

Published in final edited form as:

Soc Sci Res. 2012 January ; 41(1): 33–47. doi:10.1016/j.ssresearch.2011.07.005.

Family Structure and the Intergenerational Transmission of Educational Advantage*

Molly A. Martin**

Department of Sociology and the Population Research Institute, Pennsylvania State University

Abstract

I examine whether the effect of parents' education on children's educational achievement and attainment varies by family structure and, if so, whether this can be explained by differential parenting practices. Using data from the National Education Longitudinal Study of 1988, I find that as parents' education increases, children in single mother families experience a lower boost in their achievement test scores, likelihood of attending any post-secondary schooling, likelihood of completing a four-year college degree, and years of completed schooling relative to children living with both biological parents. Differences in parents' educational expectations, intergenerational closure, and children's involvement in structured leisure activities partially explain these status transmission differences by family structure. The findings imply that, among children with highly educated parents, children of single mothers are less likely to be highly educated themselves relative to children who grow up with both biological parents.

1. INTRODUCTION

Over the last half-century, children's family structures have dramatically transformed as marriage rates have declined and nonmarital fertility, cohabitation, and divorce rates have risen (Bumpass and Lu, 2000, Teachman, et al., 2000). Under this new family regime, fewer children are raised by both biological parents in continuously married families.

Approximately one-half of children in recent birth cohorts are expected to live in a single parent family at some point during their childhood (Bumpass and Lu, 2000).

These important changes in children's family structure could alter other family functions, such as the transmission of socioeconomic status across generations. Some scholars predict that there will be shifts in social mobility because, they argue, two biological parent families are more effective in transmitting their socioeconomic resources to their children (Biblarz and Raftery, 1993, 1999, Coleman, 1988). Most of what we know about social mobility derives from children raised in two biological parent families. For recent cohorts, however, it is important to query whether social mobility has changed under this new family regime.

© 2011 Elsevier Inc. All rights reserved.

**Direct all correspondence to Molly A. Martin, Department of Sociology, Pennsylvania State University, 211 Oswald Tower, University Park, PA 16802-6207; TEL: (814) 863-5508; FAX: (814) 863-7216; mmartin@pop.psu.edu.

*I thank Gary Sandefur, Michelle Frisco, Julien Teitler, Peter Bearman, David Johnson, Rebekah Young, R. Salvador Oropesa, Donald Treiman, Larry Bumpass, Bob Hauser, Betty Thomson, the participants of the Family Demography and Public Policy Seminar at Columbia University, the Sociology of Education brownbag at Pennsylvania State University, and the "Economic and Social Mobility" conference at University California-Davis, and the anonymous reviewers for their valuable comments. I also thank Jason Houle, Adam Lippert, and Christopher Lenn for their research assistance.

Publisher's Disclaimer: This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

These significant family structure changes offer an opportunity to investigate the intersection of economic and social capital for the production of children's educational attainment. Coleman (1988) proffered that family structure is an indicator of social capital and that social capital is essential for the transmission of economic capital from parents to children. To be clear, his theoretical argument and the current study's focus is whether family structure moderates the association between parents' socioeconomic status (SES) and children's educational attainment. Coleman (1988) predicts less mobility among children raised in two biological parent families relative to children raised in single parent families. Coleman's theoretical discussion, however, only briefly alludes to possible mechanisms. To understand how this moderation operates, I provide additional theoretical development and incorporate scholarship about parenting practices (Bodviski and Farkas, 2008, Farkas, 2003, Lareau, 2003).

Most prior research focus on differences in children's educational attainment across family structures, finding that children raised in single father and stepparent families have lower educational attainments even after accounting for their lower SES and higher unemployment rates (e.g., Amato and Booth, 1997, McLanahan, 1985, McLanahan and Sandefur, 1994). Only three studies have examined the question studied here: whether the association between parents' SES and children's education differs across family structures (Battle, 1997, 1998, Teachman, et al., 1996). Further, no studies have examined whether this moderation occurs for children's educational attainment after the 10th grade and no study explores the mechanisms by which this moderation unfolds.

This study examines differences in educational mobility for birth cohorts exposed to the first wave of modern family structure change. Born in the mid-1970s, they were primarily at risk for experiencing parental divorce. Relatively few were born to unmarried women (13%; Ventura and Bachrach, 2000) and even fewer lived with cohabitating parents (Casper and Bianchi, 2002). These cohorts are now sufficiently old enough to have completed their educations and, thus, offer the first opportunity to examine this research question.

Children's educational attainment is important because it strongly predicts later occupational status and income (Featherman and Hauser, 1978). Today, there is a greater premium for post-secondary education given declines in manufacturing, globalization, and the addition of computers in the workplace (Mare, 1995). Education also plays a key, though seemingly contradictory, role in intergenerational social mobility. On the one hand, educational attainment facilitates upward mobility, while on the other hand it helps reproduce social classes across generations (Hout and DiPrete, 2006). Thus, children's educational attainment is a linchpin in intergenerational mobility processes.

In sum, this article examines whether the educational mobility differs by family structure using data from the National Education Longitudinal Study of 1988 (NELS). The research questions are (1) does family structure moderate the association between parents' socioeconomic status and children's education? (2) how does that moderation operate? and (3) do family structure differences in parenting practices explain the differential patterns?

2. HOW THE TRANSMISSION OF SES COULD VARY ACROSS FAMILY STRUCTURES

The transmission of resources from parents to children has often been framed in investment terms, whereby parents' efforts to socialize, nurture, and financially provide for their children are characterized as investments that are made within a set of opportunities and constraints (Becker and Tomes, 1986). Economists, who most frequently use this investment language, assert that the effectiveness of one parental investment depends on the quantity of

other investments (Foster, 2002, Haveman and Wolfe, 1994). Sociological theorists such as Coleman (1988) and Bourdieu (1984) also articulate a contingent relationship amongst different forms of capital for child well-being. Family structure can be considered a parental investment in children (Haveman and Wolfe, 1994) that could modify the influence of other, complimentary investments, like family SES.

Coleman (1988) predicted such a moderation, arguing that families must have strong social capital to transmit parents' human and financial capital for their child's human capital development. Social capital for Coleman (1988) is social organization that facilitates action and is created through exchanges among network members; it can take the form of obligations, expectations, information, or norms accompanied by sanctions. Family social capital is defined as the strength of relations between a parent and child that results from parents' physical presence and the support and attention parents provide (Coleman, 1988). Coleman argues that "[t]he most prominent element of structural deficiency in modern families is the single parent family" (1988: S111). Coleman (1988) hypothesized that the effect of family SES for children's education is weaker among single parent families than two parent families.

A critical, if implicit, piece of this theoretical argument is that single parenthood should moderate the effects of family SES as it existed *prior* to divorce. Given income and labor force participation change dramatically after divorce, particularly for mothers (Duncan and Hoffman, 1985, Hoffman and Duncan, 1988, Rainwater, 1984), one would want to use a relatively exogenous measure of SES, meaning one less affected by divorce itself. The current analysis focuses on parents' education for this reason and because it is strongly correlated with children's education (Sewell, et al., 1969). That said, additional checks reveal that results are consistent when parents' occupation and income are included in the measure of family SES.

Evidence for Coleman's ideas, however, is very limited. Teachman and colleagues (1996) applied Coleman's ideas to study children's high school drop out before 10th grade, but found no support for Coleman's theory. Modest support is found, however, in two studies predicting African American's 8th grade academic achievement (Battle, 1997, 1998). Although motivated by other theoretical arguments, Battle finds that African American children raised by single parents (Battle, 1998) or divorced parents (Battle, 1997) receive a lower return to increases in family SES than their peers in two-parent and married-parent families, respectively.

Additional research is needed. Coleman's theory focused on children's human capital development, but his theory has only been applied to study early high school dropout. The current study extends Battle's (1997, 1998) research to study the full population and uses other indicators of educational achievement, namely grades, academic track placement in mathematics or science, and mathematics achievement test scores (Schneider, 2001). Further, I examine whether students successfully complete high school, attend college and later obtain a college degree (Lucas, 2001, Mare, 1981) and their total years of completed schooling (Cameron and Heckman, 1998, Lucas, 2001, Mare, 1995). Thus, I test Coleman's theory using these additional, yet standard indicators of educational achievement and attainment.

