1989, when most respondents were 15-16 years old. The third-generation measures were collected in 2009, 2010 and 2011; we used data primarily from the 2011 panel wave, when the third-generation respondents were on average 15.8 years old. When data were missing in the 2011 wave, we substituted data from the 2010 or 2009 waves (17.4% for the optimistic future expectations scale; 37.1% for the control expectations scale; 32.5% for the educational expectations scale).

Optimistic Future Expectations. We used seven items to assess optimistic future expectations in adolescence (adapted from Jessor et al., 1988). Participants were asked to estimate the likelihood that they will (1) have a job that pays well, (2) be able to own their own home, (3) have a job that they enjoy doing, (4) have a happy family life, (5) be in good health most of the time, (6) be able to live wherever they want to in the country, and (7) be

respected in their community. Response categories ranged from 1 = “very high” to 5 = “very low” (Cronbach’s $\alpha = 0.854$ [G2] and 0.875 [G3]). Responses were reverse coded so that higher scores indicated more optimistic future expectations.

Control Expectations. To measure adolescents’ control expectations, we used two items from the Pearlin Mastery Scale (Pearlin & Schooler, 1978). (1) Sense of competence: “I can do just about anything I really set my mind to do.” (2) Perceived control over future events: “What happens to me in the future mostly depends on me.” Response options ranged from 1 = “strongly disagree” to 4 = “strongly agree” (Cronbach’s $\alpha = 0.997$ [G2] and 0.951 [G3]).

Educational Expectations. To measure adolescents’ educational expectations, we used two items. (1) Educational aspirations were assessed with the item “If it were up to you, how far would you like to go in school?” (2) Educational plans were assessed with the item: “What is the highest level of schooling you really think you will finish?” Response categories ranged from 1 = “less than high school” to 6 = “PhD or professional degree” (Cronbach’s $\alpha = 0.863$ [G2] and 0.811 [G3]).

Expectations in Adulthood

Second-generation measures of control expectations and optimistic future expectations in adulthood were collected in 2005, 2009 and 2011. We used data primarily from the 2011 panel wave, when the second-generation participants were 37-38 years old. When data were missing in the 2011 wave, we used data from the 2009 or 2005 waves (7.8% for the optimistic future expectations scale; 8.1% for the control expectations scale). The control expectations scale was identical throughout the YDS study (Cronbach’s $\alpha = 0.997$ [G2 in adulthood]). However, in contrast to the 7-item optimistic future expectations scale, administered in 1989 when second-generation participants were adolescents, second-generation optimistic future expectations in adulthood were assessed using a single-item measure: “During the past month, how much of the time have you felt that the future looks hopeful and promising?” Response categories ranged from 1 = “none of the time” to 5 = “all of the time”. Note that we do not assess second-generation educational expectations in adulthood; the measures of aspirations and plans would be irrelevant to adults in their late 30’s, as the vast majority would have completed their educations.

Grade Point Average

Second- and third-generation’s academic achievement in adolescence was measured by an identical question: “What is your grade point average so far this year.” Twelve response options ranged from A to F (e.g., A, A-, B+, B, B-, etc.).

Educational Attainment

Educational attainment was measured on an ordinal scale that ranged from (1) ‘elementary or junior high school’ to (6) ‘PhD or professional degree’. For the first generation, the measure was collected in 1988, when their (second-generation) children were in grade 9 (first year of high school). When data were available for both first-generation participants, we used the higher educational attainment. Second-generation’s educational attainment was assessed in 2009, when the respondents were 35-36 years old. The scale was modified slightly to account for change in common terminology. For example, “community or

junior college degree” (for the first generation) was replaced with “associate degree” (for the second generation).

Household Income

In 1988, the household income of *first-generation* respondents was measured with the item: “What was your total household income in 1987 before taxes? Include wages and salaries, net income from business or farm, child support, dividends, interest, rent, and any other money income received by persons in your household.” The response scale ranged from “under \$5,000” to “\$100,000 or more” (13 categories). We used the natural logarithm of the midpoint of each category to reflect the decreasing value of income increments for higher-income households. *Second-generations’* household income was assessed with the item: “What was the income for your entire household in [previous year], before taxes? (Include all earners in your household).” Because respondents reported their actual household incomes, this measure was continuous. To consider inflation, we converted all incomes to 2008 equivalents and computed average logged incomes as reported across eight panel waves (1999-2009). This income measure covers the years 1998-2008, a substantial period in the lives of the third-generation children.

Control Variables

To minimize potential confounding effects, we control second- and third-generation participants’ sex and third-generation respondents’ age. Second-generation participants’ age is not controlled because it is essentially the same in all panel waves, given that this panel study tracked a cohort of ninth-graders. We included race (nonwhite versus white) in additional sensitivity analyses, which corroborate the results presented in this study. Table 1 reports descriptive statistics for all manifest variables; Table S1 in the supplemental materials displays their correlations. Because the analytic sample is a subsample of the original sample which includes only those second-generation participants who were parents by 2009-2011, Table S2 in the supplemental materials also provides descriptive statistics for all manifest variables for the original sample, including second-generation parents and nonparents, as well as for the sample of second-generation nonparents. The main differences between the analytic sample and the original sample are outlined above. Moreover, Table S2 shows that relative to the analytic sample, the sample of second-generation nonparents had, on average, slightly higher educational and optimistic expectations, grade point average, and educational attainment, with other differences between these samples being substantively negligible.

Analytic Strategy

A fully recursive structural equation model was estimated in the R statistical environment version 3.6.1, using lavaan version 0.6-3 (Rosseel et al., 2018). This technique allows for modeling multiple endogenous variables, residual correlations, and both direct and indirect effects. The model accounts for the clustering of third-generation individuals in second-generation families, estimating cluster-robust standard errors. We modeled paths between variables that exhibited a temporal sequence and residual correlations between variables measured contemporaneously (saturated structural model). As illustrated in Figure 3, influence flows from first-generation adult characteristics to second-generation

characteristics (assessed from age 15-16 through age 37-38), and subsequently to third-generation characteristics (assessed at average age 15.8). Note that the relationship between second-generations' household income (assessed from age 24 to 35, across more than a decade) and their educational attainment (assessed at age 35-36) was not modeled as a causal path because participants obtained their highest educational degrees at various time points. Instead, we represent this relationship as a residual correlation. The model controls for second-generation sex and third-generation sex and age (not shown in Figure 3). Figure 3 shows all statistically significant standardized path coefficients. Table 2 reports both significant and non-significant standardized coefficients; Table 3 reports the latent factors and residual correlations.

To adjust parameter estimation to the presence of missing data (6.9% across items and waves), we employed full information maximum likelihood estimation, an efficient method to estimate population parameters when data are partially missing (Dong & Peng, 2013). Most items (84.8%) had between 0% and 9% missing. The proportion of missing values varied between 0% and 37.9%; however, only the two items measuring second-generation control expectations in adulthood had more than 15.9% missing.

We evaluated model fit by assessing three widely-used measures of goodness-of-fit: the comparative fit index (CFI), root mean square error of approximation (RMSEA), and standardized root mean square residual (SRMR), which are differentially sensitive to distinct types of model misspecification (Hu & Bentler, 1998). Fit is typically considered acceptable when $CFI > .90$, $RMSEA < .08$, and $SRMR < .08$ (Kline, 2016; McDonald & Ho, 2002). The following indices suggest that the model reported here represents a good fit to the data: $CFI = .912$, $RMSEA = .052$ (90% confidence interval: $.047 - .057$) and $SRMR = .048$.

Results

Descriptive Statistics

Table 1 summarizes descriptive statistics for all study variables. We note that educational expectations were higher among third- than second-generation respondents, whereas control expectations were similar across generations. Optimistic future expectations were just slightly higher for third-generation respondents. Specifically, with a mean score of 4.17, second-generation adolescents aspired to roughly a 4-year college degree but thought that they would eventually finish at a level between a community college degree and a 4-year college degree (with an educational-plans mean score, m , of 3.58). By contrast, third-generation respondents aspired to almost a master's degree ($m = 4.64$) and thought that they would eventually finish between a 4-year college degree and a master's degree ($m = 4.47$). Regarding control expectations, mean scores were 3.29 and 3.28 for second- and third-generation respondents, respectively, indicating that respondents in both generations felt quite able to do just about anything they really set their mind to do and that they mostly felt in control of what happens to them in the future. Finally, optimistic future expectations were relatively high in both generations. With a score of 3 indicating a "fifty-fifty" likelihood of positive life outcomes and 4 indicating a "high" likelihood of those outcomes, second-generation's score-range from 3.56 to 4 ($m = 3.79$) indicates relatively high levels of optimistic future expectations, but third-generation's score-range from 3.66 to 4.12 ($m = 3.99$)

was slightly higher. Although rising levels of optimistic future expectations might appear to be surprising given the “Great Recession” that has diminished young people’s life prospects, they might reflect young people’s confidence in the future as a result of the expansion of higher education, increasing economic returns to college education, and growing labor market opportunities for women (Mortimer et al., 2020).

Third-generation’s grade point average (GPA) was, on average, slightly higher than second-generation’s GPA (8.73 vs. 7.32).

First-generation’s educational attainment was 2.70 on average, between a “high school graduate” (coded 2) and “some college” (3), with the greatest proportion of respondents having graduated from high school (*mode* = 2). Second-generation’s mean educational attainment was 2.85, just slightly closer to “some college;” the greatest proportion of respondents completed some college (*mode* = 3). First- and second-generations’ annual household incomes were almost identical. For first-generation respondents, the average logged income was 10.64, whereas the average income of second-generation respondents was 10.67, indicating incomes of \$41,687 for first-generation and \$42,962 for second-generation respondents (in 2008 dollars, adjusted for inflation). Note that these incomes are not directly comparable. First-generation respondents were on average 41 years old when they were surveyed, and they reported their incomes during the year prior to the initial 1988 data collection. By contrast, second-generation respondents’ incomes reflect their early income trajectory from age 24 to 35, across the observation period 1998 to 2008.

Because second-generation mothers were more likely than fathers to consent to their children’s participation in the YDS study, only 25 percent of the second-generation cohort was male. Two-thirds of this cohort was white. Almost half of the third-generation participants were male (47%). Third-generation respondents’ average age was 15.83 years in 2011, with age ranging from 11 to 23 years.

Structural Equation Modeling Results

Figure 3 displays statistically significant standardized regression coefficients from the fully recursive structural equation model. From left to right, it represents first-generation educational attainment and household income in adulthood (assessed in 1987/1988); second-generation expectations (1989) and grade point average (1990) in adolescence, and income (1999-2009), educational attainment (2009) and both optimism and control expectations (2011) in adulthood; and third-generation expectations and grade point average in adolescence (2011). Table 2 summarizes all regression coefficients including conventional *p*-values as well as *p*-values adjusted for multiple testing (false discovery rate correction, as proposed by Benjamini & Hochberg, 1995). Generally, effect sizes are not large. However, in interpreting effect sizes, we need to consider that they are net of all other effects that were controlled in the model. Furthermore, some of the variables were separated by long time periods, making strong effects unlikely. Finally, as a result of the relatively small sample, statistical power was relatively low. Consequently, in this study even small effect sizes are substantively noteworthy.

