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WILL YOU MISS ME WHEN I AM GONE?
THE ECONOMIC CONSEQUENCES OF ABSENT PARENTS

Marianne E. Page
Ann Huff Stevens

ABSTRACT

This paper examines the effects of family structure on the economic resources available to children, using family fixed-effects to control for unobservable characteristics of the family. The effects of divorce on the income and consumption of children born to two-parent households, and the effects of marriage on children born into single-parent households are both considered. In the long-run (six or more years after the most recent divorce) family income falls by 40 to 45% after divorce, and food consumption is reduced by 17%. Six or more years after the most recent marriage, income of children born to single parents rises by 50 to 57%, but there is no statistically significant increase in food consumption. These estimates are substantially less than the difference in income implied by cross-sectional comparisons of different family types. When income changes are measured according to time since the parents *first* divorce, there is substantial recovery in income, virtually all of which is explained by subsequent remarriages. Similarly, when we look at income several years after a parent's *first* marriage, the gain is 28 to 33%, reflecting the short-lived nature of many of these marriages.

Marianne E. Page
Department of Economics
University of California, Davis
One Shields Avenue
Davis, CA 95616-8578
mepage@ucdavis.edu

Ann Huff Stevens
Department of Economics
Yale University
Box 208269
New Haven, CT 06520
and NBER
ann.stevens@yale.edu

1. Introduction

Over the past fifty years the number of single-parent families in the United States has skyrocketed. Between 1960 and 1995, the number of children living apart from one of their parents increased from 12% to almost 40% (McLanahan, 1997), the rate of divorce increased by over 200% (Friedberg, 1998) and the fraction of children born out-of-wedlock rose from about 5% to over 30% (Cancian and Reed, 2000). Half of all American children today are expected to spend part of their childhood in a family headed by a mother who is divorced, separated, unwed or widowed (Bumpass and Raley, 1995).

What does this change in family structure mean for American children?   In particular, to what extent are the economic resources available to children living in single-parent families compromised by the absence of a second cohabitating adult? Social scientists often assess the "effect" of family structure on economic well-being by comparing the average income among two-parent families to the average income of single-parent families (McLanahan and Casper, 1995; Spain and Bianchi, 1996; Waite, 1995). These studies unequivocally show that family structure is substantially related to economic well-being, and are often cited by those who advocate for societal and legal changes that would strengthen marriage (e.g. Whitehead, 1996). In spite of their wide use, however, these types of statistics are unable to tell us how much of the observed gap is actually *caused* by the absence of a second parent. Cross-sectional comparisons across family types do not necessarily indicate how single-parent families would fare were they to become two-parent families because other factors may be partly responsible for the variation in resource levels.

The causal effect of family structure on a family's economic resources has important implications for public policy. In recent years, the belief that marriage bestows large economic gains has generated enthusiasm for policy proposals that encourage the formation and continuation of two-parent families (Gallager, 1996; Galston, 1996; Ooms, 1996; Popenoe, 1996; Waite, 1995; Whitehead, 1996). This enthusiasm has lead to several policy changes: the states of Arizona, Arkansas and Louisiana, for example, have created "covenant marriages," in which couples agree at the time they are married to conditions that make it harder for them to divorce.[1] In addition, about three quarters of states have broadened the eligibility criteria for the Temporary Assistance to Needy Families (TANF) program to include two-parent families. TANF's former incarnation as the Aid to Families with Dependent Children program (AFDC)), was targeted towards single-parent families on the grounds that children in such families suffer economic losses as a direct result of their parents' marital status. If the losses to children growing up in single-parent families are small, then the grounds for this type of targeting may be tenuous. If these losses are large, however, then targeted cash assistance may be an appropriate means of mitigating them.

This study has three goals. Our first goal is to estimate how much the economic status of single-parent children could be improved if they lived with both of their parents. We accomplish this task by estimating a dynamic model with longitudinal data that allows us to incorporate family-specific fixed effects. We look separately at the impact of divorce and out-of-wedlock childbearing. Although other studies have estimated changes in family income following divorce, they have focused on comparisons of pre-

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[1] Legislation for covenant marriages has also passed one house in Georgia, Oklahoma, Oregon and Texas.

divorce to post-divorce resources, which do not take life-cycle earnings growth into account, and are thus likely to underestimate the true loss. To our knowledge, there have been no studies that have used a fixed effects model to estimate the resource costs associated with being born to a single parent.

Our dynamic model also allows us to trace out the losses associated with single-parent status over an extended time interval. Children whose parents divorce, for example, may experience a short-term income reduction that is recouped in later years when their mothers remarry or become more active labor force participants. Quantifying the time-path of economic losses following a divorce or out-of-wedlock birth is particularly important in the wake of TANF, which places a five year life-time limit on receipt of benefits, and requires that participants become members of the labor force within two years of initiating benefits. If the costs of growing up in a single-parent family persist for many years, then these time limits may have serious implications for children's well-being.

Finally, we use our model to examine how family structure affects the components of income over time. We look separately at changes in fathers' earned income, mother's earned income, child support and alimony payments, and welfare income. This exercise allows us to see how families modify their behavior in response to a change in marital status.

We find that controlling for unobservable family background characteristics is important. Simple cross-sectional family income comparisons between children born out-of-wedlock and children born into two-parent families, for example, are almost 1.8 times bigger than our estimated cost of being born to a single mother. OLS regressions

produce coefficient estimates of the effects of marriage that are more than twice as large

as our fixed-effects estimates. Nevertheless, even after controlling for unobservables, we

estimate large family structure effects. Our dynamic analysis also shows that the gains

associated with marriage fall somewhat over time for children born out-of-wedlock and

that the initial losses experienced by children whose parents divorce are partially

recovered in later years. Most of this recovery is explained by the fact that a substantial

fraction of divorced mothers remarry. Finally, our dynamic income decompositions

suggest that families' respond to the absence of a second parent in a variety of ways that

help mitigate some of the costs.