Undoubtedly, one can imagine alternative arguments about how family structure moderates the influence of parents' SES. First, Coleman's emphasis on the number of parents may be too narrow. Stepparent families likely have less social capital than two biological parent families because of differences in parental obligations. Obligations are critical for the creation and maintenance of social capital because they facilitate altruistic behavior (Portes,

1998). But parental obligations are generally weaker among stepparents than biological parents because of the social importance of biological kinship (Hofferth and Anderson, 2003) and the incomplete institutionalization of stepfamilies (Cherlin, 1978). As such, two biological parent families should have more social capital than both single parent and stepparent families and, thus, be more effective at transmitting their socioeconomic resources to their children. Second, the sex of the co-residential parent may matter. In their studies of occupational mobility, Biblarz and Raftery (1999, 1997 [with Bucur]) find greater occupational mobility for children who do not live with their mothers relative to those that do, regardless of whether other adults are present. Finally, there could be no moderating effect of family structure, as Teachman and colleagues (1996) find. The current manuscript examines these various possibilities.

3. WHY FAMILY STRUCTURE MAY MODERATE THE INFLUENCE OF PARENTS' SOCIOECONOMIC STATUS FOR CHILDREN'S EDUCATION

A simple explanation for these observed differences could be social selection, particularly concerning factors characterizing single parent families at the top of the socioeconomic hierarchy and two-parent families at the bottom. Unobserved characteristics of these parents could explain both their non-normative socioeconomic status and their children's educational attainment. For example, two biological parent and step-parent families could have low socioeconomic status because of a (typically unobserved) problem that interferes with their education or employment and, in turn, their children's education. If such selection is significant, then it would appear that there was a stronger correlation between parents' SES and children's education for two biological parent families than for single parent families. To counter this risk, I not only include the standard control variables, but I also include a measure of parents' labor force problems (to better account for parents' unobserved personality or health traits) and an indicator for whether the child's sibling dropped out of school (to capture unobserved sibling and parent-child patterns).

Alternatively, these family structure differences could emerge if, as research suggests, family structure transitions alter critical parenting practices correlated with both children's education and family SES (Astone and McLanahan, 1991, Thomson, et al., 1994, Thomson, et al., 1992). Unfortunately, Coleman provides little discussion about the mechanisms underlying this process. Thus, I link several literatures to explore three possible parenting mechanisms.

First, family structure differences in parents' expectations for their child's education could generate difference in educational mobility if divorced or re-partnered parents perceive more challenges to their child's likelihood of attending college and obtaining a degree relative to parents in two biological parent families with the same level of SES. Parents' educational expectations are positively correlated with children's educational attainment (Coleman, 1988, Sewell, et al., 1969), but single and stepparent families could hold lower expectations if their child's academic performance declined as a result of the their family structure change, as is commonly observed (see Amato, 2001). If so, one would expect a weaker association between family SES and parents' educational expectations for children living in single and stepparent families relative to those living with two biological parent families. This in turn could weaken the overall association between family SES and children's educational attainment

A second potential parenting pathway is intergenerational closure (i.e., the extent to which parents know the parents of their child's friends). Intergenerational closure is important for children's education because it allows parents to effectively monitor their children and assure that their norms and sanctions are reinforced when their children are not home

(Carbonaro, 1998, Coleman, 1991). Divorced and re-partnered parents are less likely to be able to create intergenerational closure because fostering relationships with other parents takes time – a resource likely in short supply among parents managing complex family dynamics. As such, intergenerational closure is not likely to be as high among alternative families relative to two biological parent families at the same level of SES. Therefore, the link between family SES and intergenerational closure could be lower for alternative families and, in turn, weaken the association between family SES and children's educational performance.

Finally, Lareau's (2003) theory and research about social class differences in parenting styles offers an additional mechanism by which family structure could alter the educational mobility patterns. Lareau distinguishes two parenting styles that differ in their values, communication style, how children spend their leisure time, and how parents interact with social institutions. The parenting style identified as "concerted cultivation" is typically endorsed by middle- and upper-class parents and is contrasted against a style of "accomplishment of natural growth" frequently practiced by poor and working class parents (Lareau, 2003). Parents practicing "concerted cultivation" engage children in more dialogue and logical reasoning, schedule and structure children's leisure time, and advocate for their children across institutions (like schools). Quantitative research has only recently begun to include measures of "concerted cultivation" in models of children's education (Bodviski and Farkas, 2008), but prior research has found that adolescents have better schooling outcomes when their parents discuss their schooling with them and when parents are involved in their school (Muller, 1995, 1998).

Lareau's class-based parenting styles could also differ by family structure. The tasks involved in "concerted cultivation" require tremendous amounts of time, such that many mothers stay out of the paid labor market to perform these cultural tasks (Bourdieu, 1986). Similar to the expectations for intergenerational closure, one would expect that single and stepparent families are more likely to face time constraints that would limit their engagement in "concerted cultivation." Prior research demonstrates that single parent families spend less time supervising and nurturing their children (Amato, 1987, Astone and McLanahan, 1991, Thomson, et al., 1992) and provide less encouragement and support for their children's schooling (Astone and McLanahan, 1991). If concerted cultivation enhances children's academic performance and fosters middle- and upper-class values amongst children, then middle- and upper-class children in alternative families should experience more downward mobility because their parents are less likely to engage in these parenting practices.

In sum, this research examines Coleman's arguments that family structure modifies the investment of parents' socioeconomic status across multiple educational outcomes. I then examine several possible parenting pathways to explain these differences. Lastly, I utilize data on an American cohort born in the mid-1970s and, thus, came of age during the period of dramatic family demographic change. Together, these results offer new insights into Coleman's theory and uncover how social mobility processes have changed under our new family regime.

4. DATA AND METHODS

Data for this analysis derive from the National Education Longitudinal Study of 1988 (NELS:88), a nationally representative, two-stage stratified cluster sample representative of 1988 U.S. 8th graders. Children, including those who drop out or stop out of school, were resurveyed in 1990, 1992, 1994, and 2000, when most were 26 years old. Parents were surveyed in 1988 and 1992. The analysis utilizes data from all waves for the longitudinal

cohort. The data's key assets are the follow-up of dropouts, the numerous measures of school and family processes related to educational attainment and Coleman's theory, and the timing of the data collection that follows a cohort young enough to be born amidst the family demographic changes but old enough to have generally completed their schooling by the final wave.

To handle missing data due to both item nonresponse and sample attrition, I use multiple imputation, which replaces missing values with predictions based on observed data patterns (Rubin 1987). The key source of item nonresponse is that some children are missing completed 1988 parent surveys – the source for measuring family background and parental characteristics.¹ Sample attrition is a problem between 1992 and 1994 (i.e., following their expected year of high school graduation) and again between 1994 and 2000. Of the 25,851 cases in the 1988 longitudinal sample, 11,810 were lost between the 1992 and 1994 and another 2,482 were lost between 1994 and 2000. Sample attrition could bias the results because African Americans, dropouts, students in the West, those enrolled in vocational or technical programs, and those in the lowest quartile for cognitive tests had higher nonresponse rates (Thurgood, 2003).

For all respondents in the 1988 longitudinal sample with a valid 1988 sampling weight ($N=24,515$), I multiply impute the missing data, including for the dependent variables. Although there is debate within sociology about imputing the dependent variable (von Hippel, 2007), it is accepted practice among statisticians because it produces less biased estimates in both the imputation and empirical models (Graham, 2009, Little and Rubin, 2002, Schafer and Graham, 2002). To ensure that the empirical results are not sensitive to the handling of missing data, I conduct the imputations and empirical analyses under multiple specifications,² including using a listwise deletion sample ($N=5,348$). The key substantive conclusions do not change across approaches.³

To multiply impute the data, I use the freely-available software “ICE” within STATA 11.0 (Royston, 2005). The imputation equation includes all model variables, the proposed interactions amongst variables, and 24 auxiliary variables not included in the empirical models.⁴ The presented results derive from imputations created using ICE's “passive” subcommand, which imputes each variable according to its functional form (e.g., uses logistic regression for dichotomous variables). I create five imputed data sets and then edit the imputed values to be within the original variable's range of values before conducting the empirical analyses. I use STATA's “mim” prefix command to combine empirical results across imputed samples.

4.1. VARIABLES

Children's academic achievement—The three indicators of children's 1988 (i.e., 8th grade) academic achievement are their (1) self-reported GPA (range: 0.5–4.0), (2) IRT score

¹The variables with the highest proportion of missingness are parents labor force problems ($n = 11,839$), family structure ($n = 8,470$), children's structured leisure activities ($n = 7,252$), whether a sibling dropped out of school ($n = 6,933$), and parents' involvement in their child's school ($n = 5,424$).

²Scholars debate using the ICE “passive” subcommand within ICE and whether to round ordinal or multinomial variables imputed with OLS regressions (given that the statistical literature concludes that imputation with OLS regression is the most efficient and are not biased (Schafer and Graham, 2002)). In the current study, the key results are invariant to whether the “passive” subcommand is used and whether nominal or ordinal variables are imputed with OLS.