Before turning to our research questions, we document often-observed intergenerational socioeconomic status transmission. First-generation educational attainment

was positively related to second-generation educational attainment (.17, $p = .001$, $p_{\text{adjusted}} = .004$), and first-generation household income was positively related to second-generation household income (.24, $p < .001$, $p_{\text{adjusted}} < .001$). Moreover, first-generation educational attainment was related to second-generation household income via first-generation household income (indirect effect .08, $p < .001$, $p_{\text{adjusted}} < .001$). First-generation educational attainment was also related to second-generation adolescent optimism via first-generation household income (indirect effect .04, $p = .040$), but when adjusting the p -value for multiple testing this relationship was no longer significant ($p_{\text{adjusted}} > .05$).

(1) *Are there intergenerational parallels or divergences across parent-child cohorts (and historical time) in the manner in which the family of origin's socioeconomic status predicts adolescent children's future orientations?* We find evidence of continuity in the associations of socioeconomic origin and adolescent future expectations across generations. First-generation educational attainment predicted two of the three second-generation adolescent future expectations: educational expectations (.13, $p = .033$, $p_{\text{adjusted}} = .089$) and control expectations (.16, $p = .010$, $p_{\text{adjusted}} = .034$). Mirroring these relationships between G1 educational attainment and G2 adolescent educational expectations and control expectations, G2 educational attainment was positively related to the same expectations for G3 (.18, $p = .022$, $p_{\text{adjusted}} = .067$, for educational expectations and .19, $p = .011$, $p_{\text{adjusted}} = .035$, for control expectations). More affluent first-generation families also had children with more optimistic future expectations (.13, $p = .039$), although this association was not statistically significant when correcting the p -value for multiple testing ($p_{\text{adjusted}} = .101$). However, unlike in the prior generational pair, G2 household income was not significantly associated with G3 optimism. Instead, G2 adult educational attainment predicted G3 optimism (.15, $p = .037$, $p_{\text{adjusted}} = .098$) as well as educational and control expectations (.18, $p = .022$, $p_{\text{adjusted}} = .067$; and .19, $p = .011$, $p_{\text{adjusted}} = .035$, respectively). Importantly, the association of G2 educational attainment with G3 adolescent optimism was identified despite the intergenerational parallel with respect to adolescent optimism (reported by Johnson and Hitlin, 2017b). Second-generation optimism at age 15-16 was positively related to third-generation optimism (.20, $p = .030$, $p_{\text{adjusted}} = .087$), measured at about the same age (15.8) approximately two decades later. Considering the long time-span, the standardized path coefficient is relatively sizable in magnitude, comparable to the path from first- to second-generation educational attainment (.17).

(2) *Are there intergenerational similarities or differences in the ways future orientations predict adolescent school achievement?* The three-generation data enable us to observe the extent to which adolescent future expectations predict grade point average in each generation. The sizable path from G2 educational expectations to G2 GPA (.39, $p < .001$, $p_{\text{adjusted}} < .001$) suggests that educational aspirations and plans were important predictors of academic achievement in the second generation. In the third generation, however, we find that educational expectations did not significantly predict grade point average. This pattern of findings confirms Reynold's and Johnson's (2011) observation that the recent inflation of educational aspirations and plans has rendered them less consequential for achievement-related behavior and outcomes. Instead, G3 optimistic future expectations significantly predicted G3 grade point average (.19, $p = .009$, $p_{\text{adjusted}} = .032$). Similarly, G3 control expectations predicted G3 grade point average (.14, $p = .045$), although statistical significance did not survive the adjustment for multiple testing ($p_{\text{adjusted}} = .112$).

(3) *Does each G2 adolescent future expectation predict G2 adult educational attainment when the others are controlled?* We find that just one of the adolescent future orientations of interest significantly predicted adult educational attainment. This pattern of results confirms the well-documented relationship between educational expectations and educational attainment, evident here with the other more general expectations controlled (.18, $p = .004$, $p_{\text{adjusted}} = .015$). G2 educational expectations were associated with G2 educational attainment directly, but also indirectly, via G2 educational achievement, i.e., GPA (indirect effect .09, $p = .001$, $p_{\text{adjusted}} = .005$). However, G2 adolescent optimism and control expectations did not significantly predict G2 educational attainment.

(4) *Are future orientations transmitted from adult parents to children, and do adult parents' future expectations predict children's academic achievement?* Regarding intergenerational transmission, we find no evidence suggesting that the second-generation adult parent future orientations under study influence third-generation adolescent future orientations, net of prior influences that flow either directly (via parental educational attainment and adolescent optimism) or indirectly (from second-generation educational expectations via second-generation educational attainment). The findings suggest that psychological dynamics extending from the parents' adolescence – that is, early optimism – experienced across many years of the child's life, are more consequential for adolescent children's optimism than contemporaneous parental optimism (.20, $p = .030$, $p_{\text{adjusted}} = .087$, versus $-.07$, $p = .434$, $p_{\text{adjusted}} = .656$). It is also possible that genetic factors partially explain the associations between parents' optimism in adolescence and their children's optimism in adolescence, with contemporaneous influences playing a relatively minor role (Carver et al., 2010; Segerstrom, 2007), for instance, if they reflect transient environmental influences such as economic downturns. Note that parental optimism was not stable across time, as indicated by a lack of a significant association between adolescent and adult optimism, but parental control expectations exhibited significant stability from adolescence to adulthood (.31, $p = .010$, $p_{\text{adjusted}} = .034$).

Regarding the link between adult parents' future expectations and children's academic achievement, we find a significant, albeit anomalous, direct negative path from G2 adult control expectations to G3 grade point average, indicating that parents with higher expectations of control over their futures had, on average, children with lower academic achievement.

Because third-generation adolescents were not yet old enough to finish their schooling, we cannot observe the links between third-generation future orientations and their educational attainments. Future data collection will enable assessment of whether adolescent educational expectations predict attainment among contemporary adolescents as they did for the prior generation. It will also allow observation of the links between G3 adolescent achievement in school and their ultimate educational attainment.

Discussion

Future expectations reflect the subjective probability that certain behaviors will yield intended outcomes. They are an indicator of how individuals appraise their future opportunities and to what extent they believe that performing specific behaviors will have

salutary consequences (Beal & Crockett, 2010). Future expectations have been found to influence subsequent accomplishments and life outcomes (Ashby & Schoon, 2010; Shrira & Palgi, 2014). However, so far, it has been largely unclear to what extent future expectations are involved in social class reproduction, that is, the persistence of inequality across generations, although developmental science has increasingly sought to understand the psychological processes that underlie social inequality in modern societies (Rogers, 2019). Extending both life-span psychological and life-course sociological research (e.g., Baltes, 1987; Elder et al. 2011; Vuolo et al., 2012), we investigate whether parental socioeconomic status, measured here by educational attainment and income, predicted children's future expectations across recent decades in two contiguous generations despite massive changes in economic conditions and in opportunities for children to enhance their future prospects via higher education. Taking into account historical change, we also examine the potentially shifting relationships across generations between children's future expectations and their academic achievement. We address the independent predictive power of three distinct future expectations for educational attainment, albeit only in the second generation, due to the lack of information about G3 educational attainment in our time series. Similarly, we can assess the implications of parental future expectations on children's expectations and achievement only in the G2-G3 dyad.

What have we found? First, there was remarkable continuity in the links between parental socioeconomic status and children's future orientations across generations. Parental education had an almost identical association with children's educational and control expectations in the G1-G2 and G2-G3 dyads. G1 household income was positively associated with G2 adolescent optimism, while G3 optimism was responsive to G2 educational attainment, but not income. Thus, despite reason to anticipate that historically significant economic and educational changes would alter the SES-adolescent expectations linkages, they were found to be quite persistent. This pattern is in line with theory and empirical evidence whereby children growing up in educationally underprivileged families typically exhibit less academic confidence and are consequently less hopeful of completing academic trajectories (Schoon, 2006; Schoon & Heckhausen, 2019).

In contrast, we find that the implications of adolescent expectations for adolescent academic achievement (grade point average) have changed across historical time. The changing links between individual anticipations and outcomes suggest that psychological and behavioral development is not constant over time, but may change across succeeding generations (cf., Greenfield, 2009). We had thought that future expectations across the board would become less predictive of educational achievement in view of the deteriorating economic context over the period of study; instead we found a shifting pattern of effects. Whereas G2 adolescent educational expectations were strongly linked with G2 grade point average (in 1990), we found no significant link among G3 adolescents (in 2011). The widespread increase in educational aspirations accompanying the expansion of higher education during this period may have made educational expectations less consequential for academic achievement (Reynolds & Johnson, 2011). Instead, at this juncture in history, control expectations and optimism seem to have become more important for G3 academic achievement, supposedly fostering effort and persistence in the face of academic challenges, and leading children to maintain effective academic functioning.

The implication for developmental psychology is clear: although the benefits of psychological resources, such as the three dimensions of future expectations of interest here, are usually considered universal, with no consideration of variation across historical contexts, we find that educational expectations may have mattered more for the academic achievement of adolescents who grew up in relatively favorable economic times, when opportunities were more plentiful. Such expectations made no difference for the academic achievement of children in the aftermath of the Great Recession in a context of grade inflation and heightened competition for jobs (e.g., Kalleberg, 2011). Instead, in this seemingly more challenging time, adolescents with a stronger sense of control over their futures, and those with greater optimism, had higher GPA's on average. These findings call for greater attention to the historical context in developmental research in the face of findings that diverge from prior trends. They confirm a central conclusion of life-span psychology and life-course sociological research that historical and sociocultural contexts shape individual functioning and life course outcomes (Baltes, 1987; Drewelies et al., 2018; Lerner, 2008).

With respect to educational attainment in the second generation, we find that G2 adolescent educational expectations were of primary importance, with both direct and indirect effects, the latter operating through adolescent grade point average. As noted above, the positive link between G2 educational expectations and G2 adult educational attainment replicates prior findings in the large body of status attainment research (Andrew & Hauser, 2011; Bozick et al., 2010; Sewell et al., 1969). What is unclear, and what cannot be addressed in this study, is whether the same link will be found in the next generation. We might surmise that the diminished influence of G3 educational expectations on G3 GPA portends a similar decline in the importance of G3 educational expectations for G3 educational attainment. However, if optimism promotes educational attainment in the third generation, the unequal distribution of optimism across families (indicated by the positive effect of G2 educational attainment on G3 optimism) may lead to the persistence of educational inequality across G2 and G3 generations. We await further data collection from G3 adolescents to address this question, and to discover whether control expectations and optimism may replace educational expectations as significant precursors of educational success. Again, developmental psychologists interested in attainment may take note.

Finally, and rather unexpectedly, we find that G2 adult parental optimistic and control expectations did not significantly predict G3 adolescents' expectations. These null findings fly in the face of a long tradition of studies demonstrating intergenerational transmission of psychological orientations via contemporaneous socialization processes (e.g., Grønhoj & Thøgersen, 2009). Net of the long-term influence of parental optimism measured during adolescence, contemporaneous parental optimism did not significantly predict adolescent child optimism. The predictive power of parental optimism during adolescence, with respect to children's optimism, is particularly important because studies of parents and children directed to the understanding of intergenerational social class reproduction are almost always limited to concurrent measures (Mortimer & McLaughlin, 2014), thus precluding documentation of long-term processes.

