FAMILY STRUCTURE AND CHILDREN'S EDUCATIONAL OUTCOMES: BLENDED FAMILIES, STYLIZED FACTS, AND DESCRIPTIVE REGRESSIONS*

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This article adds to the growing literature describing correlations between children's educational outcomes and family structure. Popular discussions have focused on the distinction between two-parent families and single-parent families. This article shows that educational outcomes for both types of children in blended families—stepchildren and their half-siblings who are the joint children of both parents—are similar to each other and substantially worse than outcomes for children reared in traditional nuclear families. We conclude that as a description of the data, the crucial distinction is between children reared in traditional nuclear families (i.e., families in which all children are the joint children of both parents) and children reared in other family structures (e.g., single-parent families or blended families). We then turn from "stylized facts" (i.e., simple correlations) that control only for family structure to "descriptive regressions" that control for other variables such as family income. When controls for other variables are introduced, the relationship between family structure and children's educational outcomes weakens substantially and is often statistically insignificant.

What is the effect of family structure on educational outcomes for children? In this article, we add to the growing literature describing correlations between children's educational outcomes and family structure. Although popular discussions have emphasized the distinction between two-parent families and single-parent families, McLanahan and Sandefur (1994) showed, and other researchers have confirmed, that outcomes for stepchildren are similar to outcomes for children in single-parent families. McLanahan and Sandefur described their results as showing that the crucial distinction is between children who are reared by both biological parents and children who are not. This description is misleading.

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In this article we show that, as a description of the data, the crucial distinction is between children who grow up in what the Census Bureau calls "traditional nuclear families" (i.e., families in which all children are the joint children of both parents) and children who grow up in other family structures (i.e., single-parent families, blended families). We also show that outcomes for both types of children in blended families—stepchildren and their half-siblings who are the joint children of both parents—are similar to each other and substantially worse than outcomes for children reared in traditional nuclear families. Our blended-family result adds to the stock of "stylized facts"—simple empirical regularities looking for explanations. Our results also illustrate the importance of classification schemes.

Classification schemes often determine what we see. Nearly all previous research has viewed family structure through the lens of a "child-based" classification scheme, categorizing a child's family as a "stepfamily" or a "two-biological-parent family" on the basis of the child's relationship to the parents. With a child-based classification, the same blended family is a stepfamily for one child and a two-biological-parent family for another. Instead of a child-based classification of family structure, we used one that is "family based." With a family-based classification, stepchildren and joint children who live together are said to belong to a "blended family." Using a child-based classification, previous researchers have focused on differences between children reared by a stepparent and a biological parent and children reared by both biological parents, a category that, although it also includes the joint children in blended families, is dominated by children reared in traditional nuclear families. Using a family-based scheme, we distinguished between children reared in traditional nuclear families and the joint children in blended families. We investigated whether outcomes for joint children in blended families differ significantly or substantially from outcomes for children in traditional nuclear families, outcomes for stepchildren, or outcomes for children in single-parent families.

The family-structure literature has revealed more complicated patterns in the data than our previous paragraphs suggest. One strand in the literature moves from simple stylized facts—differences in mean outcomes for children reared in various family structures—to "descriptive regressions" that control for the effects of other variables, such as mother's education and family income. We found that controlling for additional variables substantially reduces the correlation between children's educational outcomes and living in a single-parent family, and that the effect of living in a single-parent family was often no longer statistically significant after we controlled for family income.

Those who favor policies that promote marriage often cite stylized facts—simple correlations between family structure and children's outcomes—while those who are skeptical of such policies respond by citing descriptive regressions that control for variables such as mother's education and family income. Both sides brandish descriptive regressions that support their positions, but the regressions that are used in the political debate are only summaries of correlations among endogenous variables. Honest policy debates rest on beliefs about structural relationships, not on stylized facts or descriptive regressions.

CONCEPTUAL ISSUES AND A REVIEW OF THE LITERATURE

Conceptual Discussion of Family Structure

Psychology, sociology, and economics suggest causal mechanisms that might explain correlations between family structure and children's educational outcomes. Each discipline postulates that children reared in certain family structures will, on average, receive more psychological support or more social, cultural, and economic resources than children reared in others. Biblarz and Raftery (1999) described these mechanisms in more detail and provided additional references to the literature. The distinction among psychological,

sociological, and economic theories is seldom useful because most theories draw on insights from all three disciplines. Although Biblarz and Raftery asserted that "almost all existing theory about the consequences of family structure for children centers around the relationship between family type and resources" (p. 323), the notion of resources in these disciplinary perspectives is very broad.

The pathways through which resources are hypothesized to affect children are often described in the language of sociology and developmental psychology. Socialization theories often point to parenting styles, which may differ systematically with family structure. For example, single-parent families may be associated with inconsistent parenting or reduced supervision and control, and these characteristics of parenting styles may adversely affect child development (Thomson, Hanson, and McLanahan 1994). Learning theories often emphasize the importance of a male role model. One variant is the "pathology of matriarchy" that was proposed by Moynihan (1965) in *The Negro Family*; another variant argues that father absence leads to a lack of knowledge about how to operate in society (McLanahan and Sandefur 1994). Loss-of-parental-control theories emphasize trauma—perhaps the loss of a parent because of death or divorce or the number of transitions from one residence to another or from one family structure to another (Wu and Martinson 1993). Stepparents may have limited abilities to parent within blended families (Cherlin and Furstenberg 1994). Economic theories typically emphasize human capital, focusing on the access of children to money and time, but the gap between economic theories, on the one hand, and sociological and psychological theories, on the other, is substantially narrowed if the crucial variable is parental time spent nurturing children rather than expenditures on books or child care.

Selection and evolutionary psychology cut across the substantive theories drawn from sociology, psychology, and economics because they are silent about the nature of the resources or the pathways through which differences in adults' motivations or characteristics affect children. Selection theories postulate that some unobserved characteristics cause both differences in family structure and differences in educational outcomes for children. For example, parental conflict, rather than divorce itself, may adversely affect child development. Research has shown that children whose parents eventually divorce may manifest behavioral problems before their parents separate (Cherlin et al. 1991). Alternatively, some individuals may be more child oriented than others, and their child orientation may be associated with certain family structures and with certain outcomes for children. Because selection does not directly identify the pathways through which parental behavior or characteristics affect children, it is a complement to, rather than a substitute for, the theories from sociology, psychology, and economics.

Evolutionary psychology purports to explain the motivation of the parents and stepparents, postulating that mothers are more willing to provide resources than fathers and that biological parents are more willing to provide resources than stepparents (for a sympathetic discussion of evolutionary psychology and extensive references to the literature, see Daly and Wilson 1999, 2000). Mothers and biological parents have greater investments in children and thus are more vested in their outcomes. Because evolutionary psychology does not specify the pathways through which parental motivations affect outcomes for children, it, like selection, is a complement to theories that propose resource-based mechanisms. In this article, we argue that to link parental motivation to conclusions about child outcomes requires assumptions about both production functions for child outcomes and intrafamily allocation processes.

Review of the Empirical Literature

Social scientists from many disciplines have estimated the empirical relationship between family structure and children's outcomes, some making modest claims about correlations and others making less-modest claims about causation. When estimating the determinants

of education, social scientists have often controlled for family structure, along with exogenous variables such as race and gender.[1] Few researchers would claim that family structure is exogenous, and it is difficult to rule out the possibility that some unobserved variables or processes influence both family structure and educational outcomes.

Perhaps the most influential work on the correlation between family structure and children's outcomes is McLanahan and Sandefur's (1994). They found that children who grow up in single-parent families and children with stepparents have lower educational attainment than those who grow up with both biological parents. The estimated correlations depend on the control variables used in the regression. After controlling for mother's employment and occupation, Biblarz and Raftery (1999) found that children living with both biological parents or a single mother have higher occupational status and educational attainment than children living with a stepparent or with a single father. Biblarz and Raftery interpreted their findings as consistent with evolutionary psychology, which argues that mothers care more about the well-being of their children than do fathers. Wojtkiewicz (1993) and Boggess (1998) reported a negative and significant correlation between living with a stepfather and children's educational attainment.

To interpret these correlations as evidence of the causal effect of family structure on children's outcomes, researchers need to assume that family structure is exogenous. This assumption is false if there are processes that jointly determine family structure and children's outcomes or if child outcomes such as behavioral problems affect family structure. Researchers attempting to control for the endogeneity of family structure have made various identifying assumptions. Manski et al. (1992) evaluated the impact of alternative parametric and identification assumptions on the estimated effect of family structure on high school graduation. They demonstrated that the estimated effect depends on the identification assumptions imposed and concluded: "Any attempt to determine the family structure effect more tightly must bring to bear prior information about the process generating family structure and children's outcomes. As long as social scientists are heterogeneous in their beliefs about this process, their estimates of family structure may vary" (p. 36).