³The key differences found in the listwise deletion models are as follows: none of the interactions are statistically significant for mathematics/science track, but all but one of the interactions for family structure (that for father-stepmother families) are significant for high school completion.

⁴Some of the additional variables included in the imputation models are whether the child completed a “dropout” survey, had a teen birth, their perceptions about their life chances, their time spent with parents, parents' rules, whether the family received public assistance, and whether an unmarried sister became pregnant. The complete list is available upon request.

on a NELS-administered mathematics achievement test (range: 15.8–66.82), and (3) teacher-reported mathematics or science track placement (1 = “low,” 2 = “average” [reference category], 3 = “high”). NELS interviewed either students’ mathematics or science teachers, but not both.

Children’s educational attainment—Using NELS-generated 2000 summary measures, I create dichotomous variables of children’s educational transitions for (1) high school completion (whether a diploma or GED), (2) post-secondary attendance, and (3) receipt of a four-year college degree. Using the same variables, I measure years of schooling completed by 2000, where the following years were assigned to particular credentials: high school completion = 12, certificate = 13, associate’s degree = 14, bachelor’s degree = 16, Master’s degree or equivalent = 18, and advanced professional degrees = 21 years.

Parents’ family structure—Based on the parents’ 1988 report of their own and their partner’s relationship to the child, I categorize family structure as: (1) two biological or adoptive parents, referred to as “two biological parent” families (the reference category), (2) single mother, (3) single father, (4) mother and male partner (or mother-stepfather), (5) father and female partner (or father-stepmother) and (6) “other” family structure. The latter includes other kin and non-kin arrangements, including three generation households (i.e., grandparent-parent-child: $N = 258$). I do not delineate families according to their marital status because less than 1% of the two biological parent families and less than 10% of the step-parent families are cohabiting.

Parents’ socioeconomic status—To capture parents’ persistent socioeconomic status and use a measure that is generally established before marital dissolution, I measure parents’ SES with parents’ educational attainment. I take the average of parents’ years of schooling and categorize it into a dummy variable according to whether the average is 13.5 years of greater, which reflects some college experience. The results are robust to sensitivity checks using other cut-points (within a range of 13 to 14 years) or a similar measure with parents’ highest years of schooling. (Results available upon request). I cannot use a higher threshold or multiple thresholds to categorize parents’ years of schooling because of power issues; relatively few single mother, mother-stepfather, and father-stepmother families have parents who completed a four-year college degree or more. I do not use the linear, calculated average because the distribution of parents’ education is irregular and these distributional problems are exacerbated when interacted with family structure. In additional robustness checks, I also include family income and parents’ occupation in the measure of SES despite the following contraindications: I cannot measure these status characteristics in NELS prior to parents’ marital dissolution, these status characteristics often change dramatically as a result of family structure change (Duncan and Hoffman, 1985), and these economic shifts largely mediate the association between parents’ divorce and children’s education (Boggess, 1998, McLanahan and Sandefur, 1994). Despite these concerns, the results do not change if I measure parents’ SES as (1) a composite of parents’ education and occupation or (2) a composite of parents’ education, occupation and income. (Results not shown but available upon request).

Parenting practices—Using parents’ 1988 reports, I measure their educational expectations for their child as (1) less than high school, (2) high school completion, (3) vocational trade or business training, (4) attend college, (5) complete college, and (6) advanced degree. Intergenerational closure is the percentage of the parents of the child’s five best friends that the parent reports knowing in 1988. Using an approach developed by Bodviski and Farkas (2008) for the ECLS-K, I can capture three of the four dimensions of concerted cultivation (Lareau, 2003). I cannot, however, capture the linguistic style of

parent-child communications because of data limitations. The first dimension of concerted cultivation, parent-child interaction about the child's schooling, is based on parents' 1988 reports for four items (all varying from 1 to 4): how often they talk to child about school experiences, high school plans, and post-high school plans, or help their child with homework. The four items are summed and then standardized to create z-scores. The second dimension, regarding children's structured leisure time, is based on parents' 1988 reports on their child's participation in 20 activities (coded as 1 if a child participates and 0 if not).⁵ I sum these extracurricular activities and standardize the sum. Finally, to capture parents' relationship with social institutions, I construct a measure about parents' involvement with their child's school based on nine, 1988 parent-reported items. First, I sum and then standardize values from five questions (ranging from 1 to 4) recording how many times the parent or their partner contacted the school to participate in school fund raising activities, volunteer, or discuss their child's academic performance, academic program for this year, and/or behavior. Next I sum and then standardize the sum of four dichotomous items recording whether the parent or their partner is involved in their child's school as a volunteer or through membership, meeting attendance, and/or participation in activities for a parent-teacher organization. The final measure is the standardized sum of these two subscales.

Controls for selection—To account for otherwise unobserved family characteristics, I include an indicator for whether the child has a sibling who dropped out of school, as reported in 1990 and 1992, and an indicator for parents' labor force problems. The latter is a sum of the following dummy variables: (1) a parent is disabled (1988 parent report), (2) a parent is unemployed (1988 parent report), (3) a parent has never held a "regular job" (1988 parent report), and (4) a parent lost their job between the 1988 and 1990 (1990 child report). For two-parent families, the variable tallies problems for both parents (range: 0–8). For single parent families, tallies problems for the residential parent (range: 0–4).

Socio-demographic controls—Other characteristics measured in 1988 and included in the models are: the child's sex, racial/ethnic identification (where non-Latino white is the reference category), region and urbanicity of their residence, whether a parent is foreign born, and sibship size (counting all biological, adopted, step- and half-siblings).

4.2. MODELS

I begin by testing whether there is evidence for the proposed interactions. I predict children's 8th grade mathematics test score and GPA with OLS regression and their math/science track placement with an ordered logistic regression, where the "average" track is the reference category. For educational attainment, I model their completed years of schooling with an OLS regression and use a sequential logit model (Mare, 1981) to predict their educational transitions, specifically whether they (1) complete high school with a diploma or GED, or not, (2) attend a post-secondary institution given they complete high school, and (3) obtain a college degree given they attend a post-secondary institution. The sequential model (or, "Mare model") is particularly vulnerable to bias due to unobserved heterogeneity because, even if an unobserved variable is not confounded with the first transition, it will become confounded with later transitions as the subsample of people at risk for the later transitions becomes more select (Buis, 2010, Cameron and Heckman, 1998). To address this, I use a new approach, the "seqlogit" command in STATA, wherein one can test the sensitivity of the results to different assumptions about the degree of unobserved

⁵Parents indicate whether the child currently attends classes outside of regular school for art, music, dance, language, history/culture of ancestors, or computer skills. Parents report whether their child borrows books from the public library, attends concerts or other musical events, or goes to art museums, science museums or history museums. Finally, the parent reports whether, since the 1st grade, the child has ever been involved with boy/girl scouts, cub scouts/brownies, campfire/bluebirds, boys club/girls club, religious group, Little League or other sports team, YMCA/YWCA/Jewish Community Center, 4-H club, and/or other community-based group.

heterogeneity (Buis, 2007, 2010, Rosenbaum, 2002).⁶ The results presented assume a large amount of unobserved heterogeneity.

I estimate the following sequence of models to test the proposed mechanisms: I predict each parenting practice using OLS regression. Model 1 is a standard, additive model and Model 2 adds the interaction between family structure and parents' education. Then, I return to predicting the child's educational transitions and years of schooling, adding the parenting measures first and then children's 8th grade achievement measures.

In all analyses, I include 1988 sample weights and use STATA's "svy" procedures to arrive at weighted point estimates and appropriate standard errors given NELS's complex sampling design. The analytic contributions of the study are the use of multiple imputation, controls for selection, and a new model of educational transitions to model education beyond the 10th grade and the potential parenting mechanisms.

5. RESULTS

Table 1 provides the basic descriptive statistics for the analytic sample. In the 8th grade, the children's average GPA is a 2.9, the average mathematics IRT test score is 34.7, and most students are in the "average" mathematics/science track. Approximately 92% of the sample completed high school, 67% received their high school diploma, 82% attended any college, 54% attended a four-year college, and 25% received their bachelor's degree by 2000. Taken together, this cohort has, on average, 14.0 years of schooling by 2000.

When they were in the 8th grade, the majority (64%) of children lived with both biological parents, yet 16% lived in single mother families, 2% in single father families, 11% in mother-stepfather families, 3% in father-stepmother families, and 3% in "other" families. Although most family structures have a mean of 13 years for parents' schooling (the exception is "other" families who have a mean of 12 years [$p < .001$]), they differ in their distribution across parents' education values. Specifically, the range is relatively compressed for single mother and mother-stepfather families, which limits my ability to test for additional differences at the top and bottom of the education distribution. Approximately 39% of two biological parent families have an average education of 13.5 years or more (i.e., termed "some college"), as compared to 48% for single mothers, 59% for single fathers, 28% for mother-stepfather families, 30% for father-stepmother families, and 23% for "other" families.

