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**Family Structure and Youths' Outcomes:
Which Correlations are Causal?**

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Abstract: Growing up in a family that lacks a biological father is correlated with a number of poor outcomes for youths. This study uses the National Educational Longitudinal Survey of 1988 (NELS) to examine the extent to which the apparent effects of divorce or remarriage are not causal, but are due to pre-existing problems or advantages of the family or youth. We find that the correlations between family structure and youth outcomes are causal: neither divorce nor remarriage appear to be related to pre-existing characteristics of the youth or family. Finally, unlike some previous research, we do not find gender differences in the effects of the presence of a father or stepfather.

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On average, youth living with a single mother are roughly twice as likely as other youth to drop out of high school, become pregnant, and be arrested. At the same time, when a single mother marries, some, but not much, of the apparent disadvantages go away. It is a common concern in the social sciences to suspect that correlations are not causal. In this case, it may be that both family structure and youths' outcomes are caused by a third variable. As Charles Manski and his coauthors noted:

It may be that, as the [cross-sectional] empirical evidence suggests, living in a nonintact family has adverse consequences for children. On the other hand, it may be that some unobserved process jointly determines family structure and children's outcomes. For example, parents who are less committed to their family may be more likely to divorce and may also provide less support for their children. Behavioral and/or medical problems such as alcoholism, depression, or drug addiction may make a person more likely to divorce and less effective as a parent (1992: 25).

One reason to suspect that the apparent effects of single parenthood may not be entirely causal is that almost all of the apparent bad effects of teen parenthood are not causal (Geronimus and Korenman, 1991; Hotz, Mullin, and Sanders, 1997). As described below, most of the disadvantages of children born of teenaged parents are due to the pre-existing disadvantages of their mothers, not due to the early age of motherhood. On average, if these young mothers had delayed childbearing, it would not have appreciatively helped the outcomes of their children.

Moreover, some past research has found that elementary-school children in to-be-divorced families did poorly on a number of measures such as test scores and teacher reports of behavior problems prior to divorce (Wallerstein, 1991). This study examines whether these results also hold for youths whose parents divorce during their teen years.

In addition, any advantage children with step-fathers have relative to those in single-parent families may also not be causal. If even before any remarriage, the to-be-remarried single mothers were typically better off than other single mothers, any apparent benefits of remarriage may be misleading.¹

Policies that may affect family structure are particularly important because many American children will probably spend part of their youth living with only one parent (Bumpass, 1984). This fact is even more striking for African-American youth, who are as likely (42%) to reside in a single parent home as a traditional home (Table 1). At the same time, the debate about policies to affect family structures takes place while researchers have no consensus as to why and how family structure matters (Sandefur and McLanahan, 1994; Wojtkiewicz, 1992). Understanding causality is crucial in designing effective policies to affect family structures. For example, at least eight states have recently considered considering making divorce more difficult (Friedberg, 1998). Such policies can only help youth if the links between family structure and

youths' outcomes are causal; if the correlation merely reflects underlying disadvantages of the parents, then reducing divorce will not help youth.²

We examine the National Education Longitudinal Study of 1988 (NELS) to shed light on these issues. This dataset has unusually good measures of the characteristics of youths and their parents. Importantly, it also has characteristics of families and youth in 8th, 10th, and 12th grades, which enables us to study divorces and remarriages that occur during high school.

Throughout, we contrast intact families with female-headed, single-parent households and with families with a biological mother and a step-father. We focus on these family structures because they are the only ones with substantial sample sizes in this dataset. The limitation to these family types is not too costly because (not coincidentally) most children live in one of these family types, and because the current policy debate has been focused on the poor outcomes of children in female headed households and families with stepfathers.

In stark contrast to the results on teen pregnancy, we find that little of the disadvantages we observe following a divorce can be predicted prior to the divorce. Thus, it does not appear that disadvantaged parents are more likely to divorce. Similarly, and equally surprisingly, we do not find evidence that disadvantaged families have lower rates of remarriage.

Theory and Method

Residing in a single-parent or step-parent home is correlated with a number of disadvantages for the children such as lower rates of completing high school or starting college, and higher rates of arrests, out-of-wedlock pregnancy, and drug use (Acock and Demo, 1994; Amato, Loomis, and Booth, 1995; Biblarz, Raftery, Bucur, 1997; Coleman, 1994; Garasky, 1995; McLanahan, 1985; McLanahan and Sandefur, 1994; Simons, 1996).

Single-parent families face a number of disadvantages that may contribute to their children's poor outcomes. On average, female-headed families have lower incomes, have less time to devote to helping children, have fewer and weaker male role models, have smaller social networks, and live in worse neighborhoods. In addition, during (and sometimes long after) the process of divorce, children can suffer disruptions from the separation from a parent, parental hostility, and/or residential and school dislocation. Children in single-parent and step-parent families are also at higher risk of sexual abuse (Russell, 1984; Gordon, 1989).

An unknown portion of these disadvantages may be correlated with divorce, but not caused by it. That is, as is usual in the social sciences, the events we want to study are not randomized in the population. Figure 1 illustrates a simplified version of the mechanism by which family structure affects youth outcomes. Although this model is still incomplete, it illustrates the complexity in trying to isolate the determinants of youth achievement. We will use several indirect methods to measure the extent to which the correlation between family structure

and the outcomes of youth may be a result of family characteristics which led to the family structure, but not be causal.

Some evidence for non-causal channels exists concerning divorces for children younger than the sample we examine. For example, Cherlin and others examined the lives of children at aged 7 (in the UK) or 7 to 11 (in the US). They then looked at the same children roughly four years later, after their parents divorced (1991). “For boys, the apparent effect of separation or divorce on behavior problems and achievement at the later point was sharply reduced by considering behavior problems, achievement levels and family difficulties at the earlier time point, before any of the families had broken up.” The non-causal channel was important, but less so, for girls. A separate study (Block, *et al.*) also found that “the undercontrolled, impulsive behavior described as characteristic of boys during the divorce and postdivorce years seems remarkably continuous with their behavior over many years in the predivorced family” (as summarized in Wallerstein, 1991). (Conversely, in some families the parents get along so poorly before the divorce that the divorce improves children’s outcomes.)

The noncausal links between divorce and youth disadvantages are particularly important to examine because most of the strong correlation between child disadvantage and having a teen mother appears to be noncausal. One study compared the children of teen mothers with the children of the teen mothers’ older sisters. Such a comparison implicitly controls for all aspects of the sisters’ shared family background. Overall, the children of the teen mother were not disadvantaged compared to their cousins whose mother had children at a later age (Geronimus and Korenman, 1991). A second study used the incidence of miscarriage, a natural experiment that delayed child-bearing by some young mothers (Hotz, Mullin, and Sanders, 1997). A miscarriage typically delays the age of first birth by several years. In this sample, the children of teenagers who became pregnant but whose first birth was delayed by miscarriage did not have better outcomes than their peers who were born of younger mothers.

Both studies indicate that the apparent disadvantages of teen parenthood are due to disadvantages of the mothers involved, not to their young age. From a policy perspective, the key point is that these disadvantages would not have been eliminated by the mothers waiting until their twenties to have children.

Were to-be-divorced families disadvantaged before the divorce?

It is possible that the correlation between divorce and youths’ subsequent disadvantages also is largely correlational, but not causal.³ Specifically, assume divorce is an indicator of other disadvantages within the family. By “disadvantage” we mean characteristics of the family that lead to high rates of divorce, poor youth outcomes before the divorce, and poor youth outcomes after the divorce. Such links due to pre-existing disadvantages imply the following hypotheses:

H1: Families that will go through a divorce had low observable predictors of child outcomes such as family income and parental helping behaviors before the divorce; and

H2: Children in families that will go through a divorce during the youths' high school years had poor outcomes before the divorce such as low tests scores, and high probability of smoking and using drugs.

To test these hypotheses, we simply compare mean levels of these variables between persistently intact families and those which would divorce. This is analogous to running a regression without controls and conducting a t-test on the coefficient on divorce. (As described below, we also run the regression with various controls.)