The findings suggest that intergenerational transmission of optimistic future expectations occurs as a long-term process extending over many years, rather than in the form of more immediate socialization during the child's adolescence. The level of optimism of the

parent, measured during the parent's adolescence, was positively related to the level of optimism of the third-generation adolescent child, despite an intervening period of more than twenty years. This pattern of "intergenerational development" (Cairns et al., 1998)—that is, intergenerational similarity in optimism at the same developmental stage (in adolescence)—suggests that optimism develops over a long period of time. We can only speculate about the mechanisms underlying such intergenerational parallel. It could be attributable to long-range patterns of socialization, parental child-rearing values and practices, role modelling, and direct tuition (e.g., Burger et al., 2020; Hurd et al., 2008; Johnson & Hitlin, 2017b). The third-generation adolescent children have had opportunities to observe their second-generation parents over many years, including their parents' challenges, modes of addressing problems, and the outcomes of these attempts and, hence, may have learned from observation (e.g., Bandura, 1986).

As previously discussed, findings from genetically informed research indicate that genetic transmission is most likely at issue as well (Caprara et al., 2009; Mosing et al., 2009; Schulman et al., 1993), although comparatively low heritability of optimism suggests that optimistic future expectations are sensitive to experiences and environmental influences across time (Carver et al., 2010). In many domains there is empirical evidence of gene-environment correlation, meaning that specific genotypes are unequally exposed to different environments (Gage et al., 2016; Kong et al., 2018; Scarr & McCartney, 1983; Stallings & Nepl, 2021). Our study does not allow us to gauge the relative, joint, or interactive influences of genetics and environments, but we recognize that inter- and intragenerational links involving future expectations found in this study likely resulted from the effects of genetics, historically changing environments, and the interplay between the two. More specifically, our empirical finding that intra- and intergenerational links among socioeconomic status, future expectations, and academic achievement vary to some extent across historical time suggest that genetic inheritance alone cannot explain the influences of family of origin on future orientations and academic achievement because we cannot assume that genetic influences change much across only two generations.

Several additional limitations of this study are deserving of note. First, as indicated in Figure 1, many plausible environmental influences on adolescent expectations, educational achievement, and socioeconomic attainment, possibly constituting mediators or moderators of the significant coefficients in our model (or eliminating them entirely), were unobserved. Second, the data were obtained from a single community in the U.S. Midwest, limiting the generalizability of the findings. Whereas St. Paul, Minnesota has demographic features that are commensurate with the nation at large (Mortimer, 2003), the adult population is somewhat better educated, the economy more diversified, and adolescents perhaps more optimistic than in other, more depressed economic regions of the country. Still, even if the level of future expectations were generally high within the entire sample, there would be little reason to expect that the intergenerational processes observed here would be specific to this community. Yet, we also acknowledge that geographic mobility, which is often associated with attainment processes, is not accounted for in this analysis. Geographically mobile individuals may have had distinct future expectations and educational trajectories whose effects were not disentangled in this study. Third, we have data from just one second-generation parent, the participant in the long-term Youth Development Study. Clearly, both

parents influence the development of their children. Fourth, and again because of data limitations, we do not have exactly comparable measures of second-generation optimism over time, with seven indicators for the second-generation respondents during adolescence, but just one for the second generation in adulthood. It is possible that stronger links between second-generation adult and third-generation adolescent optimism would have emerged if we had more indicators of this variable for second-generation adults.

Fifth, the restricted sample size may have limited our ability to detect indirect pathways of influence. The general configuration of results shown in Figure 3 suggests many indirect pathways (indicating, for instance, that second-generation adolescent educational expectations partially mediated the effect of first-generation educational attainment on second-generation adult educational attainment; or that second-generation adult educational attainment partially mediated the effect of second-generation adolescent educational expectations on the corresponding third-generation psychological construct). However, here we could demonstrate only two *indirect* pathways whose statistical significance survived the correction for multiple testing—first, the pathway from second-generation adolescent educational expectations to second-generation educational attainment via second-generation adolescent GPA; and second, the pathway from first-generation educational attainment to second-generation household income via first-generation household income. As this may be a consequence of our relatively small sample, we call for larger sample sizes in future research. Furthermore, because sample selection might have limited the generalizability of results, we replicated the analysis, without third-generation participants, with both the original (entire second-generation) sample ($N = 1139$) and the sample of second-generation nonparents ($N = 874$). The results of the replicated model using the original sample are reported in Tables S4 and S5 (Supplement 3). The results of the replicated model using the sample of second-generation nonparents are reported in Tables S6 and S7 (Supplement 3). Both replications corroborate the findings reported here. At the same time, they suggest that second-generation adolescent optimistic expectations were more strongly linked to subsequent outcomes (GPA, household income, and optimism and control expectations in adulthood), and educational expectations were more strongly linked to later household income, in the replication samples. These additional findings provide further evidence of the predictive power of future expectations, confirming our assumption that they are consequential for life course outcomes in economically prosperous historical times.

Sixth, effect sizes, indicated by standardized beta coefficients, are generally not large. The strongest effect (beta = .39) flows from G2 educational expectations to G2 academic achievement. Other significant coefficients range from .12 to .31. While the effect sizes are not large, it should be noted that they are net of all the other influences that were controlled. Estimating all paths in the fully recursive structural model might have led to “overcontrol,” with little residual variance left to estimate the effects we are particularly interested in theoretically. Moreover, some of the measurements were separated by long time periods. Given the sample size, we also had relatively low statistical power. Considering all these circumstances, finding a significant beta coefficient is noteworthy. As in much observational research, however, these coefficients are unlikely to represent unbiased causal estimates, given potential omitted variable issues.

Note also that, by study design, the age of children in the third generation did not permit us to estimate the links between their future orientations and their subsequent educational attainment. It would be interesting to observe such links to determine whether the expansion of higher education, the “hollowing-out” of the middle class, and the near universalization of post-secondary education have altered the predictive power of future orientations for educational attainment in the youth population, perhaps strengthening the presumed effects of optimism and control expectations. Finally, as noted earlier, this study did not use a genetically sensitive design. Recent research shows that parents influence their children by providing them with both an environment and genes, meaning that genetic influences likely explain a part of the effects estimated here (Hart et al., 2019). We plead that behavioral genetic research disentangle environmental and genetic pathways and their potential interactions (Briley et al., 2015) and that, in the meantime, we be cautious with any conclusions regarding purely environmental causation.

Despite these clear limitations, this research makes important contributions to the psychological understanding of attainment processes and the persistence of advantage across generations. We find that the links between parental education and adolescent future orientations were quite stable irrespective of the shifting historical context. However, the psychological correlates of academic achievement have changed in the face of historical shifts in higher education and the economic context. We document a decline over time in the predictive power of educational expectations with respect to academic achievement, and an increase in that of optimism and control expectations. Given our increasingly bifurcated economy, with rapid growth in service-oriented “bad jobs” and a smaller set of “good jobs,” college degrees have become increasingly necessary for stable employment (Vuolo et al., 2016). If grade point average continues to predict educational attainment, we might expect that optimism, passed down from parents to children over a long period of time, and control expectations, sensitive to parental education, would lead to persistent advantage for contemporary young people, assuring the continuation of social class reproduction. Overall, the findings foster understanding of the persistence of educational success, linked to particular future expectations, across generations and historical times.

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Table 1
Descriptive statistics

Measures	Measured in	Mean	SD	Min.	Max.
1st generation (N = 265)					
Highest educational attainment ^(a)	1988	2.00 ^(mode)	---	1	6
Logged household income	1988	10.64	0.78	8.42	12.06
2nd generation, in adolescence (N = 265)					
Educational expectations	1989				
Educational aspirations		4.17	1.40	1	6
Educational plans		3.58	1.32	1	6
Control expectations	1989				
Sense of competence		3.14	0.67	1	4
Perceived control over future events		3.44	0.64	1	4
Optimistic future expectations	1989				
Have a job that pays well		3.65	0.86	1	5
Be able to own your own home		3.61	1.04	1	5
Have a job that you enjoy doing		4.00	0.85	2	5
Have a happy family life		4.00	0.92	1	5
Be in good health most of the time		3.96	0.83	2	5
Be able to live wherever you want		3.56	1.06	1	5
Be respected in your community		3.72	0.88	1	5
Grade point average (GPA)	1990	7.32	2.52	1	12
Sex (1 = male)	1988	0.25	---	0	1
Race (1 = white)	1988	0.66	---	0	1
2nd generation, in adulthood (N = 265)					
Highest educational attainment ^(a)	2009	3.00 ^(mode)	---	1	5
Logged household income ^(b)	1999-2009	10.67	0.67	7.92	12.41
Control expectations	2011 ^(c)				
Sense of competence		3.22	0.54	2	4
Perceived control over future events		3.23	0.54	2	4
Optimistic future expectations	2011 ^(c)				
Future looks hopeful and promising		3.41	0.89	1	5
3rd generation, in adolescence (N = 422)					
Educational expectations	2011 ^(d)				
Educational aspirations		4.64	1.11	1	6
Educational plans		4.47	1.23	1	6
Control expectations	2011 ^(d)				
Sense of competence		3.19	0.69	1	4
Perceived control over future events		3.37	0.63	1	4
Optimistic future expectations	2011 ^(d)				
Have a job that pays well		3.97	0.85	1	5
Be able to own your own home		4.03	0.93	1	5
Have a job that you enjoy doing		4.03	0.91	1	5
Have a happy family life		4.11	0.88	1	5
Be in good health most of the time		4.12	0.79	1	5
Be able to live wherever you want		3.66	1.09	1	5
Be respected in your community		3.98	0.87	1	5
Grade point average (GPA)	2011 ^(d)	8.73	2.30	1	12
Sex (1 = male)	2011	0.47	---	0	1
Age at last available panel wave	2011 ^(d)	15.83	2.73	11	23

Note. ^(a) Because educational attainment is measured using an ordinal variable, the mode is reported rather than the mean. ^(b) Logged average yearly household income, earned from 1998 to 2008, was converted to 2008 US dollars to take account of inflation. ^(c) When data were missing in the 2011 wave, data from the 2009 and 2005 waves were substituted. ^(d) When data were missing in the 2011 wave, data from the 2010 or 2009 waves were substituted.

