Household Resource Allocation in Stepfamilies: Darwin Reflects on the Plight of Cinderella

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The living conditions of American children have changed dramatically during the past 50 years. In 1950, the vast majority of children were born to married parents and lived with both parents until they reached adulthood. Today, over a third of all children are born to unmarried parents, and over half will live apart from at least one of their parents before reaching age 18 (Larry Bumpass and James Sweet, 1989). A majority of these children will live with a stepparent or foster parent, and a substantial minority will experience multiple family disruptions and multiple changes in parental personnel.

Numerous studies have shown that remarriage is not the panacea it was once thought to be. Children who grow up in two-parent families consisting of a biological parent and a stepparent have outcomes very similar to children who grow up with only one parent, and worse than children who are raised by both of their biological parents. These differences cannot be explained by differences in income, since stepfamilies and original two-parent families enjoy similar levels of income.

One explanation for why children in stepfamilies do poorly is that stepparents are less altruistic and, indeed, may be quite hostile toward nonbiological children. According to the *theory of parental solicitude*, such feelings are rooted in psychological mechanisms that have evolved over time through the process of natural selection. Thus, while household incomes may be similar for biological and nonbiological children, investments in children may be quite different.

This paper examines differences in one input, food consumption, between different types of two-parent families, using data from the Panel Study of Income Dynamics (PSID). These data contain information on all dyadic relationships within households between 1968 and 1985, and they allow us to identify several types of parent–child relationships, including biological, adoptive, step-, and foster relationships. The paper addresses three questions:

(i) Does the number of nonbiological children in the household affect food consumption?
(ii) Do the effects vary by the sex of the nonbiological parent? (Is having a stepmother worse than having a stepfather?)
(iii) Do the effects vary by type of nonbiological parent? (Are there differences among adoptive, step-, and foster parents?)

Psychologists Martin Daly and Margo Wilson (1987) offer a powerful explanation for why nonbiological parents may be less willing to invest in children than biological parents. Drawing on evidence from evolutionary biology, they argue that parental investments (time and money) are costly, and psychological mechanisms have evolved to promote altruism toward one's own offspring and aggression and hostility toward other people's offspring. According to these researchers, natural selection favors adults who engage in nepotism and who reject ''parasitic'' efforts

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on the part of nonbiological children. In short, Cinderella's stepmother was not evil; she was simply protecting her own.

Daly and Wilson note that practices such as fostering and adoption, which are quite common among blood kin, are entirely consistent with natural selection. Raising the child of a sister or brother promotes long-term fitness. These researchers also provide some insight as to why men and women would become stepparents or foster parents. They attribute the phenomenon to ''mating effort'' on the part of nonbiological parents, that is, attempts to gain access to sexual partners who are also single parents.

In addition to explaining why having two biological parents would be the ideal situation for children, the theory of parental solicitude provides some guidance about what we might expect to find in different types of nonbiological households. For example, we would expect that having at least one biological parent in the household would be preferable to having two nonbiological parents. Thus, two foster parents or two adoptive parents would be less favorable for a child than having one adoptive, step-, or foster parent *and* a biological parent. We also might expect the ''mating effort'' of the nonbiological parent to have an indirect effect on investments in the child if the attraction toward the biological parent encourages altruistic behavior. Daly and Martin are not clear about how this attraction operates. On the one hand, if level of commitment is the key variable, we might expect adoptive parents to exhibit the most altruism, followed by stepparents and foster parents. On the other hand, if courtship is the key variable, we might expect foster parents to exhibit the most altruism, followed by stepparents and then adoptive parents. Finally, since we are interested in food consumption as a measure of parental investment, and since women typically control the purchase and preparation of food, we would expect the effects of nonbiological children to be stronger (more negative) when the nonbiological parent is the mother rather than the father.