Subsequent research that has attempted to control for the endogeneity of family structure has confirmed this conclusion. Fixed-effects estimators allow researchers to control for the endogeneity of family structure, assuming there are unobserved family characteristics that are correlated with both child outcomes and family structure. Using fixed-effects estimators, Ermisch and Francesconi (2001), Case, Lin, and McLanahan (2001), and Evenhouse and Reilly (2004) found that family structure has a significant effect on children's educational outcomes, while Björklund and Sundström (2002) found no significant effects on children's educational outcomes and Gennetian (forthcoming) found no significant effects on assessments of children's cognitive outcomes.

Parental death, some have argued, is a quasi-natural experiment that can be used to examine the effect of family structure on children's outcomes. Biblarz and Gottainer (2000), Corak (2001), and Lang and Zagorsky (2001) found that parental absence because of death has much less impact on children's outcomes than parental absence because of divorce.

Finally, using longitudinal data, researchers have compared children's outcomes before and after divorce. Cherlin et al. (1991) reported that elementary school children whose parents eventually divorced performed poorly in school prior to the change in family structure. Painter and Levine (2000), however, found no prior poor performance when they examined educational outcomes for teenagers.

1. Several researchers, including Haveman and Wolfe (1994, 1995), Manski et al. (1992), and Eckstein and Wolpin (1999), have included measures of family structure in estimates of children's educational outcomes. These estimates, however, were not linked to structural models of family structure and investments in children.

The lack of a consensus about the effect of family structure on children's outcomes is striking. Research has shown that living with a single parent or a stepparent is *correlated* with poor outcomes for children. Biblarz and Raftery (1999) showed that the correlations between family structure and children's outcomes diminish substantially as more controls for family background are added. When researchers attempt to address the endogeneity of family structure, estimated family-structure effects depend on the identification assumptions. The most consistent set of results are found when parental death is used as a quasi-natural experiment: the death of a parent appears to have a substantially less-negative effect on child outcomes than does divorce. With the exception of Biblarz and Raftery, few researchers have evaluated the robustness of the correlation between family structure and children's outcomes when control variables such as family income or mother's education are added.

The lack of empirical consensus about the effect of family structure on children's outcomes is matched by the lack of conceptual consensus or clarity. The threshold difficulty of estimating the causal effect of family structure on children's educational attainment is the lack of a well-specified counterfactual. We discuss counterfactuals in the Conclusion. Evolutionary psychology appears to offer strong predictions about the effect of family structure on outcomes for biological children and stepchildren, but appearances are deceptive. Translated into the language of economics, evolutionary psychology predicts that parents prefer their own biological children to their stepchildren. The implications of these preferences for children's outcomes depend on (a) the "production function" that relates children's outcomes to "inputs," and (b) the intrafamily resource-allocation process that determines inputs. We assume for the sake of argument that evolutionary psychology is correct about parental preferences, and briefly discuss how production functions and intrafamily allocation processes mediate the effect of parental preferences on child outcomes.

The production function for child outcomes is poorly understood, but love, affection, time, and money are presumably key inputs.[2] Some of the relevant inputs are presumably "private inputs" for a particular child, while others are child "public inputs" that benefit all the children in the family. To the extent that child public inputs are important, we might expect similar outcomes for children with similar abilities in a family; to the extent that child private inputs are important, parents can use them to favor a particular child or to compensate for or reinforce differences in children's abilities.

Now consider three alternative assumptions about the intrafamily allocation of private inputs. For definiteness, consider a family with one stepchild and one joint child; more specifically, suppose that both are the biological children of the mother, but only one is the joint child of the mother and the father. First, in Becker's (1991) *altruist model*, the altruist (assumed to be the father) controls resource allocation within the family and, given our assumption about preferences, favors the joint child over his stepchild. Second, in *bargaining models* of marriage, intrafamily resource allocation will favor the joint child. The extent to which the joint child is favored depends on the relative bargaining power of the father and the mother, as well as on the children's abilities and the productivities of child public inputs and child private inputs. Third, in models that recognize *asymmetric information* and the *difficulty spouses have monitoring each other's behavior*, stepchildren and joint children may have similar outcomes. Suppose the division of child-rearing responsibilities is highly gendered and the wife allocates inputs among the children. Suppose further that the husband's ability to observe and monitor resource

2. Unobserved heterogeneity implies that the same measured inputs may produce different outcomes; children have different abilities, parents have different abilities, and the "match" between children and parents may be important.

allocation among the children is limited.[3] In blended families, the gendered division of child-rearing responsibilities ensures that even resident fathers are effectively absent much of the time and, hence, that they are weakly positioned to monitor resource allocation between their stepchild and the joint child. If the mother controls resource allocation between the children, she will not favor one child over the other because both are her biological children.[4] The father, recognizing the mother's role as allocator, may respond by increasing or decreasing the total resources available to the mother. But regardless of the father's response, resources he attempts to channel to his own child are "taxed," and, in response, the joint child receives less than if the father's contributions were not taxed.

The asymmetric information-and-monitoring story is consistent with our findings that outcomes for joint children in blended families are neither substantially nor significantly better than outcomes for stepchildren and that outcomes for all the children in blended families are substantially and significantly worse than outcomes for children in traditional nuclear families. Our findings are also consistent with explanations that are based on unobserved heterogeneity (e.g., of parents' preferences or abilities) or with stress associated with blended families. Both explanations can be interpreted in terms of the production function, and neither requires an explicit model of intrafamily resource allocation.

In this research we made no attempt to estimate the structural relationships—the production function or the intrafamily allocation process—or even to estimate the reduced forms. We characterize our empirical results as "stylized facts" and "descriptive regressions" and view them as summaries of empirical regularities. The foregoing discussion of theory was intended only to reassure concerned readers that our empirical results are not inconsistent with the predictions of evolutionary psychology or economic theory. In the remainder of the article, we report our use of three data sets to investigate the correlation between family structure and educational outcomes.

DATA AND ESTIMATION STRATEGY

We used three data sets to investigate the association between family structure and children's educational outcomes: the National Longitudinal Survey of Youth (NLSY), the Panel Study of Income Dynamics (PSID), and the children of females from the National Longitudinal Survey of Youth (NLSY-Child). We used the NLSY and PSID to examine the effect of family structure on four schooling outcomes for young adults—years of schooling, high school graduation, college attendance, and college graduation. We used the NLSY-Child data to examine the effect of family structure on children's cognitive outcomes: three Peabody Individual Achievement Tests (PIAT)—reading recognition, reading comprehension, and math.[5]

The NLSY began in 1979 with a nationally representative sample of 12,686 young adults aged 14–21. Almost half the observations in the NLSY (5,863) came from multiple-sibling households. We worked with an "NLSY sibling sample," which we defined to include a subset of individuals who had siblings or stepsiblings in the NLSY. To be included in our sibling sample, individuals had to have completed the 1988 Childhood Residence Calendar, have complete measures of schooling in at least one year between the 1990 and 1994 survey waves, and have had at least one sibling who met these criteria.

3. This situation within the blended family parallels that discussed by Weiss and Willis (1985, 1993) in the context of divorce and child support by noncustodial fathers. In Weiss and Willis, the divorced fathers were nonresident and, therefore, weakly positioned to monitor their ex-wives' allocation of child support payments between the wives' own consumption and that of the children.

4. This does not imply that she will allocate resources equally between the children because she may compensate for or reinforce differences in the children's abilities.

5. The NLSY-Child also contains the Behavioral Problems Index, which measures children's antisocial behavior.

We eliminated individuals who were adopted, reported zero years of schooling, or reported more than one change in family structure in a given year of childhood.

The PSID began collecting data in 1968 on a nationally representative sample of 4,800 families. It has followed individuals from their original families to new ones that have formed as a result of births, marriages, divorces, and children leaving home. Our sample consisted of individuals who were born between 1960 and 1970 with educational outcomes observed between 1990 and 1993 and who had at least one sibling who met these criteria. We selected this age group because they were roughly the same age as the children in the NLSY and we could observe at least 10 years of family structure during childhood. In 1985, the PSID collected retrospective data providing information on the pairwise relationships of all individuals in a 1968 family. We used this information from the 1968–1985 Relationship file to derive our measures of family structure. Our sample included individuals who were in the 1968–1985 Relationship file (because we could observe their family structure), who had at least one biological parent in the PSID sample, who had reported years of schooling, and who had a sibling who met these criteria.

