Using "Relationship Matrices" for More Accurate Identification of Children's Living Arrangements and Circumstances

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Abstract

The dramatic changes in family composition have profound implications for studying relationships of children to other adults in a household. However, methods for studying such relationships have been outpaced by the transformation of families and thus today's studies often inaccurately assess whether a child lives with one or two parents and whether he or she is the biological child of those parents. Despite needing increased detail about relationships of children to adults in a household, few surveys gather such data. An exception is the Survey of Income and Program Participation (SIPP). It collects detailed data on household relationships through a household relationship matrix. Findings generated from a SIPP relationship matrix suggest that the federal statistical system would benefit enormously from more energetic use of relationship matrices because the matrices produce information that: (1) depicts the vast diversity of children's living arrangements; (2) provides insights into the numbers of children in those arrangements; (3) identifies demographic variation across arrangements; (4) demonstrates how models of public assistance participation are improved; and, (5) promotes cross-country comparisons of children's living arrangements. Agencies needing national level data on relationships among all members of a household should use relationship matrices rather than rely on the existing "one dimensional" methods for collecting such information.

Keywords: household composition, children's living arrangements, household relationship matrices.

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Introduction

Since the 1970s, dramatic changes have reshaped America's families. The significant shifts that American families have undergone in the past three decades are well documented (Casper and Bianchi, 2002; Teachman, Tedrow, and Crowder, 2000), but some of the more astounding changes over this period are worth noting. By 1995, 47 percent of women born between 1966 and 1970 had ever cohabited compared with only seven percent of women born between 1946 and 1970 (Bumpass and Lu, 2000; Bumpass and Sweet, 1989). Also, by 1998, about 51 percent of African American children lived with their mothers only, which was over two and half times the proportion, (about 20 percent), in 1960. Over this same period, the proportion of white children living with their mothers only increased by a factor of three reaching a little over 18 percent by 1998 (U.S. Census Bureau, 1999a, 1999b, 1999c). Lastly, between 1970 and 1998, the percentage of households that consisted of a married couple with at least one child co-residing declined from about 40 percent to about 26 percent (Teachman, Tedrow, and Crowder, 2000).

The transformation in American families has profound implications for studying children and families and a range of future social policies (Federal Interagency Forum on Child and Family Statistics, 2001). As relationships among children and adults in a family become more complex and as the pace of the changes in those relationships quicken, more sophisticated methodologies are needed to accurately describe children's living arrangements and circumstances. Without more advanced methods for measuring household composition and changes in that composition over time, American society will fail to fully comprehend the diverse needs of today's children and families, and will fall short of developing effective social and economic policies for the most vulnerable among them.

Hence, the standard methods that are used in household surveys of distinguishing how children in the household are related to a person who heads a household or how they are related to a person who heads a family within a household are outmoded and need replacement. These closely related approaches, now

more than ever before, render it difficult to assess with any precision whether a child lives with none, one, or two parents and whether he or she is the biological child of those parents. This outdated data collection method of linking children to a "household (family) head" should be replaced by an alternative method that can reflect the present realities of families in America. This study argues that a superior alternative is the "relationship matrix", which collects detailed data on the *specific* relationships of children to *all* adults in the household and permits analyses from the children's perspective (Federal Interagency Forum on Child and Family Statistics, 2001; Brandon and Bumpass, 2001).

Despite the value of using relationship matrices for collecting more precise data on children's living arrangements, the matrices are rarely found in nationally administered household surveys. As a result, studies of children are conducted, and social policies are created, with incomplete data on the exact relationships between children and adult members of a household. More informed policies and better studies would eventuate if household surveys replaced questions about children's relationships to the head of the household with relationship matrices, but, with a few exceptions, there is barely any movement towards such a change. An exception is the Survey of Income and Program Participation (SIPP) that is conducted by the U.S. Census Bureau. The SIPP uses a household relationship matrix to collect in-depth information on household relationships once over the course of collecting its longitudinal data on households and families. Even though relationship matrix data have been available for every SIPP panel since 1984, with few exceptions, (e.g., see Brandon and Bumpass, 2001; Baughman, Dickert-Conlin, and Houser, 2002; Hernandez and Brandon, 2002; Furukawa, 1994), that data has seldom been exploited by non-governmental personnel to more accurately measure the living arrangements of children, guide more innovative studies, or drive social policy formulations.