The age of our sample may lead our estimates of the effects of divorce to be either larger or smaller than previous studies. Our effects may be larger because our sample will only be at home a few years after any divorce. Thus, our measures of the effects of divorce include not only the effects of missing a live-in father, but also the short-term disruptions and conflicts that accompany many divorces. Some studies on younger respondents find that some of the harm of divorce is due to these short-term conflicts, while the longer-term disruptions from divorce are smaller. For youth aged 15-18, the short term is all that the time they have at home.⁴

Conversely, the effects we measure may be smaller because divorce has a larger effect on younger children (perhaps because they are more affected by their family environment), and because the children will spend more of their childhood living without their father.

If hypotheses 1 and 2 have some validity (that is, families and youth were disadvantaged prior to any divorce) it is important to know the proportion of the apparent effect of divorce that is due to pre-existing disadvantages. In its strongest form, we assume all of the effects of divorce are noncausal and the disadvantages that led to divorce are well measured in the dataset. These assumptions imply:

H3: Adjusting for the estimated effects of the characteristics of the family and youth before marriage should substantially reduce the estimated harm of divorce.

The simulations we run to test this hypothesis determine the portion of disadvantage among youth in recently divorced families that would have been predicted given the youth's and families' observable characteristics prior to the divorce. To create the simulations, we use the larger sample of persistently intact families to estimate how measures of the family and youth in eighth grade predict later youth outcomes. We include characteristics and behaviors of the family, characteristics of the youth in eighth grade (e.g., test scores), and behaviors of the youth in eighth grade (e.g., smoking). We then used these estimated coefficients to simulate the expected outcomes of youth whose parents divorce, conditional on the observable characteristics of the youth and their families in eighth grade.

To the extent the correlation between divorce and poor outcomes is noncausal, the simulated outcomes should be near the actual outcomes; that is, most of the disadvantages can be predicted by pre-divorce characteristics and behaviors. Conversely, if the simulated outcomes are different from the rates of intact families and near the actual rates, it suggests that most of the measured effects of divorce are not due to selection effects.⁵

Were to-be-married families less disadvantaged than other single-parent families?

A stepfather can provide a number of benefits to his stepchildren including love, income, time, emotional support, mentoring, acting as a role model, and access to social and work-related networks. At the same time, constructing a new, satisfying marital relationship commands a great deal of the mother's time and attention (McLanahan and Sandefur, 1994). The children often experience stress during the transition, and may never adapt to the new step-parent. Maternal remarriage may also increase the physical and social distance between the child and the biological father (Christensen and Rettig, 1995). Several past studies find that children with step-parents have outcomes that are generally better than children in single-parent families, although not as good of outcomes as children in intact families (e.g., McLanahan and Sandefur, 1994).

As with the results on single-parent status, both theory and evidence suggest that any apparent benefits of remarriage will be partly due to selection, not causation.

On the theory side, it is plausible that potential husbands look for some of the same characteristics in a wife that will lead to success for the mothers' children. Conversely, using the examples from the Manski, *et al.*, (quote above) a mother with depression or alcoholism may be less likely to remarry; her children are also likely to have worse outcomes. Moreover, youth with problems may reduce their mothers' marriage rates. For example, a violent youth may scare away potential stepfathers. Similarly, a sexually active daughter means a new husband is becoming not just a stepfather, but is at high risk of becoming a step-grandfather as well; this status may be less attractive to many potential husbands.

On the empirical side, two sources of indirect evidence suggest positive selection into marriage. First, never-married mothers are less likely to marry than divorced mothers are to remarry. In addition, never-married mothers have more lower education than divorced mothers. This pair of correlations will lead to stepfamilies appearing advantaged relative to single-parent families, regardless of the role of stepfathers. (In most cases, growing up with a divorced mother is correlated with fewer disadvantages than growing up with a never-married mother. At the same time, several studies find that, controlling for socioeconomic status, children from divorced families have more academic problems than children from other types of single parent families [Shaw, 1991].) Second, some evidence exists of positive selection into marriage for husbands. For example, in one large employer, men who were about to marry received higher performance

ratings prior to their marriage than did their persistently single colleagues (Korenman and Neumark, 1991). If single mothers also have similar selection, then some of any apparent advantages of remarriage are due to maternal characteristics.

These arguments suggest two hypotheses:

H4: Compared to single-parent families that will remain single, those that will remarry while a child is in high school had high observable predictors of good youth outcomes such as income and helping behaviors while the child was in eighth grade; and

H5: Compared to youth in single-parent families that will remain single, youth in single-parent families that will remarry in high school had better outcomes before the marriage such as high tests scores, and lower probability of smoking and drug use in 8th grade.

The tests of H4 and H5 are analogous to the tests of H1 and H2. One further empirical issue which can affect the evaluation of these hypotheses would be the presence of the future step-father in the life of the family. The future step-father may already be providing resources and support to the family, which would bias a finding in favor of H4 and H5. Conversely, these hypotheses may not be supported in the data because the future stepfather may be causing tension and disruption in the lives of the family.

Finally, we can apply the simulation technique described for hypothesis 3 to give the total effect of pre-existing conditions of the effects of remarriage.

H6: Controlling for characteristics of the family and youth before marriage should “knock out” most of the apparent benefits of remarriage.

Here we utilize of a sample of single parent households which do not remarry in order to obtain coefficient estimates. We then used these estimated coefficients to simulate the expected outcomes of youth whose mother remarries. To the extent the correlation between remarriage and poor outcomes is noncausal, the simulated outcomes should be near the actual outcomes; that is, most of the relative advantages can be predicted by pre-marriage characteristics and behaviors.

Sex differences in the effects of step-fathers

As noted above, previous research suggests that fathers and stepfathers can, among other benefits, provide mentoring and work-related networks, and act as role models. It is likely that the role model and mentoring effects are strongest for sons and step-sons. Conversely, remarriage also brings increased risk of sexual abuse, especially for step-daughters (Russell, 1984; Gordon, 1989). The hypothesized concentration of the benefits on stepsons and costs on stepdaughters leads to the hypotheses:

H7A: Compared to intact families, the estimated effects of single-parent status on sons' outcomes will be more negative than for daughters.

H7B: Compared to single-parent families, the estimated effects of having a step-father will be more beneficial (or less costly) for sons than for daughters.

Because sons and daughters and stepsons and stepdaughters are approximately evenly distributed, a comparison of their outcomes implicitly controls for most aspects of families. Thus, unlike the previous tests, these analyses can be performed on cross-sectional data. We estimate separate equations for boys and girls and compare the estimated effects on family structure between the two equations.⁶

Data

The National Education Longitudinal Study of 1988 (NELS) is sponsored by the National Center for Education Statistics and carried out by the Bureau of the Census. NELS is designed to provide trend data about critical transitions experienced by young people as they develop, attend school, and embark on their careers. The base year (1988) survey was a multifaceted study with questionnaires for students, teachers, parents, and the school.

Sampling was first conducted at the school level and then at the student level within schools. The data were drawn from a nationally representative sample of 1,000 schools (800 public schools and 200 private schools, including parochial institutions). Within this school sample, 25,000 eighth grade students were selected at random. The three follow-ups revisited (most of) the same sample of students in 1990, 1992, and 1994; that is, when the respondents were typically in the tenth grade, in the twelfth grade, and roughly two years after high school graduation. A randomized sample of approximately 14,000 students were interviewed in the 1994 survey. These form the base sample for the estimation.

We restrict our sample to white non-Hispanics ($N = 9692$) because family structures may have quite different effects on whites and non-whites and on Hispanics vs. other whites. Sample sizes precluded separate analyses of marriage and divorce for these ethnic groups.

Family Structure: Due to limited sample size, we focus on three family structures: intact family (with both biological parents), mother and step-father, and mother alone.⁷ We examined several other family structures – father and step-mother ($N = 216$), father alone ($N = 178$), mother and live-in companion ($N = 123$), and no biological parents ($N = 254$) – but the sample sizes were either small or in the case of children living without a biological parent, it is difficult to characterize the involvement of the parents, if any. These family structures are subsequently dropped from the main results. Respondents were also dropped if they lived with their parents less than fifty percent of the time ($N = 40$). Due to small sample size ($N = 88$), we exclude those families which had a spouse die while the youth was in high school.⁸

We coded three family transitions during high school: divorce from an intact family, (re)marriage by a single parent, and divorce from a stepfather. Some mothers who divorced while their child was in the first two years of high school then remarried in the following two years. Similarly, some single mothers who remarried then divorced within the time period in our dataset. Because we intend to capture the average effects of divorce (including subsequent remarriages), we count such families as divorced and remarried, respectively. Our results were unchanged when we dropped such multiple transitions or separately analyzed families with multiple transitions. The biannual sampling in our dataset implies we will count as persistently remarried families with a divorce from a step-father followed by remarriage before the next interview, and we will identify as persistently single parent marriage by a single mother followed by a divorce before the next interview.