Beginning in 1986, the NLSY started collecting data biennially on all the children who were born to the female NLSY respondents (the NLSY-Child data). The 1994 wave of the NLSY-Child sample contained information from 3,464 women with children. Because children under age 15 made up the majority of this sample, we focused on cognitive outcomes, rather than schooling attainment. The assessment instruments we used in this study were the three PIATs mentioned earlier. For all three assessments, we used the normalized percentile scores in our analysis.[6] Our sample from the NLSY-Child data was limited to children with siblings in the sample, aged 5–15, for whom we had data on age and the three PIAT assessments.

Given our focus on the effect of family structure on children's outcomes, the measurement of family structure requires explicit consideration. Previous studies have measured family structure as a dichotomous variable (e.g., does a child live with one or with both biological parents?). Dichotomous measures of family structure are unsatisfactory because family structure can change over childhood (e.g., as the result of divorce or remarriage). Family structure measured at a child's particular age (age 14 in the NLSY) will not adequately reflect living arrangements that change during childhood. Wolfe et al. (1996), who examined the effect of using these "window" variable measures, concluded that one-year window variables serve as weak proxies for childhood circumstances and events, and can result in unreliable estimates. Thus, we required multiple observations of family structure during childhood in our samples to estimate more accurately the effect of family structure on children's outcomes. Children in multiple-sibling households may experience different family structures. For example, in blended families the youngest child may spend his or her entire childhood with both biological parents, whereas the eldest child in the same family may be reared first by both biological parents, then by a single parent, and finally by one biological parent and a stepparent. Children living in these blended families share an environment that may have a similar impact on educational outcomes, regardless of their biological relationship to the parents. The extent to which the environment does have a similar impact is, of course, an empirical question.

In our analysis we used family-based measures of family structure that were created from retrospective data covering a child's entire childhood.[7] In the PSID and NLSY, we characterized family structure as the proportion of childhood that a child lives with both

6. For the PIAT assessments, raw scores are normalized to a national distribution on an age-specific basis.

7. Using the data collected by the 1988 NLSY Childhood Residence Calendar Supplement, we constructed age-specific changes in family structure over an individual's entire childhood, from ages 0 to 16. Using data collected in the 1968–1985 PSID Family Relationship file, we constructed age-specific changes in family structure over an individual's childhood from ages 1 to 16.

biological parents and no half-siblings (a traditional nuclear family), with a single biological parent (a single-parent family), with a biological parent who is married to a stepparent or with both biological parents and at least one half-sibling (a blended family), and alternative (other) family structures.[8] In the NLSY-Child survey, we defined family structure in each year of the survey data as living with a single mother, living with both biological parents and no half-siblings, or living in a blended family—defined as living with both biological parents and a half-sibling or living with a mother who is married to a stepfather (again treating cohabiting biological parents as if they were married). Even these definitions do not measure family structure over a child's entire childhood and may be subject to the "window" problem, but because they reflect living arrangements over multiple survey years, they are presumably better than conventional, single-year measures of family structure.

We restricted our attention to outcomes for children from "stable" blended families, which we defined as those in which at least one sibling reported living with both biological parents for the entire childhood and at least one other sibling reported living with a stepparent (see Appendix A for additional information on the identification of blended families and the definitions of the variables in this study). We excluded "unstable" blended families that ended in divorce because we wanted to examine the subset of blended families in which the joint children were most comparable to children from traditional nuclear families.[9] Thus, the joint children in our stable blended families had experienced no family-structure transitions.

Table 1 reports the means and standard deviations of the variables used in the NLSY and PSID siblings sample, along with the stable-blended-family subsample. Almost 30% of the siblings in the NLSY and 48% of the siblings in the PSID reported ever living in a nontraditional family.[10] Of the children in the PSID and NLSY who had lived in a blended family, 75% had lived with a stepfather, but only 14% had lived with a stepmother. The remaining 11% were the biological children of both parents in their blended families. Three percent of the siblings in the NLSY (154 individuals) and 8% in the PSID (111 individuals) had lived in stable blended families.[11] Within the stable-blended-family subsample, 39% of the children had lived with a stepfather, but only 9% had lived with a stepmother. The remaining 52% were the biological children of both parents in their stable blended families. The mean educational outcomes were lower in the stable-blended-family subsamples than for all siblings.

Table 2 reports the descriptive statistics for the NLSY-Child sample and our stable-blended-family subsample. Of the 4,320 siblings in the sample, 418 lived in stable blended

8. We treated cohabiting biological parents as if they were married. Following the census definition, we defined a "blended" family as one "that must include at least one stepparent, stepsibling and/or half-sibling. A stepparent is the spouse of a child's biological parent but is not the child's biological parent . . . . Half-siblings share only one biological parent" (Fields 2001). The census defines the "traditional nuclear family" as consisting of a married couple and their biological child or children, with no others present in the household. The proportion of childhood in a given family structure in the NLSY is measured as the number of years in that family structure divided by 17. In most cases an individual's childhood (ages 1–16) is not entirely observed between 1968 and 1985 in the PSID sample. Thus, we defined *family structure* as the number of years between ages 1 and 16 that a child was observed in the sample in a given family structure divided by the total number of years that the child was in the sample at ages 1–16 between 1968 and 1985.

9. We also excluded families in which none of the children were the biological children of both parents (e.g., the "Brady Bunch") because we wanted to compare the schooling outcomes of stepchildren in blended families with those of their half-siblings who were the joint children of both parents.

10. The percentage of siblings living in nontraditional families is greater in the PSID because of the oversampling of disadvantaged families.

11. Because our blended families are defined as families that remain together for the entire childhood of at least one child, these percentages are not an estimate of the percentage of children in the population who spend some portion of their childhood in a family that includes a husband, a wife, at least one stepchild, and at least one joint child of the couple.

Table 1. Descriptive Statistics for the NLSY and PSID Sibling Samples

	NLSY		PSID	
Variable	All Siblings	Half-Siblings	All Siblings	Half-Siblings
Years of Schooling	12.919	12.318	12.782	12.523
	(2.273)	(1.839)	(1.871)	(1.773)
High School Graduate = 1	0.854	0.786	0.851	0.838
	(0.353)	(0.412)	(0.356)	(0.370)
College Attendance = 1	0.416	0.292	0.388	0.360
	(0.493)	(0.456)	(0.488)	(0.482)
College Graduate = 1	0.129	0.026	0.135	0.090
	(0.335)	(0.160)	(0.342)	(0.288)
Proportion Lived in a Traditional Family	0.819	0.160	0.570	0.053
	(0.325)	(0.270)	(0.479)	(0.194)
Proportion Lived With a Single Parent	0.114	0.129	0.238	0.081
	(0.251)	(0.236)	(0.376)	(0.209)
Proportion Lived in a Blended Family	0.059	0.701	0.176	0.858
	(0.194)	(0.363)	(0.335)	(0.294)
Proportion Lived in Another Family Structure	0.007	0.010	0.015	0.009
	(0.053)	(0.063)	(0.087)	(0.066)
Lived in a Traditional Family Continuously = 1	0.698		0.524	
	(0.459)		(0.500)	
Lived in a Single-Parent Family = 1	0.164	0.071	0.181	0.045
	(0.370)	(0.258)	(0.385)	(0.208)
Lived in a Blended Family = 1	0.107	0.896	0.254	0.937
	(0.309)	(0.306)	(0.435)	(0.244)
Lived in Another Family Structure = 1	0.031	0.032	0.041	0.018
	(0.173)	(0.178)	(0.199)	(0.134)
Female = 1	0.480	0.461	0.507	0.550
	(0.500)	(0.500)	(0.500)	(0.500)
African American = 1	0.292	0.571	0.473	0.441
	(0.455)	(0.496)	(0.499)	(0.499)
Hispanic = 1	0.165	0.104	0.033	
	(0.371)	(0.306)	(0.180)	
Birth Order	3.330	3.494	3.636	3.459
	(2.221)	(2.124)	(2.480)	(2.396)
Number of Siblings	4.366	4.916	3.863	3.598
	(2.653)	(2.190)	(1.655)	(1.290)
Practiced Religion = 1	0.954	0.929	0.982	1.000
	(0.210)	(0.258)	(0.134)	(0.000)
Family Income	17,793	15,922	34,314	31,427
	(13648)	(12897)	(22155)	(12340)
Mother a High School Graduate = 1	0.358	0.286	0.356	0.396
	(0.479)	(0.453)	(0.479)	(0.491)
Mother Had Some College = 1	0.160	0.078	0.103	
	(0.367)	(0.269)	(0.304)	
Mother's Schooling Missing = 1	0.056	0.065	0.024	0.018
	(0.230)	(0.247)	(0.152)	(0.134)

(continued)

(Table 1, continued)

Variable	NLSY		PSID	
	All Siblings	Half-Siblings	All Siblings	Half-Siblings
Father a High School Graduate = 1	0.277	0.227	0.211	0.216
	(0.447)	(0.420)	(0.408)	(0.414)
Father Had Some College = 1	0.208	0.097	0.150	0.072
	(0.406)	(0.297)	(0.357)	(0.260)
Father's Schooling Missing = 1	0.130	0.240	0.150	
	(0.336)	(0.429)	(0.357)	
Sample Size	4,764	154	1,980	111

Note: Standard deviations are in parentheses.

families. Children in the NLSY-Child sample are repeatedly assessed, so we have over 10,000 child-year observations in this data set. Mean scores in the reading and math assessments were lower in the stable blended families than for all the siblings in the NLSY-Child sample. By definition, a child in a blended family in the NLSY-Child is the biological child of the mother and lives with either the biological father or a stepfather.