2. Estimating the Cost of Growing Up in a Single Parent Family

2.1 Background

It is well known that children growing up in single-parent families have fewer

economic resources than children living in two-parent families. In 1999, for example,

median family income for a two-parent family with children was $60,296, whereas

median family income for a female-headed family with children was $22,418 (Census

Bureau, March 2000 CPS). McLanahan and Sandefur (1994) estimate similar differences

in assets across family types: using the PSID, they find that while 98 % of two-parent

families with an adolescent child own their own car, only 70% of similarly defined

single-parent families own a car. Likewise, only 50% of such families own their home,

whereas 87% of two-parent families (with an adolescent) are home-owners. Many

believe that these differences in resources can explain a significant part of the well

documented differences in socioeconomic outcomes between adults who grew up in two

parent families and adults who grew up in single parent families. McLanahan and

Sandefur, (1994), for example, attribute half of the difference in outcomes to differences

in family income.[2]

Cross-sectional comparisons of income across different family types can be

misleading, however. Table 1 shows that even prior to marital dissolution average family

income and consumption are lower for families that will eventually go through divorce

than for families that will remain intact. This suggests that part of the income difference

across family types may exist for reasons other than differences in family structure.

Previous researchers have noted this problem, but have struggled to address it[3],

particularly when assessing the economic consequences for children born out-of-

wedlock—the only estimates we have been able to find for these children are simple

cross-sectional comparisons like those discussed above. Researchers have typically

estimated the costs of divorce by comparing changes in economic resources across two

time periods, before and after a divorce occurs (for a review, see Holden and Smock,

1991; also McLanahan and Sandefur, 1994), but while cross-sectional comparisons are

likely to overstate the effect of family structure on economic resources, estimates based

on simple "before and after" comparisons are likely to be downward biased since they do

not control for life-cycle earnings growth. Most of these studies do not include a control

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[2] It is important to note that there is debate about the extent to which income affects children's outcomes. Mayer (1997), for example, uses different methods and finds little evidence that income plays a role in children's outcomes.
[3] Smock, Manning and Gupta (1999) attempt to deal with the selection problem by estimating endogenous switching regression models. Their exclusion restrictions include whether the respondent (wife) worked full-time prior to the divorce, whether she lived with both her biological parents before age 14, her mother's educational attainment, age at the time of the marriage, duration of marriage and whether the marriage was a first marriage for both spouses. The authors argue that these variables predict the likelihood

group. Another drawback is that when the comparisons are restricted to only two points

in time they overlook the possibility of dynamic adjustments to changes in marital status.

The few studies that examine the time-path of economic resources following divorce

(Bane and Weiss, 1980; Butrica, 1998; Duncan and Hoffman, 1985a, 1985b; Peterson,

1989; Stirling, 1989, Weiss, 1984) are typically based on non-representative, dated

samples.[4] More important, none of them employ regression analysis, so they are unable

to control for what income growth would have been in the absence of the divorce or to

control for other factors that may be changing over time.

Duncan and Hoffman (1985a, 1985b) (with a follow-up by Butrica, 1998) provide

the most comprehensive dynamic study to date. Using the PSID, they trace out family

income for a sample of children between the ages of one and five in the year prior to their

parents' divorce, from the year before the divorce until five years after the divorce. Their

study is based on divorces or separations that occurred between 1969 and 1975. The

divorced sample's income in the years around the marital dissolution is compared to

income for a sample of children in continuously married families between 1971 and

1977. Duncan and Hoffman find that the average income of children whose parents'

divorce or separate falls by about 30% in the year after the divorce, but that within five

years of the marital dissolution, their average income is close to its pre-divorce level.

Most of this recovery can be explained by high rates of remarriage: for children whose

mothers' remain unmarried throughout the observation period, income levels remain

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of marital disruption. These variables are also likely to be correlated with income,
however.
[4] Bane and Weiss (1980) and Weiss (1984), for example, restrict their analysis to a
sample of women who remain unmarried. Peterson (1989) focuses on women aged 30-44
in 1967. Stirling (1989) looks only at women who have been divorced for at least five
years.

about 30% below their initial levels. Furthermore, although children whose mothers'
remarry regain their previous levels of income, they never catch up to their peers whose
parents remain married because incomes in continuously married families grow
throughout the period.

Our study is similar in spirit to that of Duncan and Hoffman, but it goes beyond
their work by employing a more comprehensive statistical methodology. Our empirical
framework allows us to control for income growth over the life-cycle, which enables us
to estimate the effect of divorce on economic resources relative to what they would have
been if the divorce had not taken place. We are also able to allow for differences in
income growth across family types, and to control for macroeconomic factors whose
omission may bias previous estimates. Our study extends Duncan and Hoffman's sample
by 12 years, and includes children between birth and age 16 instead of between the ages
of 1 and 5. Focusing on young children (and, therefore, young parents) could lead to
biased estimates of the average divorce effect since earnings growth is steeper among
young workers and since mothers' labor supply is lowest when their children are young.[5]

To our knowledge, there have been no attempts to take unobservables into
account when estimating the economic losses experienced by children who are born out-
of-wedlock. Cross-period comparisons have not been applied to this group, presumably
because it is difficult to come up with an appropriate "initial" period. Our model can be
extended to provide such estimates, however. Using a sample of children born into
single-parent families, we estimate the economic gains experienced by some of the
children when their mothers marry and interpret the negative of these estimates as upper

bounds on the loss associated with single-parent status. If women who marry have larger

potential gains to marriage than those who do not marry, then our estimates will overstate

the gains to marriage for the typical out-of-wedlock child, but they will still be lower than

the cross-sectional statistics that are currently cited because they will be based on a model

that controls for fixed effects.

2.2 Econometric Model

Our basic approach is to use a fixed-effects estimator to control for unobserved

family characteristics that may be correlated with divorce and marriage probabilities,

using data for children whose parents' marital status changed at some point during our

observation window and a comparison group of children whose parents' marital status

did not change during the period. Specifically, given longitudinal data on family

resources and marital histories, the effects of divorce on the economic resources available

to children can be modeled in the following way:

$$\ln I_{it} = X_{it}\beta + D_{it}\delta + \alpha_i + \gamma_t + u_{it} \tag{1}$$

where I_{it} is a measure of the economic resources available to child i in year t, X_{it} is a

vector of child/family specific variables that vary over time and that may be correlated

with the child's economic status, and D_{it} is a vector of dummy variables indicating that a

divorce has taken place in a future, current, or previous year. The error term has three

components, a child-specific fixed effect, α_i, a year-specific effect, γ_t, and a random

component, u_{it}.

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[5] Since mothers' labor supply has been increasing over time, the divorce effect may be
smaller in more recent years. Our ability to include 12 additional years of data, may
therefore affect the average estimates as well.