Our measures of family structure are incomplete because they do not tell the researcher how many multiple transitions in family structure may have taken place before the eighth grade. Garasky (1995) finds later transitions are more important than early ones, so the bias from not having data on these earlier transitions may be lessened.

Socioeconomic Status and Family Background: The missing ingredient to most analyses of the impact of family structure on the achievement of youths is adequate measures of family background and parental involvement in education. Studies have either used a socioeconomic status index provided by the data set (e.g. Lee *et al*, 1994), created an *ad hoc* index of parent's characteristics (e.g. Herrnstein and Murray, 1994), or used a limited set of family background measures which are intended to separate the effects of family structure on the achievement of youths from the effects of family background. This study employs a much more detailed measure of family background and family involvement in education which is intended to better isolate the effect of family structure on outcomes.

The measures of socioeconomic status are created from both the parent and student questionnaire. The set of variables include occupational status (using Duncan's index), parental education, and family income. These variables are converted into z-scores with mean zero and standard deviation equal to one. When there are missing values for parental education because of a missing parent, these are given a z-score of 0 and categorical variables are included to note these important missing values. To adjust family income for its size, family income is divided by the poverty line adjusted for family size. This is an improvement over most studies which simply include some measure of family income in their estimated models. The log of this income/needs ratio is included for both the student's 8th grade and 12th grade years.⁹

To supplement this fairly standard list, a wide range of measures are included which prior research suggests are indicators of advantages or disadvantages for youth. From the student questionnaire, there are a number of variables which are potentially important predictors of

success. A first set of variables control for standard demographic characteristics: region, rural vs. urban vs. suburban, race categorical variables, and a female categorical variable. A second set of variables are indirectly related to parental involvement in education, but are not exogenous to the outcome variable. These include whether a foreign language is spoken in the home, whether the mother or father is foreign born, the number of siblings, and whether the home has a library card, magazines, and many books.

From the parental questionnaire, indicators are obtained for whether the family was one of five religions, and any of four levels of religious observance. These variables may proxy for how closely a family is knit as well as social support and family and social norms. A categorical variable indicating whether at least one parent had been a teen when the youth was born is included. (Unfortunately, the dataset does not indicate whether the parents were married when the youth was born.)

The final three variables measure parents' involvement in the youth's life and education. The first variable is equal to one if the parent belonged to a parent-teacher association or related organization, or volunteered at school. The second variable is equal to one if the parent helps the child with homework. Finally, a categorical variable for whether the child had participated in clubs such as Boy or Girl Scouts during elementary school is included to proxy for the quantity of time spent with the child outside of the home.

Outcomes: This study analyzes a number of outcomes for each student. While the overall impact of family background and family structure is similar across the various outcome measures, there are subtle differences which may be important. We analyze five measures of student status in eighth grade, and four outcomes which are observed when the youth was age 20. The five measures of youth status are whether the student had behavioral problems (coded as present if the student had been disciplined at school more than three times or if the parents considered the child to have severe behavioral problems), emotional problems (coded as present if the parent said that the student had an emotional problem which could inhibit learning), smoked cigarettes, used drugs (marijuana, and harder drugs), and the student's test scores. The student's test scores are taken from a set of cognitive math and reading tests taken in eighth grade (see Levine and Painter, 1997, for a full description of the cognitive tests). The later outcomes include attending college, permanently dropping out of high school (that is, dropouts who do not receive a GED), having a child out of wedlock, and the increase in test scores between 8th and 12th grade.

Summary statistics for the analysis variables are presented in Table 2. The means for the later outcome variables are taken from the estimation sample, while the means for the remainder of the variables are taken from the complete sample. For example, the estimation sample for having a child out of wedlock is made up of females, and the estimation sample for analyzing

college attendance includes only high school graduates. Approximately four percent of the sample permanently drop out of high school, while seventy-nine percent of high school graduates have attended some college. Eight percent of the females have a child out of wedlock.

Results

As others have found, nontraditional family structures correlate strongly with both disadvantages and poor outcomes for youth (Table 3). (All differences between nontraditional and intact families are statistically significant at the 5% level unless otherwise noted.)

For income to needs ratios, stepfather families have .22 log points lower incomes and single-parent families have .73 log points lower than intact families. For most other disadvantages and outcomes, the two non-traditional families were typically similar to each other, and worse than intact families. Both step-father families and single-parent families have lower eighth grade parental involvement and participation in youth clubs than intact families (roughly 6 percentage points lower than intact).

By eighth grade, youth in nontraditional families had worse outcomes by most measures. The youth have more emotional problems (roughly 3 percentage points higher than intact), higher cigarette use (roughly 5 percentage points higher than intact), and lower test scores (.21 to .24 standard deviations lower than intact). In contrast, self-reported drug use in eighth grade of divorced and stepfather families was not statistically significant different from that of intact families.

These eighth grade disadvantages, in turn, correlated with poor outcomes for the youth. Dropout rates for both single-parent and stepfather families were 5 percentage points higher than (that is, more than double) the intact family rate. Stepfather families and single-parent had lower rates of college entrance than intact (stepfather were 17 percentage points and mother-headed were 15 percentage points lower than intact; the difference between stepfather and single-parent families was not statistically significant). Fertility out of wedlock was higher for youth in single-parent families (7 percentage points higher than intact). Unlike the other outcomes we examined, the gap for step-father families was small and not significant (1 percentage point higher).

In short, mother-headed and stepfather families provided (by these measures) almost identical environments for youth, with the exception of higher-incomes for stepfather families. In all cases, the inputs were substantially worse than for intact families. These lower inputs were matched by very similar outcomes for the two nontraditional families (other than fertility out of wedlock), consistently worse than for intact families.

Divorce as Correlate vs. Cause of Disadvantage

For reasons noted above, these correlations may not be causal. This section presents three analyses of divorce as a correlate vs. a cause of poor youth outcomes: looking for pre-existing disadvantages of the family, looking for pre-existing disadvantages of the youth, and seeing whether any pre-existing disadvantages can “knock out” the apparent effects of divorce. The following section repeats these analyses for remarriage.

Were families that would undergo divorce already disadvantaged?

Evidence in Table 3 rejects hypothesis 1 which stated that the families that would soon divorce already had significant disadvantages prior to the divorce. Compared to intact families, none of the differences in income in eighth grade, self-reports of parental involvement and helping with homework, or maternal education were statistically significant. In fact, of the small differences, many favored the to-be-divorcing families.¹⁰

We replicated the simple cross-tabulations on parental behaviors (involvement with school, helping with homework, involvement in childhood clubs) with controls for predetermined parental characteristics (Table 4). Control variables included parental education, immigrants status, and other controls listed in Table 2. Results were very similar.

Were youth in families that would undergo divorce performing poorly before the divorce?

If divorce were an indicator of disadvantage, not a cause of it, then children in families that will go through a divorce during the youths' high school years would have had poor outcomes before the divorce such as low tests scores, and high probability of smoking and drug use in 8th grade (hypothesis 2). In fact, test scores were slightly higher in to-be-divorced families (Table 3, difference n.s.). Self-reported smoking and drug use had slightly higher incidence in those families which would undergo divorce, but the differences were not statistically significant. In contrast, the differences in behavioral problems (15% vs. 9% for persistently intact) and in emotional problems (2.8% and 1.2%) were statistically significant at the five percent level.

We replicated the simple cross-tabulations with controls for predetermined parental characteristics (Table 4; controls listed in Table 2). Results were very similar.