We used these data to estimate the correlation between family structure and children's educational attainment, making no attempt to control for the endogeneity of family structure. Instead, we focused on the robustness of the correlation between children's educational outcomes and family structure when we used alternative definitions of family structure and introduced controls for family background variables.

We begin by presenting our estimates of the correlation between family structure and educational outcomes using two models, the entire sample of siblings, and our family-based measures of family structure. We were motivated to take this approach by Biblarz and Raftery (1999) who showed that the effect of family structure is sensitive to which control variables are included. In addition to family structure, our first model includes the exogenous variables of gender and race. We excluded variables that measure inputs and behaviors chosen jointly with family structure, although several studies have included such variables (see, e.g., Biblarz and Raftery 1999; Lang and Zagorsky 2001; Manski et al. 1992). To examine the sensitivity of estimates of family structure to the inclusion of other control variables, we included variables such as sibship size (number of siblings), birth order, family income, religion, and parental schooling in the second specification.

In our second approach, we compared outcomes for half-siblings within the same stable blended family. We defined our stable blended-family samples in the NLSY and PSID to ensure that each family includes at least one child reared by both biological parents until age 16.[12] If growing up with both biological parents has a substantial impact on children's educational outcomes, we would expect to find evidence of this impact in our stable blended-family samples. That is, we would expect to find that children reared by both biological parents have better outcomes than their half-siblings who spent time in single-parent families and as stepchildren in stable blended families.

12. Stable blended families in the NLSY-Child are defined as at least one sibling living with both biological parents and a half-sibling in 1994.

Table 2. Descriptive Statistics, 1986–1994 NLSY Children

Variable	All Siblings		Stable Blended Families	
	Number of Observations	Mean	Number of Observations	Mean
PIAT—Reading Recognition Percentile Score	10,803	52.990 (27.931)	1,031	49.890 (27.522)
PIAT—Reading Comprehension Percentile Score	8,799	50.839 (27.745)	822	47.658 (27.506)
PIAT—Math Percentile Score	10,803	45.141 (26.335)	1,031	42.172 (25.967)
Lived in a Traditional Family	10,803	0.475 (0.499)	1,031	
Lived With a Single Mother	10,803	0.377 (0.485)	1,031	0.228 (0.420)
Lived in a Blended Family	10,803	0.148 (0.355)	1,031	0.772 (0.420)
Age	10,803	9.064 (2.626)	1,031	9.129 (2.681)
Real Family Income	9,165	31,907 (60,310)	877	38,391 (78,272)
Female = 1	4,320	0.482 (0.500)	418	0.502 (0.501)
African American = 1	4,320	0.344 (0.475)	418	0.397 (0.490)
Hispanic = 1	4,320	0.215 (0.411)	418	0.208 (0.406)
Number of Siblings	4,320	2.139 (1.169)	418	2.656 (1.396)
Practiced Religion = 1	4,320	0.406 (0.491)	418	0.385 (0.487)
Mother a High School Graduate = 1	4,320	0.488 (0.500)	418	0.495 (0.501)
Mother Had Some College = 1	4,320	0.272 (0.445)	418	0.251 (0.434)
Low Birth Weight	4,320	0.089 (0.285)	418	0.105 (0.307)

Note: Standard deviations are in parentheses.

EMPIRICAL RESULTS

The Correlation Between Family Structure and Educational Outcomes

We begin by presenting two cross-sectional models that estimate the effect of family structure on schooling outcomes. Model A regresses schooling outcomes on variables for gender, race, an indicator for being in the disadvantaged subsample, and family structure. Model B adds measures for the number of siblings, birth order, family income, religion, and parental schooling to Model A. Estimates using the NLSY are presented in Table 3, and those using the PSID are presented in Table 4. All regression estimates throughout this

Table 3. NLSY Sibling Estimates of the Effect of Family Structure on Schooling Outcomes

	Years of Schooling		High School Graduate		College Attendance		College Graduate	
Variable	OLS Model A	OLS Model B	Probit Model A	Probit Model B	Probit Model A	Probit Model B	Probit Model A	Probit Model B
Intercept	13.269**	8.378**	1.219**	–1.874**	–0.085*	–2.499**	–0.964**	–3.013**
	(0.074)	(0.562)	(0.047)	(0.412)	(0.039)	(0.380)	(0.045)	(0.482)
Disadvantaged Oversample	–0.914**	–0.333**	–0.485**	–0.198*	–0.403**	–0.137*	–0.295**	–0.054
	(0.116)	(0.111)	(0.079)	(0.081)	(0.059)	(0.069)	(0.065)	(0.088)
Female	0.417**	0.437**	0.244**	0.311**	0.223**	0.250**	0.165**	0.208**
	(0.066)	(0.062)	(0.047)	(0.055)	(0.039)	(0.045)	(0.049)	(0.056)
African American	0.101	0.672**	0.199*	0.468**	0.058	0.383**	–0.092	0.148
	(0.120)	(0.112)	(0.088)	(0.092)	(0.065)	(0.075)	(0.068)	(0.086)
Hispanic	–0.262	0.454**	–0.078	0.197*	–0.033	0.366**	–0.308**	–0.041
	(0.149)	(0.141)	(0.090)	(0.097)	(0.077)	(0.090)	(0.096)	(0.116)
Birth Order		0.050*		0.029		0.019		–0.006
		(0.024)		(0.018)		(0.017)		(0.024)
Number of Siblings		–0.123**		–0.067**		–0.064**		–0.028
		(0.022)		(0.016)		(0.016)		(0.021)
Religion		0.494**		0.447**		0.176		0.050
		(0.188)		(0.116)		(0.115)		(0.151)
Family Income in 1979		0.352**		0.240**		0.176**		0.162**
		(0.052)		(0.040)		(0.036)		(0.046)
Mother a High School Graduate		0.551**		0.282**		0.289**		0.191*
		(0.094)		(0.086)		(0.064)		(0.082)
Mother Had Some College		1.266**		0.405**		0.778**		0.396**
		(0.131)		(0.129)		(0.087)		(0.099)
Mother's Schooling Missing		–0.163		–0.174		–0.050		–0.067
		(0.145)		(0.111)		(0.108)		(0.170)
Father a High School Graduate		0.397**		0.411**		0.198**		0.122
		(0.096)		(0.083)		(0.066)		(0.081)
Father Had Some College		1.545**		0.851**		0.833**		0.515**
		(0.124)		(0.143)		(0.080)		(0.090)
Father's Schooling Missing		0.080		0.091		0.021		–0.136
		(0.114)		(0.086)		(0.083)		(0.125)
Proportion With a Single Parent	–0.674**	–0.235	–0.417**	–0.253*	–0.356**	–0.122	–0.374**	–0.194
	(0.159)	(0.157)	(0.106)	(0.119)	(0.092)	(0.107)	(0.122)	(0.144)
Proportion in a Blended Family	–0.894**	–0.517**	–0.259*	–0.152	–0.562**	–0.322*	–0.965**	–0.884**
	(0.169)	(0.161)	(0.130)	(0.140)	(0.120)	(0.135)	(0.217)	(0.247)
Proportion Without Parents	–1.459*	–0.641	–0.678	–0.460	–0.884	–0.494	–0.310	0.290
	(0.587)	(0.615)	(0.369)	(0.451)	(0.461)	(0.515)	(0.520)	(0.589)
Sample Size	4,674	3,817	4,674	3,817	4,674	3,817	4,674	3,817
R^2	0.074	0.288	0.047	0.162	0.036	0.162	0.044	0.115

Notes: Robust standard errors clustered by family in parentheses. R^2 for the probit is a pseudo-R^2. The sample size drops between Models A and Model B because of missing data on family income for some observations.