Approximately 7% of children had a sibling drop out of school and the average number of parents' labor force problems was 0.42 (or 1.32 among those with any problems). As expected, both of these are correlated with parents' education. If parents' average years of schooling is less than 13.5 years, then the odds that a child's sibling dropped out of school increase by 50% and the number of labor force problems increases by 0.14 (both $p < .001$). Sibling dropout and parents' labor force problems are statistically significant in all models. (Results available upon request).

⁶Unobserved heterogeneity (z) is modeled as a weighted sum of all unobserved variables. z is assumed to have a normal distribution (with a mean of zero and standard deviation of γ) and to be invariant, in both its value and effect, across transitions. To test the sensitivity of the results to unobserved heterogeneity, one runs separate models, changing the *a priori* fixed value of γ (0 = no unobserved heterogeneity, 1.0 = small, 2.0 = medium, 3.0 = large). Magnitudes for γ were chosen by the author based on the estimated coefficient sizes for SES.

5.1. DOES FAMILY STRUCTURE MODERATE THE ASSOCIATION BETWEEN PARENTS' AND CHILDREN'S EDUCATION?

The evidence suggests that family structure moderates the association between parents' education and children's schooling across most measures of children's education. Wald tests indicate that the family structure-parents' education interactions are, jointly, statistically significant for mathematics test scores, grades, and educational transitions.

The results fit with Coleman's (1988) argument: for all but one measure of children's educational development, more educated, two biological parent families can better transmit their status than more educated single mother families. The lone exception is high school completion. Another consistent pattern is found for "other" families – more educated "other" families weakly transmit their status for all 8th grade achievement measures.

Occasionally other interaction coefficients are statistically significant, but the patterns are outcome-specific. All alternative family structures minus single father families have a lower return for increases in parental education for their children's mathematics test scores relative to two biological parent families. But single father families (as well as single mother and "other" families) have lower returns to increased parents' education for children's GPA. Thus, across the two key measures of achievement – test scores and grades – all children in alternative families receive a smaller benefit for having parents with some college experience.

For children's attainment, the only consistent difference is found for single mother families. Yet, conditional on a child attending college and having parents who attended some college, children in father-stepmother families are less likely to obtain their bachelor's degree relative to those from two biological parent families. Although this difference is also found in models where SES is measured as a linear composite of parents' education and occupation, it could be due to chance given the paucity of significant differences for father-stepmother families. In general, the general absence of significant differences for stepparent families suggests that Coleman's emphasis on the number of parents was correct. This likely reflects the fact that there is a lot of heterogeneity among stepparent families.

To better understand these interactions, I graph the predicted values for each significant family structure-parent education combination for all outcomes, setting all other variables to their mean or modal value. Figure 1 displays these graphs for mathematics test scores, college attendance, four-year college completion, and years of schooling. The graphs in Figure 1 show the greater boost children in two biological parent families receive for increased parents' education. Children in alternative family structures do not experience the similar educational gains with a similar increase in parents' education, particularly for mathematics test scores and obtaining a college degree. Given that 83% of the children attend post-secondary school, the advantages of living with highly educated, two biological parents are relatively small.

Summarizing Table 2 and Figure 1, the results strongly support Coleman's arguments that families with two parents are better able to leverage their socioeconomic success for their children's schooling. The results are replicated when parents' SES is measured as a linear composite of (1) parents' education and occupation or (2) parents' education, occupation, and income. In addition, when family structure is measured as the number of co-residential parents, the interaction between the number of parents and parents' education is relatively large in magnitude and highly significant (all $p < .01$) across all outcomes, consistent with Coleman's arguments. (Results not shown but available upon request). I next test whether family structures differ in their parenting practices.

5.2. DO FAMILY STRUCTURES DIFFER IN THEIR PARENTING PRACTICES?

I predict that family structure differences in parenting practices partially explain why more highly educated single mother families are less able to translate their educational advantages into better educational outcomes amongst their children. I first document the significant differences in parenting practices by family structure in general and then test whether there are family structure differences in parenting practices amongst those with more highly educated parents. Table 3 presents the results for predicting each parenting measure, where Model 1 explores whether there are any basic family structure differences and Model 2 examines whether family structure moderates the association of SES for each parenting practice.

As shown in Model 1, parents in alternative family structures have lower educational expectations for their child and know fewer parents of their child's friends, net of parents' education; all comparisons to two biological parent families are statistically significant. Regarding the measures of concerted cultivation, we see that with but one exception, parents in alternative families have fewer interactions with their children, enroll their children in fewer structured leisure activities, and are less involved in their child's school. The lone exception is that children in mother-stepfather families do not significantly differ with regard to parent-child interactions. Across all five parenting measures, the differences are greatest for children in single father, father-stepmother, and "other" families. This suggests that a mother's presence is important for these parenting practices, which aligns with our gendered parenting expectations (Coltrane, 2000).

Parents with some college experience are more likely to engage in all of these parenting practices relative to parents with less schooling. Model 2 explores whether this parenting advantage among more educated parents is applied equally across family structures. The results demonstrate that, among those whose parents have some college experience, single mothers have lower educational expectations, enroll their children in fewer structured leisure activities and are less involved in their child's school compared to parents in two biological families. The results are consistent with what we saw in Table 2: children in single mother families do not receive a similar boost in these parenting practices with a corollary increase in parents' education relative to children in two biological parent families.

Other family structure-parent education interactions are also occasionally statistically significant and follow a similar pattern, but as we saw in Table 2, the results are less consistent across various indicators for other family structures. Among families where parents have some college experience, we see that parents in mother-stepfather and "other" families have lower educational expectations for their children relative to parents in two biological parent families. Likewise, children in "other" families whose parents have some college experience are enrolled in fewer structured leisure activities than their peers in two biological parent families with similarly high educations. In addition, children living with single father and father-stepmother families with some college experience have parents who are less involved in their school. Despite the significance of these specific interactions, the family structure-parent education interactions are only statistically significant as a group for parents' school involvement.

The last thing to note is that there are no statistically significant family structure-parent education interactions in the model predicting parent-child interactions. Instead, the statistically significant differences in concerted cultivation are found for two indicators that require more time and interaction with other organizations – enrollment in structured leisure activities and parents' school involvement. Together, the results in Table 3 suggest that alternative families are, in general, less likely to engage in all these education-enhancing parenting practices and that single mother families with some college experience are less

likely to engage in most of these parenting practices compared to their similarly educated peers in two biological parent families.

5.3. DO PARENTING PRACTICES MEDIATE THESE TRANSMISSION DIFFERENCES?

The final models in Table 4 examine the contribution of parenting practices and children's earlier achievements for generating these transmission differences for children's educational attainment for single mother families. Model 1 adds the parenting indicators to the models originally shown in Table 2 and then Model 2 adds the 8th grade achievement measures.

The inclusion of parenting practices modestly attenuates the magnitude of the single mother-parent education interaction for children's post-secondary attendance, four-year college completion, and years of schooling, but the interactions remain statistically significant. The parenting practices accounting for this decline are parents' educational expectations, intergenerational closure, and children's structured leisure activities.

Children's 8th grade achievement measures, added in Model 2, are strongly associated with each educational transition and the child's eventual years of schooling. With their inclusion, the interaction between single mother status and parent education becomes statistically non-significant for obtaining a college degree and years of schooling. In contrast, the single mother-education interaction remains statistically significant for children's post-secondary attendance, yet it declines in magnitude. In other words, neither parenting practices nor children's 8th grade achievement fully explains why children in single mother families with some college experience are less likely to attend college than children with similarly educated two biological parents.

It is worth noting that parents' educational expectations and children's structured leisure activities remain statistically significant in Model 2 for predicting children's educational transitions and years of schooling even net of their correlation with children's earlier academic achievement. Further, net of children's achievement, parental school involvement is positively and significantly correlated with children's post-secondary attendance and four-year college completion. In sum, differences in parenting practice partially explain why more educated single mothers are less effective in transmitting their advantages to their children; for college completion and years of schooling, the remaining gap is largely explained by differences in children's 8th grade achievements.

6. DISCUSSION

Together, the results largely support Coleman's hypothesis that the number of co-residential parents is important for the transmission of parents' socioeconomic resources for children's human capital development. The lower returns children receive for having a highly educated single mother occur across the child's educational career: beginning with their 8th grade mathematics test scores, grades and track placement and continue by independently influencing their likelihood of attending college net of completing high school and their earlier academic achievement. Children in "other" families whose parents have some college experience also experience lower returns with regard to their 8th grade achievement measures, but not their educational attainment.