Several previous studies found that boys had more problems preceding a divorce than girls did (Wallerstein, 1991). We found no consistent evidence for that proposition (Table A3). Specifically, boys in families that would divorce had a larger gap in behavioral problems (21.7% in families that would divorce vs. 13.5% in persistently intact families, $P < .05$) than did girls (9.3% vs. 4.9%, n.s.). The male-female differences in the gap between persistently intact and to-be-divorced were not significant. The apparent disadvantage would be reversed if we performed the analysis in ratio terms: boys in to-be-divorced families had a 61% higher rate of behavior problems, while girls had a 90% higher rate. The gender differences in the gap between

divorcing and persistently intact families in other outcomes were smaller and also not significant. Moreover, for cigarette smoking, although the differences were not significant for either boys or girls, it was only girls in to-be-divorced families that had relatively high rates (6.8% in to-be-divorced vs. 4.5% in persistently intact families for girls, 3.9 vs. 4.7% for boys).

Do pre-divorce characteristics "explain" the apparent effects of divorce?

If single-parent status were largely due to pre-divorce differences in family characteristics that are measured well in the data set, then the estimated effect of these non-traditional family structures should be substantially reduced by controlling for characteristics of the parents that probably preceded any divorce or unmarried parenting such as parental education, region of residence and immigrant status (hypothesis 3), and by the characteristics of youth such as test scores and smoking.

These results are important because most previous longitudinal research on divorce has examined children before high school. As noted above, past research typically found a substantial portion of the disadvantages observed after the divorce was already present before the divorce (Wallerstein, 1991).

In contrast, our results provide much less support for an important noncausal link between divorce during high school and youth disadvantage. Table 5 presents the simulations of how youth in families that would soon divorce would have fared without the divorce. (Recall that if divorce is noncausal, these youth and their families would already be so disadvantaged that the simulated outcomes would be similar to the actual outcomes.) We first regressed youth outcomes on predetermined family characteristics youth characteristics in 8th grade such as test scores and self-reported smoking. These regressions used the sample of persistently intact families. The simulation column for Divorced from Intact families uses the coefficients from the regression and the means for Divorced from Intact Families structure to predict outcomes.

None of the gaps between persistently intact families' actual results and divorced families' simulated results were large or statistically significant. Family and youth characteristics in 8th grade predict that families which divorced would have dropped out at a 4.1% rate vs. an actual 8% rate. The 4.1% rate is similar to the 2.9% rate for persistently intact families. Similarly, the simulations on having a child out of wedlock demonstrate that we would have expected only a 7.2% rate vs. the actual rate of 11.9% when using 8th grade characteristics to predict outcomes. As with dropouts, pre-existing factors explain only a small portion of the gap between the 5.8% rate in persistently intact families. (Divorce during high school makes no difference in college attendance; thus, the simulations provide little insight for this outcome.)

Remarriage as Correlate vs. Cause

As noted above, youth who spent eighth grade in families with a single mother or with a mother and stepfather had very similar outcomes. This equality is somewhat unexpected, as families with a step-father had substantially higher average incomes.¹¹ If single mothers who were less disadvantaged than average were the most likely to remarry (that is, if there is positive selection into marriage) then the mystery is even deeper.

Consistent with the cross-sectional results, youth whose mothers remarry during high school had outcomes similar to persistently single-parent households and much worse than intact families. The exception is childbirth out of wedlock. Young women whose mothers remarried had a 5.4 percent rate of fertility out of wedlock, which was similar to the 6.1 percent rate for intact families, and far below the 14.4 percent rate for persistently single-parent families. Although large, the nine percentage point difference between single-parent families that did and did not remarry was not statistically significant. (The sample of single-parent families that had a female child and that remarried was rather small, only 74.)

The following sections review the evidence for this noncausal hypothesis for the effects on youth whose mothers remarried during the youth's high school years. For the rest of this section "remarriage" will refer to maternal remarriage while the focal youth is in high school.

Were families that remarried relatively advantaged?

The theory and evidence reviewed above indicated that there might be selection of relatively advantaged single-parent families into remarriage. With positive selection, to-be-remarried families should be typically advantaged compared to persistently single-parent families (hypothesis 4). In contrast to this hypothesis, self-reports of parental involvement (5 percentage points higher for those that remarry), helping with homework (4 percentage points higher), and involvement in youth clubs (no difference) were not substantially or significantly higher (Table 3). Differences in maternal education were small and not significant. Paternal (typically ex-husband) education, in contrast, was .12 years lower in persistently single-parent families than in families where the mother would remarry. Income:needs ratios were similar in single-parent families that would and would not remarry.

Were youth in families that would remarry doing well before the remarriage?

If remarriage is due in part to positive selection, then compared to youth in persistently single-parent families, youth in families that will remarry would have had relatively good outcomes before the remarriage (hypothesis 5).

In fact, for all of the outcomes we examined (eighth grade test scores, cigarette smoking, drug use, and teacher reports of emotional and behavioral problems), the youth in to-remarry families were similar to persistently single-parent families (Table 3). In all cases, the results were worse than for intact families.

Do characteristics preceding remarriage "explain" the effect of remarriage?

If potential husbands select wives based on the same characteristics that promote successful children (that is, positive selection into remarriage), then the estimated effect of remarriage should be substantially less beneficial when controlling for characteristics of the parents that probably preceded any divorce or unmarried parenting. Candidates include characteristics such as parental age, education, and race (hypothesis 6). (Recall that we estimated the coefficients of parental and youth characteristics in eighth grade using a sample of intact families. We then simulated the outcomes of 12th graders in families that would remarry based on the characteristics they had in eighth grade.)

We have already seen that families that remarry are not very different from single-parent families that do not remarry, and that remarriage has few significant advantages (Table 4 confirms this result with limited control variables.) For both reasons, the simulated and actual outcomes for to-remarry families are not very different from each other (Table 5).

The exception is for having a child out of wedlock. As noted above, the fertility rate for unmarried young women in families that would remarry was lower than in persistently single-parent families (5.4 vs. 15%, difference n.s.). Because the 8th grade characteristics of single-parent families that would remarry were quite similar to families that would not remarry, these apparent benefits of remarriage were not predicted by eighth grade characteristics. The simulated rate was 13.9%, far above the actual 5.4% rate. Again, the small sample size implies the gap is not significant.

Sex Differences in the Effects of Family Structures

As noted above, substantial prior research suggests that growing up without a father is a larger disadvantage for a son than a daughter (hypothesis 7A). At the same time, step-fathers may provide larger benefits and impose lower costs to their step-sons than their step-daughters (hypothesis 7B).

In this dataset, many of the gender differences of the effects of family structures were of the expected direction, but they were also typically small (Table 6). We highlight several important exceptions. The few meaningful gender differences do not have a consistent pattern; thus, the results do not support hypotheses 7A and 7B.

For example, as predicted by theory, being in a single parent family predicted a slightly higher dropout rate for young men than for young women (8.7% for young men vs. 8.3% for young women). But contrary to theory, having a stepfather also predicted higher dropout rates for young men (8.1% vs. 6.8%). Neither of these gender differences in means are statistically significant. Including a broad set of controls does not change this conclusion.

For college entrance, single-parent status predicted lower college attendance for young women (74% for men, 72% for women), while step-parent status predicted no difference. Once

a broad set of controls is included in the estimated model, there remains no difference in the single parent coefficient, but the step-father coefficient is statistically significantly lower for daughters at the 1% level.

In contrast to the theory (and to the dropout results), test score gains were higher among young women with stepfathers than for their male counterparts (five times as large, difference significant at the 1% level). Test score gains for sons and daughters did not differ meaningfully in single-parent families.

In short, nontraditional families lead to undesirable outcomes for both young men and young women. We do not find convincing evidence of systematically different effects for young men vs. young women.

Robustness Checks

We reran the results in Table 4 with a set of controls that might cause both divorce and youth outcomes, such as religiosity, whether the mother was a teen when the child was born, and parents' employment status. In general, the results were very close to those reported above.

We used different rules to create our samples of family transitions. A small number of families experienced multiple transitions during the period. In the results reported in Tables 3 and 4, we pooled divorce followed by remarriage into the divorced category, and pooled remarriage followed by divorce into the remarried category. This method counts the total effects of divorce as including the effects of divorce plus the effects of any remarriage within a year or two, weighted by the proportion of mothers who remarry in the sample period. To estimate the effects of divorce without remarriage, we separated the categories out for those families experiencing multiple transitions. The results for divorcing families only (no remarriage) were very close to those reported above. The youth outcomes in 1992-1994 are worse for families with multiple transitions, but there did not seem to be positive selection into rapid remarriage nor could we predict divorce following remarriage with pre-divorce characteristics.

