Intergenerational Transfer Inflows to Adult Children of Divorce

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Abstract

Are adult children of divorce shortchanged when it comes to receiving money from their parents? Do they lose out on parental help for buying a house, starting a business or weathering a financial crisis? Though there is evidence that divorce reduces what an individual parent might give to his adult child, no study has examined the transfers given by both divorced parents. I approach the private transfer consequences of divorce from a fresh angle by asking not "How much did the parent give?" but instead "How much did the child get?" I also address the novel question "How does a parent's remarriage affect what the child receives?" Using data from the 1988 wave of the PSID, I find that parental divorce and remarriage have no effect on the incidence of a transfer. Within the select group of children who receive a transfer, however, divorce is correlated with an increased transfer amount, while a father's remarriage is correlated with a decreased amount.

1 Introduction[1]

What effect does divorce have on the financial assistance adult children receive from their parents? While it is well-known that divorce reduces the economic well-being of minors,(McLanahan and Sandefur, 1994, Hetherington, Bridges and Insabella, 1998.) far less is known about the continuing effects of divorce once children enter adulthood.

In principle, divorce may matter little: for instance, if married parents and divorced parents care equally about the well-being of their children, then, all else equal, divorce may not affect transfers at all. But many other factors can come into play: the emotional fallout of divorce may reduce parental altruism, remarriage could increase or decrease a parent's economic resources, or parents

[1]Many thanks to my advisors, Professors Donald Cox, Peter Gottschalk and Ingela Alger for their comments. This paper is part of my PhD. dissertation, and comments are welcome.

might now use gifts to compete for a child's attention or affection, to name but a few. As the effects of divorce are difficult to predict, ex ante, the question becomes an empirical one.

Understanding the connection between divorce, remarriage and transfers to adult children is important for both policy-makers and social scientists. As the traditional nuclear family – two married parents whose only children are born of that union – edges toward minority status, the question becomes more pressing. Transfers, while not the key to most people's economic well-being, can be very important at critical life stages, providing both a leg-up and a safety net. Take homebuying, for example. It is estimated that around 20% of first-time homebuyers receive a transfer from their parents, and that the mean transfer amount is more than 50% of the downpayment. (Englehardt and Mayer, 1998) Would we expect children of divorce to be shortchanged by their parents when compared to children from intact families?

The literature to date has not addressed this question. Divorce and remarriage have received almost no attention in the economics literature on transfers, where the focus has been on studying the effect of income variations on transfer amounts. The sociology literature, on the other hand, pays much more attention to family structure and transfers, but for the most part it only looks at the incidence of a transfer, not the amount.

The most salient deficiency in the literature, however, is in how the question is approached. All of the research, with very few exceptions, asks "How much did the parent give?" instead of "How much did the child get?" The well-being of the child depends on this second question. If the typical divorced father gives $70 to his child, instead of the $100 he would have given if married to the child's mother, but the mother gives $70 on her own too, the child has a net gain. This would be missed if one only looked at how divorce affected one parent's giving.

In this paper I approach the question from a fresh point of view. I ask "How much did the child get from both parents?" and "How do divorce and remarriage affect this amount?" What I find invites further study not only into the continuing economic effects of divorce and remarriage, but also into the underlying motivations for transfers from parents, divorced or otherwise.

The data reveal that divorce and remarriage have no effect on the incidence of a transfer. All else equal, children of divorce are just as likely to receive a transfer from one or both of their parents as their peers from intact families. If, however, you take those children who receive a transfer, conditional upon income and siblings and other variables, divorce is correlated with an *increase* in transfer amount, while a *father's* remarriage is correlated with a *decreased* amount. (The mother's remarriage, on the other hand, appears to have no effect.)

Why might such patterns occur? The exchange model of transfers offers one potential explanation. Say that transfers are really motivated by a parent's desire to obtain services of some type from his child, either in the present or in the future. When parents divorce, they now must compete for those services. The child is faced with providing care to two aging parental households instead of one, and with the increased demand for his services, the price would go up. If the father remarries, however, a (usually) younger wife can be expected to live longer than the father and provide almost all the care the father will need as he ages. Demand for the child's services drops, and transfers do as well.

This is just one scenario, however. It is the objective of this paper to pin down the empirical patterns themselves, which then open the doors to many possible scenarios, and many interesting questions.

1.1 Descriptive Overview

At first glance, the descriptive evidence is not particularly conclusive. Data from the Panel Study of Income Dynamics 1998 (which contains a "Time and Money Transfers" supplement) seems to indicate that unmarried adult children of divorced or never married parents fare worse than their counterparts from intact families, both in the incidence and mean amount of a transfer. (See Table 1.) The difference in the incidence of a transfer is significant (at the 5% level), while the difference in the mean transfer amounts between the two groups is only bordlerline significant (at the 10% level).

Looking at married adult children in the PSID sample paints a slightly different picture. Couples with two sets of married parents are no more likely to receive a transfer from their parents than couples with two sets of divorced/never married parents. And while the mean transfer amount is lower for couples where both are from disrupted families, a test of the differences in means shows that the difference is statistically insignificant.

	Unmarried Children	
	Transfer	**$ Received**
From intact families	0.377	$1639.36
	n=531	*n=164*
From disrupted families	0.292	$985.90
	n=362	*n=94*

	Married Children	
	Transfer	**$ Received**
Both from intact families	0.324	$2545.68
	n=665	*n=203*
1 intact/ 1 disrupted	0.272	$3212.32
	n=651	*n=167*
Both from disrupted families	0.321	$1634.67
	n=169	*n=46*

Table 1 - Means of Parental Transfers and Transfer Amounts to PSID 1988 Splitoff Households[2]

There are reasons to expect that divorce, per se, would not have as great an effect on adult transfers as it does on transfers to minor children. Minor children have different custodial arrangements depending upon the marital status of their parents: children with married parents live with both parents and children with divorced parents only reside with one. The adult children that I will examine here are always living in a separate household from their parents, regardless of the status of their parents' marriage. In addition, divorced and married parents alike give money directly to adult children, unlike in the case of minor children where the divorced non-custodial parent must transfer money to the ex-spouse, who then may use the money for her own consumption. These factors make the dynamics of transfers to adult children of divorced parents very similar to those of adult children of married parents.

What is not similar, however, is the presence of stepparents, which only occurs in the case of children of divorce. The dynamics of the stepparent relationship could have varying effects on transfer levels. The presence of a stepparent may be a source of increased economic resources to which an adult child can appeal for help, leading to greater transfers perhaps, than those observed in children of non-remarried families or even intact families. Or, it may be that a stepparent's lack of altruism toward a stepchild may result in him guarding the couple's resources for himself or for his biological children, imposing a constraint on the biological parent's ability to give.

Table 2 shows the incidence of transfers and mean total transfer amounts to children of unmarried parents, by the remarriage status of the parents. What is striking from the table is that remarriage (except for the case where only the mother is remarried) seems to be related to a large drop in mean total transfer amount. Despite the low number of observations, the differences in mean amounts between children who have no remarried parents, or children who have only remarried mothers, and those children who have two remarried parents are statistically significant These results will be further discussed in Section 3.

[2] "Splitoff Households" are those households whose parents' households are also surveyed in the panel. "Disrupted" indicates those families where parents are divorced or never married. Only children with 2 living parents who do not coreside with child included. Married includes cohabiting couples. Weighted by PSID family weight.

	Unmarried Children	
	Transfer	**$ Received**
Neither parent remarried	0.236	$1,285.45
	n=138	*n=26*
Mother-only remarried	0.343	$1,450.62
	n=77	*n=22*
Father-only remarried	0.294	$780.47
	n=91	*n=28*
Both parents remarried	0.366	$377.79
	n=47	*n=16*

Table 2 - Means of Parental Transfers and Transfer Amounts to Children of Disrupted Families in 1988 PSID Splitoff Households[3]

1.2 What is known about divorce, remarriage and transfers

Much is known about the economic consequences of divorce for minor children, and how outcomes in adulthood are affected by the childhood experience of divorce and remarriage. Children decline in socioeconomic status, educational attainment and eventual occupational attainment and increase their likelihood of negative outcomes such as early childbearing and delinquency following a divorce. (McLanahan and Sandefur, 1994, Cherlin, 1992) The decrease in income that accompanies divorce is the single most important factor in all of these outcomes. Estimates of the magnitude of this drop vary, but a conservative estimate puts the decline in standard of living of the custodial mother at about 30% on average, while the non-custodial father's standard of living increases by 10 to 15% (Hoffman and Duncan, 1988).