In general, it appears that differences in parents' educational expectations, intergenerational closure, children's involvement in structured leisure activities and children's 8th grade academic achievements jointly account for the weaker transmission of parents' socioeconomic status among highly educated single mothers. There is, however, one exception: Even net of these factors, children of highly educated single mothers are less likely to attend a post-secondary school relative to their peers in highly educated, two

biological parent families. Thus, other processes related to college attendance *per se* are likely involved. For example, single mothers may have less time to tour colleges with their children or have less money saved for their children's college education.⁷ Future research should explore these and other avenues to consider additional ways by which children of highly educated single mothers are disadvantaged relative to their peers with similarly-educated two biological parents.

In general, the results fit with prior research. The findings for the 8th grade achievement measures modeled here for the full population mirror Battle's (1997, 1998) findings for an African American sample. Also, neither the current study nor the study by Teachman and colleagues (1996) find family structure differences in the transmission of SES for high school completion. Instead, the current study finds that differences occur during the transitions to college attendance and completion.

The results do, however, contradict Biblarz and Raftery's (1999; 1997: [with Bucur]) findings for single mother families. They find no difference between single mother and two biological parent families in the transfer of parents' SES for children's occupational attainment. This discrepancy could result because getting a job is different than getting an education or because of cohort differences. Most respondents in the current analysis were born in 1973 or 1974, whereas most of Biblarz and Raftery's sample members were born during the Baby Boom. Thus, shifts in the forming single mother families through parental death to divorce could underlie the difference. Prior research finds that children who experience a parental death have similar years of education (Amato and Keith, 1991) and likelihood of completing high school (McLanahan, 1985) as those with both biological parents, but children of divorce fare worse.

The key question is whether these are truly family structure effects. Replication with other data and family structure measures, such as the number of family transitions (Fomby and Cherlin, 2007) or the child's age at transition(s) (Garasky, 1995), could clarify the theoretical process. Unfortunately, NELS:88 does not have information on family formation and dissolution prior to 1988 to explore this. I did, however, conduct supplementary analyses to see if family structure changes during high school alter these findings, but it does not (largely because single mother families in 1988 are the most likely to experience additional, subsequent family structure changes). (Results available upon request). Future research should utilize other data to explore how particular family structure trajectories inhibit the transmission of parents' SES and to test additional mechanisms not measured in NELS:88, such as parental stress and conflict.

Alternatively, one can consider what omitted factors might explain the results. Because the key finding is an interaction, one must consider how the moderation of SES by family structure may be reflecting other processes. One possibility is a measurement issue. The weaker association of "family" SES and children's education could be due to the lack of data on the absent father. Fortunately, increases in educational homogamy (Mare, 1991) lessens this concern, but it is a reminder that, where possible, it is helpful to collect data on all biological and social parents. Another possibility is selection into these different family structures. Prior research suggests that selection does not fully account for family structure effects on children's educational attainment (Manski, et al., 1992, Sandefur and Wells, 1999), but this conclusion might not hold across all samples or for this interaction. The current study takes selection seriously by including measures of parents' labor force problems and sibling dropout and using a new technique for modeling educational transitions that tests the sensitivity of the results to threats of unobserved heterogeneity

⁷I thank an anonymous reviewer for suggesting this alternative mechanism.

(Buis, 2010, Cameron and Heckman, 1998). Interestingly, if I had not accounted for unobserved heterogeneity, the magnitude and statistical significance of these family structure-SES interactions would have been suppressed. Despite these advances, I cannot definitively determine causality from these results.

The results for single mothers are reminiscent of the “perverse openness” found for African Americans’ intergenerational mobility relative to Whites during the early 1960s (Duncan, 1969, Featherman and Hauser, 1978, Hout, 1984). High status African American parents were less able to transmit their status to their children relative to high status Whites. The current findings provide a new lens by which to interpret those studies. The historically higher rates of single parenthood among African Americans (Sandefur, et al., 2001) may be a key explanation for those early mobility differences. Further, during the 1970s and 1980s, when the family – as an institution – continued to change and alternative family structures became more common among non-Hispanic Whites (Casper and Bianchi, 2002), racial differences in intergenerational mobility declined (Hout, 1984).

From a public policy perspective, the results provide an opportunity to reconsider the relative trade-off between public and private (i.e., family) child investments. In their landmark study, Becker and Tomes (1986) concluded that public investments in children could offset parents’ investments (i.e., as a substitution effect), especially among families who are not wealthy. Their conclusion, however, derives from models that assume parents are equally able to invest in their children, but the current research calls that into question. As such, public expenditures on children may not reduce parents’ investments and, in some cases, could help reduce inequalities arising from parents’ differential capacity to invest in their children.

7. CONCLUSION

The primary goal of this manuscript is to fully test Coleman’s (1988) hypothesis that, as a measure of social capital, family structure moderates the effect of SES for the development of children’s human capital. Recent shifts in family structure allow us to examine the status transmission process better, but Coleman left many of the possible mechanisms unclear. By amending Coleman’s theory to investigate key dimensions of parenting practices, the current study bridges several theoretical and empirical traditions.

Lareau (2003) documents that middle and upper class parents are acutely aware that their children’s future largely rests on the child’s educational experiences and, thus, begin relatively early in the child’s life to develop their child’s the academic and noncognitive skills (e.g., habits related to self-control, taking initiative, and focus on tasks) that are predictive of both school and career success (Farkas, 2003). Yet it generally takes money, time and effort to engage in parenting practices that foster these academic and noncognitive skills. High status single mothers are accomplished, but frequently time constrained. As shown in Table 3, two biological parent families are better able to use their resources and engage in these academic-enhancing parenting practices than single mothers and, as a result, better secure a floor beneath their children.

With the “declining significance of marriage” among American parents (Bumpass and Lu, 2000), children today are less likely to grow up in a middle class home (McLanahan, 2004). Yet the risks do not end there. The relatively few children raised by a single mother in a middle- or upper-class home are less likely to maintain that status as an adult when compared to their similarly privileged peers raised by both biological parents.

References

1. Amato P. Children of divorce in the 1990s: An update of the Amato and Keith (1991) meta-analysis. *Journal of Family Psychology*. 2001; 15:355–370. [PubMed: 11584788]
2. Amato PR. Family Processes in One-Parent, Stepparent, and Intact Families: The Child's Point of View. *Journal of Marriage and the Family*. 1987; 49:327–337.
3. Amato, PR.; Booth, A. *A generation at risk : growing up in an era of family upheaval*. Harvard University Press; Cambridge, Mass: 1997.
4. Amato PR, Keith B. Parental Divorce and Adult Well-Being: A Meta-Analysis. *Journal of Marriage and the Family*. 1991; 53:43–58.
5. Astone NM, McLanahan SS. Family Structure, Parental Practices and High School Completion. *American Sociological Review*. 1991; 56:309–320.
6. Battle J. The Relative Effects of Married Versus Divorced Family Configuration and Socioeconomic Status on the Educational Achievement of African American Middle-Grade Students. *Journal of Negro Education*. 1997; 66:29–42.
7. Battle JJ. What Beats Having Two Parents?: Educational Outcomes for African American Students in Single-Versus Dual-Parent Families. *Journal of Black Studies*. 1998; 28:783–801.
8. Becker GS, Tomes N. Human Capital and the Rise and Fall of Families. *Journal of Labor Economics*. 1986; 4:S1–S39.
9. Biblarz TJ, Raftery AE. The Effects of Family Disruption on Social Mobility. *American Sociological Review*. 1993; 58:97–109.
10. Biblarz TJ, Raftery AE. Family Structure, Educational Attainment, and Socioeconomic Success: Rethinking the “Pathology of Matriarchy”. *American Journal of Sociology*. 1999; 105:321–365.
11. Biblarz TJ, Raftery AE, Bucur A. Family Structure and Social Mobility. *Social Forces*. 1997; 75:1319–1341.
12. Bodviski K, Farkas G. “Concerted cultivation” and unequal achievement in elementary school. *Social Science Research*. 2008; 37:903–919.
13. Boggess S. Family structure, economic status, and educational attainment. *Journal of Population Economics*. 1998; 11:205–222. [PubMed: 12293834]
14. Bourdieu, P. *Distinction : a social critique of the judgement of taste*. Harvard University Press; Cambridge, Mass: 1984.
15. Bourdieu, P. The Forms of Capital. In: Richardson, JG., editor. *Handbook of Theory and Research for the Sociology of Education*. Greenwood Press; New York: 1986.
16. Buis, ML. *seqlogit: Stat Module to Fit a Sequential Logit Model*. 2007.
17. Buis, ML. *Inequality of Educational Outcome and Inequality of Educational Opportunity in the Netherlands during the 20th Century, (Dissertation)*. Vrije Universiteit; Amsterdam: 2010.
18. Bumpass L, Lu HH. Trends in Cohabitation and Implications for Children's Family Contexts in the United States. *Population Studies*. 2000; 54:29–41.
19. Cameron SV, Heckman JJ. Life Cycle Schooling and Dynamic Selection Bias: Models and Evidence for Five Cohorts of American Males. *Journal of Political Economy*. 1998; 106:262–333.
20. Carbonaro WJ. A Little Help from My Friend's Parents: Intergenerational Closure and Educational Outcomes. *Sociology of Education*. 1998; 71:295–313.
21. Casper, LM.; Bianchi, SM. *Continuity and Change in the American Family*. Sage Publications; Thousand Oaks, CA: 2002.
22. Cherlin A. Remarriage as an Incomplete Institution. *American Journal of Sociology*. 1978; 84:634–650.
23. Coleman, J. *Parental Involvement in Education*. U.S. Department of Education; Washington, DC: 1991.
24. Coleman JS. Social Capital in the Creation of Human Capital. *American Journal of Sociology*. 1988; 94:S95–S120.
25. Coltrane S. Research on Household Labor: Modeling and Measuring the Social Embeddedness of Routine Family Work. *Journal of Marriage and Family*. 2000; 62:1208–1233.