Conclusions

We have three main results.

Divorce: For divorces during a youth's high school, we find no evidence of pre-selection of disadvantaged families. Parental characteristics and parenting behaviors are similar in intact families that will and will not undergo divorce. At the same time, there is some evidence that youth in these families already experience some disadvantages. Although their test scores are similar, their parents and teachers report more emotional and behavioral problems. It is plausible that these problems are due in part to the tensions that will soon end their parents' marriage. (It is also possible that in some families the youth's problems may raise stress in the family that, in

turn, raises the probability of divorce.) Correspondingly, most of the disadvantage of divorce observed in outcomes (permanent dropout, child out of wedlock, etc.) is found to be causal, and not predicted by characteristics of the family when the youth was in eighth grade. These findings are in contrast to several studies on younger children, and in contrast to the results on the effects of having a teenage parent.

Remarriage: Youths whose mothers remarried during high school had almost the same outcomes as those whose mother remarried earlier, or of those whose mother never remarried. Again, all of the effects (or noneffects) of acquiring a stepfather appear to be causal; we could not detect any consistent pattern of positive selection of mothers or children into remarriages.

Sex differences: Finally, contrary to some past research, the effects of having a father or stepfather do not appear to be more beneficial (less harmful) for sons than for daughters.

Caveats

For several reasons, these results do not immediately apply to policy.

Most importantly, many young Americans will spend all or part of their youth in families without two biological parents. Thus, any simple generalization about the effects of divorce, single parenthood, or step-parenting must be made cautiously to avoid stigmatizing a large portion of the population. In the typical regression family structure explains 5 to 10 percent of variance of outcomes. This is a substantial portion, but still small. It would be a gross mischaracterization of these results or of the research literature more broadly to use them as descriptions of all single parents and step-parents.

In addition, in families with very high levels of tension, especially those with physical abuse, divorce or single parenthood is likely to improve the lives of youth (Amato, Loomis, and Booth, 1995). These results measure the effects of divorce, but do not show what would have happened if the tensions still increased, but the parents were discouraged from divorcing. It is almost sure that even if the marginal divorce is bad for youth, many divorces may be beneficial. Moreover, the parents always know more about their situation than do policy-makers; thus, self-selection into divorce will always have some benefits greater than would be predicted based on any observable factors that can be incorporated into divorce rules.

Finally, policies must be sensitive to how they shift bargaining power within the family. For example, policies that make divorce more difficult can reduce the already-low bargaining power of spouses that are abused (typically mothers). Because mothers typically invest more of their resources in their children, such shifts in bargaining power can be bad for both women and children.

Policy Implications and Future Research

As others have found, these results indicate that youth have better outcomes if they grow up in families with two biological parents. Subject to the many caveats noted above, these results support policies that at the margin encourage parents to marry or to remain married. Such policies start by improving the child support system. Moreover, it makes sense that divorces in nonabusive families with minor children should be (slightly) more difficult, perhaps with longer waiting periods and more care that the custodial parent has consented to the divorce. Making marriage for nonparents slightly more difficult (e.g., with a waiting period) can be useful in discouraging the formation of families that are likely to fail (Galston, 1996). Encouraging premarital classes that teach communication and problem-solving skills might also be useful.

These results suggest that most of the apparent effects of divorce and remarriage are not due to pre-existing disadvantages, leaving room for them to be causal. Some marriages probably turn very destructive around the time of divorce, so maintaining them would be harmful and the effects are not, in fact, causal. When the relation is causal, future research will need to uncover the channels that operate. For example, are the lower incomes of single-parent families largely to blame? If so, better child support and welfare can be sufficient to improve children's lives. Alternatively, if it is a lack of parental involvement in schools that matters, quite different policies are called for. Finally, it may be the case that non-traditional families have quite different responses to the potential causal factors which help determine youth outcomes. For example, in regressions not shown, family income is a more powerful predictor of youth outcomes for intact families than for remarried families. Such subtleties imply that policy will have to be carefully constructed.

Table 1
Family Structure by Ethnic Group

<i>Family Structure of Children in the 8th grade</i>	<i>Ethnic Heritage</i>				
	<i>Asian</i>	<i>Hispanic</i>	<i>African</i>	<i>White non- Hispanic</i>	<i>Total</i>
<i>* Both biological parents</i>	85.91%	71.56%	42.42%	74.00%	71.53%
<i>*Of these, will divorce during youth's high school</i>	2.11%	4.54%	9.70%	5.02%	4.98%
<i>Father, step-mother</i>	1.07%	1.81%	0.65%	2.25%	1.96%
<i>* Mother, step-father</i>	3.84%	7.38%	9.19%	9.56%	8.84%
<i>*Of these, will divorce during youth's high school</i>	13.89%	16.10%	19.30%	9.73%	11.47%
<i>* Single mother</i>	4.38%	15.00%	41.61%	12.30%	14.88%
<i>*Of these, will remarry during youth's high school</i>	12.20%	9.58%	5.81%	15.29%	11.97%
<i>Single father</i>	0.96%	0.38%	0.24%	0.25%	0.32%
<i>No biological parent</i>	3.84%	3.88%	5.89%	1.63%	2.48%

** We analyze these family types because they have sufficient sample sizes. We include only the white non-Hispanic sample in the analysis.*

The percentages in the rows illustrating family structure transitions (indented rows) are based on the corresponding population at risk of that transition (the row immediately preceding). For example, the table indicates that 15.29% of White non-Hispanic female-headed households remarried during youth's high school.

Table 2: Summary statistics

Analysis Variables	Means	Std Dev.
Family Structures		
Single parent family which remarried	0.016	0.125
Single parent family throughout the sample	0.114	0.318
Stepparent family which remarried	0.011	0.102
Stepparent family throughout the sample	0.089	0.285
Divorced from Intact family	0.037	0.189
Family Characteristics		
Log (Income/needs) in 8th grade	1.182	0.812
Log (Income/needs) in 12th grade	1.176	0.829
Parent involved in educational system	0.574	0.494
Parent involved in children's clubs	0.931	0.254
Youth characteristics in 8th grade		
Child has behavioral problems (1988)	0.107	0.309
Child has emotional problems (1988)	0.020	0.141
Child smokes cigarettes (1988)	0.058	0.234
Test scores in 8th grade {z}	0.185	0.975
Youth outcomes		
Permanent dropout	0.042	0.201
College attender	0.799	0.401
Had a child out of wedlock (among women)	0.081	0.272
Gain in test scores from 1988 to 1992	35.069	40.263
Included as limited controls:		
Female	0.515	0.500
Native English Speaker	0.897	0.393
Father foreign born	0.056	0.229
Mother foreign born	0.052	0.222
Oldest child	0.325	0.468
Live in the south (Missing category is northeast)	0.320	0.467
Live in the west	0.141	0.348
Live in the central	0.341	0.474
Live in urban area (Missing category is suburb)	0.197	0.398
Live in rural area	0.350	0.477
Mother was a teen parent	0.251	0.434
Father's education {z}	0.118	0.881
Mother's education {z}	0.134	0.905
Father's occupation {z}	0.083	0.899
Included as full controls (in addition to limited controls listed above):		
Father unemployed	0.045	0.207
Mother's occupation {z}	0.099	0.937
Mother unemployed	0.281	0.449
Religious affiliation - Baptist (Missing is other Protestant)	0.180	0.384
Religious affiliation - Catholic	0.305	0.460
Religious affiliation - Other religion	0.097	0.296
Religious affiliation - Missing religion	0.033	0.178
Religious affiliation - No religion	0.025	0.156
Religiosity - very religious	0.422	0.494
Religiosity - religious	0.157	0.364
Religiosity - somewhat religious	0.163	0.370

<i>Number of siblings</i>	2.302	5.102
<i>More than 50 books in home</i>	0.926	0.263
<i>Has at least one magazine subscription</i>	0.817	0.387
<i>Family has a public library card</i>	0.826	0.379

Note: Variables marked (z) are z-scored to have mean zero and s.d. 1 in the multi-racial sample. Reported summary statistics differ from 0 and 1 due to analysis of only the white non-Hispanic sample.