The vector of divorce indicators (D_{it}) contains three types of variables: dummy variables that equal one in the years prior to the divorce, a dummy variable equal to one in the year that the divorce takes place, and a series of dummy variables indicating that a divorce took place in a previous year. The first set of indicator variables captures the possibility that family resources may begin to deteriorate prior to the actual divorce. This might happen if, for example, a divorce is precipitated by a parent's job loss: failure to include "years prior" dummies would lead to a biased estimate of the effect of the divorce. Our model, therefore, includes a dummy variable for each of the two years preceding the divorce. The dummy variable indicating the year of the divorce captures the immediate effect of the divorce on family income and consumption, whereas the coefficients on the set of variables indicating that a divorce has taken place in a previous year will reflect the persistence of the divorce effect over time. Two methods will be used to define these post-divorce indicators. Initially, these variables will refer to the years that have elapsed since the child *first* experienced his parents' divorce. Later, we will define the variables with respect to years since the most *recent* divorce. We follow the post-divorce period for six years, including a dummy variable indicating that six or more years have elapsed since the divorce took place.

The error term in the above equation contains a time-invariant child-specific effect, α_i, which captures anything about the child's family that is constant over time. Since most children in single parent families live with their mothers, this variable will primarily pick up characteristics of the child's mother that may be correlated with both divorce probabilities and the family's resources. If mothers with lower earnings capacity are more susceptible to divorce, then estimates of divorce effects that fail to control for

α_i will be biased towards finding larger losses. As discussed above, other studies have estimated the resource losses associated with divorce by comparing family resources in a particular period before the divorce to family resources in a particular period after the divorce, but unless the change in resources is compared to an appropriate control group the estimates produced using this method will not tell us how much better off children would be if their parents had remained together. Furthermore, the approach may overstate or understate the average annual losses associated with the event, depending on which "before" and "after" years are chosen. The advantage of the model we employ is that it traces out the economic consequences in each year following the divorce and allows us to estimate both the short-term and long-term effects, which may differ.

Because this model includes fixed effects, the variables in X that do not vary over time, such as race and mother's education, are eliminated from the model. The only variables included in X are the child's age, his age squared and family size.[6] Equation (1) also includes a vector of calendar-year dummy variables (γ_t). These variables will control for economy-wide income and consumption changes over time, including both business cycle effects and trends in income and consumption over the period we study.

Unbiased estimates of the economic consequences of being born into a single-parent family are even more elusive than unbiased estimates of divorce effects because unlike the case of divorce there is no obvious "before" period to compare the single-parent family's resources. As a result, existing information is limited to simple cross-sectional comparisons. We propose an alternative way of estimating these losses that

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[6] In the consumption regressions we also control for the family's "food needs," which is a variable created by the PSID to measure the caloric needs of the family, accounting for family size, sex, and the age of the family members.

allows us to incorporate family fixed effects. Specifically, using a longitudinal sample of children born out-of-wedlock we can estimate the parameters of the following model

$$\ln I_{it} = X_{it}\beta + M_{it}\delta + \alpha_i + \gamma_t + u_{it} \qquad (2)$$

Where M_{it} is a vector of dummy variables indicating that a marriage has taken place in a future, current, or previous year. The negative of these parameters can be interpreted as the loss associated with remaining in a single-parent family that was formed by an out-of-wedlock birth. This model is essentially the inverse of equation (1) in that it compares changes over time in the resources available to children whose parents' married at some point during our observation window to changes over time in the resources of children whose parents remained single. The advantage of this approach is that it allows us to control for unobservable child/family specific factors that may be correlated with both marital decisions and economic status.

Our estimates of δ provide information on the effects of changes in family structure on the children who experience them. In the language of Heckman, LaLonde, and Smith (1999) we estimate the effect of "treatment on the treated." If the impact of divorce or marriage would be different for children whose family structure remains constant over time then $\hat{\delta}$ will be a biased estimate of the average effect that divorce or marriage would have on the population. For example, if the gains to marriage are larger for women who choose to marry than for women who choose not to marry then our estimates of δ will be upward biased estimates of the costs to children of growing up in a single-parent family formed by an out-of-wedlock birth. We show, however, that even with this upward bias our estimates are substantially smaller than estimates that do not control for fixed effects. Furthermore, they do directly apply to the majority of children

born to single mothers, since 52% of children born to single parents have spent some time in a two-parent household by the time they reach age 15. Forty percent of these children experience at least one year in a two-parent household by the age of six.

In the case of divorce, similar issues arise; we estimate the effects of divorce among those children whose parents do actually divorce. In this case, however, it is less clear how estimates of divorce effects for the untreated group would be of interest to policymakers. We care about how much better off the "treated" children would be if their parents had not divorced. Estimates of the population-wide effect of divorce would not answer this question.

3. Data

Our data come from the 1968 through 1993 waves of the Panel Study of Income Dynamics, a longitudinal survey conducted by the University of Michigan's Institute for Social Research. The PSID began by interviewing a national probability sample of families in 1968 and has reinterviewed the members of those families every year since. The PSID also follows a subsample of families in poverty. We make use of both samples in order to increase the precision of the estimates. Our regressions are weighted using the individual weights for the last year in which the individual is observed.

Since our primary interest is in how family structure affects the economic resources available to children, our sample consists of children who are potentially followed from the year of birth until age 16. Our analysis is based on two samples: the first sample consists of children born into two-parent families, and the second sample consists of children born into single-parent families. We use the first sample to estimate

the effects of divorce, and the second sample to estimate the losses associated with being born out-of-wedlock. Children who were born prior to the 1968 survey are excluded from the sample because we cannot determine whether they were born into a two-parent or single-parent family. After individuals turn 16 they are no longer followed, because we want to be sure that any observed changes in family structure are associated with their family of origin. Some PSID children are not present throughout the entire length of the survey. We include these individuals from birth until the first year they are missing data, but do not include them in any subsequent years even if they have valid data, because the missing years make it impossible to determine parents' marital status in that year, and, therefore, to accurately ascertain the number of years since a change in family structure took place.