Table 2
Standardized path coefficients from the fully recursive structural equation model

Outcome	Predictor	Coeff.	P-value	P-value adjusted (FDR)
G1 household income	G1 educational attainment	.332***	.000	.000
G2 educational expectations in adolescence	G1 educational attainment	.132*	.033	.089
	G1 household income	.024	.677	.869
G2 control expectations in adolescence	G1 educational attainment	.162*	.010	.034
	G1 household income	-.031	.643	.857
G2 optimistic future expectations in adolescence	G1 educational attainment	.004	.960	.968
	G1 household income	.134*	.039	.101
G2 grade point average (GPA)	G1 educational attainment	.015	.743	.912
	G1 household income	.033	.471	.704
	G2 educational expectations in adolescence	.390***	.000	.000
	G2 control expectations in adolescence	-.052	.628	.856
	G2 optimistic future expectations in adolesc.	.154	.065	.147
G2 household income in adulthood	G1 educational attainment	.069	.184	.331
	G1 household income	.238***	.000	.000
	G2 educational expectations in adolescence	.004	.950	.968
	G2 control expectations in adolescence	-.023	.793	.916
	G2 optimistic future expectations in adolesc.	.122	.175	.319
G2 educational attainment in adulthood	G2 GPA	.118*	.032	.089
	G1 educational attainment	.167**	.001	.004
	G1 household income	.079	.133	.254
	G2 educational expectations in adolescence	.183**	.004	.015
	G2 control expectations in adolescence	.012	.881	.942
G2 optimistic future expectations in adulthood	G2 optimistic future expectations in adolesc.	.153	.057	.135
	G2 GPA	.225***	.000	.000
	G1 educational attainment	.005	.953	.968
	G1 household income	.104	.173	.319
	G2 educational expectations in adolescence	-.177	.059	.135
G2 control expectations in adulthood	G2 control expectations in adolescence	.229	.057	.135
	G2 optimistic future expectations in adolesc.	.072	.492	.725
	G2 educational attainment	.160*	.033	.089
	G2 household income	.029	.718	.908
	G2 GPA	.073	.367	.583
	G1 educational attainment	-.091	.152	.286
	G1 household income	.078	.248	.421
	G2 educational expectations in adolescence	-.101	.227	.390
	G2 control expectations in adolescence	.305*	.010	.034
G3 educational expectations in adolescence	G2 optimistic future expectations in adolesc.	.024	.838	.924
	G2 educational attainment	.147*	.030	.087
	G2 household income	-.023	.791	.916
	G2 GPA	.028	.626	.856
	G1 educational attainment	.064	.298	.499
	G1 household income	-.016	.814	.924
	G2 educational expectations in adolescence	-.171	.073	.159
	G2 control expectations in adolescence	.173	.103	.216
	G2 optimistic future expectations in adolesc.	.018	.850	.925
G3 control expectations in adolescence	G2 educational attainment	.178*	.022	.067
	G2 household income	.013	.842	.924
	G2 GPA	.006	.934	.968
	G2 optimistic future expectations in adalth.	-.034	.680	.870
	G2 control expectations in adulthood	-.061	.497	.725
G3 control expectations in adolescence	G1 educational attainment	-.065	.363	.853

	G1 household income	.028	.725	.908
	G2 educational expectations in adolescence	-.142	.133	.254
	G2 control expectations in adolescence	.028	.782	.916
	G2 optimistic future expectations in adolesc.	.172	.113	.226
	G2 educational attainment	.194*	.011	.035
	G2 household income	-.041	.564	.795
	G2 GPA	-.037	.617	.856
	G2 optimistic future expectations in adalth.	-.067	.410	.628
	G2 control expectations in adulthood	.025	.798	.916
G3 optimistic future expectations in adolescence	G1 educational attainment	.012	.841	.924
	G1 household income	-.017	.792	.916
	G2 educational expectations	.003	.115	.226
	G2 control expectations	-.074	.550	.784
	G2 optimistic future expectations in adolesc.	.199*	.030	.087
	G2 educational attainment in adolescence	.150*	.037	.098
	G2 household income in adolescence	.104	.115	.226
	G2 GPA	-.030	.657	.858
	G2 optimistic future expectations in adalth.	-.068	.434	.656
	G2 control expectations in adulthood	.034	.650	.857
G3 grade point average (GPA)	G1 educational attainment	-.011	.840	.924
	G1 household income	.045	.338	.551
	G2 educational expectations	.062	.378	.593
	G2 control expectations in adolescence	.009	.919	.966
	G2 optimistic future expectations in adolesc.	-.023	.765	.916
	G2 educational attainment in adolescence	.094	.111	.226
	G2 household income	.079	.097	.207
	G2 GPA	.019	.734	.911
	G2 optimistic future expectations in adalth.	.092	.206	.365
	G2 control expectations in adulthood	-.145**	.009	.032
	G3 educational expectations in adolescence	.128	.059	.135
	G3 control expectations in adolescence	.141*	.045	.112
	G3 optimistic future expectations in adolesc.	.193**	.009	.032

*** $p < .001$, ** $p < .01$, * $p < .05$ (p -values unadjusted for multiple testing). The last column reports p -values adjusted for multiple testing using the false discovery rate (FDR) method proposed by Benjamini and Hochberg (1995). The following covariates were included in the model but not shown here: G2 sex and G3 sex and age. The complete table with all coefficients is provided in Supplement 2 (see Table S3).

Table 3
Latent factors and residual correlations

Latent factors	Indicators	Loading	<i>P</i> -value	<i>P</i> -value adjusted (FDR)
2nd generation, in adolescence (1989)				
G2 educational expectations	Educational aspirations	.758		
	Educational plans	1.017***	.000	.000
G2 control expectations	Sense of competence	.571		
	Perceived control	.797***	.000	.000
G2 optimistic future expectations	Have a job that pays well	.800		
	Able to own your own home	.877***	.000	.000
	Have a job that you enjoy doing	.702***	.000	.000
	Have a happy family life	.577***	.000	.000
	Be in good health most of the time	.494***	.000	.000
	Able to live wherever you want	.528***	.000	.000
	Be respected in your community	.648***	.000	.000
2nd generation, in adulthood (2011)				
G2 control expectations	Sense of competence	1.026		
	Perceived control	.968***	.000	.000
3rd generation, in adolescence (2011)				
G3 educational expectations	Educational aspirations	.742		
	Educational plans	.909***	.000	.000
G3 control expectations	Sense of competence	.827		
	Perceived control	.517***	.000	.000
G3 optimistic future expectations	Have a job that pays well	.768		
	Able to own your own home	.818***	.000	.000
	Have a job that you enjoy doing	.750***	.000	.000
	Have a happy family life	.615***	.000	.000
	Be in good health most of the time	.584***	.000	.000
	Able to live wherever you want	.687***	.000	.000
	Be respected in your community	.627***	.000	.000
Residual correlation between				
	and	Coeff.		
G2 optimistic future expectations (1989)	G2 control expectations (1989)	.517***	.000	.000
G2 optimistic future expectations (1989)	G2 educational expectations (1989)	.568***	.000	.000
G2 control expectations (1989)	G2 educational expectations (1989)	.307***	.000	.000
G2 household income (1999-2009)	G2 educational attainment (2009)	.110	.055	.784
G2 optimistic future expectations (2011)	G2 control expectations (2011)	.271***	.000	.000
G3 optimistic future expectations (2011)	G3 control expectations (2011)	.433***	.000	.000
G3 optimistic future expectations (2011)	G3 educational expectations (2011)	.346***	.000	.000
G3 control expectations (2011)	G3 educational expectations (2011)	.172*	.039	.605

Note. Standardized coefficients. *** $p < .001$, ** $p < .01$, * $p < .05$ (p -values unadjusted for multiple testing). The last column reports p -values adjusted for multiple testing using the false discovery rate (FDR) method proposed by Benjamini and Hochberg (1995).

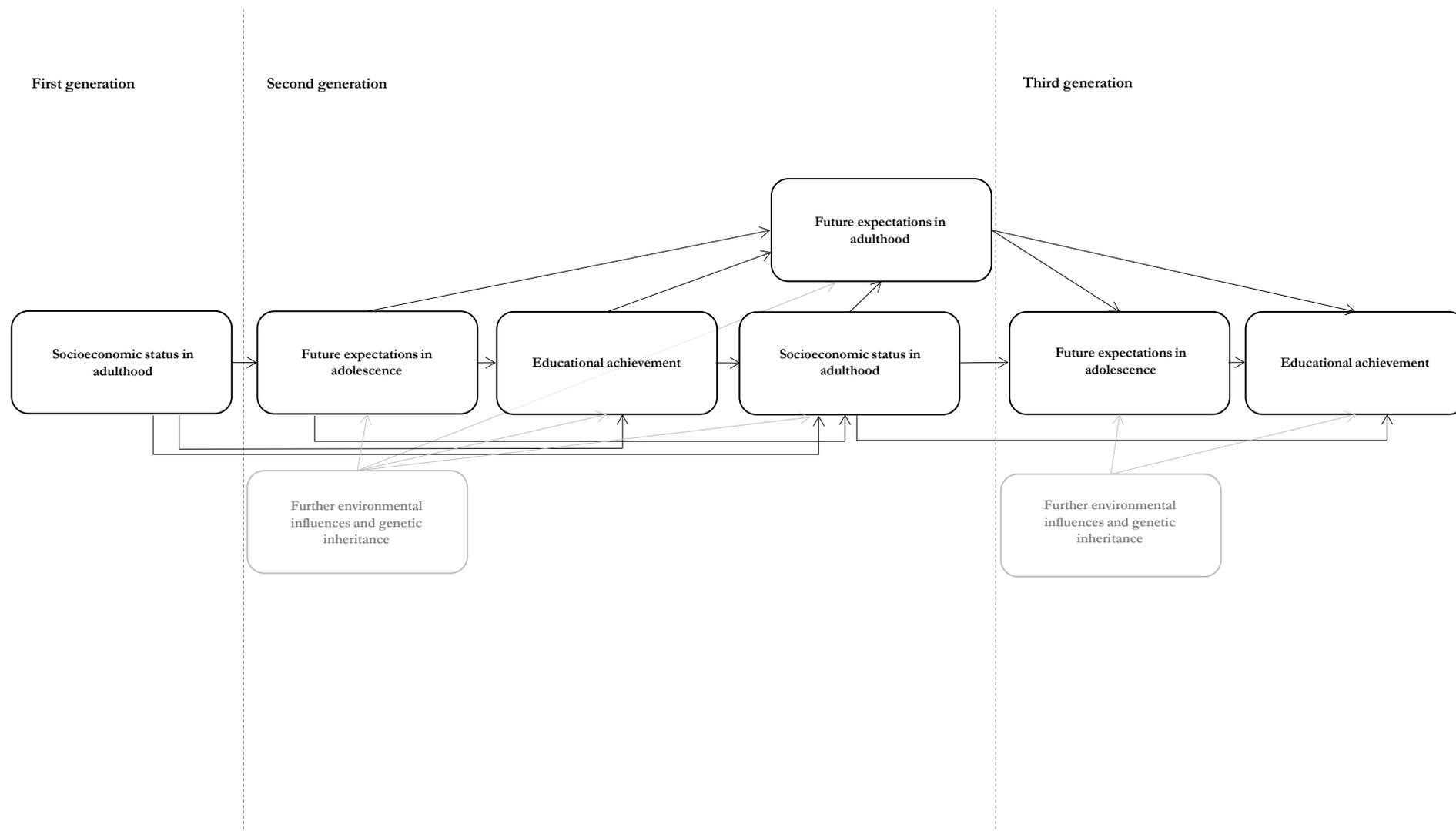


Figure 1. Theoretical causal model animating our study. Factors in black boxes were observed empirically; factors in gray boxes were unobserved.