The next section of the paper discusses both the data and our measures of family structure, and the final section reports the results. We find that the number of children in a household with a nonbiological parent significantly reduces expenditure on food consumed at home. In general, the effects are stronger when the nonbiological parent is the mother rather than the father, although foster fathers have a strong negative effect on consumption. The results are robust across different specifications, they hold up when we instrument for household income, and they are limited to consumption within the household.

I. Data

We use data from the PSID to examine the relationship between family structure and expenditure on food. In order to isolate the impact of family structure, we restrict our attention to two-parent households sampled in the PSID SRC sample. The PSID provides a data file on the relationship between all members of a household for every year from 1968 to 1985, and we limit our analysis to this period in order to ensure that we have the most accurate relationship information possible. Food-expenditure information was not collected in the PSID in 1973. Until 1972, it was unclear whether respondents reported on food paid for with food stamps as part of their household's food expenditure. For this reason, we restrict our attention to the 13 years of food-expenditure data over the period 1972–1985. A detailed description of our data is presented in Case et al. (1999).

The vast majority of children in our two-parent sample live with both biological parents (90 percent), with the next largest group being those who live with one biological and one stepparent (5 percent). There may be many relationships between children and adults living under one roof at any given time. When Cinderella's father married her stepmother (who had two daughters of her own), there were two children in the household with a biological mother and a stepfather, and one with a biological father and a stepmother. Our data on food expenditure are available only at the household level, and thus our estimation strategy will have to be flexible enough to make use of the different relationships that exist simultaneously within a household. In our regression analysis, we control for the number of children in the household and, separately,

for the number of children with an adoptive mother in the household, the number with a stepmother, and the number with a foster mother (the number with a biological mother will be the omitted category). The same holds for fathers: we control separately for the number of children with an adoptive, step-, and foster father.

The foster parents are divided into two types: parents are defined as type-2 foster parents if a child lives with both a foster mother and foster father. An adult is defined as a type-1 foster parent if the adult lives with (but is not married to) the child's biological, adoptive, or stepparent and if this adult reports that he or she is raising the child. Both types of foster parents are assumed to provide child-fostering, although type-2 foster parents generally carry the title ''foster parent.'' These two types of child-fostering may be different, and we allow for this by identifying these groups separately.

Adoptive, step-, and foster parents are different from biological parents in many observable dimensions. The average age of a woman who is the biological mother of at least one child living in her household (which we will refer to as a ''biological-mother household'') is 34.9 years, compared with 31.6 for stepmother households, 41.4 for adoptive mother households, and 44.9 for type-2 foster-mother households. Stepmother households are larger on average than biological-mother households (4.55 members on average versus 4.12), due primarily to the presence of additional children. Stepmothers work a greater number of annual hours (1,117) than do biological mothers (732), on average, and the total household income in their households is higher ($40,222, in 1982 dollars, compared with $33,510 for biological-mother households).

In our regression analysis below, we control for a wide range of household characteristics that may determine food expenditures and that may vary between household types. These include age of the household head and wife; indicators that the household head has less than a high-school degree, that the head has exactly a high-school degree, and that the head of household is white; and information on the number of hours worked annually by the head and the wife, total household income and income squared, the value of the household's food stamps, the household's size, the number children by age category, and the information on child–parent relationships discussed above.

II. Estimation

Table 1 presents the results of regressing household food expenditure for home consumption on these household variables and a set of year indicators. The dependent variable is food expenditure including food stamps in real (1982) dollars. All regressions presented in the paper estimate robust standard errors and allow for correlation in the residuals of observations that share the same family interview number (FIN) for 1968. The first column presents ordinary least-squares (OLS) regression results for 1972–1985. We have also run these regressions with family-size squared and cubed added to the regression, to absorb nonlinearities in household size that might otherwise load onto family-structure variables. The results are robust to the inclusion of these variables.