Table 3: Summary Statistics by Family Type

	<i>Intact family in 1988</i>	<i>Persistently intact</i>	<i>Divorced during high school</i>	<i>Single parent in 1988</i>	<i>Persistently single parent</i>	<i>Remarried during high school</i>	<i>Step-father family in 1988</i>	<i>Persistently Step-father</i>	<i>Divorced from Step-father during high school</i>
<i>N in 1988</i>	6767			1125			874		
<i>N of subgroups over next four years</i>		6410	357		986	139		778	96
Family in 1988 (Youth in eighth grade)									
<i>Parental Involvement in Education</i>	0.610	0.610	0.627	0.444	0.439	0.475	0.466	0.464	0.479
<i>Parents help with homework</i>	0.439	0.440	0.415	0.360	0.355	0.396	0.405	0.404	0.417
<i>Parents and children are involved in clubs</i>	0.941	0.941	0.938	0.892	0.891	0.892	0.915	0.918	0.896
<i>Mother's education (z)</i>	0.172	0.173	0.137	0.062	0.059	0.083	-0.078	-0.083	-0.040
<i>Father's education (z)</i>	0.171	0.176	0.084	-0.024	-0.024	-0.024	-0.113	-0.088	-0.311 ^b
<i>Eighth grade income/needs</i>	1.302	1.304	1.256	0.570	0.561	0.639	1.083	1.105	0.910 ^b
Family in 1992 (Youth in 12th grade)									
<i>Twelfth grade income/needs</i>	1.266	1.292	0.862 *	0.746	0.638	1.354 ^a	1.019	1.084	0.574 ^b
Youth in 1988 (Youth in eighth grade)									
<i>Behavioral Problems</i>	0.094	0.091	0.146 *	0.150	0.148	0.165	0.153	0.152	0.167
<i>Cigarette smoking</i>	0.047	0.046	0.056	0.096	0.091	0.129	0.096	0.099	0.073
<i>Emotional problems</i>	0.013	0.012	0.028 *	0.041	0.039	0.058	0.043	0.037	0.094 ^b
<i>Drug use</i>	0.127	0.125	0.160	0.117	0.120	0.101	0.116	0.117	0.104
<i>Eighth grade test scores (z)</i>	0.236	0.239	0.188	0.018	0.016	0.032	-0.004	-0.005	0.002
Youth Outcomes 1992-94 (Youth aged roughly 18 to 20)									
<i>Permanent Drop out</i>	0.038	0.035	0.095 *	0.094	0.092	0.108	0.093	0.090	0.115
<i>College attender</i>	0.776	0.779	0.725	0.629	0.629	0.633	0.612	0.612	0.615
<i>Gain in test scores</i>	33.888	33.917	33.370	38.630	38.848	37.087	39.576	40.564	31.567 ^b

<i>Child out of wedlock</i>	0.061	0.058	0.107 *	0.133	0.144	0.054 ^a	0.073	0.071	0.218 ^b
<i>Arrests</i>	0.117	0.113	0.191 *	0.237	0.233	0.262	0.195	0.200	0.146

Notes: The sample for the child out of wedlock outcome includes only young women, and the sample for arrests includes only young men. A young man is considered to have been arrested if he reports at least one arrest.

* represents statistically significantly worse than in persistently intact families at the 5% level. Tests are one-tailed.

^a represents statistically significantly better than in persistently single parent families at the 5% level. Tests are one-tailed.

^b represents statistically significantly worse than in persistently step-parent families at the 5% level. Tests are one-tailed.

Note that sample sizes for family transitions are modest, and some events such as child out of wedlock are rare; thus, large changes may not be statistically significant.

Table 4: Do Control Variables Change the Cross-Tabulations?

Each row presents the estimated effects of family structure from a separate regression.

All equations include the limited controls as referenced in Table 2.

Reference group is persistently intact families.

Child in	Divorce while High School	Persistently Female-Headed	Female Head who Remarried	Persistently Step-father	Step-father who Divorced
Family & parental characteristics					
Parental involvement	0.032 (0.028)	-0.160* (0.018)	-0.133* (0.044)	-0.104* (0.020)	-0.055 (0.053)
Helping with homework	-0.029 (0.027)	-0.080* (0.017)	-0.050 (0.041)	-0.034 (0.019)	-0.018 (0.051)
Participated in kid clubs	0.000 (0.012)	-0.038* (0.009)	-0.047* (0.025)	-0.013 (0.009)	-0.020 (0.025)
Maternal education	0.008 (0.044)	-0.142* (0.029)	-0.112 (0.069)	-0.086* (0.032)	0.021 (0.093)
Paternal education	-0.048 (0.046)	-0.436* (0.110)	-0.545* (0.150)	-0.102* (0.033)	-0.258* (0.088)
Income:needs in 8th grade	0.010 (0.035)	-0.676* (0.027)	-0.595* (0.072)	-0.029 (0.026)	-0.119 (0.069)
Income:needs in 12th grade	-0.380* (0.041)	-0.576* (0.030)	0.141* (0.062)	-0.053 (0.029)	-0.464* (0.073)
Outcomes					
Permanent	0.036* (0.013)	0.050* (0.008)	0.058* (0.024)	0.022* (0.007)	0.003 (0.013)
Dropout	0.008 (0.022)	-0.089* (0.016)	-0.117* (0.042)	-0.072* (0.017)	-0.024 (0.045)
College attender	0.025 (0.019)	0.073* (0.016)	-0.009 (0.026)	0.055* (0.016)	0.077* (0.044)
Had a Child out of wedlock (Sample = women)					
Gain in test scores	-2.123 (2.154)	2.732 (1.452)	0.452 (3.778)	3.269 (1.654)	-5.605 (3.682)

* Significantly different from persistently intact families at the 5% level. Standard errors are corrected for the presence of heteroskedasticity.

All equations include the limited controls as referenced in Table 2

Table 5				
Simulations				
<i>Outcome</i>	<i>Family Structure</i>	<i>Actual Mean</i>	<i>Simulated Mean</i>	
Permanent Dropout	Persistently Intact	.029	.029	
	Divorced from Intact	.080	.041 *	
	Persistently Single Parent	.085	.085	
	Remarried from Single Parent	.085	.104	
College Attender	Persistently Intact	.821	.821	
	Divorced from Intact	.819	.807	
	Persistently Single Parent	.731	.731	
	Remarried from Single Parent	.729	.730	
Had a Child out of Wedlock (Female youth)	Persistently Intact	.058	.058	
	Divorced from Intact	.119	.072 *	
	Persistently Single Parent	.150	.150	
	Remarried from Single Parent	.055	.139 *	

Note: In the first stage we estimated regressions relating youth outcomes to family and youth characteristics in 8th grade using the Persistently Intact sample. The simulation column for Divorced from Intact uses the coefficients from the regression and the means for Divorced from Intact Families structure to predict outcomes. The simulation column for Remarried from Single Parent follows the same procedure, but uses the coefficients estimated on families with Persistently Single Parent. This procedure implies that the **bold** pairs of coefficients are equal by construction; the simulations recreate the actual means on families with no change in structure.

* represents differences in the columns that are significant at the 5 percent level. Such differences suggest that the differences in mean characteristics are not sufficient to predict the entire differences in outcomes we observe.