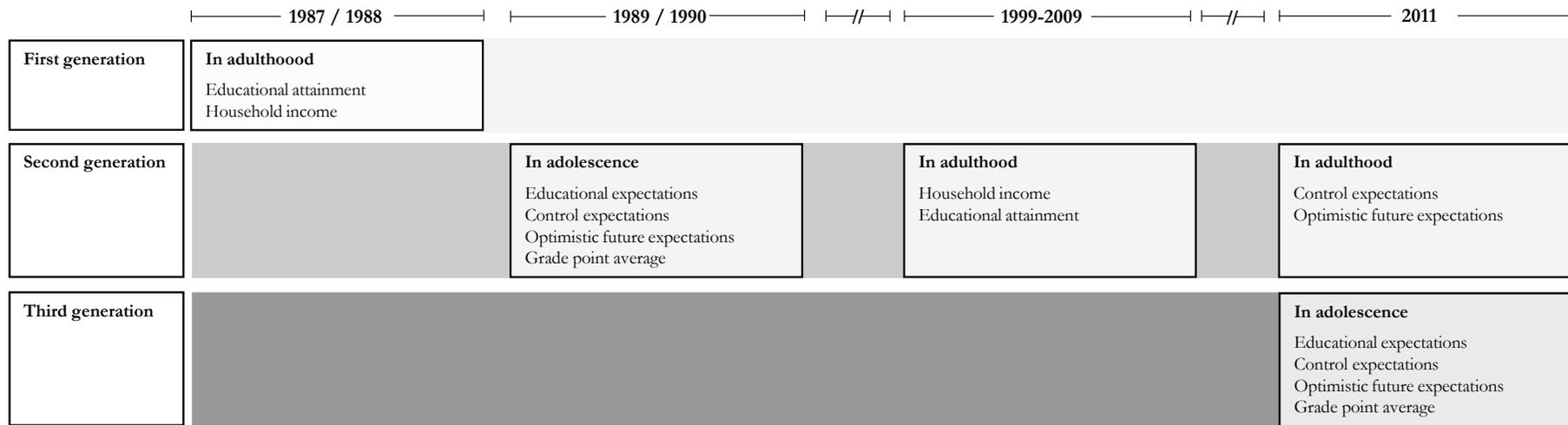


Figure 2. Conceptual model illustrating when and for which generation of respondents the key study variables were measured.

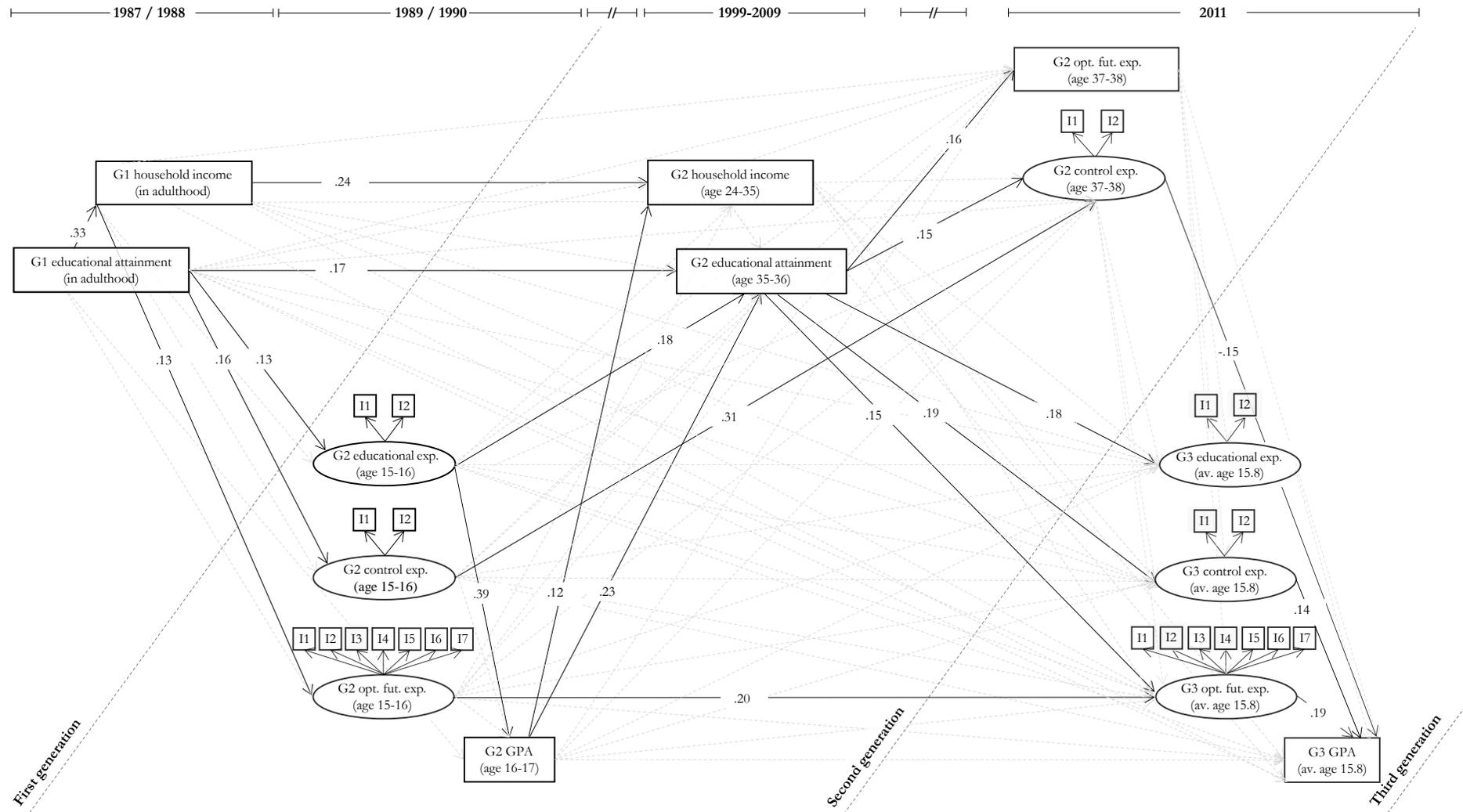


Figure 3. Structural equation model illustrating how influence flows from first-generation adult characteristics to second-generation characteristics (assessed from age 15-16 through age 37-38), and subsequently to third-generation characteristics (assessed at average age 15.8). The structural model was saturated, with paths between variables that exhibit a temporal sequence and residual correlations between contemporaneous variables. Solid arrows depict statistically significant paths; dotted arrows depict nonsignificant paths. Residual correlations are not shown for the sake of readability. The model controls for second-generation sex and third-generation sex and age (not depicted).

Supplemental Materials

Socioeconomic Origin, Future Expectations, and Educational Achievement: A Longitudinal Three-Generation Study of the Persistence of Family Advantage

Abstract

This file contains supplementary information for the article “Socioeconomic Origin, Future Expectations, and Educational Achievement: A Longitudinal Three-Generation Study of the Persistence of Family Advantage.” It is designed to be used as a reference for readers seeking information on specific subjects. It is not designed to be read from beginning to end.

Supplement 1

Correlation Matrix

Table S1 reports the zero-order correlations among all manifest variables. Table 1 in the main document provides information on when each of the variables was measured and it summarizes the descriptive statistics for all variables.

Table S1
Zero-order correlations

Measures	1	2	3.1	3.2	4.1	4.2	5.1	5.2	5.3	5.4	5.5	5.6
1st generation												
1 Highest educational attainment												
2 Logged household income	.332***											
2nd generation, in adolescence												
<i>Educational expectations</i>												
3.1 Educational aspirations	.018	-.053										
3.2 Educational plans	.124*	.042	.760***									
<i>Control expectations</i>												
4.1 Sense of competence	.045	-.024	.104	.214***								
4.2 Perceived control over future	.139***	.055	.186***	.308***	.450***							
<i>Optimistic future expectations</i>												
5.1 Job that pays well	.002	.030	.340***	.500***	.143***	.322***						
5.2 Own your own home	.041	.093	.327***	.497***	.223***	.338***	.730***					
5.3 Job that you enjoy doing	-.008	.044	.337***	.471***	.150**	.301***	.573***	.602***				
5.4 Happy family life	-.021	.010	.179***	.282***	.255***	.302***	.449***	.546***	.404***			
5.5 Good health most of the time	-.080	.093	.129*	.223***	.228***	.237***	.338***	.393***	.424***	.481***		
5.6 Live wherever you want	.197***	.039	.105*	.301***	.156**	.217***	.368***	.459***	.443***	.296***	.389***	
5.7 Respected in the community	.062	.071	.158**	.279***	.289***	.297***	.518***	.525***	.467***	.436***	.425***	.388***
6 Grade point average (GPA)	.059	.003	.383***	.471***	.234***	.102*	.200***	.267***	.238***	.189***	.274***	.258***
7 Male	-.096	-.012	-.096	-.051	-.037	-.021	.061	.137**	-.057	.020	.078	.046
2nd generation, in adulthood												
8 Highest educational attainment	.255***	.086	.339***	.415***	.188***	.123*	.245***	.293***	.149**	.101*	.098	.159**
9 Logged household income	.126*	.199***	.095	.139**	.015	.068	.134**	.270**	.085	.091	.101*	.184***
<i>Control expectations</i>												
10.1 Sense of competence	-.004	.254	-.010	.066	.244***	.210**	.156*	.134*	.144*	.110	.143*	.065
10.2 Perceived control over future	-.002	.073	-.010	0.66	.241***	.216**	.150*	.136*	.143*	.117	.142*	.053
<i>Optimistic future expectations</i>												
11 Future hopeful and promising	.083	.140*	.061	.046	.191**	.183**	.224***	.191**	.134*	.153*	.093	.065

Note. Pearson correlations, point-biserial correlations, and Phi coefficients. For Phi coefficients (which indicate the association between two binary variables), approximate significance is indicated. *** $p < .001$, ** $p < .01$, * $p < .05$.

Table S1
Zero-order correlations (continued)

Measures	1	2	3.1	3.2	4.1	4.2	5.1	5.2	5.3	5.4	5.5	5.6
3rd generation, in adolescence												
<i>Educational expectations</i>												
12.1 Educational aspirations	.081	-.045	-.044	.036	.118*	.036	.102*	.075	.012	.088	.005	.054
12.2 Educational plans	.112*	.014	-.004	.049	.082	.034	.082	.028	.019	.049	.027	.114*
<i>Control expectations</i>												
13.1 Sense of competence	-.026	.031	-.037	.015	.074	.016	.074	.093	.061	.005	-.016	-.003
13.2 Perceived control over future	-.018	-.039	-.068	-.080	.027	-.061	.009	-.016	.067	.056	.091	.005
<i>Optimistic future expectations</i>												
14.1 Job that pays well	.034	.071	.030	.102	.142**	.064	.127*	.148**	.125*	.097	.103*	.113*
14.2 Own your own home	.118*	.053	.063	.113*	.113*	.052	.163**	.237***	.121*	.108*	.064	.139**
14.3 Job that you enjoy doing	.000	.050	.039	.100	.066	.026	.138**	.126*	.098	.061	.107*	.110*
14.4 Happy family life	.065	.049	.082	.125*	.128*	.024	.140**	.156**	.127*	.180	.100*	.147**
14.5 Good health most of the time	-.020	-.017	.061	.108*	.110*	.033	.071	.087	.065	.101	.045	.062
14.6 Live wherever you want	.028	-.034	.078	.090	.022	.020	.017	.095	.063	.022	.002	.084
14.7 Respected in the community	.053	.015	.051	.106*	.054	-.043	.085	.140**	.139**	.023	.057	.143**
15 Grade point average (GPA)	.096	.120*	.118*	.134*	-.006	.011	.115***	.175***	.002	.062	-.020	-.009
16 Male	.038	-.038	.019	.018	.093	.064	.033	.090	.057	.040	.021	.063
17 Age at last available wave	-.128*	-.167**	-.078	-.098	.092	.021	-.060	-.117*	-.033	-.042	-.065	-.085

Note. Pearson correlations, point-biserial correlations, and Phi coefficients. For Phi coefficients (which indicate the association between two binary variables), approximate significance is indicated.
*** $p < .001$, ** $p < .01$, * $p < .05$.