*$p < .05$; **$p < .01$

Table 4. PSID Sibling Estimates of the Effect of Family Structure on Schooling Outcomes

	Years of Schooling		High School Graduate		College Attendance		College Graduate	
Variable	OLS Model A	OLS Model B	Probit Model A	Probit Model B	Probit Model A	Probit Model B	Probit Model A	Probit Model B
Intercept	13.330**	5.691**	1.432**	–2.551*	–0.110	–6.414**	–0.686**	–5.819**
	(0.106)	(1.364)	(0.088)	(1.216)	(0.068)	(1.054)	(0.078)	(1.417)
Disadvantaged Oversample	–0.605**	–0.071	–0.294*	–0.031	–0.310**	0.043	–0.379**	–0.042
	(0.151)	(0.131)	(0.119)	(0.121)	(0.096)	(0.097)	(0.119)	(0.123)
Female	0.282**	0.311**	0.066	0.100	0.297**	0.356**	0.130	0.133
	(0.083)	(0.076)	(0.078)	(0.080)	(0.060)	(0.064)	(0.072)	(0.078)
African American	–0.190	0.459**	0.024	0.420**	–0.099	0.363**	–0.358**	0.051
	(0.153)	(0.141)	(0.123)	(0.129)	(0.100)	(0.104)	(0.124)	(0.135)
Hispanic	–0.182	0.466	–0.207	0.178	0.095	0.544**	–0.204	0.101
	(0.368)	(0.329)	(0.249)	(0.265)	(0.195)	(0.195)	(0.317)	(0.322)
Birth Order		–0.020		–0.030		–0.015		0.001
		(0.021)		(0.020)		(0.019)		(0.026)
Number of Siblings		–0.152**		–0.084*		–0.113**		–0.143**
		(0.035)		(0.035)		(0.031)		(0.040)
Religion		–0.466		–0.404		–0.327		–0.527
		(0.485)		(0.348)		(0.320)		(0.394)
Family Income in 1979		0.725**		0.406**		0.602**		0.525**
		(0.121)		(0.112)		(0.095)		(0.127)
Mother a High School Graduate		0.337**		0.357**		0.157		0.047
		(0.106)		(0.106)		(0.085)		(0.111)
Mother Had Some College		1.196**		0.949**		0.805**		0.484**
		(0.180)		(0.248)		(0.134)		(0.163)
Mother's Schooling Missing		0.007		0.054		0.000		0.148
		(0.280)		(0.281)		(0.279)		(0.275)
Father a High School Graduate		0.321*		0.223		0.282**		0.150
		(0.124)		(0.127)		(0.096)		(0.126)
Father Had Some College		0.908**		0.326		0.630**		0.545**
		(0.176)		(0.209)		(0.119)		(0.149)
Father's Schooling Missing		0.180		0.051		0.144		0.106
		(0.186)		(0.160)		(0.152)		(0.244)
Proportion With a Single Parent	–0.556**	–0.054	–0.532**	–0.294	–0.323**	0.059	–0.454**	–0.165
	(0.145)	(0.193)	(0.129)	(0.165)	(0.108)	(0.151)	(0.150)	(0.219)
Proportion in a Blended Family	–0.483**	–0.234	–0.341**	–0.308*	–0.145	0.034	–0.423**	–0.284*
	(0.160)	(0.140)	(0.128)	(0.128)	(0.104)	(0.103)	(0.132)	(0.134)
Proportion Without Parents	–1.355*	–0.409	–1.152*	–0.706	–0.598	0.119	–1.235	–0.699
	(0.565)	(0.488)	(0.499)	(0.485)	(0.457)	(0.445)	(0.905)	(0.861)
Sample Size	1,980	1,980	1,980	1,980	1,980	1,980	1,980	1,980
Adjusted R^2	0.084	0.252	0.049	0.125	0.041	0.159	0.094	0.199

Notes: Robust standard errors clustered by family in parentheses. R^2 for the probit is a pseudo-R^2.

*$p < .05$; **$p < .01$

article report standard errors that are clustered by family and adjusted using the Huber-White method to account for the correlation between observations from the same family. The models use family-based measures of family structure; all models have measures for the proportion of childhood spent in a single-parent family, blended family, or other family structure, with the proportion spent in a traditional nuclear family being the omitted category. We can interpret the coefficient on the proportion of childhood in a given family structure as the effect on schooling of spending an additional fraction of childhood in that family structure and a correspondingly lesser fraction in a traditional nuclear family.

Like previous research, our ordinary least-squares (OLS) and probit cross-sectional estimates of Model A in both data sets show that the proportion of childhood spent in a single-parent family or in a blended family has negative and significant effects on schooling outcomes. As additional variables are included in Model B, we observe results similar to those in Biblarz and Raftery (1999). The estimated effect of growing up with a single-parent attenuates and is not statistically significant in seven of the eight models estimated in Tables 3 and 4. In estimates not reported here, we found that much of the attenuation in the effect of single-parent families on educational outcomes results from the inclusion of family income in Model B. The estimated effect of growing up in a blended family is less negative in Model B than in Model A, but the coefficients remain negative and statistically significant in five of the eight models. Our results suggest that the estimated effect of family structure is sensitive to the inclusion of other variables in the regression.[13] After controlling for additional variables, we found that blended families are more negatively correlated with lower educational attainment than single-parent families.

We now turn to the correlation of family structure with child assessment outcomes. Table 5 presents two sets of estimates for each of three child assessment outcomes (reading recognition, reading comprehension, and math). In the first OLS specification, Model A, the normalized percentile assessment scores for each outcome are regressed on variables for age, gender, race, and family structure. Model B adds number of siblings, religion, mother's schooling, family income, and an indicator for low birth weight to Model A. Family structure is measured as an indicator variable for each year an individual is in the data set. The results for Model A indicate that living with a single parent or in a blended family significantly decreases reading and math scores. The estimated effect of family structure on assessment outcomes decreases substantially in Model B when additional variables are included in the regression.[14] More specifically, the results for Model B indicate that living with a single-parent or in a blended family is always negative. But of the six family-structure coefficients reported in Table 5 only one, the effect on reading recognition of living in a blended family, attains statistical significance.

Blended-Family Estimates

We next consider educational outcomes in stable blended families. We begin with schooling attainment. Because our stable blended-family sample is small in each data set, we combined the blended family subsamples from the PSID and NLSY for this analysis. The top panel of Table 6 tests the null hypothesis of no difference in mean schooling between siblings from stable blended families and siblings from traditional nuclear families in the combined PSID-NLSY sample. For all four schooling outcomes, we rejected the null hypothesis of no difference. Mean schooling outcomes in the

13. We experimented with alternative specifications in Tables 3 and 4 and found our results to be robust. The estimates presented in Tables 3 and 4 fit the data better than those using dummy variables for family structure but tell the same story.

14. In results available from us on request, we found similar estimated effects of family structure on the Behavioral Problems Index.

Table 5. NLSY-Child Sibling Estimates of the Effect of Family Structure on Assessment Outcomes

	Reading Recognition		Reading Comprehension		Math Test Scores	
Variable	OLS Model A	OLS Model B	OLS Model A	OLS Model B	OLS Model A	OLS Model B
Intercept	65.551**	21.234**	90.458**	49.054**	56.728**	13.991*
	(1.281)	(5.817)	(1.296)	(6.753)	(1.139)	(5.549)
Age	–0.798**	–0.801**	–3.430**	–3.244**	–0.244*	–0.183
	(0.124)	(0.126)	(0.122)	(0.131)	(0.106)	(0.113)
Female	6.340**	6.342**	3.708**	3.551**	0.793	0.627
	(0.786)	(0.771)	(0.761)	(0.732)	(0.706)	(0.703)
African American	–8.026**	–6.288**	–9.098**	–7.256**	–12.752**	–11.431**
	(1.215)	(1.187)	(1.158)	(1.142)	(1.083)	(1.090)
Hispanic	–9.083**	–6.162**	–7.845**	–4.916**	–11.938**	–9.642**
	(1.400)	(1.284)	(1.330)	(1.221)	(1.243)	(1.171)
Number of Siblings		–2.403**		–2.198**		–1.423**
		(0.491)		(0.451)		(0.427)
Religion		2.147*		1.719*		0.572
		(0.840)		(0.818)		(0.762)
Family Income		3.776**		3.288**		3.611**
		(0.560)		(0.657)		(0.529)
Mother a High School Graduate		7.033**		7.670**		6.132**
		(1.294)		(1.287)		(1.103)
Mother Had Some College		14.599**		13.825**		12.108**
		(1.483)		(1.480)		(1.338)
Low Birth Weight		–4.570**		–4.371**		–3.470**
		(1.604)		(1.544)		(1.251)
Lives in a Blended Family	–4.360**	–3.099*	–2.872*	–1.970	–2.541*	–1.786
	(1.422)	(1.410)	(1.383)	(1.343)	(1.251)	(1.238)
Lives With a Single Mother	–7.772**	–1.665	–7.028**	–1.842	–5.917**	–0.740
	(1.087)	(1.138)	(1.058)	(1.178)	(0.978)	(1.026)
Sample Size	10,803	9,109	8,799	7,424	10,803	9,109
R^2	0.071	0.148	0.155	0.220	0.082	0.141

Notes: Robust standard errors clustered by family in parentheses. R^2 for the probit is a pseudo-R^2. Estimates use all observations without missing data.