We use three different measures of the economic resources available to the family: the log of pre-tax family income, the log of post-tax family income, and the log of family consumption. Each of these measures has its pros and cons as a measure of economic well-being. A number of researchers have argued that consumption measures are preferable to income measures because income systematically understates the financial resources available to a household, and because consumption is a more direct measure of well-being (Meyer and Sullivan, 2001). Unfortunately, consumption information in the PSID is limited to food consumption, and although food consumption is the sort of necessary expenditure that is of interest to policymakers, one might expect to see less variation in food expenditures than in almost any other consumption item: families may spend down their savings in order to maintain some threshold level of food consumption. We remain agnostic about which measure is best, and present the results

for both income and consumption.[7] Most of the literature focuses on pre-tax income, but

we present results for post-tax income as well since changes in the number of adult

earners in the family may change the family's tax bracket. In order to account for

changes in family composition that accompany resource changes, all of our regressions

control for family size. We have also used income-to-needs as a dependent variable, and

the estimates generated from those regressions are very similar to our income results.[8]

Economic resources are measured at the level of the PSID family unit. This

means that if children are living with both their mother and their grandparents, and the

mother and grandparents are pooling resources and expenses, then the grandparent's

resource contributions are included as part of what is available to the child.   This seems

like the appropriate way of measuring children's economic well-being since single

parents' living arrangements may be chosen as a way of maximizing their resources.[9] [10]

The timing of the PSID questions varies across the different variables. Questions

about family income clearly refer to the previous calendar year, whereas information

about family structure is recorded at the point of the interview. Since a change in family

structure recorded at the time of the interview may have occurred at any time in the

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[7] Food consumption data are missing for 1973, 1988 and 1989. The PSID also includes
information about expenditures on rent and mortgage payments, and utilities, but these
data are missing additional years and so we do not use them. It would be difficult to
compute housing consumption flows from owner occupied housing since some
households have no mortgage payments.

[8] The results from this exercise are available from the authors.

[9] An exception to this is that individuals who return to an extended family home after
being out on their own continue to be interviewed by the PSID as a separate family unit.
For example, an adult daughter of a PSID family who returns to her parents home after
having a child will continue to be counted as a head of her own household.

[10] Focusing on aggregate measures of resources overlooks the important question of how
resources are allocated *within* families. It may be that economic shocks cause parents to
disproportionately reduce their own consumption in order to maintain their children's

previous year, we ignore the different frames of reference and match the family structure and income data from the same *survey* year.[11] The timing of the food consumption questions is ambiguous, but Zeldes (1989) argues that it refers to the point of the interview rather than the previous year.[12] Again, we match the family structure information and the consumption information from the same survey year. We eliminate observations for which income or consumption data are imputed.

A limitation of the PSID is that it is difficult to identify relationships among sample members who are not household heads. This is probably not a serious problem for the sample of children who begin life in two-parent families since the parents of most of these children are household heads or wives whose marital status is well documented, but it is potentially problematic for our sample of children born out-of-wedlock because a larger fraction of these children are living in families in which the household head is not the parent. We therefore use the PSID Relationship and Marital History files to carefully document transitions between marital (or cohabitating) states. We define a family as a two-parent family if the child's custodial parent is married or living as a couple with another adult. Our definition of divorce includes married couples who are living in separate residences and unmarried couples who had been living together but are separated. Similarly, when we refer to "marriage" among parents of children born out-of-wedlock we include both legal marriage and cohabitation. These broad definitions of

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consumption at its previous level. We know of no longitudinal data set that would allow us to investigate this issue, however.

[11] We have also conducted the analysis linking the current survey year's family structure information to the following survey year's income information and obtain very similar results.

[12] An exception is food expenditures paid for using food stamps. Before 1977, this is measured using average monthly food stamp expenditures last year, but after 1977 the question refers to food stamp expenditures in the month of the survey.

two-parent families are intended to focus our analysis on the economic consequences associated with the presence of a second adult in the household, regardless of legal marital status.

After deleting observations for which the income and consumption measures are imputed or missing, the sample of children beginning life in a two-parent family contains 53,188 child-year observations, and 7,397 children, 1,352 of whom experience a parental divorce. The income sample of children born out-of-wedlock contains 12,628 child-year observations and 2,042 children, 465 of whose custodial parents marry sometime before they turn 16. These samples are slightly smaller when consumption is our dependent variable since the PSID is missing food consumption information in 1973, 1988 and 1989.

4. Results

4.A. The Economic Consequences of Marital Dissolution

In Table 1 we document why cross-sectional comparisons of children's resources might be problematic. The table provides the means of our variables in the year of the child's birth, which is before the change in family structure occurs. On the left side of the table we see that those households that will eventually experience a divorce have lower income and food consumption than those households in which the parents remain together. Parents who ultimately divorce also have less education on average, than parents who remain together, and are more likely to be black. These *observable* differences across families provide a hint that *unobservable* differences may also be correlated with both family structure and economic resources. When we use our data to run ordinary least squares regressions of family resources on marital status (controlling

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for the child's age, age-squared, race, mother's education and year dummies) we find that children living in divorced families have pre-tax income that is 55% below that of children in intact families, post-tax income that is 52% lower, and food consumption that is 27% below that of their counterparts. Table 2 shows what happens to the estimated resource loss when we take unobservable differences into account. The estimates in the left-hand columns of Table 2 are based on equation (1), and document the losses following the first divorce. The estimates on the right hand side of the table document the losses following the most recent divorce. We present Huber adjusted standard error estimates, which take into account the possibility that siblings' error terms are correlated.

Beginning with the left side of Table 2, we see that including fixed effects substantially reduces the estimated cost of divorce. Nevertheless, the decline in economic resources is still large: in the first year following a divorce, for example, pre-tax family income falls by about 42%, post-tax income falls by 32% and food consumption declines by 29%.[13] Over most of the post-divorce years, the reduction in food consumption is around 50 and 70% of the post-tax income reduction.[14] This is broadly consistent with previous studies that have estimated the elasticity of food consumption with respect to income to be between 0.6 and 0.7.[15]

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[13] The estimated "year of divorce" effect for the income measures will provide a mixture of income from before and after the divorce. For this reason, we refer to the period one year after the divorce as our first post-divorce observation. For food consumption, the timing is slightly different. The food consumption questions, as noted above, are likely to refer to the year of the survey, and so the "year of divorce" effect will capture a post-divorce period.

[14] Because the timing differs between the consumption and income measures, this ratio is calculated using, for example, the effect on food consumption one year after the divorce relative to income two years after the divorce.

[15] See Tobin (1950), Maddala (1971), Izan (1980) and Magnus and Morgan (1997) for estimates of the income elasticity of food.

Over the course of the next six years, more than half of the loss in economic resources is recouped so that six or more years later, pre- and post-tax income are 15-20% lower than they would have been if the divorce had not occurred and food consumption is six percent lower than would be expected with no divorce. These estimates are notably smaller than those produced by simple before and after comparisons, which are typically weighted towards short-term losses. Using the same dataset, McLanahan and Sandefur (1994) for example, estimate that teenagers who experience a parental divorce sometime between ages 12 and 17 experience an income decline of approximately 50%.