Table S1
Zero-order correlations (continued)

Measures	5.7	6	7	8	9	10.1	10.2	11	12.1	12.2	13.1	13.2
2nd generation, in adolescence												
6 Grade point average (GPA)	.164**											
7 Male	-.005	.047										
2nd generation, in adulthood												
8 Highest educational attainment	.201***	.407***	-.036									
9 Logged household income	.116*	.225***	.266***	.280***								
<i>Control expectations</i>												
10.1 Sense of competence	.125*	.060	.002	.085	.002							
10.2 Perceived control over future	.134*	.053	-.002	.077	.007	.993****						
<i>Optimistic future expectations</i>												
11 Future hopeful and promising	.027	.094	.020	.185**	.132*	.282***	.262***					
3rd generation, in adolescence												
<i>Educational expectations</i>												
12.1 Educational aspirations	.070	.058	.127*	.151**	.049	-.066	-.078	.051				
12.2 Educational plans	.094	.093	.169**	.184***	.100*	-.063	-.072	.030	.686***			
<i>Control expectations</i>												
13.1 Sense of competence	.059	.035	.009	.111*	-.015	.060	.068	.017	.157**	.135**		
13.2 Perceived control over future	.056	-.017	.027	.073	.027	-.002	.005	-.074	.067	.095	.421***	
<i>Optimistic future expectations</i>												
14.1 Job that pays well	.117*	.074	-.048	.158**	.073	.060	.060	-.015	.228***	.242***	.292***	.074
14.2 Own your own home	.164**	.084	.032	.210***	.231***	.006	.014	.003	.277***	.281***	.232***	.117*
14.3 Job that you enjoy doing	.124*	.057	.009	.191***	.088	.023	.023	-.090	.215***	.264***	.280***	.154**
14.4 Happy family life	.139*	.076	.032	.208***	.076	.057	.056	-.010	.162**	.174**	.201***	.131**
14.5 Good health most of the time	.144**	.016	.080	.098	.095	.018	.026	-.032	.107*	.173**	.233***	.120*
14.6 Live wherever you want	.105*	.066	.047	.158**	.148**	.009	.011	-.039	.208***	.173**	.243***	.155**
14.7 Respected in the community	.119*	.090	.007	.225***	.145**	.068	.067	.044	.240***	.256***	.218***	.135**
15 Grade point average (GPA)	.083	.147***	.073	.230***	.173***	-.089	-.082	.104	.262***	.299***	.179***	.120***
16 Male	.062	.018	-.109*	.050	.041	.027	.034	-.059	-.195***	-.169**	.099*	.064
17 Age at last available wave	-.125*	-.040	-.195***	-.140**	-.188***	.087	.087	-.035	-.020	-.193***	.026	.036

Note. Pearson correlations, point-biserial correlations, and Phi coefficients. For Phi coefficients (which indicate the association between two binary variables), approximate significance is indicated. *** $p < .001$, ** $p < .01$, * $p < .05$.

Table S1
 Zero-order correlations (continued)

Measures	14.1	14.2	14.3	14.4	14.5	14.6	14.7	15	16	17
3rd generation, in adolescence										
<i>Optimistic future expectations</i>										
14.2 Own your own home	.715***									
14.3 Job that you enjoy doing	.606***	.613***								
14.4 Happy family life	.453***	.483***	.550***							
14.5 Good health most of the time	.432***	.458***	.425***	.426***						
14.6 Live wherever you want	.521***	.598***	.523***	.392***	.418***					
14.7 Respected in the community	.432***	.502***	.443***	.515***	.502***	.519***				
15 Grade point average (GPA)	.277***	.325***	.294***	.199***	.130*	.174**	.150**			
16 Male	-.018	-.027	-.087	-.050	.051	.040	-.025	-.217***		
17 Age at last available wave	-.048	-.190***	-.149**	-.079	-.097	-.121*	-.140**	-.265***	.012	

Note. Pearson correlations, point-biserial correlations, and Phi coefficients. For Phi coefficients (which indicate the association between two binary variables), approximate significance is indicated.
 *** $p < .001$, ** $p < .01$, * $p < .05$.

Supplement 2

Descriptive Statistics for the Analytic Sample, the Original Sample, and the Sample of Nonparents

Table S2 reports descriptive statistics for all manifest variables for the analytic sample; for the original sample, including second-generation parents and nonparents; and for the sample of second-generation nonparents. The main differences between the different samples are summarized in the Measures section.

Table S2

Descriptive statistics for the analytic (three-generation) sample (N = 422), the original (two-generation) sample (N = 1139), and the sample of (G2) nonparents (N = 874)

Measures	Analytic sample					Original sample				Sample of nonparents			
	Measured in	Mean	SD	Min.	Max.	Mean	SD	Min.	Max.	Mean	SD	Min.	Max.
1st generation													
Highest educational attainment ^(a)	1988	2.00 ^(mode)	---	1	6	2.00 ^(mode)	---	1	6	2.00 ^(mode)	---	1	6
Logged household income	1988	10.64	0.78	8.42	12.06	10.81	0.81	8.47	12.20	10.83	0.82	8.47	12.20
2nd generation, in adolescence													
Educational expectations													
Educational aspirations	1989	4.17	1.40	1	6	4.46	1.30	1	6	4.53	1.26	1	6
Educational plans		3.58	1.32	1	6	3.86	1.29	1	6	3.93	1.27	1	6
Control expectations													
Sense of competence	1989	3.14	0.67	1	4	3.15	0.68	1	4	3.14	0.68	1	4
Perceived control over future events		3.44	0.64	1	4	3.38	0.62	1	4	3.38	0.62	1	4
Optimistic future expectations													
Have a job that pays well	1989	3.65	0.86	1	5	3.79	0.81	1	5	3.82	0.79	1	5
Be able to own your own home		3.61	1.04	1	5	3.84	0.96	1	5	3.88	0.94	1	5
Have a job that you enjoy doing		4.00	0.85	2	5	4.00	0.86	1	5	4.00	0.86	1	5
Have a happy family life		4.00	0.92	1	5	3.97	0.90	1	5	3.96	0.89	1	5
Be in good health most of the time		3.96	0.83	2	5	4.03	0.83	1	5	4.05	0.83	1	5
Be able to live wherever you want		3.56	1.06	1	5	3.60	1.03	1	5	3.59	1.02	1	5
Be respected in your community		3.72	0.88	1	5	3.81	0.88	1	5	3.81	0.89	1	5
Grade point average (GPA)	1990	7.32	2.52	1	12	7.69	2.45	1	12	7.83	2.43	1	12
Sex (1 = male)	1988	0.25	---	0	1	0.47	---	0	1	0.54	---	0	1
Race (1 = white)	1988	0.66	---	0	1	0.63	---	0	1	0.65	---	0	1
2nd generation, in adulthood													
Highest educational attainment ^(a)	2009	3.00 ^(mode)	---	1	5	4.00 ^(mode)	---	1	6	4.00 ^(mode)	---	1	6
Logged household income ^(b)	1999-2009	10.67	0.67	7.92	12.41	10.91	0.95	4.09	13.12	10.97	1.00	4.09	13.12
Control expectations													
Sense of competence	2011 ^(c)	3.22	0.54	2	4	3.23	0.60	1	4	3.21	0.63	1	4
Perceived control over future events		3.23	0.54	2	4	3.30	0.58	1	4	3.29	0.59	1	4
Optimistic future expectations													
Future looks hopeful and promising	2011 ^(c)	3.41	0.89	1	5	3.44	0.88	1	5	3.44	0.88	1	5

Note. This table does not include the G3 variables. ^(a) Because educational attainment is measured using an ordinal variable, the mode is reported rather than the mean which would not be readily interpretable. ^(b) Logged average yearly household income, earned from 1998 to 2008, converted to 2008 US dollars to take account of inflation. ^(c) When data were missing in the 2011 wave, data from the 2009 and 2005 waves were substituted.

Complete Table with all Coefficients from the Structural Equation Model

Table S3 shows all coefficients from the fully recursive structural equation model, including the coefficients of G2 sex and G3 sex and age. It reports both p -values unadjusted for multiple testing and p -values adjusted for multiple testing using the false discovery rate method (FDR).

Table S3

Standardized path coefficients from the fully recursive structural equation model (including all covariates)

Outcome	Predictor	Coefficient	P -value	P -value adjusted (FDR)
G1 household income	G1 educational attainment	.332***	.000	.000
G2 educational expectations in adolescence	G1 educational attainment	.132*	.033	.089
	G1 household income	.024	.677	.869
G2 control expectations in adolescence	G2 male	-.048	.317	.524
	G1 educational attainment	.162*	.010	.034
	G1 household income	-.031	.643	.857
G2 optimistic future expectations in adolescence	G2 male	-.009	.889	.942
	G1 educational attainment	.004	.960	.968
	G1 household income	.134*	.039	.101
G2 grade point average (GPA)	G2 male	.130*	.017	.053
	G1 educational attainment	.015	.743	.912
	G1 household income	.033	.471	.704
	G2 educational expectations in adolescence	.390***	.000	.000
G2 household income in adulthood	G2 control expectations in adolescence	-.052	.628	.856
	G2 optimistic future expectations in adolescence	.154	.065	.147
	G2 male	.063	.221	.386
	G1 educational attainment	.069	.184	.331
	G1 household income	.238***	.000	.000
	G2 educational expectations in adolescence	.004	.950	.968
	G2 control expectations in adolescence	-.023	.793	.916
G2 educational attainment in adulthood	G2 optimistic future expectations in adolescence	.122	.175	.319
	G2 GPA	.118*	.032	.089
	G2 male	.304***	.000	.000
	G1 educational attainment	.167**	.001	.004
	G1 household income	.079	.133	.254
G2 educational attainment in adulthood	G2 educational expectations in adolescence	.183**	.004	.015
	G2 control expectations in adolescence	.012	.881	.942