Table 6
Gender Differences

<i>Outcome</i>	<i>Family Structure</i>	<i>Male</i>		<i>Female</i>	
		<i>Mean</i>	<i>Coeff. w/full controls</i>	<i>Mean</i>	<i>Coeff. w/full controls</i>
Permanent Dropout N = 3359 Males & 3593 Females	Persistently Intact	0.031		0.028	
	Divorced from Intact	0.083	0.019 * (0.013)	0.071	0.028 * (0.014)
	Persistently Single Parent	0.087	0.021 * (0.009)	0.083	0.013 * (0.007)
	Remarried from Single Parent	0.057	0.036 * (0.025)	0.115	0.007 (0.012)
	Persistently Step-Parent	0.081	0.009 (0.007)	0.068	0.010 (0.007)
	Divorced from Step-parent	0.058	-0.004 (0.006)	0.032	-0.009 (0.004)
	College Attender N = 3162 Males & 3399 Females	Persistently Intact	0.845		0.795
Divorced from Intact		0.845	0.030 (0.031)	0.795	-0.005 (0.027)
Persistently Single Parent		0.740	0.003 (0.024)	0.720	-0.039 (0.022)
Remarried from Single Parent		0.738	-0.020 (0.055)	0.686	-0.084 (0.051)
Persistently Step-Parent		0.694	-0.034 (0.027)	0.697	-0.104 * (0.029)
Divorced from Step-parent		0.646	0.093 (0.052)	0.815	-0.047 (0.058)
Change in Test scores from 1988 to 1992 N = 3506 Males & 3712 Females		Persistently Intact	34.288		33.637
	Divorced from Intact	35.880	0.857 (3.500)	31.151	-1.946 (2.935)
	Persistently Single Parent	38.196	3.093 (2.323)	39.473	0.714 (2.259)
	Remarried from Single Parent	35.320	-0.927 (5.339)	38.271	3.812 (5.462)
	Persistently Step-Parent	36.472	-3.822 (2.399)	43.796	5.682 * (2.785)
	Divorced from Step-parent	35.933	0.163 (5.686)	29.012	-11.454 * (5.150)

Notes:

* Significantly different from persistently intact (the omitted group in the regression) at the 5% level

Only the coefficients on remarriage from single parent family are statistically different from each other in the the permanent drop out regressions. The coefficient on persistently step-parent in the college regressions and on persistently step- parent and divorced from step-parent in the gain in test scores regressions are statistically different.

"Full controls" are listed in Table 2.

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Appendix 1: Youth Outcome Regressions by Family Type

Table A1: Sample = Intact Families

All Analysis variables measured when youth was in eighth grade.

Outcome	Permanent Dropout N = 5975 Pseudo-R ² = .3353		College Attender N = 5719 Pseudo-R ² = .23		Had Child Out of Wedlock N = 3118 Pseudo-R ² = .1413	
	Coef. (DF/DX)	Std. Error	Coef. (DF/DX)	Std. Error	Coef. (DF/DX)	Std. Error
Female	0.249 *	0.085	0.200 *	0.045		
Father foreign born	-0.207	0.276	0.006	0.124	0.284	0.176
Mother foreign born	-0.156	0.307	0.403 *	0.146	-0.181	0.204
Oldest child	-0.020	0.105	0.058	0.053	-0.005	0.098
Live in the south	0.163	0.131	0.074	0.075	-0.131	0.131
(Missing category is northeast)						
Live in the west	0.009	0.167	-0.127	0.084	0.008	0.140
Live in the central	0.053	0.120	-0.080	0.063	0.076	0.108
Live in urban area	0.122	0.119	-0.041	0.067	0.176	0.109
(Missing category is suburb)						
Live in rural area	-0.288 *	0.098	-0.028	0.051	-0.025	0.090
Mother was a teen parent	0.004	0.105	-0.120 *	0.054	0.176	0.100
Father's education {z}	-0.168 *	0.071	0.202 *	0.038	-0.052	0.068
Mother's education {z}	-0.069	0.075	0.129 *	0.038	0.064	0.069
Father's occupation {z}	-0.072	0.058	0.054	0.028	-0.083	0.052
Father unemployed	0.033	0.150	0.074	0.100	0.040	0.144
Mother's occupation {z}	-0.063	0.050	0.036	0.026	0.014	0.044
Mother unemployed	-0.020	0.090	0.035	0.051	0.002	0.085
Religious affiliation - Baptist (Missing is other Protestant)	0.141	0.120	-0.021	0.068	0.144 *	0.118
Religious affiliation - Catholic	-0.126	0.124	0.218 *	0.059	-0.094	0.105
Religious affiliation - Other religion	0.365 *	0.138	-0.142	0.079	0.215	0.132
Religious affiliation - Missing religion	0.288	0.207	-0.051	0.138	0.080	0.236
Religious affiliation - No religion	0.235	0.231	-0.042	0.165	0.358	0.244
Religiosity - very religious	-0.701 *	0.109	0.166 *	0.057	-0.318 *	0.100
Religiosity - religious	-0.349 *	0.126	0.297 *	0.075	-0.253	0.131
Religiosity - somewhat religious	-0.482 *	0.129	0.176 *	0.073	-0.036	0.117
Number of siblings	0.119 *	0.029	-0.044 *	0.017	0.075	0.029
More than 50 books in home	-0.098	0.126	0.031	0.086	0.061	0.149
Has at least one magazine subscription	-0.237 *	0.092	0.110	0.059	-0.133	0.099
Family has a public library card	-0.138	0.092	0.095	0.056	-0.092	0.105
Log (Income/needs) in 8th grade	-0.059	0.064	0.204 *	0.038	-0.170 *	0.059
Parent involved in educational system	-0.111	0.088	0.098 *	0.046	-0.030	0.083
Parent involved in children's clubs	-0.256 *	0.118	0.273 *	0.096	0.251	0.155
Child has behavioral problems	0.581 *	0.104	-0.230 *	0.075	0.327 *	0.157
Child has emotional problems	0.533 *	0.200	-0.209	0.197	0.056	0.271
Child smokes cigarettes	0.128	0.133	-0.357 *	0.097	0.373 *	0.145
Test scores in 8th grade {z}	-0.370 *	0.059	0.433 *	0.027	-0.291 *	0.049
Intercept	-1.570 *	0.242	0.003	0.159	-1.617 *	0.272

Appendix 1 (cont.)

Table A2: Sample = Persistently Single Parent Families

Outcome	Permanent Dropout N = 902 Pseudo-R2 = .4255		College Attender N = 791 Pseudo-R2 = .2351		Had Child Out of Wedlock N = 498 Pseudo-R2 = .1815	
	Coef. (DF/DX)	Std. Error	Coef. (DF/DX)	Std. Error	Coef. (DF/DX)	Std. Error
Female	0.146	0.175	0.052	0.113		
Father foreign born	0.494	0.354	0.617	0.343		
Mother foreign born	0.098	0.262	0.163	0.214	-0.208	0.330
Oldest child	0.093	0.189	-0.177	0.129	0.342	0.187
Live in the south	0.131	0.230	-0.027	0.182	-0.188	0.252
(Missing category is northeast)						
Live in the west	-1.297 *	0.436	-0.081	0.205	0.088	0.290
Live in the central	-0.265	0.224	-0.213	0.162	0.025	0.232
Live in urban area	0.121	0.238	-0.036	0.157	-0.367	0.262
(Missing category is suburb)						
Live in rural area	-0.167	0.178	0.068	0.131	-0.361 *	0.172
Mother was a teen parent	-0.873 *	0.252	-0.094	0.172	0.401	0.218
Father's education {z}	0.183	0.177	-0.008	0.210	0.491	0.220
Mother's education {z}	-0.155	0.133	0.174 *	0.085	-0.118 *	0.122
Father's occupation {z}	0.879 *	0.370	0.423	0.297	0.110	0.377
Father unemployed	0.680	0.625	0.136	0.754	1.204	0.719
Mother's occupation {z}	-0.165	0.093	0.142 *	0.068	-0.145	0.092
Mother unemployed	-0.425	0.215	-0.117	0.157	-0.129	0.196
Religious affiliation - Baptist (Missing is other Protestant)	0.460 *	0.227	0.254	0.167	0.028	0.208
Religious affiliation - Catholic	-0.481	0.279	0.184	0.141	0.207	0.217
Religious affiliation - Other religion	0.839 *	0.301	0.032	0.191	-0.331	0.311
Religious affiliation - Missing religion	-0.283	0.395	0.346	0.371	-0.319	0.475
Religious affiliation - No religion	0.216	0.405	-0.114	0.317	-0.260	0.367
Religiosity - very religious	-1.190 *	0.270	0.407 *	0.147	-0.331	0.207
Religiosity - religious	-0.502	0.263	0.525 *	0.183	0.089	0.231
Religiosity - somewhat religious	-0.721 *	0.243	0.367 *	0.152	-0.300	0.204
Number of siblings	0.073	0.049	-0.086 *	0.037	-0.006	0.053
More than 50 books in home	-0.427 *	0.200	-0.256	0.194	0.067	0.244
Has at least one magazine subscription	0.114	0.177	0.060	0.128	0.224	0.180
Family has a public library card	0.150	0.190	0.040	0.146	-0.037	0.188
Log (Income/needs) in 8th grade	-0.208 *	0.098	0.186 *	0.079	-0.293 *	0.113
Parent involved in educational system	-0.348 *	0.176	0.184	0.114	0.014	0.163
Parent involved in children's clubs	-0.686 *	0.200	0.293	0.183	-0.304	0.220
Child has behavioral problems	0.644 *	0.220	-0.305	0.180	0.255	0.242
Child has emotional problems	-0.091	0.310	-0.209	0.298	0.622	0.528
Child smokes cigarettes	0.718 *	0.209	-0.073	0.236	-0.019	0.311
Test scores in 8th grade {z}	-0.386 *	0.122	0.445 *	0.068	-0.320 *	0.106
Intercept	-0.560	0.422	0.245	0.345	-0.731	0.408