The remarriage of parents does have a mitigating effect on household income, but it is unclear whether this provides any significant benefit for minor children. In fact, the case may be that the well-being of children in stepfamily households is no better than that of children living in divorced, single-parent homes. (Cherlin, 1992, Cherlin and Furstenberg, 1994) The benefits of an increase in household income may be offset by the stressors related to remarriage, some of which stem from increased conflict over family finances. (Hetherington, Bridges and Insabella, 1998). The gender of the stepparent may also be a factor in the child's outcome. Case, McLanahan and others have demonstrated decreased investments in food and healthcare, and a poorer educational outcome in children being cared for by a stepmother in a remarried home versus

[3] "Splitoff Households" are those households whose parents' households are also surveyed in the panel. "Disrupted" families are those families where parents are divorced or never married. Only children with 2 living parents who do not coreside with child included. Weighted by PSID family weight.

a biological mother in a remarried home. (Case, Lin and McLanahan, 2000a, Case, Lin and McLanahan, 2000b and Case and Paxson, 2001) They have not as yet carried this approach into looking at investments in adult children.

The effect of divorce on relationships between parents and adult children is a well-studied topic in the sociological literature, and it is in this context that several sociologists have examined transfers. There is consensus that a single or divorced parent is less likely to give money to his adult child than he would be as part of an intact parent couple. (Furstenberg, Hoffman and Shrestha, 1995, Amato, Rezac and Booth, 1995, White, 1992) Whether or not the child is as likely, less likely, or more likely to receive a transfer from either parent has not been well explored. One study that provides some insight into this issue is Amato, Rezac and Booth (1995), who examined the role that parental marital quality, divorce and remarriage has on various "helping" variables between parents and adult children. Using a random sample of 443 families with young adult children (364 intact families and 79 divorced families), Amato, et al found that the probability of receiving a transfer from either parent (or giving a transfer to a parent) was essentially the same as receiving a transfer from married biological parents, except in the case of transfers needed for higher education. In that case, children of divorce were found to be less likely overall to obtain a transfer. How the quantity of the transfer compares with the quantity received by children of intact families was not examined.

Indeed, most papers in the sociological realm have not looked at transfer amounts, due most likely to their concern with transfers as indicative of a support relationship, and not as a resource for overcoming liquidity constraints. Some have, however, looked at remarriage and step-relationships and have found that parental remarriage has little or no effect on the probability of a transfer. Furstenberg, Hoffman and Shrestha (1995), use data from the PSID to demonstrate that divorce lowers the probability of a transfer from mothers and to an even greater extent from fathers, and find that remarriage has no significant effect on the probability of a transfer. Amato, Rezac and Booth (1995) found a minimal increase in the probability of help received from mothers (where "help" is an index variable that includes help in transportation, childcare, home or car repairs, housework, and advice/encouragement), and no significant difference in help received from fathers as a result of remarriage.

There is a substantial economics literature examining transfers between parents and children, but the effects of divorce and remarriage on transfers have not been explicitly researched. In empirical examinations, when divorce is included as a regressor in transfer estimations (which has been done in very few papers), the results are varied. Cox and Rank (1992), using data from the National Survey of Families and Households find, that "parents together" is correlated with an increased likelihood of receiving a transfer from parents. McGarry and Schoeni (1995) and McGarry (1999) use data from the Health and Retirement Survey to find that a donor parent being married (whether to the child's other

parent or to a stepparent - the two cases are not distinguished) results in both a lower incidence of transfers and a lower mean transfer amount from the parent. Controlling for household income and wealth, this is attributed to "married" implying more adults in the parent's household and less income available to give to a child. Villanueva (2001) uses the PSID to analyze incoming transfers to married couples. He includes "husband's parents divorced" and "wife's parents divorced" as regressors, but does not discuss the results, nor report their significance in the tables showing the results of his tobit and OLS regressions, some of which show a positive relationship between divorce and the incidence and amount of a transfer. Even Altonji, Hayashi and Kotlikoff's (1997) well-cited paper on altruism and transfers includes divorce and remarriage as regressors in the transfer equations, but then never reports the results.

The primary theoretical focus in the economics literature has been to use income effects on transfers to help determine the underlying motivations for transfers - altruism, exchange or, more recently, genetic fitness. (Becker, 1981, Bernheim, Schleifer and Summers, 1985, Altojni, Hayashi & Kotlikoff, 1996 and 1997, Cox, 1987 and 1990, Cox and Rank, 1992, McGarry & Schoeni, 1995, Case, et al., 2000b). In the altruism model (Becker 1981), parents give to their children because the child's utility enters in the parent's own utility function. In the exchange models (Cox 1987), parents give because they expect some sort of service in return from their children, and this service is what enters the parent's utility function.

The genetic fitness motive, which is just starting to gain attention, (Case, Lin and McLanahan 2000b) implies that parents give to their children not out of some generic desire for their well-being, but out of a more instinctual drive to ensure that the children will carry on the parents' genetic material. For example, it may be that parents pay for a child's college education in order to make him or her more likely to earn a good income, attract a healthy, productive spouse and thus be more fit and likely to bear children with a good chance of survival. Only in this third realm has an examination of divorce and stepfamily relationships been prominent, and the findings, as mentioned above, are that stepmothers in particular invest less in non-biological minor children than in their biological children.

There is no consensus as of yet on the underlying parental motivations for transfers but it is important to understand the underlying models. Greater study of transfers in non-traditional families may shed more light on the subject in the future.

The most explicit theoretical modeling of the effects of divorce on minor children's consumption comes from Weiss and Willis (1985), who model children as collective goods in a marriage characterized by altruistic parents. In the Weiss and Willis model, the Samuelson "tragedy of the commons" occurs post-divorce. The loss of control of non-custodial parents over expenditures on

children, combined with the fact that fathers and mothers no longer account for the utility gained by the ex-spouse in their determination of the optimal expenditure on the child, results in lower-than-optimal allocations to children.

What follows is a very simple model of parental transfers which I elaborate to gain some insights on how divorce and remarriage might affect transfers to adult children. Key features of the model include altruism as the motivation for parental giving and the use of game theory to establish the optimal transfers to children post-divorce. It does not feature the Weiss and Willis (1985) "tragedy of the commons" result because of a differently specified utility function, but it can be used to demonstrate how the method of transfer (either to the ex-spouse or directly to the child) is a primary factor in determining the transfer amount to the child and her ability to achieve pre-divorce consumption levels. Most importantly for this paper, it demonstrates how the simple fact of remarriage, holding all other factors constant, could result in lowered transfers to an adult child.

Then, using data from the PSID, I will test the theory to see if an adult child's ability to obtain transfers is affected by the divorce and remarriage of her parents in the ways the theoretical model predicts. I will use a variety of specifications - probit analysis of the likelihood of a transfer, OLS on transfer amounts, and tobit analysis - to see what each might reveal. As stated previously, the significant correlations between divorce and transfer amount, and father's remarriage and transfer amount, lead to some future avenues for research.

2 A Model of Parental Transfers with Varied Family Types

2.1 Introduction

This model outlines how resources may be allocated by altruistic parents in three types of families - intact, divorced, and remarried. Each parent's utility is based on own consumption, the consumption of a spouse (if married) and the consumption of an adult child and an adult stepchild (if remarried). I will assume that spouses are equally altruistic toward each other as they are to themselves, but may be less (or more) altruistic toward their children. Married couples engage in cooperative bargaining to determine allocation of total family income. Divorced parents play a Cournot-type game to determine their own consumption and a transfer to their child, taking the other parent's transfer as given. Remarried parents engage in a combination of the two games, bargaining with their spouses and allocating money toward a transfer to the children, taking the other parents' transfers as given.

2.2 Baseline - The Intact Family

As a baseline, I start by looking at how married parents might allocate consumption in a very simple model of parental altruism. Take a family with only three members, a mother, a father and one adult child. Assume that parents m and f, denoting mother and father respectively, engage in cooperative bargaining to allocate their income. The mother's and father's utility is based on their own and each other's consumption, c_m and c_f, valued equally, and the consumption of their adult child, c_k, discounted by the altruism parameter $\alpha > 0$.

$$U_f = U_m = \ln c_f + \ln c_m + \alpha \ln c_k \tag{1}$$

The resource constraint is

$$I_f + I_m = c_f + c_m + T_k \tag{2}$$

and

$$c_k = I_k + T_k \tag{3}$$

where I_f, I_m, and I_k are the endowment incomes of the father, mother and child and T_k represents the parents' transfer to the child.

The Nash bargaining solution results from the maximization of the Lagrangian

$$\begin{aligned} L(c_m, c_f, T_k, \lambda) &= (U_m - U_m^{Div})(U_f - U_f^{Div}) + & (4)\\ &\quad \lambda(I_f + I_m - c_m - c_f - T_k) & (5) \end{aligned}$$

where U_m^{Div} and U_f^{Div} denote the utility of the mother and father in the divorced state, or the threat points.