	G2 optimistic future expectations in adolescence	.153	.057	.135
	G2 GPA	.225***	.000	.000
	G2 male	-.008	.879	.942
G2 optimistic future expectations in adulthood	G1 educational attainment	.005	.953	.968
	G1 household income	.104	.173	.319
	G2 educational expectations in adolescence	-.177	.059	.135
	G2 control expectations in adolescence	.229	.057	.135
	G2 optimistic future expectations in adolescence	.072	.492	.725
	G2 educational attainment	.160*	.033	.089
	G2 household income	.029	.718	.908
	G2 GPA	.073	.367	.583
	G2 male	-.005	.942	.968
G2 control expectations in adulthood	G1 educational attainment	-.091	.152	.286
	G1 household income	.078	.248	.421
	G2 educational expectations in adolescence	-.101	.227	.390
	G2 control expectations in adolescence	.305*	.010	.034
	G2 optimistic future expectations in adolescence	.024	.838	.924
	G2 educational attainment	.147*	.030	.087
	G2 household income	-.023	.791	.916
	G2 GPA	.028	.626	.856
	G2 male	-.003	.972	.972
G3 educational expectations in adolescence	G1 educational attainment	.064	.298	.499
	G1 household income	-.016	.814	.924
	G2 educational expectations in adolescence	-.171	.073	.159
	G2 control expectations in adolescence	.173	.103	.216
	G2 optimistic future expectations in adolescence	.018	.850	.925
	G2 educational attainment	.178*	.022	.067
	G2 household income	.013	.842	.924
	G2 GPA	.006	.934	.968
	G2 optimistic future expectations in adulthood	-.034	.680	.870
	G2 control expectations in adulthood	-.061	.497	.725
	G3 male	-.251**	.001	.004
	G3 age	-.153*	.013	.041
G3 control expectations in adolescence	G1 educational attainment	-.065	.363	.853
	G1 household income	.028	.725	.908
	G2 educational expectations in adolescence	-.142	.133	.254
	G2 control expectations in adolescence	.028	.782	.916
	G2 optimistic future expectations in adolescence	.172	.113	.226
	G2 educational attainment	.194*	.011	.035

	G2 household income	-.041	.564	.795
	G2 GPA	-.037	.617	.856
	G2 optimistic future expectations in adulthood	-.067	.410	.628
	G2 control expectations in adulthood	.025	.798	.916
	G3 male	.112	.069	.153
	G3 age	.030	.645	.857
G3 optimistic future expectations in adolescence	G1 educational attainment	.012	.841	.924
	G1 household income	-.017	.792	.916
	G2 educational expectations	.003	.115	.226
	G2 control expectations	-.074	.550	.784
	G2 optimistic future expectations in adolescence	.199*	.030	.087
	G2 educational attainment in adolescence	.150*	.037	.098
	G2 household income in adolescence	.104	.115	.226
	G2 GPA	-.030	.657	.858
	G2 optimistic future expectations in adulthood	-.068	.434	.656
	G2 control expectations in adulthood	.034	.650	.857
	G3 male	-.017	.759	.916
	G3 age	-.111*	.042	.106
G3 grade point average (GPA)	G1 educational attainment	-.011	.840	.924
	G1 household income	.045	.338	.551
	G2 educational expectations	.062	.378	.593
	G2 control expectations in adolescence	.009	.919	.966
	G2 optimistic future expectations in adolescence	-.023	.765	.916
	G2 educational attainment in adolescence	.094	.111	.226
	G2 household income	.079	.097	.207
	G2 GPA	.019	.734	.911
	G2 optimistic future expectations in adulthood	.092	.206	.365
	G2 control expectations in adulthood	-.145**	.009	.032
	G3 educational expectations in adolescence	.128	.059	.135
	G3 control expectations in adolescence	.141*	.045	.112
	G3 optimistic future expectations in adolescence	.193**	.009	.032
	G3 male	-.191***	.000	.000
	G3 age	-.186**	.001	.004

*** $p < .001$, ** $p < .01$, * $p < .05$ (p -values unadjusted for multiple testing). The last column reports p -values adjusted for multiple testing using the false discovery rate (FDR) method proposed by Benjamini and Hochberg (1995).

Supplement 3

Replication of the Structural Equation Model Using Distinct Samples

To estimate the extent to which the model results are sensitive to the use of distinct samples, we replicated the structural equation model using different samples. Tables S4 and S5 summarize the results from the model that is based on the original (entire second-generation) sample which includes 1139 respondents. Tables S6 and S7 summarize the results from the model that is based on the sample of second-generation nonparents which includes 874 respondents. As mentioned in the Discussion in the main manuscript, both replications corroborate the findings reported in this article. In addition, they indicate that, in the replication samples, adolescent optimistic expectations were more strongly associated with subsequent outcomes (educational achievement in adolescence as well as household income, optimism and control expectations in adulthood), and educational expectations were more strongly associated with later household income. These findings further strengthen the theory that certain future expectations are consequential for individual development, contributing to shape life course outcomes (cf., Ashby & Schoon, 2010; Beal & Crockett, 2010; Burger, in press; Schoon et al., 2021).

Table S4

Standardized path coefficients from the fully recursive structural equation model, based on the original (G2) sample (N = 1139)

Outcome	Predictor	Coefficient	P-value	P-value adjusted (FDR)
G1 household income	G1 educational attainment	.421***	.000	.000
G2 educational expectations in adolescence	G1 educational attainment	.339***	.000	.000
	G1 household income	.051	.167	.247
G2 control expectations in adolescence	G2 male	-.082*	.015	.032
	G1 educational attainment	-.043	.407	.485
G2 optimistic future expectations in adolescence	G1 household income	-.002	.967	.967
	G2 male	.045	.266	.369
	G1 educational attainment	.065	.104	.165
G2 grade point average (GPA)	G1 household income	.117**	.006	.014
	G2 male	.095**	.009	.020
	G1 educational attainment	.143***	.000	.000
	G1 household income	.058	.082	.141
G2 household income in adulthood	G2 educational expectations in adolescence	.351***	.000	.000
	G2 control expectations in adolescence	-.004	.920	.935
	G2 optimistic future expectations in adolescence	.136**	.001	.003
	G2 male	-.049	.099	.162
G2 household income in adulthood	G1 educational attainment	.013	.756	.794
	G1 household income	.071	.137	.207

	G2 educational expectations in adolescence	.181**	.003	.008
	G2 control expectations in adolescence	-.043	.439	.514
	G2 optimistic future expectations in adolescence	.151**	.006	.014
	G2 GPA	.090	.051	.096
	G2 male	.078	.059	.108
G2 educational attainment in adulthood	G1 educational attainment	.206***	.000	.000
	G1 household income	.037	.359	.444
	G2 educational expectations in adolescence	.264***	.000	.000
	G2 control expectations in adolescence	-.033	.479	.540
	G2 optimistic future expectations in adolescence	.047	.365	.444
	G2 GPA	.276***	.000	.000
	G2 male	-.034	.307	.414
G2 optimistic future expectations in adulthood	G1 educational attainment	.075	.099	.162
	G1 household income	-.031	.464	.533
	G2 educational expectations in adolescence	-.144*	.017	.035
	G2 control expectations in adolescence	.071	.352	.444
	G2 optimistic future expectations in adolescence	.174**	.003	.008
	G2 educational attainment	.208***	.000	.000
	G2 household income	.027	.542	.600
	G2 GPA	.009	.854	.882
	G2 male	-.062	.126	.195
G2 control expectations in adulthood	G1 educational attainment	-.048	.349	.444
	G1 household income	-.025	.626	.669
	G2 educational expectations in adolescence	-.061	.332	.438
	G2 control expectations in adolescence	.198	.061	.108
	G2 optimistic future expectations in adolescence	.150*	.018	.035
	G2 educational attainment	.162*	.013	.029
	G2 household income	-.058	.268	.369
	G2 GPA	-.064	.258	.369
	G2 male	-.023	.607	.660

*** $p < .001$, ** $p < .01$, * $p < .05$ (p -values unadjusted for multiple testing). The last column reports p -values adjusted for multiple testing using the false discovery rate (FDR) method proposed by Benjamini and Hochberg (1995).

Table S5

Latent factors and residual correlations, based on the original (G2) sample (N = 1139)

Latent factors	Indicators	Loading	<i>P</i> -value	<i>P</i> -value adjusted (FDR)
2nd generation in adolescence (1989)				
G2 educational expectations	Educational aspirations	.767		
	Educational plans	.973***	.000	.000
G2 control expectations	Sense of competence	.854		
	Perceived control	.333*	.040	.008
G2 optimistic future expectations	Have a job that pays well	.754		
	Able to own your own home	.777***	.000	.000
	Have a job that you enjoy doing	.699***	.000	.000
	Have a happy family life	.592***	.000	.000
	Be in good health most of the time	.549***	.000	.000
	Able to live wherever you want	.512***	.000	.000
	Be respected in your community	.598***	.000	.000
2nd generation in adulthood (2011)				
G2 control expectations	Sense of competence	.937		
	Perceived control	.586***	.000	.000
Residual correlation between	and	Coefficient		
G2 optimistic future expectations (1989)	G2 control expectations (1989)	.277***	.000	.000
G2 optimistic future expectations (1989)	G2 educational expectations (1989)	.371***	.000	.000
G2 control expectations (1989)	G2 educational expectations (1989)	.197***	.000	.000
G2 household income (1999-2009)	G2 educational attainment (2009)	.165**	.003	.008
G2 optimistic future expectations (2011)	G2 control expectations (2011)	.357***	.000	.000

Note. Standardized coefficients. *** $p < .001$, ** $p < .01$, * $p < .05$ (p -values unadjusted for multiple testing). The last column reports p -values adjusted for multiple testing using the false discovery rate (FDR) method proposed by Benjamini and Hochberg (1995).

Table S6

Standardized path coefficients from the fully recursive structural equation model, based on the sample of (G2) nonparents (N = 874)

Outcome	Predictor	Coefficient	P-value	P-value adjusted (FDR)
G1 household income	G1 educational attainment	.446***	.000	.000
G2 educational expectations in adolescence	G1 educational attainment	.373***	.000	.000
	G1 household income	.042	.331	.419
	G2 male	-.107**	.307	.408
G2 control expectations in adolescence	G1 educational attainment	-.003	.978	.978
	G1 household income	.054	.421	.492
	G2 male	.091	.307	.408
G2 optimistic future expectations in adolescence	G1 educational attainment	.080	.080	.155
	G1 household income	.142**	.004	.011
	G2 male	.049	.202	.307
G2 grade point average (GPA)	G1 educational attainment	.174***	.000	.000
	G1 household income	-.110**	.005	.013
	G2 educational expectations in adolescence	.386***	.000	.000
	G2 control expectations in adolescence	-.146	.316	.408
	G2 optimistic future expectations in adolescence	.106*	.022	.052
	G2 male	-.042	.203	.307
G2 household income in adulthood	G1 educational attainment	-.045	.375	.452
	G1 household income	.008	.891	.921
	G2 educational expectations in adolescence	.267**	.003	.009
	G2 control expectations in adolescence	-.005	.964	.978
	G2 optimistic future expectations in adolescence	.150**	.024	.055
	G2 GPA	.107*	.046	.095
	G2 male	.027	.589	.664
G2 educational attainment in adulthood	G1 educational attainment	.189***	.000	.000
	G1 household income	.060	.280	.395
	G2 educational expectations in adolescence	.246***	.000	.000
	G2 control expectations in adolescence	-.045	.494	.567
	G2 optimistic future expectations in adolescence	.053	.368	.451
	G2 GPA	.315***	.000	.000
	G2 male	-.051	.183	.307
G2 optimistic future expectations in adulthood	G1 educational attainment	.100	.050	.100
	G1 household income	-.091	.102	.192
	G2 educational expectations in adolescence	-.097	.243	.359

	G2 control expectations in adolescence	.171	.272	.392
	G2 optimistic future expectations in adolescence	.158*	.025	.055
	G2 educational attainment	.213**	.001	.003
	G2 household income	.028	.630	.685
	G2 GPA	.024	.707	.756
	G2 male	-.066	.151	.267
G2 control expectations in adulthood	G1 educational attainment	-.066	.309	.408
	G1 household income	-.064	.379	.451
	G2 educational expectations in adolescence	-.046	.622	.685
	G2 control expectations in adolescence	.174	.116	.212
	G2 optimistic future expectations in adolescence	.173*	.027	.058
	G2 educational attainment	.246**	.004	.011
	G2 household income	-.092	.192	.307
	G2 GPA	-.095	.200	.307
	G2 male	-.017	.761	.780

*** $p < .001$, ** $p < .01$, * $p < .05$ (p -values unadjusted for multiple testing). The last column reports p -values adjusted for multiple testing using the false discovery rate (FDR) method proposed by Benjamini and Hochberg (1995).