26. Duncan GJ, Hoffman SD. A Reconsideration of the Economic Consequences of Marital Dissolution. *Demography*. 1985; 22:485–497. [PubMed: 4076480]
27. Duncan, OD. Inheritance of poverty or inheritance of race?. In: Moynihan, DP., editor. *On Understanding Poverty*. Basic Books; New York: 1969. p. 85-110.
28. Farkas G. Cognitive Skills and Noncognitive Traits and Behaviors in Stratification Processes. *ANNUAL REVIEW OF SOCIOLOGY*. 2003; 29:541–562.
29. Featherman, DL.; Hauser, RM. *Opportunity and change*. Academic Press; New York: 1978.
30. Fomby P, Cherlin AJ. Family Instability and Child Well-Being. *American Sociological Review*. 2007; 72:181–204. [PubMed: 21918579]
31. Foster EM. How Economists Think about Family Resources and Child Development. *Child Development*. 2002; 73:1904–1914. [PubMed: 12487501]
32. Garasky S. The Effects of Family Structure on Educational Attainment: Do the Effects Vary by the Age of the Child? *The American Journal of Economics and Sociology*. 1995; 54:89–105.
33. Graham JW. Missing Data Analysis: Making it Work in the Real World. *Annual Review of Psychology*. 2009; 60:549–576.
34. Haveman, RH.; Wolfe, BS. *Succeeding generations : on the effects of investments in children*. Russell Sage Foundation; New York: 1994.
35. Hofferth SL, Anderson KG. Are All Dads Equal? Biology versus Marriage as a Basis for Paternal Investment. *Journal of Marriage and the Family*. 2003; 65:213–232.
36. Hoffman SD, Duncan GJ. What *Are* the Economic Consequences of Divorce? *Demography*. 1988; 25:641–645. [PubMed: 3267545]
37. Hout M. Occupational Mobility of Black Men: 1962 to 1973. *American Sociological Review*. 1984; 49:308–322.
38. Hout M, DiPrete TA. What we have learned: RC28's contributions to knowledge about social stratification. *Research in social stratification and mobility*. 2006; 24:1–20.
39. Lareau, A. *Unequal Childhoods: Class, Race, and Family Life*. University of California Press; Berkeley: 2003.
40. Little, RJA.; Rubin, DB. *Statistical Analysis with Missing Data*. 2. John Wiley and Sons; Hoboken, New Jersey: 2002.
41. Lucas SR. Effectively maintained inequality: Education transitions, track mobility, and social background effects. *The American Journal of Sociology*. 2001; 106:1642.
42. Manski CF, Sandefur GD, McLanahan S, Powers D. Alternative Estimates of the Effect of Family Structure During Adolescence on High School Graduation. *Journal of the American Statistical Association*. 1992; 87:25–37.
43. Mare RD. Change and Stability in Educational Stratification. *American Sociological Review*. 1981; 46:72–87.
44. Mare RD. Five Decades of Educational Assortative Mating. *American Sociological Review*. 1991; 56:15–32.
45. Mare, RD. Changes in educational attainment and school enrollment. In: Farley, R., editor. *State of the union: America in the 1990's, Volume 1: Economic Trends*. Russell Sage Foundation; New York: 1995. p. 155-213.
46. McLanahan S. Family Structure and the Reproduction of Poverty. *American Journal of Sociology*. 1985; 90:873–901.
47. McLanahan S. Diverging destinies: How children are faring under the second demographic transition. *Demography*. 2004; 41:607–627. [PubMed: 15622946]
48. McLanahan, S.; Sandefur, GD. *Growing up with a single parent : what hurts, what helps*. Harvard University Press; Cambridge, Mass: 1994.
49. Muller C. Maternal Employment, Parent Involvement, and Mathematics Achievement. *Journal of Marriage and Family*. 1995; 57:85–100.
50. Muller C. Gender Differences in Parental Involvement and Adolescents' Mathematics Achievement. *Sociology of Education*. 1998; 71:336–356.
51. Portes A. Social Capital: Its Origins and Applications in Modern Sociology. *Annual Review of Sociology*. 1998; 24:1–24.

52. Rainwater, L. Mothers' Contributions to the Family Money Economy in Europe and the United States. In: Voydanoff, P., editor. *Work and Family*. Mayfield Publishing; Palo Alto, CA: 1984. p. 73-88.
53. Rosenbaum, PR. *Observational Studies*. Springer; New York: 2002.
54. Royston P. Multiple imputation of missing values: Update of ice. *Stata Journal*. 2005; 5:527-536.
55. Sandefur, GD.; Martin, M.; Eggerling-Boeck, J.; Mannon, SE.; Meier, AM. An Overview of Racial and Ethnic Demographic Trends. In: Smelser, NJ.; Wilson, WJ.; Mitchell, F., editors. *America Becoming: Racial Trends and Their Consequences*. National Academy Press; Washington, D.C: 2001. p. 40-102.
56. Sandefur GD, Wells T. Does Family Structure Really Influence Educational Attainment? *Social Science Research*. 1999; 28:331-357.
57. Schafer JL, Graham JW. Missing Data: Our View of the State of the Art. *Psychological Methods*. 2002; 7:147-177. [PubMed: 12090408]
58. Schneider B. Educational stratification and the life course. *Sociological Focus*. 2001; 34:463-466.
59. Sewell WH, Haller AO, Portes A. The Educational and Early Occupational Attainment Process. *American Sociological Review*. 1969; 34:82-92.
60. Teachman JD, Paasch K, Carver K. Social Capital and Dropping Out of School Early. *Journal of Marriage and the Family*. 1996; 58:773-783.
61. Teachman JD, Tedrow LM, Crowder KD. The changing demography of America's families. *Journal of Marriage and the Family*. 2000; 62:1234.
62. Thomson E, Hanson TL, McLanahan SS. Family Structure and Child Well-Being: Economic Resources vs. Parental Behaviors. *Social Forces*. 1994; 73:221-242.
63. Thomson E, McLanahan SS, Curtin RB. Family Structure, Gender, and Parental Socialization. *Journal of Marriage and the Family*. 1992; 54:368-378.
64. Thurgood, L. *NCES Handbook of Survey Methods*. National Center for Education Statistics U.S. Dept. of Education Institute of Education Sciences; Washington, DC: 2003.
65. Ventura SJ, Bachrach CA. Nonmarital Childbearing in the United States, 1940-99. *National Vital Statistics Reports*. 2000; 48:1-40.
66. von Hippel PT. Regression with Missing Ys: An Improved Strategy for Analyzing Multiply Imputed Data. *Sociological Methodology*. 2007; 37:83-117.