*$p < .05$; **$p < .01$

stable-blended-family sample are substantially and significantly lower than those for children from traditional nuclear families.[15]

Next, we compare the mean educational outcomes for joint children from stable blended families with outcomes for children from traditional nuclear families. The middle panel of Table 6 shows that in three of the four outcomes joint children from blended families have significantly lower educational attainment.

Finally, we evaluate whether schooling outcomes within the stable-blended-family sample differ for the stepchildren and the joint children. These results are presented in the

15. These results do not change when nonstable blended families are included in the analysis.

Table 6. Tests of Mean Differences in the PSID and NLSY Sibling Sample

A. Test: Mean Outcome for Half-Siblings in Stable Blended Families Versus Siblings in Traditional Families

Outcome	Mean, Half-Siblings	Mean, Traditional Families	Test Statistic	*p* Value
Years of Schooling	12.403 (0.111)	13.131 (0.034)	6.256	0.000
High School Graduate	0.807 (0.024)	0.887 (0.005)	3.202	0.002
College Attendance	0.321 (0.029)	0.456 (0.008)	4.542	0.000
College Graduate	0.053 (0.014)	0.161 (0.006)	7.255	0.000
Sample Size	265	4,301		

B. Test: Mean Outcome for Children in Traditional Families Versus Joint Children in the Stable-Blended-Family Sample

Outcome	Mean, Joint Children	Mean, Traditional	Test Statistic	*p* Value
Years of Schooling	12.508 (0.143)	13.131 (0.034)	4.234	0.000
High School Graduate	0.855 (0.032)	0.887 (0.005)	0.994	0.322
College Attendance	0.339 (0.043)	0.456 (0.008)	2.699	0.008
College Graduate	0.040 (0.018)	0.161 (0.006)	6.470	0.000
Sample Size	124	4,301		

C. Test: Mean Outcome for Joint Children Versus Stepchildren in the Stable-Blended-Family Sample

Outcome	Mean, Joint Children	Mean, Stepchildren	Test Statistic	*p* Value
Years of Schooling	12.508 (0.143)	12.312 (0.167)	0.891	0.374
High School Graduate	0.855 (0.032)	0.766 (0.036)	1.858	0.064
College Attendance	0.339 (0.043)	0.305 (0.039)	0.584	0.560
College Graduate	0.040 (0.018)	0.064 (0.021)	–0.863	0.389
Sample Size	124	141		

Notes: Traditional defined as observed in the survey as always living with both biological parents. *Stepchild* defined as ever living with a stepparent.

bottom panel of Table 6. For three of the four schooling outcomes, the joint children in stable blended families do better than the stepchildren.

For the fourth schooling outcome, graduation from college, the stepchildren do better than the joint children, but the sample size was very small: only 14 individuals in the blended family sample were college graduates. Furthermore, the difference between the

stepchildren and the joint children in stable blended families is not statistically significant. A comparison of the bottom panel of Table 6 with the top panel shows that the differences in mean schooling outcomes within the blended family are small relative to the difference between schooling outcomes for children in blended families and schooling outcomes for children in traditional nuclear families. Given the lack of statistical significance and the small sample size, we could be committing a Type II error of accepting the null hypothesis when the null is false. To examine this possibility, we estimated the power of the hypothesis tests in the bottom panel of Table 6, assuming a 5% level of significance. All the hypothesis tests in the bottom panel of Table 6 have an estimated power equal to 1, suggesting a negligible chance of committing a Type II error.

In Table 7 we present estimates from two models of schooling using the stable-blended-family sample.[16] Model A is a parsimonious model in which family structure is measured as the proportion of childhood spent in a nonintact family. We used this variable because it captures the differences between the stepchildren and joint children in the blended families. Model B includes additional family-background characteristics. In both models, the proportion of childhood spent in a nonintact family has a negative and statistically insignificant effect on educational attainment.[17]

Our results on the impact of family structure on educational attainment can be summarized as follows: using family-based measures of family structure, estimates of the effect of living with a single parent differ significantly, depending on which family-background variables are included in the model. Regardless of the specification used, the effect of living in a blended family remains negative and significant. In the stable-blended-family sample, the differences in educational outcomes between the joint children and stepchildren is small, and both types of children from blended families do poorly when compared with children from traditional nuclear families. The tests of mean differences indicate that growing up in a stable blended family has a negative impact on schooling outcomes for both stepchildren and joint children. In the stable-blended-family regressions, stepchildren do somewhat worse than joint children, but the difference is small and not statistically significant.[18]

We now turn to the effect of family structure on the three child assessment outcomes. Table 8 reports the results of tests of mean differences in the assessment outcomes for children in the NLSY-Child sample. The first panel of Table 8 shows statistically significant differences in the mean outcomes between the children in the stable blended-family sample and the children from traditional nuclear families in the NLSY-Child sample. For all three outcomes, we reject the null hypothesis of no difference in the mean scores across the two groups. The second panel of Table 8 compares the mean outcomes for joint children in stable blended families with those for children from traditional nuclear families. Again the differences are large: the children in traditional nuclear families have substantially better outcomes.

The bottom panel of Table 8 reports the mean outcomes within the stable blended-family sample, comparing the stepchildren ("her children") with the joint children of both parents ("their children"). We found that stepchildren have lower mean scores on both reading assessments and the math assessment. When we tested the null hypothesis

16. Only three of the four schooling outcomes are presented in Table 7 because only 14 individuals in the blended-family sample graduated from college.

17. This result also holds when the models are estimated separately for the PSID and NLSY. These results are available from us on request.

18. Case et al. (2001) found that stepchildren in stepmother families do substantially and significantly worse than joint children in these families. However, they also found no significant difference in educational outcomes between stepchildren and joint children in stepfather blended families. As we mentioned earlier, the majority of children in our sample were from stepfather blended families.

Table 7. PSID and NLSY Blended-Family Sample Estimates of the Effect of Family Structure on Educational Outcomes

	Years of Schooling		High School Graduate		College Attendance	
Variable	OLS Model A	OLS Model B	Probit Model A	Probit Model B	Probit Model A	Probit Model B
Intercept	12.036**	10.743**	0.895**	0.145	–0.897**	–1.226**
	(0.311)	(0.648)	(0.250)	(0.540)	(0.230)	(0.365)
PSID = 1	0.259	0.240	0.250	0.044	0.161	0.208
	(0.304)	(0.342)	(0.255)	(0.292)	(0.206)	(0.237)
Disadvantaged Oversample	0.137	0.131	–0.151	–0.143	0.255	0.293
	(0.279)	(0.276)	(0.257)	(0.253)	(0.216)	(0.211)
Female	0.331	0.293	0.056	0.040	0.442**	0.464**
	(0.221)	(0.224)	(0.172)	(0.185)	(0.165)	(0.174)
African American	0.270	0.403	0.266	0.389	0.052	0.148
	(0.323)	(0.325)	(0.284)	(0.282)	(0.223)	(0.231)
Hispanic	0.181	0.236	–0.324	–0.421	–0.006	0.023
	(0.692)	(0.748)	(0.442)	(0.476)	(0.476)	(0.492)
Birth Order		0.067		0.063		0.034
		(0.075)		(0.065)		(0.047)
Number of Siblings		–0.067		–0.027		–0.036
		(0.078)		(0.067)		(0.065)
Religion		0.947*		0.512		
		(0.464)		(0.459)		
Mother a High School Graduate		0.213		0.395		0.090
		(0.281)		(0.260)		(0.203)
Mother Had Some College		1.061		0.161		1.138**
		(0.549)		(0.428)		(0.419)
Mother's Schooling Missing		0.220		0.088		0.630
		(0.605)		(0.489)		(0.434)
Father a High School Graduate		0.658*		0.324		0.436*
		(0.304)		(0.278)		(0.198)
Father Had Some College		0.836		0.415		0.529
		(0.493)		(0.580)		(0.347)
Father's Schooling Missing		0.092		–0.348		–0.027
		(0.373)		(0.306)		(0.342)
Proportion in Nonintact Family	–0.330	–0.231	–0.381	–0.279	–0.130	–0.081
	(0.274)	(0.292)	(0.200)	(0.213)	(0.195)	(0.222)
Sample Size	265	265	265	265	265	265
Adjusted R^2	0.028	0.103	0.034	0.089	0.037	0.083

Notes: Robust standard errors clustered by family in parentheses. R^2 for the probit is a pseudo-R^2.