By assuming that the parents value their own and their spouse's consumption equally, the bargaining question becomes a trivial one: regardless of the values of the threat points, the problem simplifies to a maximization of the shared utility function subject to the budget constraint. Solving for the utility maximizing consumption allocations results in the following parental consumption, transfer and child consumption levels:

$$c_f^{Int} = c_m^{Int} = \frac{I_f + I_m + I_k}{2 + \alpha} \tag{6}$$

$$T_k^{Int} = \frac{\alpha(I_f + I_m) - 2I_k}{2 + \alpha} \tag{7}$$

and

$$c_k^{Int} = \frac{\alpha(I_f + I_m + I_k)}{2 + \alpha} \tag{8}$$

where the superscript Int denotes the intact family state.

A positive transfer occurs to the child as long as

$$I_k < \frac{\alpha(I_f + I_m)}{2}$$

Now that the baseline transfer level for the child with married parents is established, I will look at two cases for non-intact families and how transfers may be affected.

2.3 Case 1 - Divorced Parents with Direct Transfers

In the first case, the biological parents are divorced and no remarriage has taken place. The parents each make transfers directly to their adult child. What I will show here is that with direct transfers it is possible for adult children to maintain their pre-divorce transfer levels after a parental divorce, under certain assumptions. These assumptions include that both parents maintain their pre-divorce incomes and pre-divorce levels of altruism toward the child, and that the parents and child's incomes fall within a certain range of each other's. This will be detailed below.

This result contrasts with the result for minor children under the traditional (indirect) child support transfer regime, whereby a non-custodial parent makes transfers to a custodial parent, who then chooses how much to spend on the child. Under the traditional system, children's transfers decrease after a divorce. (This outcome, which has been empirically observed, is outlined for this model in Appendix D.)

In this case, both parents play a Cournot-type game, whereby they choose utility-maximizing consumption levels for themselves, and transfer levels to their child, taking the other parents' transfers as given. The setups are symmetric for the father and mother, so we need look only at the father's problem.

The father maximizes

$$U_f = \ln c_f + \alpha \ln c_k \tag{9}$$

where

$$c_k = I_k + T^f + \overline{T^m} \tag{10}$$

T^f and T^m denote the father's and mother's transfers, with the overbar indicating that the father takes the mother's transfer as given. The maximization is subject to the resource constraint

$$I_f = c_f + T^f \tag{11}$$

The solution to this Cournot game results in the equilibrium transfers from both parents, and total transfers under divorce (T_k^{Div}) to the child:

$$T^f = \frac{(1+\alpha)I_f - (I_k + I_m)}{(2+\alpha)} \tag{12}$$

$$T^m = \frac{(1+\alpha)I_m - (I_k + I_f)}{(2+\alpha)} \tag{13}$$

$$T_k^{Div} = \frac{\alpha(I_m + I_f) - 2(I_k)}{(2+\alpha)} \tag{14}$$

The total transfer to the child is equal to the transfer given by married parents, T_k^{Int}. Note that the parents' incomes must stay within a certain range of each other's and the child's in order for there to be a positive transfer from each of them. For example, for the mother to make a transfer, her income must satisfy the condition:

$$I_m > \frac{I_f + I_k}{1+\alpha} \tag{15}$$

If the father's or the child's incomes are very high relative to hers, she will be better off simply spending her income on her own consumption. Of course, the higher her degree of altruism, the greater the income spread would have to be to make her withhold a transfer. As long as there are positive transfers from both parents, consumption of the father, the mother and the child stay the same as in the intact family state:

$$c_f^{Div} = c_m^{Div} = \frac{I_f + I_m + I_k}{2+\alpha} \tag{16}$$

$$c_k^{Div2} = \frac{\alpha(I_f + I_m + I_k)}{2+\alpha} \tag{17}$$

The parents' have equal utility in the divorced state:

$$U_f^{Div} = U_m^{Div} = (1+\alpha)[\ln(I_f + I_m + I_k) - \ln(2+\alpha)] + \alpha \ln \alpha \tag{18}$$

which is mentioned here simply because this utility determines the threat point in the Nash Bargaining game between parents and their new spouses in the following case.

(See Appendix A for all of above derivations.)

Key assumptions on which this result rests are that parents do not suffer an income change as a result of divorce, the incomes of the parents fall within a range of each other's and their child's as specified above, and the parents' altruism parameter toward their child, α, remains constant pre- and post-divorce. It also rests on the initial assumption that as an intact couple, the parents value each other's consumption equally to their own.

What if the parents have incomes that differ to the extent that one parent does not provide a transfer to the child? In that case this model predicts that the child will actually receive a higher transfer. (See Appendix B.) The intuition

for this is that in the intact family state, the parent with the higher income had to direct a large share of that income to the other parent's consumption. Post-divorce, that parent will be able to spend more on the child. Although it may seem counterintuitive that divorce would actually raise transfer levels, the empirical analysis below will show that this may be the case.

The potential equal outcomes for mothers, fathers and children pre and post-divorce is reminiscent of Becker's (1972) "Rotten Child Theorem", in which the presence of an altruistic parent prevents children from behaving selfishly, because the parent can adjust transfers to ensure that an increase in one child's income benefits all children (and a decrease equally harms all children). In this case, the behavior of a "Rotten Ex" would be tempered by that person's altruism toward his or her child, which would allow the consumption of the lower-income ex-spouse to remain at pre-divorce levels.

2.4 Case 2 - Remarried Parents

Having seen that under a direct transfer regime and certain conditions adult children can achieve pre-divorce transfer levels, I will modify that regime to reflect a common situation for children of divorce: the presence of stepparents. What I will find in Case 2 is that even though the biological parents stay equally altruistic toward their children, and maintain their pre-remarriage level of income, the presence of a stepparent with a lower degree of altruism toward the child results in a drop in transfers. The degree of altruism between "steps" determines how close children of remarried parents can get to their pre-remarriage level of transfers.

2.4.1 The Set-Up

Let there now be two families, m_1, f_1, k_1 and m_2, f_2, k_2 denoting the members of original families 1 and 2 respectively. The parents of each family divorce and remarry the spouse from the other family. Now there are two *stepfamilies*: F^{12}, comprised of m_1,and f_2, and F^{21}, comprised of m_2 and f_1. (The adult children could be considered as belonging to both families.)

Unlike in the original intact family, the spouses now have different utility functions, reflecting each one's altruism toward his or her own biological child, α, and some degree of altruism toward his or her spouse's child, γ, where $\gamma > 0$. There are two games simultaneously being played in this setup. One is the bargaining between spouses in the remarried couples over consumption and their transfers to their children and stepchildren. The other is the Cournot-type game being played between the two couples over transfers to the children. First, I use a Nash Bargaining framework between the spouses in the remarried couple to determine their Best Response transfers to each of their children, taking the transfers of the other couple as given. Then, the Cournot equilibrium transfers with the other remarried couple can be found through substitution.

Because the setups are symmetric, both in the Nash Bargaining game (the husband and wife have equal bargaining power and threat points) and in the Cournot game with the other remarried couple (both couples solve the exact same problem), we can find an analytical solution to what would otherwise be an intractable model.

Taking F^{12}, the mother's and father's utility functions are

$$U_{m1} = \ln c_{m1} + \ln c_{f2} + \alpha \ln c_{k1} + \gamma \ln c_{k2} \tag{19}$$

$$U_{f2} = \ln c_{m1} + \ln c_{f2} + \alpha \ln c_{k2} + \gamma \ln c_{k1} \tag{20}$$

$$\text{where } c_{k1} = I_k + T_1^{12} + \overline{T_1^{21}} \text{ and } c_{k2} = I_k + T_2^{12} + \overline{T_2^{21}} \tag{21}$$

T_1^{12} denotes the transfer from $F^{12}$to k_1, and $\overline{T_1^{21}}$ denotes the transfer from F^{21} to k_1, taken as given. The Best Response transfer is found using Nash Bargaining subject to the resource constraint $I_f + I_m = c_{m1} + c_{f2} + T_1^{12} + T_1^{21}$. The couple's problem is set up in the Lagrangian:

$$\begin{aligned} L(c_{m1}, c_{f2}, T_1^{12}, T_2^{12}, \lambda) \quad &= \quad (U_{m1} - U_{m1}^{Div})(U_{f2} - U_{f2}^{Div}) + \\ &\quad \lambda(I_f + I_m - c_{m1} - c_{f2} - T_1^{12} - T_2^{12}) \end{aligned} \tag{22}$$

The threat points for the Nash Bargaining game, U_{m1}^{Div} and U_{f2}^{Div}(18), are the same for both parents under the assumption that mother's and father's incomes fall within the range where both are making transfers in the divorced state. With equal threat points and symmetric utility functions, the solution will be symmetric, with $T_1^{12} = T_2^{12}, \overline{T_1^{21}} = \overline{T_2^{21}}$and $c_{m1} = c_{f2}$.