On the other hand, at first glance our estimates appear to be substantially larger than those produced by Duncan and Hoffman. Duncan and Hoffman emphasize the ratio of post-divorce to pre-divorce income and find that in the year following separation children's (pre-tax) family income is 32% lower than its pre-divorce level and that five years later it is just four percent lower than its pre-divorce level. Our estimated losses of 42% (one year) and 25% (five year) are larger because our model explicitly accounts for income growth over the life-cycle. Assuming that parents who divorce have similar income trajectories as parents who remain together, Duncan and Hoffman's estimates suggest that children whose parents divorce experience a 37% decline in income in the year following a divorce, and that five years after the divorce takes place their income is 14% lower than it would have been. The small differences between these estimates and our own may result from our ability to control for macroeconomic conditions.

Two potential explanations for the recovery pattern immediately come to mind. First, mothers' human capital investment may increase family income over time. Second,

some mothers will remarry, thus increasing the economic resources available to their children through the addition of a spouse's earnings. About 30% of the divorced parents in our sample ultimately remarry during our observation window.

We explore this possibility on the right side of Table 2, where the estimates are based on a specification in which the divorce dummies refer to the number of years since the *last* divorce. For years in which the child is (because of remarriage) again in a two-parent household, all of the divorce dummies are set equal to 0, and a dummy variable indicating that the child currently resides in a two-parent family is set equal to 1. The coefficient estimates on the divorce dummies now indicate how much of the economic loss associated with divorce persists for children whose mothers do not remarry. We find that subsequent marriages explain a large portion of the recovery process: pre- and post-tax family income of children whose mothers remain unmarried six or more years after the marital dissolution are 40 to 45% lower than they would have been if the divorce had not taken place. Among those who do not remarry, food consumption recovers more than income but six or more years later it continues to be 17% lower than if no divorce had occurred.

Previous work has emphasized that changes in family structure are a common pathway into (and out of) poverty (Bane and Ellwood, 1986). Our results can be interpreted in this light: we show that the average child whose parents divorce will experience quite modest long-run declines in economic well-being compared to estimates produced by the cross-sectional studies cited above, but that the size of the expected changes in children's income and consumption are closely tied to subsequent changes in family structure. We estimate that the average family experiences a six percent fall in

food consumption and a 15% reduction in after-tax income. An important reason for these relatively modest long-run reductions in income and consumption, however, is that many parents will remarry and thus restore some of the economic resources lost with divorce. For children whose parents remain unmarried, the average losses associated with divorce are much larger, ranging from 17 to over 40 percent. This emphasizes the important role that family structure plays in the material resources available to children.

4.A.1. Robustness Checks

One concern with the estimates presented in Table 2 is that even in the absence of divorce income may grow less rapidly among those who will eventually divorce than among those families that remain intact. If this is true, our fixed-effects estimates will overstate the reduction in income due to the divorce, since our estimates of income growth over the life-cycle are identified off of both types of families. In order to investigate this possibility, we have estimated models in which we include both a family-specific trend and a family-specific fixed effect. These models produce no evidence that divorcing families have lower earnings trajectories than intact families. In fact, parents who ultimately divorce have slightly more positive earnings trends than those who remain together, although the difference in trends between these two groups is not statistically significant. As a result, the inclusion of family-specific trends slightly increases the estimated cost of divorce, although the estimates are generally not statistically different from those reported in Table 2.

Another potential concern is that our regression framework does not control for time-varying factors that might be correlated with both the probability of divorce and

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[16] The divorce dummies are all set to zero for years in which the mother is married.

family resources. If the onset of mental illness or drug abuse leads to a significant

number of divorces, for example, then our estimates may still be biased. Charles and

Stephens (2001) examine whether the probability of divorce is associated with job loss or

the onset of a disability and find that job loss does increase the likelihood of a marital

break-up. This could mean that some of the estimated losses associated with divorce are

actually the effect of an earlier, precipitating event. We cannot directly investigate all

possible events but we have tried to acknowledge their possible effects by including

dummy variables for years prior to the divorce in order to see whether some other event

could be generating the decline in income. We find no evidence that family income falls

in any year prior to the divorce. Food consumption begins to fall in the year prior to the

divorce, but this may simply reflect respondents' uncertainty about the time period to

which the PSID question refers. We have also run regressions that include variables

indicating whether the head of household has recently become unemployed or disabled,

since these events are observable in the PSID, but including these controls has no

substantive impact on our estimates. Finally, we have run IV regressions using an

indicator for whether the family's state of residence currently has a unilateral divorce law

as an instrument for divorce. Several researchers (e.g. Friedberg, 1998; Gruber, 2000;

Reilly and Evenhouse, 1997) have documented a correlation between unilateral divorce

laws and divorce rates. Unfortunately, virtually all of the within state variation in

unilateral divorce laws occurs during the early 1970's, which means that most of the

children in our sample cannot contribute to this IV identification strategy. As a result, the

standard error estimates produced by our IV analysis are more than two orders of

magnitude larger than those produced by OLS, so our IV estimates provide no information about the economic consequences of divorce.

4.B. The Economic Losses for Children Born to Single Mothers

Estimating the loss in economic resources for children born into single-parent families is trickier than estimating the losses associated with divorce because the event that creates the single-parent family does not provide a change in marital status to which the resources can be compared. As a result, most of what we know about the relative resources available to such children comes from cross-sectional comparisons. Table 1 indicates why this might be problematic: compared to the mothers of children born into two-parent families, the mothers of children born out-of-wedlock have typically completed lower levels of education and are much more likely to be black. Within the sample of children who are born into single-parent families there are also differences in some observable characteristics between those whose mothers eventually marry and those whose mothers do not. Single mothers who do eventually marry are less likely to have only a high school education, and are much less likely to be black.[17] Differences in the observable characteristics presented in the table may only hint at important differences in unobservable characteristics across groups. Our method of estimating the income losses associated with single parenthood allows us to control for these characteristics.