RESEARCH HIGHLIGHTS

- Does the intergenerational association of education vary by family structure?
- Do differences in parenting practices explain this moderation?
- Uses the National Education Longitudinal Study: 1988–2000
- The intergenerational association of education is lower in single mother families
- Key are differences in parent’s educational expectations, intergenerational closure and children’s leisure activities

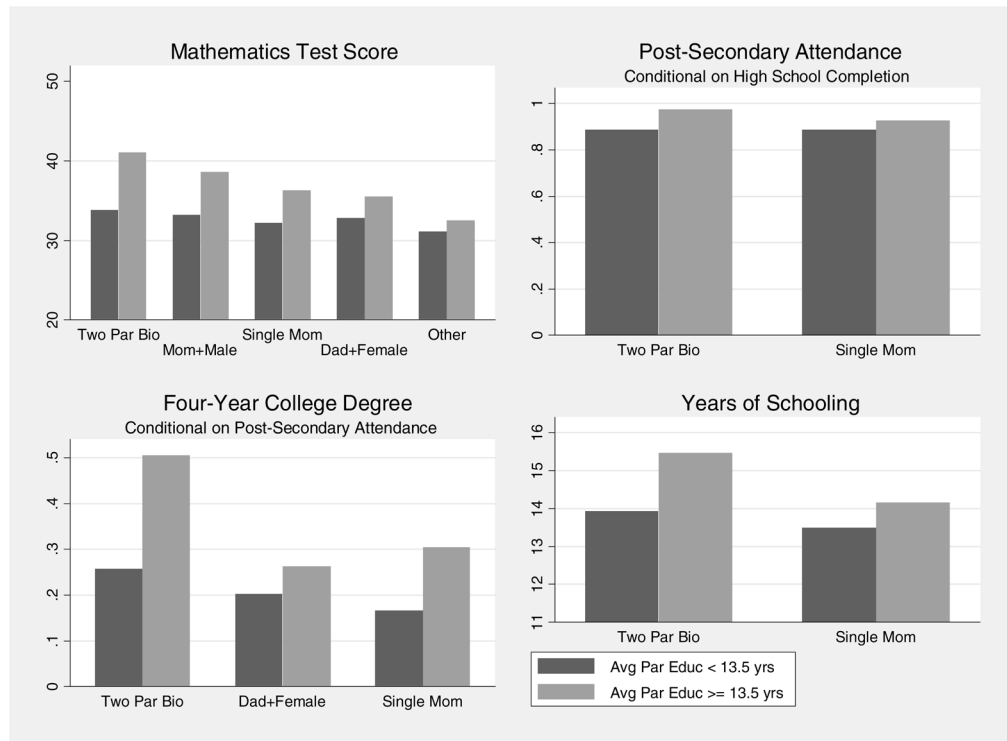


Figure 1. Predicted Values and Probabilities Comparing Statistically Significant Differences in the Association between Key Indicators of Children’s Educational Development and the Combination of Family Structure and Parents’ Education
 Note: Based on results in Table 2.

Table 1
 Weighted Statistics for the Full Sample, Adjusted for Clustering and Averaged across Imputed Samples

	Mean or %
Academic Achievement, 8 th grade	
Mathematics IRT test score (range: 15.8 – 66.82)	34.7
Grades (range: 0.5–4.0)	2.9
Mathematics/science track (range: 1 – 3)	2.1
Educational Attainment	
High school graduate (diploma / GED)	92.3%
Any college attendance	82.5%
Attended four-year college	54.4%
Completed four-year college degree	25.0%
Years of schooling (range: 8 – 21)	14.0
Family Structure, 8 th grade ^a	
Two biological parents ($n = 16,443$)	65.4%
Single mother ($n = 3,902$)	16.2%
Single father ($n = 515$)	2.0%
Mother-stepfather ($n = 2,511$)	11.1%
Father-stepmother ($n = 593$)	2.6%
Other ($n = 635$)	2.6%
Parents' Average Years of Schooling ^a (range: 8 – 21)	13.1
Parents' average education 13.5 years	39.0%
Parenting Practices, 8th grade	
Parents' education expectations (range: 1 – 6)	4.4
Intergenerational closure	66.0%
Concerted Cultivation	
Parent engagement with children about schooling, standardized	0.00
Extracurricular leisure activities, standardized	-0.04
Parent involvement in their child's school, standardized	-0.04
Indicators for Selection, 8 th – 10 th grades	
Sibling dropped out	7.7%

Martin

Page 21

	Mean or %
Parent labor force problems (range: 0 – 5)	0.42
Socio-Demographic Controls, 8 th grade	
Sex = Male	50.1%
Number of siblings (range: 0 – 6)	2.3
Foreign-born parent	13.3%
Region	
Northeast	19.2%
North Central	25.7%
South	35.4%
West	19.7%
Urbanicity	
Central City	25.1%
Suburban	43.6%
Rural	31.3%

Source: National Education Longitudinal Survey: 1988–2000, N = 24,515

^aSample sizes are averaged across multiply imputed data sets.

Table 2
Selected Coefficients for Models Predicting Children's Academic Achievement and Educational Attainment and Testing for Family Structure Differences in the Effect of Parents' Education

	8th Grade Achievement			Education Transitions			Years of Schooling
	Math Test Score	Grades	Math/Sci. Track	High School Completion	Any College Attendance	College Degree	
<i>Family Structure, 8th grade (reference = Two Biological Parent)</i>							
Single mother	-1.717*** (0.352)	-0.204*** (0.022)	-0.265** (0.073)	-1.045** (0.251)	-0.688* (0.209)	-1.054** (0.231)	-0.568*** (0.110)
Single father	-2.823** (0.849)	-0.208** (0.069)	-0.390 (0.241)	-1.605* (0.529)	-1.402* (0.463)	-1.116 (0.714)	-0.917** (0.239)
Mother + male	-0.515 (0.374)	-0.115*** (0.026)	-0.094 (0.065)	-0.787* (0.248)	-0.492* (0.170)	-1.049*** (0.185)	-0.461*** (0.089)
Father + female	-0.811 (0.623)	-0.126* (0.053)	-0.018 (0.121)	-1.038* (0.408)	-0.372 (0.365)	-0.558 (0.426)	-0.524* (0.197)
Other	-2.650*** (0.557)	-0.251*** (0.045)	-0.271* (0.126)	-1.638** (0.457)	-0.869 (0.370)	-1.683** (0.426)	-0.894** (0.187)
<i>Parent's avg. education = Some college, 8th grade</i>	7.248*** (0.233)	0.345*** (0.014)	0.705*** (0.047)	2.355*** (0.308)	2.905*** (0.187)	2.597*** (0.115)	1.509*** (0.071)
<i>Family Structure-Parents' Average Education Interactions</i>							
Single mother * Some college	-2.977*** (0.475)	-0.142*** (0.033)	-0.231* (0.100)	-1.044+ (0.520)	-1.611** (0.330)	-0.934* (0.285)	-0.642** (0.186)
Single father * Some college	-2.189 (1.121)	-0.220* (0.083)	-0.198 (0.256)	-0.836 (0.733)	-1.288 (0.615)	-1.617 (0.786)	-0.569 (0.315)
Mother + male * Some college	-2.374** (0.675)	-0.079 (0.050)	-0.219 (0.122)	-0.846 (0.674)	-0.161 (0.496)	-0.694 (0.307)	-0.354 (0.173)
Father + female * Some college	-3.848** (1.135)	-0.153 (0.078)	-0.530 (0.267)	-0.745 (0.851)	-1.348 (0.621)	-1.521* (0.576)	-0.482 (0.409)
Other * Some college	-5.526*** (1.050)	-0.324** (0.085)	-0.643* (0.225)	-0.896 (1.151)	-1.334 (0.822)	-1.376 (0.686)	-0.559 (0.377)
Wald Test p-value ^d	0.000	0.003	0.105		0.024		0.171

Source: National Education Longitudinal Survey: 1988–2000, missing data multiply imputed. N = 24,515.

Standard errors in parentheses.

+ p < .10.

* p < .05.

** p < .01.

*** p < .001

Note: Models are weighted and adjusted for sample design and control for sex, race/ethnicity, parents' nativity, region, urbanicity, number of siblings, sibling dropout, and parents' labor market problems. Mathematics test scores, grades, and years of schooling are predicted with OLS regression. Mathematics/Science track placement is predicted with ordinal logistic regression. Education transitions are predicted with a sequential logistic regression model (Mare 1981) with unobserved heterogeneity assumed to be large ($\gamma = 3.0$; see footnote 13; Buis 2007).

^aThe Wald Test provides evidence for whether the family structure-parents' education interactions are statistically significant as a group.