Solving the Nash Bargaining game for the Best Response transfer from F^{12} to child 1 (which is equal to the transfer to child 2) results in

$$T_1^{12} = \frac{(\alpha + \gamma)(I_f + I_m) - 4\overline{T_1^{21}} - 4I_k}{4 + 2(\alpha + \gamma)} \tag{23}$$

So the Best Response from F^{21} is

$$T_1^{21} = \frac{(\alpha + \gamma)(I_f + I_m) - 4\overline{T_1^{12}} - 4I_k}{4 + 2(\alpha + \gamma)} \tag{24}$$

Using substitution, and assuming symmetric solutions, we can find the equilibrium transfers, total transfer (T_k^{Rem}) and equilibrium consumption for the child:

$$T_1^{12} = T_1^{21} = \frac{(\alpha + \gamma)(I_f + I_m) - 4I_k}{2(4 + \alpha + \gamma)} \tag{25}$$

$$T_k^{Rem} = \frac{(\alpha + \gamma)(I_f + I_m) - 4I_k}{4 + \alpha + \gamma} \tag{26}$$

$$c_{k1}^{Rem} = T_k^{Rem} + I_k = \frac{(\alpha + \gamma)(I_f + I_m + I_k)}{4 + \alpha + \gamma} \tag{27}$$

Note that in the case that $\alpha = \gamma$, the child's consumption is the same as in the intact state (and the same as in the divorced state with no remarriage.) It will be lower otherwise. The same will hold for child 2. (See Appendix C for above derivations.)

The parents' consumption levels are

$$c_{m1}^{Rem} = c_{f2}^{Rem} = \frac{2(I_f + I_m + I_k)}{4 + \alpha + \gamma}$$

Comparing T_k^{Div} (14) with T_k^{Rem} (26), it is clear that remarriage, unlike divorce in this model, lowers children's transfer and consumption levels. The exception is when parents are equally altruistic toward their biological and step children ($\gamma = \alpha$).

2.5 Discussion

In this model, the occurence of a parental divorce has no effect per se on the total amount transferred to the child (or the consumption level of the child). This assumes, of course, that neither income, which can be controlled for empirically, nor altruism, which is unobservable, change post-divorce. It also assumes that mother's and father's incomes fall within a certain range of each other and of their child's income. (If their incomes are highly unequal, the child's transfer actually *increases* post divorce.) Intuitively, this result is appealing: as long as a transfer is not going to an ex-spouse, there is no reason why a parent would want his child's utility to change due to divorce, and utility maximizing consumption levels for self and child during marriage would not necessarily change.

The introduction of stepparents, however, does lower the transfers to children. This result could be considered surprising given the setup I have chosen: income has not changed, the number of biological parents and children have not changed and the biological parents' altruism toward their children has not changed. It is simply the mechanism by which resources are allocated intra-stepfamily, combined with the stepparents' lower level of altruism toward the stepchildren, which results in lowered transfers to the children.

The intuition for this result is that within an intact family, any resources the couple allocates away from their own consumption go toward the consumption of their own child, and increase both parents' utilities. In a remarried couple, in order to direct resources toward one spouse's biological child, that spouse has to agree to allow some of the resources to be directed to his or her stepchild. The stepchild's consumption does not increase the spouse's utility to the same degree that a biological child's consumption does, and the spouse will prefer a lower overall transfer to both children than would be the case if the entire transfer was going toward his or her biological child.

The exception to this is when stepparents are equally altruistic toward stepchildren as toward their biological children, in which case transfers would remain unchanged from the intact family state. In the following section I will use empirical evidence to test these results for divorce, and to gain some insight on stepparental altruism.

3 Empirical Evidence - Transfers from parents to children in the PSID

The model elaborated above predicts that divorce would have no effect on parental transfers, holding all else equal, or in some cases might actually cause transfers to increase. It also predicts that remarriage would have a detrimental effect on transfers. Using cross-sectional data from the PSID, and its Time and Money Transfers Supplement (1988), I regress transfers from parents/stepparents on the usual socioeconomic variables included in transfer equations, but also include the parents' marital status to see if divorce and remarriage have the predicted effects. Of course, a key issue in this type of regression, where I ideally want to determine the *exogeneous* effects of divorce and remarriage, is their endogeneity within the model. A greater discussion of this issue in included below in section 3.3.1.

3.1 The Data

The Panel Study of Income Dynamics is a longitudinal survey of households in the United States, started in 1968. The sample, with proper weighting, is representative of all US households. It is particularly useful for the study of transfers for two reasons. First, the 1988 wave included a special "Time and Money Transfers" supplement which details transfers of time and money to and from sample households, providing specific details on the relationships between the households and the givers and receivers of these transfers. The second reason is that the PSID sample set grows over time with the addition of "splitoff" households -children leaving the base household and forming their own households. This makes it possible to observe key covariates for a subsample of children and their parents.

The 1988 PSID sample consists of 7,114 households. For the purposes of this analysis, only "splitoff" households with unmarried household heads are included. ("Unmarried" means that the head is neither married nor cohabiting at the time of the survey.) The base unit of observation is a household where the "head" is the child of an original 1968 household, and at least one of his or her parents continues to participate in the panel study. Further paring of the sample is done by restricting the observations to those children with two living, non-coresident parents. The subsample then includes 893 households.

3.1.1 Dependent variables

The dependent variables that are used in the following regressions are 1) whether a transfer from parents or stepparents occurred, and 2) the sum of all transfers from parents or stepparents received by the child. The pertinent survey questions are:

> During 1987, did (you/your family living there) receive any loans, gifts, or support worth $100 or more from your [parents/father (and stepmother)/ mother (and stepfather)]?

And,

> About how much were those loans, gifts or support worth in 1987?

There are two factors that make the dependent variable somewhat less than ideal. The first is the inclusion of loans in the question. Because there is no way to separate out what are loans vs. gifts, I will assume that loans are a type of transfer. This is common to the transfer literature. The second issue is the censoring of transfers at $100. $100 is a relatively low censoring point when compared with other datasets, and it is probably negligible. There is the risk, however, that this censoring could exclude transfers that occur among families at the lowest socioeconomic level in the survey.

To determine how significant this censoring might be, I looked at another question in the PSID regarding loans, gifts or support given *by* the respondent to a non-household member. For some reason, no censoring point is included in this question, so any amount is a valid response. In the Time and Money Transfer supplement, out of 32,850 reports of "helping" of any type, 7,708 of the reports were of loans, gifts or support given by the recipient. Of these, only 113 respondents reported transfer amounts of less than $100, so fewer than 1.5% of responses fell in this range. Assuming that the results for transfers received would be similar, I believe it is acceptable to ignore the censoring issue, as other authors have done. (i.e., Altonji, Hayashi & Kotlikoff, 1997)

3.1.2 Independent Variables

The independent variables included here are, for the most part, those used commonly in econometric studies of transfers, with the exception of the variables regarding divorce and remarriage (which some authors include and others do not.)

Child/Transfer Recipient:

age

sex: takes value of 1 if male

siblings: number of *natural* siblings reported by respondent. See discussion of the reporting of half-siblings in Section 3.2.

children in the household: the number of children living with the child/transfer recipient. Ideally, the number of the recipients *biological* children would be used, but there was too much missing information in the PSID Individual file to determine how many biological children the recipient had in 1988.

black: takes value of 1 if recipient is black

education: less than high school, high school, some college, college, and grad school

household income: includes all wages, labor and non-labor income (excluding family transfers) for head and other household members.

parents unmarried: takes a value of 1 if the biological parents of the child are divorced or never-married. The basic questionnaire for the PSID does not ask specifically about parental divorce, only whether parents are married or not. Using data from the Marriage History file, I can determine if a divorce occurred or not, but only if the marriage existed during the years of the PSID. This reduces the number of observations by about 250 and changes the characteristics of the data set quite significantly. Here I will assume that divorce and non-marriage have similar effects

father remarried: takes a value of 1 if father is remarried

mother remarried: takes a value of 1 if mother is remarried

Parents/Transfer Donors:

joint parental income: sum of all wages, labor, and non-labor income for the father and mother of the head. Usually this data is reported by the parent him or herself, but when it is not (for example, when the parents are divorced and only the mother of the head is surveyed in the PSID), I use the child's report of the parent's income (if available). When the child reports a range for the income, the midpoint of that range is ascribed. When the child reports an income for his remarried parent and stepparent, the parent is ascribed one-half of the couple's income

joint parental wealth: for married parents, this variable is taken first from their self-reported net worth, and when that is missing, from the child's report of the parent's net worth. In cases where the exact amount was unknown, but a range was reported, I ascribed the midpoint of the range as the net worth. For remarried parents, I used half of the reported net worth for the remarried couple, as the PSID lumps a couple's assets together.

distance from child: indicator variables for ranges of distance (less than 1 mile, 1 to 10 miles, 10 to 100 miles, over 100 miles, or unknown)

age: mother's age and father's age are included. The father's age is missing in about 100 of the observations. These missing observations are correlated with those cases where parents are divorced. In order to include these observations, I imputed missing mother's and father's age data by taking the mean difference between the age of fathers and mothers in the sample, and the mean difference between the age of fathers, mothers and children in the sample. If mother's age was available, I added the mean difference to her age to impute the father's age.