*$p < .05$; **$p < .01$

that there is no mean difference in outcomes between "her children" and "their children," we again failed to reject the null hypothesis: we found no significant difference in the mean outcomes for the stepchildren and the joint children in stable blended families. We evaluated the power at the 5% level of significance of the hypothesis tests in the bottom panel of Table 8. The reading comprehension and math hypothesis tests have an estimated

Table 8. Tests of Mean Differences, NLSY-Child Sibling Sample

A. Test: Mean Outcome for Half-Siblings in Stable Blended Families Versus Siblings in Traditional Families

Outcome	Mean, Half-Siblings	Mean, Traditional Families	Test Statistic	*p* Value
PIAT—Reading Recognition	49.369 (1.228)	57.896 (0.572)	6.364	0.000
PIAT—Reading Comprehension[a]	46.838 (1.330)	56.696 (0.597)	6.945	0.000
PIAT—Math	41.627 (1.136)	50.333 (0.548)	6.830	0.000
Sample Size	418	1,861		

B. Test: Mean Outcome for Children in Traditional Families Versus Joint Children in the Stable-Blended-Family Sample

Outcome	Mean, Joint Children	Mean, Traditional	Test Statistic	*p* Value
PIAT—Reading Recognition	49.615 (1.810)	57.896 (0.572)	4.485	0.000
PIAT—Reading Comprehension[b]	49.645 (2.096)	56.696 (0.597)	3.333	0.001
PIAT—Math	42.025 (1.724)	50.333 (0.548)	4.702	0.000
Sample Size	199	1,861		

C. Test: Mean Outcome for Joint Children Versus Stepchildren in the Stable-Blended-Family Sample

Outcome	Mean, Joint Children	Mean, Stepchildren	Test Statistic	*p* Value
PIAT—Reading Recognition	49.615 (1.810)	49.145 (1.675)	–0.191	0.848
PIAT—Reading Comprehension[c]	49.645 (2.096)	44.994 (1.713)	–1.715	0.087
PIAT—Math	42.025 (1.724)	41.264 (1.503)	–0.334	0.738
Sample Size	199	219		

Notes: Tests performed on average assessment scores. *Traditional* defined as observed in the survey as always living with both biological parents. *Stepchild* defined as ever living with a stepparent.

[a]353 half-sibling and 1,609 traditional family observations.

[b]140 joint children and 1,609 traditional family observations.

[c]140 joint children and 213 stepchildren observations.

power of 1 and 0.998, respectively, suggesting a negligible chance of committing a Type II error. The reading-recognition test has less power at 0.784.

Finally, in Table 9 we present regression estimates of the effect of family structure on children's assessments using the NLSY-Child stable-blended-family sample. The results for Models A and B are presented in the table for the three assessments. We found that living in a single-parent family or a blended family generally has a positive but insignificant effect on the PIAT assessments. Only one of the family-structure variables

Table 9. NLSY-Child Blended-Family Estimates of the Effect of Family Structure on Assessment Outcomes

	Reading Recognition		Reading Comprehension		Math Test Scores	
Variable	OLS Model A	OLS Model B	OLS Model A	OLS Model B	OLS Model A	OLS Model B
Intercept	62.531**	22.869	87.854**	26.162	53.486**	2.933
	(3.757)	(18.321)	(3.855)	(17.111)	(3.240)	(15.943)
Age	–1.380**	–1.403**	–3.957**	–3.817**	–0.417	–0.406
	(0.485)	(0.516)	(0.417)	(0.443)	(0.323)	(0.369)
Female	5.300*	6.140*	3.385	3.906	0.171	–0.535
	(2.421)	(2.572)	(2.306)	(2.330)	(2.058)	(2.085)
African American	–6.574	–6.245	–7.827*	–7.285*	–12.757**	–13.249**
	(4.053)	(3.980)	(3.753)	(3.569)	(3.403)	(3.327)
Hispanic	–9.375*	–6.098	–8.939*	–4.708	–11.253**	–8.563*
	(4.107)	(3.923)	(3.592)	(3.187)	(3.578)	(3.492)
Number of Siblings		–3.705**		–2.853*		–1.127
		(1.384)		(1.396)		(0.965)
Religion		2.743		1.332		1.326
		(3.257)		(3.079)		(2.788)
Family Income		4.297*		6.135**		4.682**
		(1.901)		(1.593)		(1.581)
Mother a High School Graduate		1.300		0.616		4.057
		(3.943)		(3.904)		(3.195)
Mother Had Some College		9.881		10.191		12.074*
		(5.649)		(5.550)		(4.714)
Low Birth Weight		–3.623		–6.267		–4.484
		(4.895)		(5.021)		(3.090)
Lives With a Stepfather	4.406	2.514	4.533	3.610	1.438	–0.209
	(3.254)	(3.413)	(3.191)	(3.374)	(2.557)	(2.528)
Lives With a Single Mother	1.581	8.032	1.277	8.380*	–1.736	3.947
	(3.767)	(4.598)	(3.891)	(4.206)	(2.992)	(3.432)
Sample Size	1,031	866	822	696	1,031	866
R^2	0.045	0.136	0.146	0.243	0.060	0.128

Notes: Robust standard errors clustered by family in parentheses. R^2 for the probit is a pseudo-R^2. Estimates use all observations without missing data.

*$p < .05$; **$p < .01$

is statistically significant in Table 9: living with a single parent has a positive and statistically significant effect on reading comprehension, even with controls for family-background characteristics.

Tables 8 and 9 indicate that stable-blended-family child assessment outcomes differ from the full NLSY-Child sample. Comparing the effect of family structure using the stable-blended-family sample, we found that the estimated coefficients on the family-structure variables often change signs and generally become statistically insignificant. Our results are based on 418 observations, which should be sufficient to generate statistically significant point estimates. Using the NLSY-Child data and mother fixed-effects estimates in blended families, Gennetian (forthcoming) found essentially the same results.

Our estimates show that outcomes for both types of children in stable blended families—stepchildren and their half-siblings who are the joint children of both parents—are substantially worse than for children reared in traditional nuclear families. Because these estimated correlations are merely the result of regressing one endogenous variable on another, however, they do not provide a basis for policy.

CONCLUSION

In this article, we have augmented the stock of stylized facts and descriptive regressions that summarize the correlations between family structure and children's educational outcomes. Our results pertain only to educational outcomes and may not generalize to other outcomes, such as health or teen pregnancy. Our contribution to the stock of stylized facts concerns blended families. It is well known that, on average, children reared in traditional nuclear families have substantially better educational outcomes than stepchildren reared in stable blended families. We found that children reared in traditional nuclear families also have substantially better educational outcomes than the joint children from stable blended families. Within stable blended families, the difference between the joint children and the stepchildren is neither substantial nor statistically significant.

Controlling not only for family structure but also for variables such as mothers' education and family income, descriptive regressions reveal a different pattern of family-structure effects than do the stylized facts that control only for family structure. With additional controls, the effect of family structure falls substantially and often loses statistical significance. In particular, with controls for family income, the effect of living in a single-parent family is no longer statistically significant.

How can we understand these findings? Four explanations, separately or in combination, may account for at least some of them. First, family structure may well be a proxy for other variables that affect outcomes for children. If family structure is correlated with family resources (e.g., time and money) that are devoted to children and if we fail to control for these variables, then family structure will pick up some of their effects. Because descriptive regressions do not correspond to either structural or reduced-form relationships, there is no principled way to argue about which variables ought to be included and which ought to be excluded from descriptive regressions.[19]

The second explanation is stress. Although the Brady Bunch was preternaturally happy, the presence of stepchildren is often described as a source of stress. The sociologist Andrew Cherlin (1978) characterized remarriage as an "incomplete institution," arguing that roles in such families lack clear definition; for example, there is no consensus about when it is appropriate for a stepfather to discipline a stepchild. Most discussions of blended families focus on outcomes for stepchildren. Few researchers have discussed the joint children in blended families, although Gennetian (forthcoming) is an important exception. The stresses and strains of blended families—the presence of stepchildren, not necessarily their behavior—might affect outcomes for the joint children as well as for the stepchildren. Stress might explain why children in blended families have worse educational outcomes than children in other two-parent families.