Table 3

Selected Coefficients for Models Predicting Parenting Practices

	Parents' Expectations		Intergenerational Closure		Parent-Child Interaction		Structured Leisure Activities		Parent School Involvement	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
<i>Family Structure, 8th grade (reference = Two Biological Parents)^a</i>										
Single mother	-0.284*** (0.027)	-0.217*** (0.039)	-0.067*** (0.010)	-0.066*** (0.013)	-0.196*** (0.026)	-0.203*** (0.033)	-0.251*** (0.024)	-0.190*** (0.028)	-0.291*** (0.022)	-0.244*** (0.025)
Single father	-0.328*** (0.084)	-0.316 (0.144)	-0.144*** (0.024)	-0.155*** (0.039)	-0.430*** (0.061)	-0.427** (0.115)	-0.366*** (0.052)	-0.344* (0.113)	-0.436*** (0.056)	-0.309*** (0.065)
Mother + male	-0.097* (0.035)	-0.040 (0.041)	-0.050*** (0.010)	-0.043** (0.011)	-0.014 (0.028)	-0.015 (0.032)	-0.098*** (0.027)	-0.071 (0.031)	-0.170*** (0.026)	-0.134*** (0.028)
Father + female	-0.338*** (0.072)	-0.303** (0.083)	-0.147*** (0.021)	-0.150*** (0.026)	-0.260** (0.062)	-0.306** (0.088)	-0.259*** (0.041)	-0.201** (0.056)	-0.215** (0.060)	-0.146* (0.067)
Other	-0.399*** (0.078)	-0.296** (0.094)	-0.122*** (0.026)	-0.107*** (0.027)	-0.288** (0.061)	-0.303** (0.071)	-0.400*** (0.048)	-0.312*** (0.062)	-0.244*** (0.056)	-0.231** (0.058)
Parent's avg. educ. = Some college	0.795*** (0.020)	0.850*** (0.022)	0.076*** (0.006)	0.080*** (0.007)	0.240*** (0.016)	0.233*** (0.019)	0.625*** (0.017)	0.668*** (0.020)	0.358*** (0.018)	0.398*** (0.023)
<i>Family Structure-Parents' Average Education Interactions</i>										
Single mother * Some college		-0.148* (0.055)		-0.004 (0.015)		0.016 (0.043)		-0.134* (0.042)		-0.105* (0.044)
Single father * Some college		-0.038 (0.150)		0.018 (0.051)		-0.002 (0.148)		-0.052 (0.160)		-0.229* (0.088)
Mother + male * Some college		-0.183* (0.067)		-0.023 (0.019)		0.001 (0.064)		-0.077 (0.057)		-0.113 (0.058)
Father + female * Some college		-0.098 (0.189)		0.011 (0.040)		0.135 (0.127)		-0.167 (0.101)		-0.199* (0.087)
Other * Some college		-0.416* (0.163)		-0.062 (0.050)		0.063 (0.138)		-0.353* (0.110)		-0.026 (0.105)
Wald Test p-value ^d		0.139		0.669		0.971		0.248		0.088

Source: National Education Longitudinal Survey: 1988–2000, missing data multiply imputed. N = 24,515

Standard errors in parentheses

[†] p < .10,

* p < .05,

** p < .01,

*** p < .001

Note: Models are weighted and adjusted for sample design and control for the same variables listed in Table 2. All variables modeled with OLS regression.

^a Given the interaction, these estimates are for those with average parental education < 13.5 years.^b Given the interaction, these estimates are for two biological parent families with average parental education >= 13.5 years

^cThe Wald Test provides evidence for whether the family structure-SES interactions are statistically significant as a group

Table 4

Selected Coefficients for Models Predicting Children's Educational Transitions and Years of Schooling including the Theorized Mediating Variables

	Educational Transitions						Years of Schooling	
	Model 1			Model 2			Model 1	Model 2
	H.S. Completion	Attend College	College Degree	H.S. Completion	Attend College	College Degree		
<i>Family Structure, 8th grade (reference = Two Biological Parent)^a</i>								
Single mother	-0.830* (0.260)	-0.416 (0.219)	-0.800* (0.243)	-0.547 (0.265)	-0.165 (0.230)	-0.503 (0.265)	-0.383** (0.109)	-0.218 (0.107)
Single father	-1.269 (0.538)	-0.981 (0.483)	-0.656 (0.716)	-1.030 (0.563)	-0.742 (0.499)	-0.401 (0.661)	-0.626* (0.228)	-0.443 (0.211)
Mother + male	-0.792* (0.260)	-0.464* (0.172)	-0.987** (0.189)	-0.672 (0.283)	-0.344 (0.171)	-0.918** (0.197)	-0.405** (0.082)	-0.314** (0.077)
Father + female	-0.698 (0.444)	0.017 (0.408)	-0.111 (0.420)	-0.767 (0.467)	0.011 (0.426)	0.031 (0.434)	-0.278 (0.190)	-0.247 (0.185)
Other	-1.360* (0.524)	-0.494 (0.433)	-1.236* (0.438)	-1.121 (0.524)	-0.217 (0.433)	-0.804 (0.495)	-0.629* (0.218)	-0.427 (0.198)
Parent's avg. education = Some college	1.294** (0.349)	1.791*** (0.198)	1.575*** (0.122)	0.847 (0.362)	1.454*** (0.208)	1.181*** (0.135)	0.829*** (0.065)	0.549*** (0.065)
<i>Family Structure-Parents' Average Education Interactions</i>								
Single mother * Some college	-0.847 (0.577)	-1.392** (0.351)	-0.780* (0.298)	-0.491 (0.593)	-1.176* (0.358)	-0.607 (0.334)	-0.516* (0.185)	-0.342 (0.177)
Single father * Some college	-0.824 (0.796)	-1.197 (0.644)	-1.675 (0.803)	-0.376 (0.871)	-0.884 (0.652)	-1.321 (0.758)	-0.528 (0.311)	-0.283 (0.288)
Mother + male * Some college	-0.601 (0.736)	0.085 (0.522)	-0.505 (0.302)	-0.369 (0.833)	0.255 (0.519)	-0.365 (0.319)	-0.218 (0.158)	-0.115 (0.160)
Father + female * Some college	-0.488 (0.845)	-1.155 (0.657)	-1.480* (0.622)	-0.172 (0.839)	-0.861 (0.674)	-1.193 (0.667)	-0.365 (0.375)	-0.128 (0.370)
Other * Some college	-0.268 (1.266)	-0.732 (0.906)	-0.950 (0.693)	0.367 (1.371)	-0.271 (0.933)	-0.578 (0.755)	-0.208 (0.382)	0.103 (0.349)
<i>Parenting Practices</i>								
Parent's education expectations	0.906*** (0.066)	0.930*** (0.051)	1.185*** (0.045)	0.513*** (0.064)	0.592*** (0.051)	0.650*** (0.048)	0.574*** (0.022)	0.311*** (0.022)
Intergenerational closure	0.523* (0.199)	0.276 (0.146)	0.600** (0.157)	0.339 (0.207)	0.133 (0.147)	0.421* (0.161)	0.237* (0.088)	0.133 (0.084)
Parent-child interaction	-0.083 (0.087)	-0.061 (0.051)	-0.184* (0.068)	0.039 (0.093)	0.049 (0.052)	-0.009 (0.072)	-0.070 (0.037)	0.008 (0.036)
Leisure activities	0.565** (0.113)	0.519*** (0.081)	0.380** (0.074)	0.370* (0.121)	0.359** (0.086)	0.160 (0.078)	0.258*** (0.043)	0.138* (0.043)
School involvement	-0.090 (0.104)	0.201 (0.088)	0.100 (0.064)	0.027 (0.114)	0.297* (0.092)	0.200* (0.068)	0.043 (0.039)	0.090 (0.037)
<i>8th grade Achievement</i>								
Math test score	--	--	--	0.103*** (0.011)	0.065*** (0.007)	0.073*** (0.006)	--	0.037*** (0.002)
Grades	--	--	--	1.412*** (0.131)	1.058*** (0.091)	1.681*** (0.085)	--	0.712*** (0.032)
Math/science track	--	--	--	0.508** (0.112)	0.369** (0.091)	0.359** (0.083)	--	0.194** (0.039)

	Educational Transitions				Years of Schooling	
	Model 1		Model 2		Model 1	Model 2
	H.S. Completion	Attend College	College Degree	H.S. Completion	Attend College	College Degree
Wald Test p-value ^c		0.060		0.164	0.411	0.741

Source: National Education Longitudinal Survey: 1988–2000, missing data multiply imputed. N = 24,515.

Standard errors in parentheses

⁺ p < .10,

* p < .05,

** p < .01,

*** p < .001

Note: Models are weighted and adjusted for sample design and control for the same variables listed in Table 2. Education transitions are predicted with a sequential logistic regression model (Mare 1981) with unobserved heterogeneity assumed to be large ($\lambda = 3.0$; see footnote 13; Buis 2007).

^a Given the interaction, these estimates are for those with average parental education < 13.5 years.

^b Given the interaction, these estimates are for two biological parent families with average parental education > = 13.5 years.

^c The Wald Test provides evidence for whether the family structure-SES interactions are statistically significant as a group.