If both mother's and father's ages were missing, I added the mean difference to the child's age. All results are robust to dropping the imputed observations.

3.2 Descriptive Results for Unmarried Children

Tables 3a and 3b show the summary characteristics (mean and standard deviation) for children from intact and disrupted families in the sample. As far as transfers are concerned, children of divorced or never married parents are less likely to receive a transfer from either parent (29% vs. 38%) and when they do, they receive less on average than children of an intact family ($986 vs. $1639), although this difference in transfer amount is only statistically significant at the 10% level.

There are other significant differences, however, between children from disrupted and children from intact families. Children of disrupted families have a lower household income ($20,169 vs $23,277), they are younger (27.7 years vs. 29.3 years), and they are more likely to be black (28% vs. 11%). They have more siblings on average (3.7 vs. 3.1) and more children in their household (.63 vs. .38). They are also less likely to have a college education. Their parents are younger, less wealthy and have a lower joint income. (This is robust to exclusion of outliers, which are included in the table, but it also reflects the fact that 171 of the 362 children of unmarried parents report that their father's income is unknown.)

Intuitively, one might expect that having younger, less financially well off parents would account for the difference in transfer incidence and amount between children of married and non-married parents. The multivariate analysis will show that this is not the case.

	Intact	Disrupted	All
	N=531	N=362	N=893
child's income*	$23,277	$20,169	$22,283
	(18,954)	(17,224)	(18,466)
age***	29.349	27.723	28.829
	(6.005)	(5.926)	(6.025)
male	0.495	0.440	0.477
	(0.500)	(0.497)	(0.500)
# siblings**	3.135	3.714	3.320
	(2.459)	(2.903)	(2.622)
# children in hh***	0.378	0.634	0.461
	(0.819)	(1.089)	(0.921)
black***	0.110	0.277	0.163
	(0.313)	(0.448)	(0.370)
high school education*	0.198	0.270	0.221
	(0.399)	(0.444)	(0.415)
more than high school	0.354	0.302	0.337
	(0.479)	(0.460)	(0.473)
college education***	0.268	0.151	0.230
	(0.443)	(0.358)	(0.421)
grad school	0.054	0.037	0.049
	(0.226)	(0.190)	(0.215)
transfer received**	0.377	0.292	0.350
	(0.485)	(0.455)	(0.477)
total dollars received*	$1639.36	$985.90	$1465.20
	(3328.34)	(1257.92)	(2934.26)

Table 3a - Summary Characteristics of Unmarried Splitoff Households in PSID 1988 - Children's Characteristics[4] [5]

[4] Only children with 2 living parents, who do not coreside with parents included. Weighted by family weight.

[5] * indicates significant differences in means at 10% level, ** significant at 5% level, ***significant at 1% level.

	Intact	Disrupted	All
	N=531	N=362	N=893
mother remarried	0	0.379	0.119
	(0)	(0.486)	(0.324)
father remarried	0	0.467	0.147
	(0)	(0.500)	(0.354)
joint parental wealth***	$246,223	$97,478	$198,955
	(653,368)	(184,570)	(553,733)
joint parental income	$45,695	$32,452	$41,462
	(90,723)	(33,027)	(77,344)
mother's age***	56.687	51.888	55.159
	(7.724)	(8.497)	(8.282)
father's age***	59.465	53.750	57.792
	(8.065)	(9.590)	(8.922)
father distance unknown***	0.001	0.198	0.064
	(0.037)	(0.399)	(0.245)
father $<$ 1 mile***	0.137	0.038	0.105
	(0.344)	(0.192)	(0.307)
father 1 to 10 miles	0.258	0.186	0.235
	(0.438)	(0.390)	(0.424)
father 10 to 100 miles	0.282	0.214	0.260
	(0.450)	(0.410)	(0.439)
mother distance unknown	0.001	0.015	0.005
	(0.031)	(0.120)	(0.073)
mother $<$ 1 mile	0.138	0.143	0.139
	(0.345)	(0.350)	(0.347)
mother 1 to 10 miles	0.259	0.296	0.271
	(0.439)	(0.457)	(0.445)
mother 10 to 100 miles*	0.284	0.216	0.262
	(0.451)	(0.412)	(0.440)

Table 3b - Summary Characteristics of Unmarried Splitoff Households in PSID 1988 - Parents' Characteristics[6] [7]

[6] Only children with 2 living parents, who do not coreside with parents included. Weighted by family weight.

[7] * indicates significant differences in means at 10% level, ** significant at 5% level, ***significant at 1% level.

	Neither	Mother	Father	Both
	N=138	N=77	N=91	N=47
child's income	$19,270	$16,292	$26,681	$15,346
	(15,050)	(12,681)	(23,102)	(8,472)
age	28.706	27.929	27.570	26.208
	(6.850)	(4.618)	(5.574)	(5.89)
male	0.432	0.372	0.455	0.477
	(0.497)	(0.487)	(0.501)	(0.505)
# siblings	4.304	3.936	3.620	2.494
	(3.541)	(2.509)	(2.552)	(2.303)
# children in hh	0.759	0.898	0.471	0.398
	(1.283)	(1.143)	(0.906)	(0.858)
black	0.319	0.321	0.279	0.115
	(0.468)	(0.470)	(0.451)	(0.323)
hs education	0.186	0.177	0.346	0.376
	(0.390)	(0.384)	(0.478)	(0.490)
more than hs	0.276	0.293	0.302	0.373
	(0.449)	(0.458)	(0.462)	(0.489)
college education	0.175	0.154	0.168	0.091
	(0.381)	(0.364)	(0.376)	(0.290)
grad school	0.065	0.052	0.000	0.035
	(0.248)	(0.223)	(0.000)	(0.187)
transfer received	0.236	0.343	0.294	0.366
	(0.426)	(0.478)	(0.458)	(0.487)
total dollars received	$1,285.54	$1,450.62	$780.47	$377.79
	(1286.545)	(1,872.40)	(788.55)	(227.56)

Table 4a - Summary Characteristics by Parents' Remarriage Status - PSID 1988 - Children's Characteristics[8]

[8] Only children with 2 living unmarried parents, who do not coreside with parents included. Weighted by family weight.

	Neither N=136	Mother N=77	Father N=91	Both N=47
joint parental wealth	$120,803	$92,448	$94,896	$63,979
	(253,237)	(173,359)	(143,162)	(69,791)
joint parental income	$25,845	$29,636	$42,151	$33,547
	(29,658)	(28,090)	(42,049)	(24,017)
mother's age	55.474	51.533	49.942	48.736
	(8.669)	(7.219)	(8.932)	(6.947)
father's age	56.48	52.396	54.036	49.892
	(11.37)	(9.565)	(8.634)	(6.273)
father dist unknown	0.308	0.355	0.000	0.032
	(0.464)	(0.482)	(0.000)	(0.178)
father $<$ 1 mile	0.054	0.022	0.050	0.012
	(0.227)	(0.149)	(0.218)	(0.111)
father 1-10 mile	0.132	0.152	0.263	0.218
	(0.340)	(0.362)	(0.443)	(0.417)
father 10-100 mile	0.197	0.178	0.217	0.313
	(0.399)	(0.385)	(0.414)	(0.469)
mother dist unknown	0.005	0.000	0.045	0.000
	(0.072)	(0.000)	(0.207)	(0.000)
mother $<$ 1 mile	0.131	0.125	0.220	0.063
	(0.339)	(0.333)	(0.416)	(0.246)
mother 1-10 miles	0.333	0.278	0.187	0.356
	(0.473)	(0.451)	(0.392)	(0.484)
mother 10-100 miles	0.241	0.304	0.168	0.171
	(0.429)	(0.463)	(0.375)	(0.381)

Table 4b - Summary Characteristics by Parents' Remarriage Status - PSID 1988 - Parents' Characteristics[9]

The descriptive results for the relationship between remarriage and transfers (Table 4a) seem to show that children whose parents remarry are *more* likely to receive a transfer. These differences are statistically insignificant, however. What is interesting to note is that in looking at the amount of a transfer when one is received, children whose mothers are remarried receive about the same as children with no stepparents, and even the apparent drop in transfer amount for children with remarried fathers (only) is not statistically significant. It is when both parents are remarried that a significantly lower transfer amount is observed.