Some have suggested that the number of family-structure transitions experienced by stepchildren and by children in single-parent families explains the poor outcomes they experience. Although we did not systematically examine the effects of the number of

19. The discussion of the effect of family resources on outcomes for children is an example. The articles in Duncan and Brooks-Gunn (1996) generally argued that increases in family resources have positive effects on child outcomes, Mayer (1997) contended that most of the observed correlation between family resources and child outcomes reflects unobserved heterogeneity, and Blau (1999) provided a balanced summary of the discussion. The underlying difficulty is that the discussion of family-resource effects, like the discussion of family-structure effects, requires a well-specified counterfactual (e.g., an increase in cash welfare benefits or winning the lottery), but discussions of counterfactuals are conspicuously absent.

family-structure transitions, our findings for the educational outcomes of joint children in stable blended families cannot be explained this way. The joint children in stable blended families grew up with both biological parents and experienced no family-structure transitions. Yet their educational outcomes are similar to those of stepchildren and of children in single-parent families, and much worse than those of children in traditional nuclear families.[20]

The third explanation hinges on the allocation of time and other resources within blended families. If a mother in a blended family allocates resources among children, and if all the children are hers, as they usually are, then she may use her ability to allocate resources to "compensate" for any negative effects of family structure on stepchildren. This explanation highlights the fact that observed educational outcomes are not "pure" family-structure effects, whatever that might mean, but also reflect the effects of any compensating or reinforcing family-allocation decisions.

The fourth explanation is heterogeneity. Observed heterogeneity draws our attention to which of the observed variables investigators choose to control for. The descriptive regressions show that the correlations between family structure and outcomes for children fall substantially and often lack statistical significance when we control for variables such as mothers' education and family income. Unobserved heterogeneity draws our attention not only to differences in unobserved behaviors that may influence outcomes for children but also to differences in preferences and ability that influence the choice of family structure, education, and childbearing. Parents in blended families and single-parent families that result from divorce or nonmarital fertility may differ from parents in traditional nuclear families in unobserved as well as observed characteristics. Even if family structure has no "direct" or "causal" effect on outcomes for children, unobserved heterogeneity and selection could account for the association between outcomes for children and family structure that are summarized in the stylized facts and descriptive regressions.

Our analysis also demonstrates that what we see depends on the lens we look through—the classification scheme we bring to the analysis. Classification schemes illuminate some relationships and obscure others. Furthermore, as Bowker and Star (1999) emphasized, classification schemes themselves often become visible only when alternatives appear. Using a family-based, rather than a child-based, classification of family structure, we see the children in blended families—the stepchildren and the joint children—in a new light.

Although we have augmented the set of stylized facts regarding family structure, we conclude by emphasizing that stylized facts and descriptive regressions cannot support either scientific conclusions or policy analysis. Counterfactuals are required. In economics most questions have default counterfactuals that are not spelled out explicitly because they are generally understood. Questions about the effect of family structure lack default counterfactuals. Interpreted literally, the question, "What is the effect of family structure on outcomes for children?" is ill posed because it asks about the effect of one endogenous variable on another. We argue for clarifying the family-structure question by specifying an explicit counterfactual.

Any counterfactual will clarify the question, but policy analysis requires policy-relevant counterfactuals: the death of a parent provides a counterfactual, but not one that is useful for policy analysis. In contrast, the effect of a change in the income tax that reduces the marriage penalty or a change in state divorce laws on outcomes for children provide policy-relevant counterfactuals. Gruber (forthcoming) investigated the effect of unilateral divorce on outcomes for children, using state-to-state differences in the timing of the "divorce revolution"—the transition from fault-based divorce to divorce by mutual consent and the transition from divorce by mutual consent to unilateral divorce. Gruber

20. The fact that children of widows have educational outcomes that are similar to those of children in traditional nuclear families also casts doubt on the importance of the number of family-structure transitions.

found that unilateral divorce has a negative and significant effect on children's educational attainment. Although Gruber did not use the language of counterfactuals, he reviewed the family-structure literature, which generally claims that divorce has adverse effects on outcomes for children, and criticized it for failing to recognize and deal with the endogeneity of family structure.

Our results imply cautions for policy. Neither stylized facts nor descriptive regressions provide defensible estimates of the effects of family structure. Designers of policy interventions need to know more about the determinants of outcomes for children than they can learn from stylized facts and descriptive regressions. Policies that are intended to improve outcomes for children often focus on family structure, which is easy to observe and, some believe, relatively easy to influence through tax and welfare policy; couples counseling; or legal rules governing marriage, divorce, and child support. If the stylized facts about the relationship between outcomes for children and family structure reflect the influences of variables other than family structure, then policies that affect family structure may have little or no effect on outcomes for children. Our blended-family results and descriptive-regressions results call into question the causal interpretation of the stylized facts about the relationship between family structure and outcomes for children.

APPENDIX A: DATA CONSTRUCTION AND DEFINITIONS OF VARIABLES

Although the NLSY contains information on multiple sibling households, the data do not explicitly report whether a pair of siblings are half or full. The PSID does identify half-siblings in the Family Relationship file. However, to facilitate comparisons across the data sets, we used the same identification approach for each. To identify half-siblings in the data, we compared measures of family structure in a household.

We used a similar approach to identify stable blended families in the NLSY-Child data. We identified half-siblings within a household using the following criteria: (1) one sibling reported living with a father, and the other reported not living with a father; (2) both siblings reported not living with a father but reported fathers living at different distances from them; or (3) one child reported that the father was dead, while the other did not. To make our NLSY-Child stable blended-family sample more nearly comparable to the NLSY stable blended-family sample, we imposed the additional restriction that at least one child in the household reported having lived with both biological parents from birth until the time of the survey. Table A1 contains the definitions of the variables used in this analysis.

Appendix Table A1. Definitions of Outcome and Family-Structure Variables: PSID, NLSY, and NLSY-Child

Variable	Definition
PSID and NLSY	
Years of schooling	NLSY: Maximum years of schooling observed 1985–1994
	PSID: Maximum years of schooling observed 1985–1997
High school graduate = 1	Indicator: Completed high school by 1994 in NLSY and by 1997 in PSID
College attendance = 1	Indicator: Attended college by 1994 in NLSY and by 1997 in PSID
College graduate = 1	Indicator: Completed college by 1994 in NLSY and by 1997 in PSID

(continued)

(Appendix Table A1, continued)

Variable	Definition
NLSY-Child	
Peabody Individual Achievement Tests	Nationally normed percentile scores
Reading recognition	
Reading comprehension	
Math percentile scores	
NLSY and PSID Family-Structure Variables	
NLSY proportion defined as	Years living in a given family structure (child aged 0–16) divided by 17
PSID proportion defined as	Years observed between 1968 and 1985 (child aged 1–16) in a given family structure, divided by total years observed between 1968 and 1985 (child aged 1–16)
Proportion lived in a traditional family	Living with both biological parents and biological siblings only
Proportion lived with a single parent	Living with either a single mother or a single father and no stepparent
Proportion lived in a blended family	Living with a stepparent and a biological parent who are married or living with both biological parents and at least one half-sibling
Proportion lived in another family structure	Living without a biological parent and with other relatives, in foster care, and so forth
Lived in a traditional family continuously = 1	Indicator variable of the proportion lived with both biological parents = 1
Lived in a single parent family = 1	Indicator variable of ever lived with a single parent and never lived with a stepparent
Lived in a blended family = 1	Indicator variable of ever lived in a blended family
Lived in another family structure = 1	Indicator variable of ever lived without both biological parents
NLSY-Child Family Structure Variables[a]	
Lived in a traditional family	Indicator for 1986, 1988, 1990, 1992, and 1994
Lived with a single mother	Indicator for 1986, 1988, 1990, 1992, and 1994
Lived in a blended family	Indicator for 1986, 1988, 1990, 1992, and 1994
Other Independent Variables	
Female = 1	Indicator: Female = 1
African American = 1	Indicator: African American = 1
Hispanic = 1	Indicator: Hispanic = 1
Birth order	NLSY and PSID: Number of older siblings + 1
Number of siblings	NLSY: Average number of siblings reported in 1979 and 1993
	PSID: Average number of siblings, 1968–1985
	NLSY-Child: Total number of siblings, 1994
Practiced religion = 1	Indicator: child practiced religion = 1

(continued)

(Appendix Table A1, continued)

Variable	Definition
Other Independent Variables (cont.)	
Family income	NLSY: Log of family income, 1979
	PSID: Log of average family income, 1968–1985
	NLSY-Child: Log of family income in 1986, 1988, 1990, 1992, 1994, deflated by PCE deflator (1992 = 100)
Mother a high school graduate = 1	Indicator: Biological mother is a high school graduate
Mother had some college = 1	Indicator: Biological mother had more than 12 years of schooling
Mother's schooling missing = 1	Mother's educational information missing
Father a high school graduate = 1	Indicator: Biological father is a high school graduate
Father had some college = 1	Indicator: Biological father had more than 12 years of schooling
Father's schooling missing = 1	Father's educational information missing
Age	NLSY-Child: Age in 1986, 1988, 1990, 1992, 1994
Low birth weight	Indicator for birth weight lower than 5.5 pounds

[a]All children in the NLSY-Child sample live with their biological mothers.

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