Findings here suggest that the federal statistical system would benefit enormously from the more energetic use of the SIPP relationship matrices. Though analyses of the household relationship matrices is computationally daunting, the information produced can: (1) depict the diversity of American children's living arrangements; (2) provide insights into the numbers of children in those arrangements; (3) identify

demographic variation across arrangements; (4) demonstrate how models of public assistance participation are improved; and, (5) promote cross-country comparisons of children's living arrangements. Federal agencies needing national level data on children and families should encourage the adoption of multi-dimensional relationship matrices for collecting data on relationships between children and adults in a household rather than relying on existing "one dimensional" methods for collecting such information.

Data and Measurement Strategy

Sample

The primary source of data for this study is the 1996 SIPP. The sample selected for the 1996 SIPP is a stratified multistage probability sample that is nationally representative of households in the civilian noninstitutionalized U.S. population. Respondents are followed for a 48-month period and interviewed every four months over that period. At each interview, a household informant is asked to provide demographic, employment, income, and program participation information for every member of the household for each of the past four months (U.S. Census Bureau, 2001). Included in the demographic information are the number of families in the household and the composition of each family in each of the preceding four months. Children aged 15 years and younger in households are enumerated and information is gathered on their age, gender, race, and ethnicity. Original sampled members 15 years of age and older who move addresses are located, if possible, and retained (U.S. Census Bureau, 2001). This study only uses SIPP cross-sectional data collected on children under the age of 15 at reference month four of Wave 2,[1] but the survey design permits identifying the month children enter the panel and, if they leave, the month they leave.

Within the 34,287 sampled households interviewed in Wave 2, 91,216 persons were enumerated. Interviews were sought with every member of these households who was over the age of 15 years. Of the 34,287 sampled households, 22,574 (65.8 percent) contained no children younger than 15 years of age and were therefore ineligible for this study. This left 11,713 households containing 19,267 children younger than 15 years of age eligible for analyses. Of the 19,267, 117 children were immediately excluded because

the household relationship matrix contained missing relationship codes (13.68 percent); or parent imputations that were inconsistent with parent identifiers (61.3 percent); or other data inconsistencies that were irreconcilable (25.02 percent). Thus, data from the household relationship matrix made it possible to more precisely describe the relationships among 19,150 children and the adults with whom they shared a dwelling. Further sample losses occurred, however, when data from parent and household records were appended to the records of children. Even though Wave 2 identifiers in the household relationship matrix and in the "core" data permitted accurately appending parental, familial, and household level information to the children's records, missing data on non-child variables in the core data at the forth reference month further reduced the size of the sample.[2] Notwithstanding, the SIPP is a high quality survey that permits collecting a rich amount of household socio-demographic data on children younger than 15 years, including, but not limited to, information on their exact relationships to adults in a household at Wave 2.

Measuring intra-household relationships

Although the main focus of the SIPP is collecting information on labor force participation, jobs, income, and participation in federal assistance programs, information on other topics, such as household relationships, is also collected in topical modules on a rotating basis (U.S. Census Bureau, 2001). Generally, the finer-grained data on household relationships has been collected in Wave 2, which has—by design or chance—meant collecting data on household relationships over the summer months. (This data collection period could create lower estimates of household composition if children are away over the summer months for one reason or another.)