Children with two remarried parents display a number of other statistically significant differences from the other children of disrupted families. They are younger, poorer, have fewer children and are less likely to be black. They also

[9] Only children with 2 living unmarried parents, who do not coreside with parents included. Weighted by family weight.

report *fewer* siblings than their counterparts with neither or only one parent remarried. This is a strange result, given that a parent's remarriage is usually correlated with more siblings rather than fewer. In investigating this outcome, I have concluded that the reporting on half-siblings in the PSID is quite inconsistent. In the questionnaire, respondents are asked about *natural* siblings, but it is clear from examining the data that the reporting of half-siblings is entirely random - many respondents report them as siblings, but (probably more) don't report them. What I believe is happening with this variable is that children with two remarried parents have a higher proportion of half-siblings in their total sibling count, and given that the fraction of half-siblings reported is much less than 1, they are reporting a smaller percentage of their siblings than children in the other categories report.

Who gives to the children? While this paper is concerned with the total transfers received by children, it is interesting to note how the giving breaks down between fathers and mothers. Of all the children of divorced or unmarried parents in the sample 22% received a transfer from their mother, and 13% received a transfer from their father, while 6% received from both their parents. 67% of all the dollars given to these children came from mothers, while 33% came from fathers. Essentially, children of disrupted families are twice as likely to receive from their mothers as from their fathers, and their mothers, on average, give twice as much as their fathers give.

3.3 Key Issues for Multivariate Analysis

There are three key issues concerning the estimation of the effects of divorce and remarriage on transfers: endogeneity, censoring/selection and sibling observations in the sample.

3.3.1 Endogeneity

It is possible in this model that divorce and remarriage are endogeneous; certain unobservable characteristics of the child's parents, which are correlated with being divorced or remarried are also correlated with transfer outcomes. A divorced father is more likely than a married father to have "deadbeat dad" characteristics, which would be correlated with lower transfer amounts. The answer to endogeneity is either to find instrumental variables, or to use differences-in-differences estimation over time to find the transfer differences for the same child pre- and post-divorce. The latter option is inapplicable to a cross-section sample. The former, however, might be applicable if a suitable instrument could be found. In testing a wide variety of instruments (religion, living in a state which adopted unilateral divorce earlier rather than later, eldest child in family being female, to name a few), none were found to be relevant in this sample. F-tests following first-stage IV regressions for all these variables were far less than the "10" cutoff point recommended for relevant instruments (Stock and Watson, Ch. 10, 2002).

Could divorce and remarriage be exogeneous? Possibly, but not likely for divorce, although the endogeneity of remarriage is more disputable. I will proceed under the heroic assumption of exogeneity, but any determination of the "causality" of divorce and remarriage on transfers as a result of the following analysis would be up for debate

3.3.2 Censoring and Selection

As mentioned previously, transfer amounts are censored at $100, and transfers are only observed if a positive transfer takes place. While the $100 cutoff is probably not important, observing a transfer will be correlated with unobservables that affect transfers overall. For part of the following analysis I will correct for selection using a random-effects Tobit model. Ideally, a Heckman estimation could be used, because it does not require the coefficients and the errors in the selection equation and in the transfer amount equation to be proportional. Finding a valid exclusionary restriction, however, was not possible.

3.3.3 Sibling observations

The sample used includes many instances of sibling observations. Sibling observations are unlikely to be independent; some components of the unobservables will be highly correlated across siblings. For part of the analysis to follow, I will simply use robust standard errors with clustering on the family id. For the selection corrected analysis, there are two approaches to dealing with this correlation. One might be to introduce fixed effects in the Tobit model, but in this case using fixed effects precludes the estimation of the coefficients I am most interested in, namely parental divorce and remarriage. Across most families, there is no variation in these variables. (There are only a few cases of half siblings in the sample.).

Using *random-effects* is another option. With random effects we account for some portion of the error term being constant across families. One requirement of random effects is that the variance of this constant part of the error be orthogonal to the observed variables that are constant across familty members. That is to say, if the error term e_{fi} is composed of a family specific component ν_f and an individual component u_i, those variables such as divorce or parental income or number of siblings which are constant across sibling observations should be unrelated to the variance of ν_f. This is a strong assumption, but one that I will make in order to proceed.

3.4 Multivariate Results

I begin with the estimate of a simple Probit regression, where the dependent variable equals 1 if a transfer has occurred, and 0 otherwise.

	Coef	z-value	P>| z |
child's hh income	-.0000104**	-2.57	0.010
age	-.0271733**	-2.37	0.018
male	.0369788	0.34	0.734
# siblings	-.024566	-1.17	0.242
# children in hh	.0309683	0.58	0.562
black	-.1411335	-1.19	0.232
hs education	-.0152601	-0.11	0.913
more than hs	.1392928	0.98	0.327
college education	.3979393**	2.09	0.037
grad school	-.0260735	-0.08	0.939
parents unmarried	-.0826255	-0.51	0.607
mother remarried	.1667665	1.07	0.286
father remarried	.067542	0.39	0.693
joint parental wealth	9.82 e-06	0.51	0.608
joint parental income	7.35 e-06***	3.44	0.001
father dist unknown	-.3700188	-1.55	0.120
father < 1 mile	-.0906704	-0.36	0.721
father 1 to 10 miles	.0254471	0.13	0.895
father 10 to 100 miles	-.0694717	-0.37	0.714
mother dist unknown	.0619386	0.11	0.912
mother < 1 mile	.0581796	0.25	0.800
mother 1 to 10 miles	-.0821165	-0.41	0.682
mother 10 to 100 miles	.0780093	0.41	.680
father's age	-.0038821	-0.45	0.650
mother's age	.0042262	0.39	0.698
constant	.2177097	0.52	0.604

Number of observations = 856, Wald chi2(25)=72.22, Pseudo R-squared=0.0938, robust standard errors clustered on family id.

*** indicates significance at 1% level, ** indicates significance at 5 % level

Table 5a - Probit Analysis - Transfer Probability as Function of the Covariates

The probit analysis shows no effect of any of the family structure variables on the probability of receiving a transfer. Child's income, child's age and parents' income are all highly significant and show the expected signs. Having a college education is highly significant as well, and all the regressions I run show that college or graduate education is highly correlated with transfers. There is obviously great potential for endogeneity with the education variable. Children with a higher education are likely to have parents who are very willing to invest in their children, and this willingness would certainly extend to providing other types of transfers.

Note that the income coefficients (both child's and parents') are very small, while their significance is high. This is similar to results from other authors.

(Cox and Rank, 1992, Altonji, Hayashi & Kotlikoff, 1997, McGarry, 1999). Income does matter, but its explanatory power for the incidence or amount of a transfer is very small. When compared with the coefficient for college education, for example, the effect of even a $1000 change in the child's or parents' income seems very small. I would interpret this result as showing that it is the unobservables, many of which are highly correlated with college education, that really determine whether a child receives a transfer or not.

	Coef	t-value	P>| t |
child's income	-.0000159***	-3.32	0.001
age	.0376795*	-1.84	0.067
male	.0307067	0.20	0.841
# siblings	-.0509875*	-1.84	0.067
# children in hh	.0678222	0.84	0.400
black	-.5574572***	-3.40	0.001
hs education	-.1440384	-0.70	0.483
more than hs	.2298524	1.21	0.228
college education	.5299335**	2.05	0.041
grad school	1.408454***	3.50	0.001
parents unmarried	.3809756**	2.13	0.034
mother remarried	-.2592978	-1.25	0.211
father remarried	-.5680713**	-2.57	0.011
joint parental wealth	3.11 e-07	1.34	0.181
joint parental income	2.94 e-07	0.29	0.769
father dist unknown	-.2769457	-0.90	0.369
father $<$ 1 mile	-.7222838**	-2.14	0.033
father 1 to 10 miles	-.1256576	-0.57	0.571
father 10 to 100 miles	.147363	0.61	0.544
mother dist unknown	-.1483489	-0.34	0.731
mother $<$ 1 mile	.299304	0.93	0.355
mother 1 to 10 miles	-.067826	-0.30	0.767
mother 10 to 100 miles	-.1170452	-0.45	0.652
father's age	-.0025337	-0.24	0.811
mother's age	-.0296125**	2.04	0.042
constant	6.171407	11.62	0.000

Number of observations = 250, F(25,228) = 6.40, R-squared=0.3290 robust standard errors clustered on family id

*** indicates significance at 1% level, ** indicates significance at 5 % level

Table 6 - Projection - Log Transfer Amount on Covariates

Following the Probit analysis, I run an OLS projection of the log of transfer amount (to lessen the effect of outliers) on the covariates, for those children who receive a transfer. (See Table 6.) This allows me to explore the correlations seen in the descriptive results further. Conditional on receiving a transfer, having

divorced parents is significantly correlated with a larger transfer; holding all else equal, divorced is associated with a 38% *increase* in transfer amount.

The positive correlation of divorced parents with transfer amount might be considered somewhat counterintuitive, but there are several potential explanations. One comes from the the model: parents' incomes may be unequal enough that divorce may allow a higher earning parent who no longer has to support a lower earning parent to give more to a child than the child may have gotten with married parents. There also could be some gaming behavior on the part of the child or parents. A child might hide the fact that one parent has already given him or her money when asking the other parent for money. Or the parents may compete for the child's affection (or services, if the exchange motivation for transfers applies) by each attempting to provide the child with a larger gift.