Appendix 2: Means by Family Type by Gender

Table A3: Summary Statistics by Family Type: Young Men

	Intact in 1988	Persis- tently intact	Divorced during high school	Single parent in 1988	Persistent-ly single parent	Remarried during high school	Step-father family in 1988	Persistent-ly Step- father	Divorced during high school
	3309	3157	152	524	459	65	416	375	41
Family in 1988 (Youth in eighth grade)									
Parental Involvement in Education	0.617	0.617	0.599	0.441	0.442	0.431	0.483	0.472	0.585
Parents help with homework	0.442	0.442	0.434	0.334	0.333	0.338	0.385	0.381	0.415
Parents and children are involved in clubs	0.950	0.950	0.961	0.906	0.911	0.877	0.938	0.936	0.951
Mother's education	0.189	0.191	0.160	0.112	0.120	0.052	-0.030	-0.044	0.101
Father's education	0.191	0.198	0.043	-0.017	-0.020	0.000	-0.080	-0.057	-0.291
Eighth grade income/needs	1.326	1.329	1.280	0.587	0.605	0.460	1.152	1.166	1.028
Family in 1992 (Youth in 12th grade)									
Twelfth grade income/needs	1.299	1.319	0.934	0.731	0.637	1.278	1.071	1.131	0.601
Youth in 1988 (Youth in eighth grade)									
Behavioral Problems	0.139	0.135	0.217	0.214	0.216	0.200	0.226	0.224	0.244
Cigarette smoking	0.047	0.047	0.039	0.107	0.109	0.092	0.103	0.107	0.073
Emotional problems	0.017	0.016	0.039	0.059	0.057	0.077	0.053	0.045	0.122
Drug use	0.157	0.156	0.191	0.145	0.150	0.108	0.163	0.165	0.146
Eighth grade test scores	0.191	0.195	0.111	-0.018	-0.025	0.032	0.017	0.021	-0.019
Youth Outcomes 1992-94 (Youth aged roughly 18 to 20)									
Permanent Drop out	0.034	0.033	0.072	0.090	0.085	0.123	0.089	0.088	0.098
College attender	0.750	0.753	0.704	0.615	0.621	0.569	0.618	0.611	0.683
Gain in test scores	34.291	34.248	35.192	37.895	38.260	35.320	36.513	36.859	33.342

Table A3: Summary Statistics by Family Type: Young Women

	Intact in 1988	Persistent-ly intact	Divorced during high school	Single parent in 1988	Persistent-ly single parent	Remarried during high school	Step-father family in 1988	Persistent-ly Step- father	Divorced during high school
	3458	3253	205	601	527	74	458	403	55

Family in 1988 (Youth in eighth grade)

Parental Involvement in Education	0.605	0.602	0.649	0.446	0.436	0.514	0.450	0.457	0.400
Parents help with homework	0.436	0.438	0.400	0.383	0.374	0.446	0.424	0.424	0.418
Parents and children are involved in clubs	0.932	0.933	0.922	0.879	0.875	0.905	0.895	0.901	0.855
Mother's education	0.155	0.157	0.120	0.019	0.006	0.110	-0.122	-0.119	-0.146
Father's education	0.152	0.155	0.114	-0.029	-0.027	-0.045	-0.142	-0.117	-0.326
Eighth grade income/needs	1.278	1.280	1.238	0.556	0.522	0.796	1.020	1.047	0.821

Family in 1992 (Youth in 12th grade)

Twelfth grade income/needs	1.235	1.265	0.808	0.759	0.639	1.419	0.967	1.036	0.553
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Youth in 1988 (Youth in eighth grade)

Behavioral Problems	0.051	0.049	0.093	0.095	0.089	0.135	0.087	0.084	0.109
Cigarette smoking	0.046	0.045	0.068	0.087	0.076	0.162	0.090	0.092	0.073
Emotional problems	0.010	0.009	0.020	0.025	0.023	0.041	0.035	0.030	0.073
Drug use	0.098	0.096	0.137	0.093	0.093	0.095	0.072	0.072	0.073
Eighth grade test scores	0.280	0.282	0.246	0.048	0.051	0.032	-0.024	-0.030	0.018

Youth Outcomes 1992-94 (Youth aged roughly 18 to 20)

Permanent Drop out	0.042	0.038	0.112	0.098	0.099	0.095	0.096	0.092	0.127
College attender	0.800	0.804	0.741	0.642	0.636	0.689	0.607	0.613	0.564
Gain in test scores	33.503	33.596	32.019	39.271	39.359	38.639	42.358	44.012	30.244

¹When a single mother marries during her child's high school years we refer to the event as a "remarriage;" in fact, for some of the single mothers the marriage will be a first marriage.

²Laws to inhibit divorce can only be effective if divorce, in fact, is affected by such laws. Some theoretical arguments suggest that divorces will occur at the same rate regardless of the law because spouses can bargain efficiently (Becker, 1981). Friedberg (1998) and Gray (1998) present conflicting evidence that legal changes affect divorce rates.

³Manski, et al., used nonparametric methods to bound the influence of family structure on dropouts (1992). In most of their specifications they could not reject that the cross-sectional correlation between family structure and youth dropping out of high school was within their estimated nonparametric bounds. The strength of their method is that it relied on no assumptions linking the cross-sectional correlations to causality. The downside of making so few assumptions is that the bounds they estimated were very wide. Thus, most their results were also consistent with the hypothesis that all or most of the observed correlations are not causal.

⁴We looked for evidence that some of higher dropout rate we observe in families undergoing divorce is a short-run effect due to disruption, and the effect later declines. If the effects of divorce decline, then high school dropouts from families that divorced during high school would be more likely to return for junior college classes or for a GED degree than dropouts from persistently intact families. We found no evidence for a higher rate of returning to school; the dropouts from families with a recent divorce were slightly and not statistically significantly less likely to return for more education.

⁵The regression coefficients which were used in the simulations are presented in Appendix 1.

⁶The analogous test would be to interact sex with family structure (e.g., Lee *et al*, 1994).

⁷ Additional stratification was explored, but did not significantly change the implications of the analysis. These include the various reasons for being a single parent such as being divorced, widowed, and having never been married.

⁸We excluded an additional 27 families where the parent and youth surveys had conflicting reports on family structure.

⁹ The square of family income was also entered to capture nonlinear effects; its inclusion did not effect the results on family structure.

¹⁰Although prior to a divorce income:needs ratios were similar in intact families that will and will not undergo divorce, the ratio declined by about a third in families undergoing divorce. In other datasets the living standard of children and custodial parents drops roughly 15 to 30 percent after divorce (Peterson, 1996). The NELS results may be on the high side due to measurement error, a decline over time in the status of newly divorced families, or the relatively older age of the youth (and, perhaps, the correspondingly greater number of years of full-time homemaking for some mothers).

¹¹ The similar outcomes of stepfather and mother-headed families coupled with higher income for the former does not imply that the estimated effect of having a stepfather controlling for income is negative. Instead, income is less closely related to youth's outcomes in stepfather families. The interpretation of this result remains the topic of future research.