In any event, after contacting members of a household, the exact relationships between all household members are pinpointed and recorded.[3] The relationship matrix establishes a matrix of specific and detailed relationships of each household member to all other members, including children. For example, a sibling is identified as full sibling, step or half sibling, adoptive sibling, or foster sibling. In-law relationships are also identified, as are adults' relationships. Importantly, from the elaborate matrix of relationships, children in a household in Wave 2 can be identified as living with both biological parents who may or may not be

married; living with only one biological parent who may or may not live with a partner, or may be a lone parent; or living with no biological or adoptive parents. In the case of the latter, children can be identified as living with a grandparent or other type of relative, or a non-relative, for example, a foster parent. Hence, the household relationship matrix data permits the construction of measures of intra-household relationships, including intergenerational ones. Undoubtedly, using the household relationship matrix that potentially allows for a matrix encompassing 31 relationship categories surpasses a standard unidimensional survey item that indicates the relationship of a household member to the householder/reference person who maintains the household.[4]

An appropriate sampling weight provided in the SIPP topical module allowed estimating the proportions of American children living in particular living arrangements in the summer of 1996 and contrasting their demographic and household circumstances.[5] With only limited aggregation, Table 1 shows that the 19,150 children younger than 15 years of age were spread across 23 different living arrangements. Despite its simplicity, Table 1 shows that: (a) about ninety-six percent of children live with at least one parent; (b) among children living with two parents, only 1.28 percent have one or more adoptive parents; and, (c) among children living with only one biological parent who also shares a household with an adult of the opposite sex, 71.1 percent of those adults of the opposite sex are recorded as "unrelated" rather than the "partner" of the children's parent. (Point (c) adds to an earlier discussion of Baughman and colleagues (2002).) Thus, by exploiting the SIPP household relationship matrix, a more precise and illuminating picture of the diversity in American children's living arrangements is possible.

Descriptive and Multivariate Analyses

Descriptive analyses

Table 2 shows the distribution of living arrangements among the estimated 53.33 million American children 14 years old and younger.[6] Importantly, the data confirm the finding that 96.5 percent of children in America live with at least one biological parent (Casper and Bianchi, 2002; Hernandez, 1993). But, what is also important to know is which other adults besides a parent share the household and what are their exact

relationships to the children. Perhaps the type of relationship between them affects the resources available to the children?

It is clear from Table 2, for instance, that among the roughly two and a half million children with only one biological parent who has a partner that those children are much more likely (73.5 percent) to live with their biological parents' married partners, i.e., stepparents, than live with their biological parents' cohabiting partners (26.5 percent). Moreover, children with only biological mothers with male partners are about as likely to have the male partners as stepfathers (73.2 percent) as children with only biological fathers with female partners (75.2 percent).

Interestingly, if partner status versus unrelated status is not misreported, approximately three percent of children (N = 1,543,743) live with cohabiting adults. For nearly 57 percent of them, both adults are their biological parents. Thus, if a child lives with a cohabiting couple, chances are a little over fifty-fifty that that couple raising him or her are the biological father *and* the biological mother. Plainly, the chances of a child living with both biological parents cohabiting are smaller than the chances of a child living with both biological parents in a marriage—the latter being about 95 percent. Nevertheless, these SIPP data show that among children who live with cohabiting couples, the majority live with both biological parents, not one biological parent only and that parent's partner.

No more striking example of the changes in families since the 1970s exists than the number of children living with lone parents. Table 2 indicates that nearly 12 million children under the age of 15 years live with lone parents. So, over one in five children live with a lone parent, which nowadays is unsurprising. But, what is surprising is that when children live with lone fathers or mothers, they are nearly equally likely to live with at least one grandparent as well, 15.6 versus 18.9 percent respectively. Also, reflecting trends that have caused a rethinking of family policies (Casper and Bryson, 1998; Brandon, 2003; Dench and Thomson, 1999), about 55 percent of children who live with neither parent, live with grandparents.

The diversity in American children's living arrangements is associated with considerable differences in the compositional characteristics of their households. Table 3 shows some of the differences across 11 alternative living arrangements.