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[17] It is worth noting that while family income is higher in the year of birth for out-of-wedlock children whose parents do not marry than for those whose parents do eventually marry, in subsequent years this reverses. For example, among children who are still in single parent families at the age of four, average family income among those who will later marry is more than $14,000, but among those whose mothers are not observed to marry before the end of our sample average family income is about $12,000. This pattern appears to be driven by a few outliers, and may reflect changes in living arrangements

Using our sample of children born out-of-wedlock, we compare the income gains for children whose mothers eventually marry to the income gains for children whose mothers remain single, and interpret the negative of these estimates as the estimated resource loss associated with remaining in a single-parent family. The drawback to our approach is that, by using women who marry to identify the costs of living in this type of single-parent family, we will generate a type of selection bias. If there is heterogeneity in the gains to marriage and, as seems likely, those women who marry have larger gains to marriage than those who do not, our estimates will be upward biased estimates of the average income gain that would result if all out-of-wedlock mothers were to marry. However, the estimated effects are unbiased estimates of the gains to children whose parents actually do marry. As noted above, roughly half of the parents of children born out-of-wedlock will marry before the child is 15 years old.

The results of our exercise are presented in Table 3. One year after marriage pre-tax family income increases by 53%, and post-tax income increases by 48%. The effects of excluding federal taxes from income are smaller in this sample than for our sample of children born into two-parent households, which probably reflects the very low income levels of many families formed by an out-of-wedlock birth. Six or more years after the observed marriage, post-tax income is 28 percent higher than it would be if the children had remained in single-parent families.

Food consumption is estimated to increase by 17% in the year of the marriage, but immediately falls again. The effects of marriage on food consumption are very small, sometimes negative, and never statistically significant in the years following the

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over time. For example, a teenage mother may live with her parents during the year her baby is born but may subsequently move out.

marriage. This indicates a much lower elasticity of food consumption with respect to income than we found in our sample of children born into two-parent families, which probably results from the mothers' relatively lower incomes. Food consumption is likely to be maintained at some minimal level even when income is at the very low levels found in many of these single-parent households.

On the right side of Table 3 we show what happens to our estimates when we control for the possibility of initial marriages breaking up (and for subsequent marriages). In these regressions, the key variables indicate time elapsed in a two-parent household; the dummy variables are set to zero during years in which the household returns to single-parent status, and an additional dummy variable is added to these regressions indicating that a parent is currently between marriages. These results show that declining economic gains shown on the left side of the table are driven mainly by the fact that many marriages do not last: for those children whose parents remain married there is a fairly stable increase in post-tax income of between 50 and 58%. This suggests that virtually all of the reduction in the gains to marriage occurs as a result of the original marriages breaking up.

These large income estimates suggest that children born into single-parent families suffer substantive economic losses *as a direct result* of their parents' marital status, and that cross-sectional differences between the resources available to these children and those available to children in two-parent families do not merely reflect differences in their parents' unobservable characteristics. At the same time, however, we find that cross-sectional comparisons will substantially overstate the potential gains from marriage. If we run a simple OLS regression controlling for age, age-squared, family

size, mother's education, whether the child is black and calendar year, the estimated increase in income associated with marriage is much larger, at 118%, compared to our estimated gain of 57 to 59%. Further, the gain to a typical child whose mother marries at a point in time is even smaller, since many of these marriages will be short-lived.

As with our sample of children born into two-parent families, we have also attempted to estimate models that allow for family-specific trends using our sample of children born to single parents. Unfortunately, these models are not well-identified because for many of the families in the sample, there are relatively few observations available prior to the marriage. Our results provide some suggestive evidence that those mothers who do eventually marry have higher rates of income growth in the years prior to marriage than those who do not. Although the differential in the income growth rates is not statistically significant, the point estimate is fairly large, suggesting an annual income growth rate that is five percent higher among women who do eventually marry. Including family-specific trends reduces the estimated gains to marriage, but also makes the estimates extremely imprecise, so that we cannot statistically distinguish most coefficients between the two models (those with and without family-specific trends).

5. How do Families Adjust to Changes in Family Structure?

Our estimates indicate that the economic losses experienced by children living in single-parent families are substantial.[18] These losses might be bigger still, however, if families failed to adjust their behavior in response to changes in family structure.

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[18] Of course, our estimates tell us nothing about the distribution of resources within families. It may be that when resources decline parents reallocate in order to maintain their children's previous consumption levels. This is an important issue that deserves

Consider the effects of divorce in the absence of any changes in labor supply, household structure (other than departure of one parent), or welfare receipt: assuming that children remain with their mothers, the mechanical effect would simply be the loss of the father's income. But resource losses could be much lower if family members draw on other income sources. In order to better understand how different potential behavioral responses combine to affect our estimated resource losses, we next look at individual components of income around the time of the change in family structure.

5.A. Behavioral Responses to Divorce

We begin our analysis of income components by estimating the average loss in father's earnings, which illustrates (approximately) what would happen to family income if there were no behavioral responses.[19] Here, we essentially re-estimate equation (2), but replace our dependent variables with father's earnings and look specifically at the first two years following divorce. Note that for this exercise we use income measured in levels rather than in logs, which leads to a larger estimated percentage income decline, but allows us to include cases in which the individual income components are equal to zero. The levels specification is not our preferred specification for the main analysis because a change in family structure is likely to have very different level effects on rich and poor families. The table defines time since the divorce relative to the most recent divorce, so that all observations in the "after" period are for children whose parents remain unmarried. The results produced by this exercise are shown in the first row of

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further investigation but we know of no data on the distribution of family resources that follows families over time.

[19] More precisely, we use father's income within the child's household. In the years after a divorce in which the father has left the household, father's income is equal to zero.

Table 4. In subsequent rows of the table we add child support, mother's earnings, welfare income, and the earnings of other household members to the income definition.

In the period 1 to 2 years after divorce, father's income falls to zero, which translates into an average loss of approximately $32,000. This corresponds to an 83% loss in family income relative to the year before the divorce takes place.[20] Of course, it is not necessarily the case that father's income will disappear completely from the child's set of available resources since many fathers pay child support when they no longer reside in the household. The second row of Table 4 shows how divorce affects the sum of father's income and child support. Child support appears to replace a relatively small fraction of the income of the co-resident father. The loss of income from the father in the initial years after a divorce is approximately 12 percent lower when child support is included, or roughly $28,000. The magnitude of this estimate is roughly consistent with average child support received, as reported by the Census Bureau, of approximately $3700 in 1995 (U.S. Census Bureau, 1999).