Remarriage, however, is a different story. The correlation of father's remarriage with decreased transfers is also as predicted by the model, but mother's remarriage is insignificant. Not only that, but having a remarried father is associated with a *43%* drop in transfer amount, a rather large effect. Why would a father's remarriage matter so, and a mother's not matter at all? This question is ripe for further study, but a few potential answers come to mind. One could be that the altruism parameter for mothers is higher than that for fathers, and a stepmother may successfully bargain for her biological children to receive more of a couple's resources, drawing resources away from the stepchildren. Recall the Case, Lin and McLanahan (2000a and 2000b) and Case and Paxson (2001) results, which found that stepmothers (and not stepfathers) invested less in minor stepchildren versus biological children when it came to nutrition, healthcare and education. This is taken as evidence of a *genetic fitness* motivation for transfers, and that may be in evidence here as well.

It also may be that fathers are more likely than mothers to have more children resulting from a remarriage, and as discussed above, half-siblings are mismeasured in this survey. The remarried father coefficient may be picking up the effect of more siblings, or of more anticipated future siblings.

A third potential reason is based on the assumption that there is an *exchange* motivation for transfers, and it would explain not only the drop in transfers associated with remarriage, but the increase associated with divorce. That explanation goes as follows. Parents give to their children primarily in exchange for caregiving services. Because women have a longer life expectancy than men, and wives are generally younger than their husbands, they do not count on their husbands to be their caregivers when they are elderly. Thus, they are always interested in providing transfers to their children, whether they are married or divorced or remarried, in order to ensure these services later in life. Men, on the other hand, can generally assume their wives will be their caregivers. Their wives are younger and live longer. When they get divorced, however, ensuring caregiving from their children becomes more important, and for that reason

children's transfers might increase post-divorce. The children now have two parents attempting to purchase these services. Once a remarriage takes place (again, for the most part, to a younger wife), the anticipated need for these services disappears, and children now have only one parent providing transfers in exchange for future services.

The other significant covariates that are negatively correlated with transfer amount are child's income, age, siblings, being black and having the father live within a mile of the child. Having a college or graduate level education is positively correlated with transfer amount, as is the mother's age. Parent's income is insignificant.

	Coef	z-value	P>| z |
child's income	-.0000241***	-3.22	0.001
age	-.0766987***	-3.13	0.002
male	.1311764	0.62	0.538
# siblings	-.0873076**	-2.27	0.023
# children in hh	.0809586	0.74	0.458
black	-.6360761***	-2.62	0.009
hs education	-.0183936	-.06	0.950
more than hs	.4836109*	1.71	0.086
college education	1.237588***	3.43	0.001
grad school	.8483356	1.31	0.191
parents unmarried	.0147062	0.05	0.962
mother remarried	.1393673	0.43	0.666
father remarried	-.0884091	-0.25	0.799
joint parental wealth	2.63 e-07	1.11	0.267
joint parental income	4.07 e-06**	2.47	0.014
father dist unknown	-.9856443**	-2.12	0.034
father < 1 mile	-.4454982	-0.87	0.383
father 1 to 10 miles	.0233071	0.06	0.949
father 10 to 100 miles	-.0615497	-0.16	0.869
mother dist unknown	-.0041889	-0.00	0.997
mother < 1 mile	.2069615	0.45	0.650
mother 1 to 10 miles	-.1858153	-0.49	0.622
mother 10 to 100 miles	.0652779	0.17	0.865
father's age	-.0050133	-0.31	0.757
mother's age	.0178337	0.85	0.397
constant	5.511882***	6.98	0.000

Number of observations = 856, uncensored obs=246, censored obs=610 Number of groups= 632. Wald chi2(25)=109.13. Variance of family component of error, .8586594 variance of overall component of error 1.916058

*** indicates significance at 10% level, ** indicates significance at 5 % level

Table 7 - Random-Effects Tobit - Log Transfer Amount on Covariates

Finally, I run a selection-corrected model, using random-effects tobit. As mentioned above, using a Heckman model would be ideal, but finding an exclusionary restriction was not possible. Tobit carries a rather restrictive set of assumptions regarding the effects of the covariates on the selection equation and the amount equation - namely that the effects are proportional. In that sense, we might expect to see it mimic the probit analysis. Like the probit, the tobit regression shows no impact of divorce or remarriage on the amount of transfers. Child's income, child's age, number of siblings, being black, and not knowing the whereabouts of the father, all decrease the amount of a transfer. Having a college education increases it, but there is certainly endogeneity in this variable. An increase in the parents' joint income also increases the amount of a transfer, but weakly. (A $1000 increase in parents' income would cause a 0.41% increase in the amount of a transfer.)

It is worth discussing the appearance of "father's distance unknown" as a significant negatively related covariate in this regression. (Not knowing the whereabouts of the father is related to a 63% drop in transfer amount, a higher drop than caused by any other covariate.) This variable indicates quite starkly a lack of relationship between the father and child, and it is highly correlated with divorce. Almost 20% of the children of divorced parents report not knowing where their father lives, in contrast with less than 1% of the children of married parents. Also, in contrast, only 1.5% of the children of divorced parents report not knowing where their mother lives.

While this variable is endogenous - a father's lack of contact with his child is certainly correlated with unobservables that affect transfers - it may actually be an observable case of the most extreme of the unobservables often associated with divorce - the father's disengagement from the child. It is, after all, the variable that declares "no relationship". The propensity to disengage from children may well exist in fathers in married parent couples as well, but only in the divorced state does this tendency have the opportunity to be observed. In married couples the disinterest of a father may be masked by the mother, or the mother (as is the case with many mothers I know) may put great effort into keeping a potentially disinterested father engaged and contributing financially to a child.

4 Conclusion

The dynamics of transfers to adult children suggest that the effect of parental divorce on transfers may be different for adult children than for minors. A simple model with altruistic parents or stepparents bargaining over the transfer to an adult child or stepchild demonstrates that divorce may actually impact the total transfer amount received by a child positively, if at all, prior to a parent's remarriage. Once remarriage takes place, however, the model shows how the

impact of bargaining between biological parents and stepparents, combined with a lower level of altruism on the part of stepparents toward steppchildren, results in lowered transfers.

Empirical examination of the issue is complicated by the endogeneity of divorce and remarriage - the correlation of divorce and remarriage with unobserved characteristics on the part of the parents that may affect transfers. Ideally, a valid instrument could be used to represent these variables, but in this study none were found. Therefore, any implications of causality in the empirical evidence should be questioned.

That being said, the empirical evidence suggests that divorce and remarriage do not affect the probability of a receiving a transfer from either parent. When a child receives a transfer, however, the marital status variables are significantly related to the overall amount of the transfer . Divorce is actually correlated with higher transfer amounts, while a father's remarriage is correlated with lower. Why does the father's remarriage seem to matter and not the mother's? This paper does not attempt to answer this question, but the question could shed light not only on the economic nature of remarriage, but on the underlying motivations for transfers themselves.

For example, the answer may lie in different levels of maternal and paternal altruism toward children, or in the motivation of stepmothers to divert resources to their own biological children. Both of these explanations might support a *genetic fitness* motivation for transfers. Or, the dichotomy could be due to ramifications of the *exchange* motivation for transfers combined with different life expectancies for men and women. There are, of course, many other potential explanations

Given the trends in divorce and remarriage, it may be good news to see that the economic consequences of divorce (measured simply in terms of financial support provided by parents) are mitigated by children entering adulthood. But given the numbers of children who will be experiencing life with a stepparent, the effects of subsequent marriages on support for adult children from prior marriages requires more examination. Young adults who might otherwise be able to expect significant support from their parents may see their total inflows decline as their fathers, in particular, take on new spouses.