Table S7
 Latent factors and residual correlations, based on the sample of (G2) nonparents ($N = 874$)

Latent factors	Indicators	Loading	<i>P</i> -value	<i>P</i> -value adjusted (FDR)
2nd generation in adolescence (1989)				
G2 educational expectations	Educational aspirations	.782		
	Educational plans	.934***	.000	.000
G2 control expectations	Sense of competence	.686		
	Perceived control	.423***	.000	.000
G2 optimistic future expectations	Have a job that pays well	.736		
	Able to own your own home	.766***	.000	.000
	Have a job that you enjoy doing	.714***	.000	.000
	Have a happy family life	.598***	.000	.000
	Be in good health most of the time	.541***	.000	.000
	Able to live wherever you want	.492***	.000	.000
	Be respected in your community	.569***	.000	.000
2nd generation in adulthood (2011)				
G2 control expectations	Sense of competence	.686		
	Perceived control	.423	.186	.307
Residual correlation between	and	Coefficient		
G2 optimistic future expectations (1989)	G2 control expectations (1989)	.277*	.015	.037
G2 optimistic future expectations (1989)	G2 educational expectations (1989)	.323***	.000	.000
G2 control expectations (1989)	G2 educational expectations (1989)	.266***	.000	.000
G2 household income (1999-2009)	G2 educational attainment (2009)	.179**	.012	.031
G2 optimistic future expectations (2011)	G2 control expectations (2011)	.389***	.000	.000

Note. Standardized coefficients. *** $p < .001$, ** $p < .01$, * $p < .05$ (p -values unadjusted for multiple testing). The last column reports p -values adjusted for multiple testing using the false discovery rate (FDR) method proposed by Benjamini and Hochberg (1995).

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Supplement 4

Replication of the Structural Equation Model Using an Observed Composite Measure of Educational Expectations

In our main structural equation model, we measured educational expectations as a latent construct using two indicators, educational aspirations and educational plans. To the extent that these two indicators have unique relations with other variables in the structural model, the latent construct specification might result in biased paths to and from other variables in the structural model (Rhemtulla et al., 2020). We examined whether the model coefficients remain stable when using a mean score, rather than a latent construct, to measure educational expectations. The results of this sensitivity analysis are reported in Tables S8 and S9. There are 24 paths to and from other variables in the structural equation model. All regression coefficients remain relatively stable in the sensitivity analysis. While three coefficients change sign, this should not be interpreted as invalidating the results because the respective coefficients were close to zero and had comparatively large standard errors.

Table S8

Standardized path coefficients from the fully recursive structural equation model

Outcome	Predictor	Coefficient	<i>P</i> -value	<i>P</i> -value adjusted (FDR)
G1 household income	G1 educational attainment	.333***	.000	.000
G2 educational expectations in adolescence	G1 educational attainment	.094	.125	.248
	G1 household income	.006	.916	.972
	G2 male	-.060	.192	.873
G2 control expectations in adolescence	G1 educational attainment	.162*	.012	.120
	G1 household income	-.029	.670	.972
	G2 male	-.010	.884	.972
G2 optimistic future expectations in adolescence	G1 educational attainment	.002	.972	.972
	G1 household income	.136*	.036	.269
	G2 male	.128*	.019	.172
G2 grade point average (GPA)	G1 educational attainment	.030	.432	.972
	G1 household income	.036	.471	.972
	G2 educational expectations in adolescence	.379***	.000	.000
	G2 control expectations in adolescence	-.045	.702	.972
	G2 optimistic future expectations in adolescence	.178*	.027	.339
G2 household income in adulthood	G2 male	.069	.169	.678
	G1 educational attainment	.067	.195	.602
	G1 household income	.240***	.000	.000
	G2 educational expectations in adolescence	.033	.570	.972
	G2 control expectations in adolescence	-.025	.777	.972

	G2 optimistic future expectations in adolescence	.114	.202	.589
	G2 GPA	.102	.066	.148
	G2 male	.308***	.000	.000
G2 educational attainment in adulthood	G1 educational attainment	.178**	.001	.017
	G1 household income	.079	.136	.492
	G2 educational expectations in adolescence	.159*	.012	.060
	G2 control expectations in adolescence	.009	.915	.972
	G2 optimistic future expectations in adolescence	.180*	.022	.318
	G2 GPA	.227***	.000	.000
	G2 male	-.009	.870	.972
G2 optimistic future expectations in adulthood	G1 educational attainment	-.008	.913	.972
	G1 household income	.101	.187	.589
	G2 educational expectations in adolescence	-.139	.126	.318
	G2 control expectations in adolescence	.230	.053	.318
	G2 optimistic future expectations in adolescence	.044	.668	.972
	G2 educational attainment	.159*	.037	.248
	G2 household income	.036	.641	.972
	G2 GPA	.070	.385	.945
	G2 male	-.003	.967	.972
G2 control expectations in adulthood	G1 educational attainment	-.097	.130	.545
	G1 household income	.075	.267	.722
	G2 educational expectations in adolescence	-.095	.259	.678
	G2 control expectations in adolescence	.306**	.009	.120
	G2 optimistic future expectations in adolescence	.014	.905	.972
	G2 educational attainment	.145*	.033	.248
	G2 household income	-.018	.827	.972
	G2 GPA	.027	.649	.972
	G2 male	-.003	.965	.972
G3 educational expectations in adolescence	G1 educational attainment	.054	.344	.843
	G1 household income	.027	.637	.972
	G2 educational expectations in adolescence	-.136*	.044	.353
	G2 control expectations in adolescence	.136	.167	.452
	G2 optimistic future expectations in adolescence	.016	.857	.972
	G2 educational attainment	.178*	.022	.212
	G2 household income	.027	.637	.972
	G2 GPA	-.005	.934	.972
	G2 optimistic future expectations in adulthood	-.034	.657	.972
	G2 control expectations in adulthood	-.047	.558	.972
	G3 male	-.242**	.000	.017
	G3 age	-.094	.088	.137
G3 control expectations in adolescence	G1 educational attainment	-.071	.321	.972

	G1 household income	.024	.760	.972
	G2 educational expectations in adolescence	-.156	.053	.492
	G2 control expectations in adolescence	.033	.741	.972
	G2 optimistic future expectations in adolescence	.164	.113	.452
	G2 educational attainment	.197*	.010	.120
	G2 household income	-.039	.580	.972
	G2 GPA	-.025	.735	.972
	G2 optimistic future expectations in adulthood	-.061	.444	.972
	G2 control expectations in adulthood	.024	.799	.972
	G3 male	.111	.070	.346
	G3 age	.029	.653	.972
G3 optimistic future expectations in adolescence	G1 educational attainment	.014	.807	.972
	G1 household income	-.020	.756	.972
	G2 educational expectations in adolescence	-.041	.591	.452
	G2 control expectations in adolescence	-.073	.564	.972
	G2 optimistic future expectations in adolescence	.199*	.030	.248
	G2 educational attainment	.157*	.028	.267
	G2 household income	.104	.117	.452
	G2 GPA	-.017	.805	.972
	G2 optimistic future expectations in adulthood	-.069	.426	.972
	G2 control expectations in adulthood	.035	.643	.972
	G3 male	-.019	.734	.972
	G3 age	-.113*	.039	.277
G3 grade point average (GPA)	G1 educational attainment	-.008	.884	.972
	G1 household income	.056	.316	.901
	G2 educational expectations in adolescence	.078	.233	.949
	G2 control expectations in adolescence	.011	.904	.972
	G2 optimistic future expectations in adolescence	-.028	.714	.972
	G2 educational attainment	.095	.107	.452
	G2 household income	.077	.103	.452
	G2 GPA	.012	.832	.972
	G2 optimistic future expectations in adulthood	.096	.187	.654
	G2 control expectations in adulthood	-.145**	.010	.120
	G3 educational expectations in adolescence	.114	.053	.318
	G3 control expectations in adolescence	.142*	.043	.286
	G3 optimistic future expectations in adolescence	.203**	.005	.120
	G3 male	-.195***	.000	.000
	G3 age	-.192**	.000	.017

*** $p < .001$, ** $p < .01$, * $p < .05$ (p -values unadjusted for multiple testing). The last column reports p -values adjusted for multiple testing using the false discovery rate (FDR) method proposed by Benjamini and Hochberg (1995).

Table S9
Latent factors and residual correlations

Latent factors	Indicators	Loading	<i>P</i> -value	<i>P</i> -value adjusted (FDR)
2nd generation in adolescence (1989)				
G2 control expectations	Sense of competence	.570		
	Perceived control	.798**	.002	.000
G2 optimistic future expectations	Have a job that pays well	.797		
	Able to own your own home	.875***	.000	.000
	Have a job that you enjoy doing	.700***	.000	.000
	Have a happy family life	.582***	.000	.000
	Be in good health most of the time	.498***	.000	.000
	Able to live wherever you want	.528***	.000	.000
	Be respected in your community	.654***	.000	.000
2nd generation in adulthood (2011)				
G2 control expectations	Sense of competence	1.026		
	Perceived control	.968***	.000	.000
3rd generation in adolescence (2011)				
G3 control expectations	Sense of competence	.832		
	Perceived control	.514***	.000	.000
G3 optimistic future expectations	Have a job that pays well	.768		
	Able to own your own home	.818***	.000	.000
	Have a job that you enjoy doing	.750***	.000	.000
	Have a happy family life	.615***	.000	.000
	Be in good health most of the time	.584***	.000	.000
	Able to live wherever you want	.688***	.000	.000
	Be respected in your community	.627***	.000	.000
Residual correlation between	and	Coefficient		
G2 optimistic future expectations (1989)	G2 control expectations (1989)	.517***	.000	.000
G2 optimistic future expectations (1989)	G2 educational expectations (1989)	.499***	.000	.000
G2 control expectations (1989)	G2 educational expectations (1989)	.279***	.000	.000
G2 household income (1999-2009)	G2 educational attainment (2009)	.106	.064	.972
G2 optimistic future expectations (2011)	G2 control expectations (2011)	.272***	.000	.000
G3 optimistic future expectations (2011)	G3 control expectations (2011)	.430***	.000	.000
G3 optimistic future expectations (2011)	G3 educational expectations (2011)	.297***	.000	.000
G3 control expectations (2011)	G3 educational expectations (2011)	.152*	.039	.605

Note. Standardized coefficients. *** $p < .001$, ** $p < .01$, * $p < .05$ (p -values unadjusted for multiple testing). The last column reports p -values adjusted for multiple testing using the false discovery rate (FDR) method proposed by Benjamini and Hochberg (1995).