One potentially important behavioral response following divorce is a change in mothers' labor supply. The next row of Table 4 adds mother's earnings to the measure of income used in row 2, and shows that this response plays an important role in replacing the loss in resources following the father's departure. Adding mother's earnings to the income definition reduces the initial loss to approximately $25,000 in the initial years after the divorce, which translates into a 63% loss in total family income. Of course this gain in income may come at the expense of spending time with her children and does not take additional child care expenses into account.

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[20] Results for subsequent years are very similar and are available from the authors upon request.

Along with increases in earned income, any take-up of public assistance for single mothers will further diminish the costs of divorce. Row 4 of Table 4 shows, however, that the extent to which transfer income mitigates the loss in fathers' income is small compared to the effect of child support and mother's earnings. When we add AFDC benefits to the income definition in the initial years after divorce the total income loss is further diminished by $700.

At first glance, the estimated effect on total family income of adding income from other family members is puzzling (Row 5). One might expect that other family members, such as grandparents or aunts and uncles, would increase their contributions to the family following a relative's divorce. In fact, our estimate implies that the opposite is occurring. The result is driven by a few families who receive extremely high levels of income from other family members before the divorce occurs, and disappears when the top 1% of the distribution of other income (before the divorce) is removed from the sample.

5.B. Behavioral Responses to Marriage

In the last column of Table 4, we repeat the income decomposition for our sample of out-of-wedlock children whose mothers marry. The first row shows the increase in income that would occur if the only change resulting from marriage was the addition of a male partner. Father's earnings increase family income by approximately $17,000 in the first two years after marriage, which would more than double total family income if all other income sources remained the same.[21] The second row in the table considers whether the gains to marriage are reduced when we account for the fact that child support

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[21] We refer to "father's income" although this may actually be step-father's income, or the income of a male cohabitor who is unrelated to the child.

may have been received prior to marriage, and shows that for children born to single-parents child support plays a very limited role: adding child support to the income definition reduces the gains to marriage by less than $400.

We next examine the extent to which an adjustment in mother's labor supply may alter the gains associated with marriage. As was the case with children born to two parent households, the mother's labor supply response has the largest impact on the estimated resource cost. The cost of single-parent status is estimated to be $4000 or 25% lower than it would be if mothers did not increase their labor supply as a result of being without a live-in partner.

Unsurprisingly, AFDC plays a somewhat larger role maintaining income among out-of-wedlock children than among children who experience divorce. Including AFDC in the income definition reduces the estimated gains to marriage by roughly $1000 (or 6%).[22] Finally, the contribution of other family members also appears to be reduced when marriages occur. Including earnings of other family members reduces the gains to marriage by about $1000.

6. Conclusions

Family structure has a significant impact on the economic resources that are available to children. In the long run, family income of children whose parents divorce and remain divorced for at least six years falls by 40 to 45% and food consumption is reduced by 17%. Among the less-studied population of children born to single parents there is no evidence of an increase in food consumption, but those whose parents marry and remain married for at least six years experience post-tax income gains of 50% and

pre-tax gains of 57%. The more modest effects of living with a single parent on food consumption suggest that children's access to essentials may be somewhat better protected than estimates focused on income indicate.

While our estimated effects of family structure on income are large, three important points should be kept in mind. First, because the estimates are based on variation within the same families over time they are substantially smaller than estimates based on cross-sectional comparisons of different types of families. The frequency with which cross-sectional income comparisons motivate concern about family structure makes it important to recognize the extent to which they may overstate the true losses associated with living in a single-parent family.

Second, the estimated income changes, (as in most of the previous literature) do not apply to the typical child who experiences a parental divorce at a point in time, but rather to those whose parents are currently divorced. When we measure the reduction in resources six years after the first observed divorce, and so allow for the possibility of remarriage, we find income losses of 15 to 20%, and consumption losses of just six percent. Similarly, the typical gains for a child born out-of-wedlock whose parent is currently married are smaller than the long-run effects cited above, since many marriages do not last.

Finally, it is important to note that while we estimate that single-parent families have substantially lower incomes than they would have if a second parent were in the household, these income losses do not necessarily translate into a decline in children's resources. Our model cannot inform us about the distribution of resources within families, and it may be that parents work hard to ensure that their children's needs are

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[22] This falls to about $600 in the later years after marriage.

met by disproportionately reducing their own resources when income falls. This is an important issue that deserves further investigation. Unfortunately, we do not know of any panel datasets that contain information on how resources are distributed within the household.

With this caveat, our findings suggest that family structure has a long-term impact on the economic resources that are available to children. The costs associated with growing up in single-parent families are not temporary but largely persist until a marriage or re-marriage occurs. This has important implications for public policy. Time limits recently imposed as part of welfare reform, for example, could result in substantive reductions in the economic well-being of children living in single-parent families. Furthermore, if income plays an important role in determining children's later success in life (which is matter of some debate), then our results suggest that policies that encourage two-parent families may be justified.

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Table 1. Sample Means in Year of Birth

	Born into Two Parent Family		Born into Single Parent Family	
	Remain in Two Parent Family	**Parents Divorce**	**Remain in Single Parent Family**	**Parent Eventually Marries**
Pre-tax Family Income	40,964	33,852	17,907	17,218
	(25243)	(24977)	(19081)	(15165)
Post-tax Family Income	30,778	24,864	16,162	16,718
	(17347)	(13460)	(15435)	(14324)
Food Consumption	5877	5284	4430	4285
	(2778)	(2380)	(2795)	(2920)
Mother's ed <= High School	0.551	0.624	0.78	0.72
	(0.50)	(0.49)	(0.41)	(0.45)
Black	0.081	0.11	0.63	0.35
	(0.27)	(0.31)	(0.48)	(0.48)
Maximum AFDC Benefit for Family of Four	7808	7805	6657	7344
	(2990)	(3133)	(3004)	(3102)
Family Size	4.14	3.92	4.42	3.74
	(1.32)	(1.10)	(2.02)	(1.90)
Number of Children in Sample	6228	1235	1606	483

Note: Standard deviations in parenthesis

Table 2. Estimated Economic Consequences Associated with Single Parent Family Status
Children Born into Two Parent Families