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A Derivations for Case 1 - Divorce with Direct Transfers

The father's maximization problem is set up in the Lagrangean

$$L(c_f, T^f, \lambda) = \ln c_f + \alpha \ln(I_k + \overline{T^m} + T^f) + \lambda \left(I_f - c_f - T^f\right) \tag{28}$$

The first order conditions are:

$$c_f : \frac{1}{c_f} = \lambda \tag{29}$$

$$T^f : \frac{\alpha}{I_k + \overline{T^m} + T^f} = \lambda \tag{30}$$

$$\lambda : I_f = c_f + T^f \tag{31}$$

Equating the FOC's for c_f and T^f to get the expression for c_f in terms of T^f and then substituting into the FOC for λ, we can solve for T^f to obtain the best response function for father's transfers:

$$T^f_{BR} = \frac{\alpha I_f - I_k - \overline{T^m}}{1+\alpha} \tag{32}$$

Because the problem is symmetric, the mother's Best Response will be:

$$T^m_{BR} = \frac{\alpha I_m - I_k - \overline{T^f}}{1+\alpha} \tag{33}$$

Substituting the mother's Best Response into the father's, we can arrive at the Nash Equilibrium transfer levels:. $\mathrm{T}^f = \frac{(1+\alpha)I_f - (I_k+I_m)}{2+\alpha}$(34)

$$T^m = \frac{(1+\alpha)I_m - (I_k+I_f)}{2+\alpha} \tag{35}$$

and the total transfer to the child:

$$T^{Div}_k = T^f + T^m = \frac{\alpha(I_f+I_m) - 2I_k}{2+\alpha} \tag{36}$$

the consumption levels:

$$c^{Div}_k = T^f + T^m + I_k = \frac{\alpha(I_f+I_m+I_k)}{2+\alpha} \tag{37}$$

$$c^{Div}_f = c^{Div}_m = I_f - T^f = I_m - T^m = \frac{(I_f+I_m+I_k)}{2+\alpha} \tag{38}$$

and the parents' utility levels:

$$\begin{aligned} U^{Div}_m &= U^{Div}_f = \ln\left(\frac{(I_f+I_m+I_k)}{2+\alpha}\right) + \alpha\ln\left(\frac{\alpha(I_f+I_m+I_k)}{2+\alpha}\right) && (39)\\ &= (1+\alpha)[\ln(I_f+I_m+I_k) - \ln(2+\alpha)] + \alpha\ln\alpha && (40)\end{aligned}$$

B Derivations for Case 1 With Highly Unequal Parental Earnings

Take the mother's equilibrium transfer equation from Appendix A (35). A positive transfer will only result if $I_m > (I_f + I_k)/(1+\alpha)$. If the mother's income is less than or equal to this amount, no transfer from her takes place. In that case, at equilibrium, the father substitues a O into his best response function (32) resulting in a total transfer of

$$T^{Div}_f = \frac{\alpha I_f - I_k}{1+\alpha} \tag{41}$$

How does this compare with the transfer the child would receive if his parents were married? The child's transfer will be higher in the intact state as long as subtracting the transfer under divorce (41) from the transfer under an intact regime (7) results in a positive number.

$$T^{Int} - T_f^{Div} = -\alpha I_f + \alpha I_m + \alpha^2 I_m - \alpha I_k$$

is greater than zero iff

$$I_m > \frac{I_f + I_k}{1+\alpha}$$

This, however, is precisely the condition that was violated in the equilibrium transfer equation for the mother, resulting in only the father giving a transfer. Therefore, as long as the mother's income is so low that in the divorced state the mother does not provide a transfer, the child's transfer amount actually increases following a divorce.

C Derivations for Case 2 - Remarried Parents

C.1 Optimal transfers and children's consumption

Based on the setup described in section 2.4.1, F^{12} determines its optimal consumption levels through Nash bargaining between m_1 and f_2, taking the transfer from F^{21} as given, and then determines the Nash-Cournot equilibrium transfers. The Lagrangian is a function of $c_{m1}, c_{f2}, T_1^{12}, T$ and λ:

$$\begin{aligned} L \quad = \quad & \left[\ln c_{m1} + \ln c_{f2} + \alpha \ln(I_k + T_1^{12} + \overline{T_1^{21}}) + \gamma \ln(I_k + T_2^{12} + \overline{T_2^{21}}) - U_{m1}^{Div}\right] \\ & \left[\ln c_{m1} + \ln c_{f2} + \alpha \ln(I_k + T_2^{12} + \overline{T_2^{21}}) + \gamma \ln(I_k + T_1^{12} + \overline{T_1^{21}}) - U_{f2}^{Div}\right] \\ & +\lambda(I_f + I_m - c_{m1} - c_{f2} - T_1^{12} - T_2^{12}) \end{aligned}$$

Solving for the first-order conditions, assuming a symmetric solution, $c_{m1} = c_{f2}, T_1^{12} = T_2^{12}, \overline{T_1^{21}} = \overline{T_2^{21}}$, and keeping in mind the equal threat points, $U_{m1}^{Div} = U_{f2}^{Div}$ results in

$$c_{m1} : \frac{2}{c_{m1}}\left[2\ln c_{m1} + (\alpha+\gamma)\ln(I_k + T_1^{12} + \overline{T_1^{21}}) - U_{m1}^{Div}\right] = \lambda \qquad (42)$$

$$T_1^{12} : \frac{\alpha+\gamma}{I_k + T_1^{12} + \overline{T_1^{21}}}\left[2\ln c_{m1} + (\alpha+\gamma)\ln(I_k + T_1^{12} + \overline{T_1^{21}}) - U_{m1}^{Div}\right] = \lambda \qquad (43)$$

This implies that

$$c_{m1} = \frac{2(T_1^{12} + \overline{T_1^{21}} + I_k)}{\alpha+\gamma} \qquad (44)$$

Substituting into the FOC for λ (the budget constraint) allows us to solve for F^{12}'s best response transfers to child one (and therefore also to child two)

$$T_1^{12} = \frac{(\alpha+\gamma)(I_f + I_m) - 4\overline{T_1^{21}} - 4I_k}{4 + 2(\alpha+\gamma)} \qquad (45)$$

This implies that the best response for F^{21} is

$$T_1^{21} = \frac{(\alpha+\gamma)(I_f+I_m) - 4\overline{T_1^{12}} - 4I_k}{4+2(\alpha+\gamma)} \tag{46}$$

This can be solved using substitution for the Nash-Cournot equilibrium transfers

$$T_1^{12} = T_1^{21} = \frac{(\alpha+\gamma)(I_f+I_m) - 4I_k}{2(4+\alpha+\gamma))} \tag{47}$$

and total transfers to the child

$$T_1^{Rem2} = \frac{(\alpha+\gamma)(I_f+I_m) - 4I_k}{(4+\alpha+\gamma)} \tag{48}$$

which implies that

$$c_{k1}^{Rem2} = \frac{(\alpha+\gamma)(I_f+I_m+I_k)}{(4+\alpha+\gamma)} \tag{49}$$

C.2 Parents' consumption

The parents' consumption is found simply by substitituting the transfer amounts into the budget constraint, and keeping in mind that $c_{m1} = c_{f2}$.

D Divorced Parents with Traditional Child Support

It is interesting to note that in the case of divorced parents of minor children, using traditional child support, this model reflects the outcome that has been empirically documented by so many - namely, that transfers from non-custodial parents to the child (through the custodial parent) drop significantly post-divorce. Child support payments (the transfers) are made from the non-custodial parent to the custodial parent who spends it according to her discretion. The results of this case support the intuition that one of the problems with the traditional method of child-support for minors is the indirect nature of the parent's contribution to the child. Non-custodial parents, usually fathers, have no control over how their transfer is used, or whether it is going toward the child's consumption, versus the mother's. Depending upon the level of animosity between the parents, as well as the geographical distance which makes monitoring even more difficult, the willingness of fathers to provide a transfer may virtually disappear.

The game modeled here is a Stackelberg-type game, which is solved using backward induction. Assume that the mother is the custodial parent, and the father is the non-custodial parent. The father is not able to affect his child's consumption directly through his transfer. Instead, he transfers an amount to the mother and then observes how she optimally divides her total resources

(income plus the transfer) between her consumption and her child's. Once he knows how his transfer affects the child's consumption, he can then optimally choose his utility maximizing transfer.

The mother's best response levels of c_m and T^m are found by maximizing:

$$U_m = \ln c_m + \alpha \ln c_k \tag{50}$$

subject to the resource constraints:

$$I_m + \overline{T^f} = c_m + T^m \tag{51}$$

and:

$$c_k = I_k + T^m \tag{52}$$

with the overbar indicating that the mother takes the father's transfer as given. The best response level of T^m(and therefore the child's total transfer) is:

$$T^m = \frac{\alpha(I_m + \overline{T^f}) - I_k}{(1+\alpha)} \tag{53}$$

which means that the child's consumption is:

$$c_k = \frac{\alpha(I_m + \overline{T^f} + I_k)}{(1+\alpha)} \tag{54}$$

Knowing this best response function, the father determines his optimal levels of c_f and T^f by maximizing:

$$U_f = \ln c_f + \alpha \ln c_k \tag{55}$$

subject to:

$$I_f = c_f + T^f \tag{56}$$

and equation 54 I shall also impose the non-negativity constraint:

The resulting optimal transfer T^f is:

$$T^f = \frac{\alpha I_f - I_k - I_m}{(1+\alpha)} \tag{57}$$

Substituting back into the mother's best response transfer, we find the total transfer to the child T_k^{cs} to be

$$T_k^{cs} = \frac{\alpha^2(I_m + I_f) - (1+2\alpha)I_k}{(1+\alpha)^2} \tag{58}$$

Note that a transfer from the father only takes place if $I_f > (I_k + I_m)/\alpha$.

Subtracting T_k^{cs} (58) from T_k^{int} (7) we find that transfers in the intact, married parents state are always greater.