The first seven rows provide information on the importance of household structure. Holding constant the number of children in the household, if a mother trades in a biological child for an adopted child, expenditure on food at home decreases by roughly $200 per year, about 5 percent of total food expenditure, on average. This effect hovers around significance at the 10-percent level in all specifications. If a mother traded one biological child for one stepchild, holding all else constant, expenditure on food at home would decrease by $274 per year, on average. This effect is significant at better than a 5-percent level in all specifications. This represents between 6 percent and 7 percent of the household's food budget. If a mother traded a biological child for a type-2 foster child, food expenditure would decrease by roughly $365 a year, on average. This effect hovers around significance at a 15-percent level in all specifications. Type-1 foster children, children that a woman identifies as a child she is ''raising'' with the child's biological, step-, or adoptive father, appear to be treated like biological children of the mother. The coefficient is small, with a t statistic well below 1 in all specifications.

TABLE 1—FOOD CONSUMED AT HOME, PSID SRC, 1972–1985 (DEPENDENT VARIABLE = REAL FOOD EXPENDITURE FOR HOME CONSUMPTION [MEAN = $4,305.20])

Independent variable	OLS	2SLS	Means
Number of children with adoptive mother	−203.98 (130.67)	−192.84 (126.94)	0.055
Number of children with stepmother	−273.51 (126.88)	−304.27 (126.13)	0.022
Number of children with type-2 foster mother	−364.68 (258.91)	−345.84 (243.98)	0.006
Number of children with type-1 foster mother	−41.40 (232.60)	−21.34 (222.17)	0.001
Number of children with adoptive father	89.88 (102.55)	88.92 (100.99)	0.081
Number of children with stepfather	−67.47 (59.76)	−68.76 (59.19)	0.086
Number of children with type-1 foster father	−407.19 (107.21)	−402.86 (107.14)	0.006
Food-stamp value (1982 dollars)	0.228 (0.096)	0.228 (0.117)	40.21
Total household income (1982 dollars)	0.041 (0.003)	0.038 (0.018)	33,627.24
(Total household income)^2 ($\times 10^{-6}$)	−0.124 (0.024)	−0.019 (0.197)	$1{,}570 \times 10^6$
Number of children in household	−131.74 (257.56)	−157.52 (258.11)	2.09
Number of children aged 0–6	−157.38 (74.84)	−125.96 (77.12)	0.713
Number of children aged 7–12	64.64 (70.11)	86.48 (69.94)	0.604
Number of children aged 13–18	255.19 (66.79)	268.23 (66.41)	0.559
Family size	643.06 (249.68)	651.61 (250.07)	4.10

Notes: Robust standard errors (presented in parentheses) were estimated allowing for correlation between observations sharing a 1968 family interview number (FIN). Year indicators, household head's age, wife's age, wife's annual hours of work, and categorical variables for household head's education (less than high school, 12 years of school) are included in all regressions. Household head's annual hours of work and an indicator for race = white is included in the first column (OLS). In the second (2SLS) column, these variables are used as instruments for total household income and income squared. Number of observations = 13,629.

We take two results from this, one concrete and one suggestive. The concrete result is that the presence of stepchildren is associated with lower food expenditure for home consumption, when those children are stepchildren of the mother. The results are also suggestive that spending is lower, the less strong the tie that binds the mother to the child: less spent on adoptive than biological children, less on stepthan on adoptive children, and less on foster than on stepchildren. These results are consistent with a story in which women make decisions on the household budget and shift resources elsewhere when the tie to the child is less strong.

The results for fathers are quite different. Food expenditure for home consumption does not respond to the exchange of a man's biological children for step- or adoptive children. In contrast to the results above, food expenditure is lower when a man reports being a type-1 foster father. (These are men who are not married to the child's mother but report raising the child.)