Years Before or After Divorce	Year Since First Divorce			Year Since Last Divorce		
	Log Income	Log After-tax Income	Log Consumption	Log Income	Log After-tax Income	Log Consumption
2 years before	**-0.011**	**-0.008**	**0.010**	**0.000**	**0.018**	**0.013**
	(0.059)	(0.056)	(0.045)	(0.058)	(0.055)	(0.045)
	-0.011	*-0.008*	*0.010*	*0.000*	*0.018*	*0.013*
1 year before	**-0.052**	**-0.028**	**-0.134**	**-0.045**	**-0.022**	**-0.132**
	(0.052)	(0.049)	(0.061)	(0.050)	(0.048)	(0.061)
	-0.051	*-0.028*	*-0.125*	*-0.044*	*-0.022*	*-0.124*
Year of Divorce	**-0.356**	**-0.241**	**-0.348**	**-0.360**	**-0.246**	**-0.346**
	(0.070)	(0.065)	(0.066)	(0.068)	(0.065)	(0.067)
	-0.300	-0.214	-0.294	-0.302	*-0.218*	-0.292
1 year after	**-0.541**	**-0.389**	**-0.203**	**-0.692**	**-0.514**	**-0.252**
	(0.072)	(0.066)	(0.055)	(0.072)	(0.070)	(0.052)
	-0.418	*-0.322*	*-0.184*	*-0.499*	*-0.402*	*-0.223*
2 years after	**-0.386**	**-0.260**	**-0.156**	**-0.595**	**-0.431**	**-0.241**
	(0.072)	(0.071)	(0.056)	(0.074)	(0.080)	(0.064)
	-0.320	*-0.229*	*-0.144*	*-0.448*	*-0.350*	*-0.214*
3 years after	**-0.302**	**-0.195**	**-0.169**	**-0.622**	**-0.455**	**-0.266**
	(0.080)	(0.074)	(0.069)	(0.072)	(0.085)	(0.090)
	-0.261	*-0.177*	*-0.155*	*-0.463*	*-0.366*	*-0.234*
4 year after	**-0.205**	**-0.108**	**-0.138**	**-0.547**	**-0.374**	**-0.221**
	(0.081)	(0.071)	(0.055)	(0.064)	(0.078)	(0.066)
	-0.185	*-0.102*	*-0.129*	*-0.421*	*-0.312*	*-0.198*
5 year after	**-0.282**	**-0.194**	**-0.102**	**-0.674**	**-0.505**	**-0.211**
	(0.098)	(0.081)	(0.054)	(0.079)	(0.085)	(0.062)
	-0.246	*-0.176*	*-0.097*	*-0.490*	*-0.396*	*-0.190*
6 or more years after	**-0.220**	**-0.165**	**-0.060**	**-0.599**	**-0.517**	**-0.180**
	(0.085)	(0.082)	(0.046)	(0.082)	(0.082)	(0.059)
	-0.197	*-0.152*	*-0.058*	*-0.451*	*-0.404*	*-0.165*
Number of Observations	48111	48111	46523	48111	48111	46523

Note: Standard errors in parentheses. Percentage effect in italics.

Table 3. Estimated Economic Consequences Associated with Single Parent Family Status
Children Born into Single Parent Families

Years Before or After Marriage	Year Since First Marriage			Year Since Last Marriage		
	Log Income	Log After-tax Income	Log Consumption	Log Income	Log After-tax Income	Log Consumption
2 years before	**0.084**	**0.081**	**-0.161**	**0.099**	**0.094**	**-0.164**
	(0.104)	(0.103)	(0.124)	(0.103)	(0.101)	(0.124)
	0.088	*0.084*	*-0.149*	*0.104*	*0.099*	*-0.151*
1 year before	**-0.102**	**0.107**	**-0.049**	**-0.082**	**-0.088**	**-0.051**
	(0.175)	(0.174)	(0.071)	(0.173)	(0.172)	(0.070)
	-0.097	*0.113*	*-0.047*	*-0.079*	*-0.084*	*-0.049*
Year of Marriage	**0.506**	**0.471**	**0.157**	**0.527**	**0.490**	**0.146**
	(0.130)	(0.126)	(0.066)	(0.128)	(0.124)	(0.067)
	0.658	*0.602*	*0.170*	*0.693*	*0.633*	*0.157*
1 year after	**0.426**	**0.389**	**-0.033**	**0.465**	**0.426**	**-0.012**
	(0.131)	(0.127)	(0.082)	(0.126)	(0.122)	(0.083)
	0.531	*0.476*	*-0.032*	*0.592*	*0.531*	*-0.012*
2 years after	**0.327**	**0.300**	**-0.075**	**0.471**	**0.432**	**0.003**
	(0.131)	(0.127)	(0.088)	(0.118)	(0.115)	(0.093)
	0.387	*0.349*	*-0.073*	*0.602*	*0.541*	*0.003*
3 years after	**0.319**	**0.291**	**-0.073**	**0.502**	**0.459**	**-0.068**
	(0.135)	(0.130)	(0.097)	(0.126)	(0.122)	(0.088)
	0.375	*0.338*	*-0.071*	*0.653*	*0.583*	*-0.066*
4 year after	**0.251**	**0.225**	**0.003**	**0.508**	**0.463**	**0.003**
	(0.139)	(0.135)	(0.084)	(0.125)	(0.121)	(0.086)
	0.286	*0.252*	*0.003*	*0.663*	*0.589*	*0.003*
5 year after	**0.239**	**0.210**	**-0.022**	**0.471**	**0.429**	**0.002**
	(0.141)	(0.138)	(0.090)	(0.135)	(0.130)	(0.089)
	0.270	*0.234*	*-0.022*	*0.602*	*0.536*	*0.002*
6 or more years after	**0.286**	**0.250**	**-0.010**	**0.453**	**0.402**	**0.020**
	(0.170)	(0.166)	(0.096)	(0.187)	(0.184)	(0.098)
	0.331	*0.284*	*-0.010*	*0.573*	*0.495*	*0.020*

Note: Standard errors in parentheses. Percentage effect in italics.

Table 4. Components of Income Change Associated with
Changes in Family Structure

		1 year before divorce	1-2 years after divorce	1 year before marriage	1-2 years after marriage
Dependent variable					
(1)	father's earnings		**-$32,231**		**$17,211**
			(5018)		(1534)
(2)	(1) + child support received		**-$28,237**		**$16,892**
			(4133)		(1554)
(3)	(2) + mother's earnings		**-$24,563**		**$12,758**
			(4025)		(2309)
(4)	(3) + afdc of head & wife		**-$23,841**		**$11,777**
			(4042)		(2008)
(5)	(4) + earnings of others		**-$26,737**		**$10,798**
			(4396)		(2224)
(6)	total family income		**-$26,760**		**$10,534**
			(4220)		(2517)
Average family income		**$38,708**		**$16,223**	