Panel A of Table 3, based on the living arrangements having at least one biological parent present, suggests that children with lone mothers only, followed by children with lone fathers only, were the most likely to live in households that also contained a grandparent. Repeating the pattern, the latter two types of living arrangements were also the most likely to have an aunt or uncle, (i.e., a sibling or a sibling-in-law of the lone parent), living in households, as well. Children living with only one biological parent cohabiting with an opposite sex partner were less likely compared with children in other arrangements that are shown in panel A to live with grandparents, uncles or aunts, or cousins, as well. By definition, however, children living with one biological parent only who cohabited with an opposite sex partner were the most likely to live with a non-relative, i.e., the opposite sex partner who is not biologically related to children. In this living arrangement, even if the opposite sex partner acts as a parent and is perceived by the child as "my parent", the household relationship matrix records the partner as unrelated to the child. Panel A also reveals that children in arrangements with one (married) biological parent and a stepparent were the least likely compared to the other five arrangements in panel A to have biological siblings present in the household. Possibly, some of the siblings could have been living with their non-custodial biological parent from a previous relationship. By contrast, children with both married biological parents compared with children in the other six arrangements were the most likely to have biological siblings present, as well.

Panel B of Table 3 shows aspects of household composition for children living with neither biological parent. Over one in three children living with grandparents with neither parent present were also living with an aunt or uncle. That proportion is higher than for any other group of children in any other living arrangement in Panel A or B. Nearly always, the children living with grandparents compared with children living with other non-biological surrogate parents, (i.e., other relatives, non-relatives, and foster parents), had no siblings present in grandparents' households. By contrast, a third of children living with

other parental substitutes had at least one other sibling living with them. Comparing panels A and B, the children living with non-parents are more likely not to have siblings co-residing compared with the children living with at least one parent.

Lastly, Table 3 shows that the gender and race of children differ across living arrangements. Larger proportions of male children compared with female children live with single fathers, married biological fathers and stepmothers, and foster parents. Among the arrangements shown in Table 3, male children compared with female children are least likely to live with married biological mothers with stepfathers. Turning to racial differences, compared with all other arrangements, less than half the children living with grandparents only are Non-Hispanic white. Furthermore, there is a large difference in the proportion of Non-Hispanic white children depending upon the gender of their single parents. Specifically, the proportion of Non-Hispanic white children living with single fathers only is much higher than the proportion of children living with single mothers only, 0.83 compared with 0.572, respectively. The proportion of Non-Hispanic white children is highest among children living with two married biological parents. Expanding Table 3 to demonstrate differences in economic characteristics across living arrangements is possible but not pursued since the primary aim of Table 3 is to show compositional differences across children's living arrangements.

The utility of data from the household relationship matrix for multivariate analyses: an example

Tables 1, 2, and 3 reveal that children's living arrangements are diverse and the relationships with adults in a household are potentially equally varied. Previous research has shown that which parents are present and how they are related to children in the household matters to a multiplicity of child and family outcomes (Moffitt, Reville and Winkler, 1998; Brandon and Bumpass, 2001, McLanahan, 1988; McLanahan and Sandefur, 1994). But, questions remain about whether child and family outcomes vary according to the exact relationships among children and adults in a household. Given the focus on measurement in this study, sets of multivariate logistic regressions (Agresti, 1990; Allison, 1999) further explore the associations between the types of relationships among children and adults in a household and the odds of receiving food

stamps[7], controlling for other socio-demographic and economic variables. (Though important, discussion of the control variables is let alone so that the focus stays on living arrangements and the presence or absence of co-residing adult relatives and non-relatives.)

Table 4 shows results of fitting three logistic models predicting the odds of food stamp receipt among children living with at least one parent. Moving left to right, Models 1 through 3 contain alternative measures of children's living arrangements that become progressively disaggregated to better reflect the exact relationships between children and adults in a household. For example, Model 1's measures are imprecise because they only distinguish three alternative types of living arrangements, i.e., children living with: (1) a single parent, (2) a cohabiting parent, or (3) a married parent. By comparison, the eight measures in Model 3 are more precise as they distinguish among children living with: (1) a single mother, (2) a single father, (3) a mother and a stepfather, (4) a father and a stepmother, (5) a mother and cohabiting partner, (6) a father and cohabiting partner, (7) two biological cohabiting parents, and (8) two married biological parents. The presence of grandparents and aunts and uncles are also specified in the models.