These results are also robust to the way the wife's hours of work are treated. The results are quantitatively very similar, and qualitatively the same, if we remove wife's annual hours of work, or if we replace wife's annual hours of work with discrete variables that identify a woman as not participating in the labor force (annual hours of work equal to zero); participating part-time (less than 800 hours per year); participating part-time but with a higher level of participation (800–1,400 hours per year); and participating full-time (more than 1,400 hours per year). Participation affects food consumed at home (expenditure is highest when a woman does not participate in the labor force) but does not change the relationship between food expenditure and family structure.

The second (2SLS) column instruments real income and income squared to see whether our results are being driven by measurement error in income. Our results would not be surprising if adoptive households were poorer than biological households, and if step-households were poorer than adoptive households and our total income measure were measured with error. In that case, we would expect to see the ''true'' income information loading onto variables with which it is correlated (here, information on family types). For this reason, we instrument total household income and its square using the household head's annual hours worked, hours of work squared, and the indicator that the head of household is white. These three variables are highly correlated with household income; the *F* statistic of these

three variables in the first-stage regression is 101.92 (p value = 0.0000). One can question whether these variables belong in the main regression, and indeed they might. The two-stage least-squares (2SLS) results are presented here to see whether the coefficients on family types are sensitive to instrumentation, which would then lead us to be cautious in what we say about the impact of family structure on food expenditure. Our 2SLS results are very similar to our OLS results; the coefficients on family types are insensitive to instrumenting for total income.

A second check on these data is provided by analyzing whether family structure influences expenditure on food away from home. If the family-structure variables were simply picking up income effects, then we would expect to see a similar pattern for food expenditure away from home. These results (Case et al., 1999) show a very different pattern from that seen in Table 1. The family-relationship coefficients are small and insignificant. With the same motivation, we have also tested to see whether family structure affects the number of rooms in the household, or the number of rooms above that which the PSID determines to be ''necessary'' for a household of a given type. We find no significant family-structure effects in consumption of housing.

III. Discussion

There are many explanations for our findings, some of which we can rule out given the patterns we see in these data. (In this discussion, it is important to bear in mind that the sample of nonbiological parents here is rather small; only 10 percent of the child-years in the sample are for children living other than with two biological parents.) One might wonder whether the negative relationship between stepmothers and food expenditure arises because the children being raised by stepmothers have some of their meals away from home with their biological mothers. That is possible, but it seems an unlikely explanation for two reasons: it would not explain why the same sort of phenomenon is observed for adopted children; and by itself it would not explain why we do not see this pattern for stepfathers. (Presumably some fraction of the biological fathers of children living with stepfathers have visitation arrangements, and they might also take these children away at mealtime.)

It is possible that the reason biological children are better fed is that parents expect to have a greater connection to them in later life. This does not explain why we fail to find a strong bond between adopted children and their mothers. One way to test this would be to see whether the length of time a child has lived with a parent affects the household food consumption.

It is possible that household income is systematically lower in step-households because of alimony and child-support payments made elsewhere. We plan to follow up on this explanation, by examining the child support and alimony paid out (although again it is not clear why we would only find this among mothers, and not among fathers).

It is also possible that lower spending on food at home is good for children. Perhaps nonbiological parents are stricter and buy less junk food. We plan to study the interaction between food expenditure and child outcomes to try to shed light on this.

Finally, it would be interesting to compare the findings for the United States with those in developing countries, where child-fostering occurs quite frequently.

REFERENCES

Bumpass, Larry and Sweet, James. ''Children's Experience in Single-Parent Families: Implications of Cohabitation and Marital Transitions.'' *Family Planning Perspectives*, November–December 1989, *21*(6), pp. 256–360.

Case, Anne; Lin, I-Fen and McLanahan, Sara. ''How Hungry Is the Selfish Gene? Evidence from U.S. Step Families.'' Mimeo, Princeton University, 1999.

Daly, Martin and Wilson, Margo. ''The Darwinian Psychology of Discriminative Parental Solicitude,'' in Daniel W. Leger, ed., *Nebraska Symposium on Motivation*, Vol. 35. Lincoln: University of Nebraska Press, 1987, pp. 91–144.