Likelihood-ratio tests performed between pairs of the logistic models shown in Table 4 suggest that Models 2 and 3, which contain more accurate measures of the relationships between children and parents, better explain the odds of food stamp receipt among children compared with Model 1. Drawing upon Long and Freese's (2003) description for testing multiple coefficients using the likelihood-ratio (LR) test, hypotheses that the effects of more precise measures of children's living arrangements are simultaneously equal to zero are rejected at the 0.001 levels, ($\chi^2 = 61.65$, $df = 5$, $p < .001$ for Model 3 relative to Model 1; and, $\chi^2 = 58.98$, $df = 3$, $p < .001$ for Model 2 relative to Model 1). Yet, the LR test failed to reject the hypothesis that measures distinguishing between married stepfamilies and cohabiting biological parents and partners are simultaneously equal to zero, ($\chi^2 = 2.68$, $df = 2$, $p < .2625$). Thus, model 3 fails to out-perform Model 2.[8]

Models in Table 4 also indicate that the presence of relatives and non-relatives in a household is associated with the odds of food stamp receipt. Children living with grandparents or adult non-relatives

have higher odds—at least a third more likely—than children not living with grandparents or adult non-relatives of food stamps receipt. However, children living with uncles or aunts are a third less likely compared with children not living with uncles or aunts of receiving food stamps. The results could indicate that grandparents and non-relatives are unemployed thereby increasing the chances of the household requiring government assistance. By contrast, siblings of a parent, i.e., aunts and uncles, may be more likely to work and contribute to the household's economic self-sufficiency.

Because the SIPP relationship matrix provides much information about the types of relationships between children and adult relatives in the household, another set of logistic regression models were fitted to test the hypothesis that the generational structure in single-parent families changes the odds of food stamp receipt. A lack of precise measures about which types of adult relatives share a household with children has prevented testing this conjecture until now, even though a growing literature suggesting that the generational structure of households is correlated with positive and negative economic outcomes, e.g., poverty status and welfare participation (Brandon, 2003; Casper and Bryson, 1998).

Similar to Table 4, Models 1 through 3 in Table 5 contain alternative measures of children's living arrangements when they live with a single parent only. Measures are gradually disaggregated to better reflect the exact generational structure of the relationships among children, single parents, and other adult relatives in a household. For example, Model 1's measures are inadequate since they only distinguish between children living with a: (1) single mother or (2) single father. By comparison, the eight measures in Model 3 are more detailed as they distinguish among children living with a: (1) single mother only, (2) single mother and her adult siblings, (3) single mother and her mother, (4) single mother living with her siblings and mother, (5) single father only, (6) single father and his adult siblings, (7) single father and his mother, (8) single father living with his siblings and mother. Thus, the possible generational structures of children's living arrangements when living with single parents include: first and second, and third generations.

Importantly, LR tests performed between pairs of the logistic models shown in Table 5 suggest that Model 3, reflecting the more precise measures of the generational relationships between children, adult relatives, and single parents, better explains the odds of food stamp receipt among children compared with Models 1 and 2. The hypothesis that the effects of more precise measures of children's generational living arrangements that include identifying particular types of relatives are simultaneously equal to zero are rejected at the .01 level or below ($\chi^2 = 17.33$, $df = 6$, $p < .01$ for Model 3 relative to Model 1; $\chi^2 = 14.28$, $df = 4$, $p < .01$ for Model 3 relative to Model 2). The LR test failed to reject the hypothesis that measures distinguishing between the presence of adult relatives in households with children and single parents are simultaneously equal to zero ($\chi^2 = 3.06$, $df = 2$, $p < .2171$). Hence, these findings support past research arguing that studies of children living with single parents need to more seriously consider the specific generational structures of these particular living arrangements.

Models in Table 5 also indicate that the presence of non-relatives in a household is associated with increased odds of food stamp receipt. Children living with adult non-relatives have higher odds—at least 35 percent more likely—than children not living with adult non-relatives of food stamps receipt. Results could again indicate that non-relatives are more likely to be unemployed and increase the chances of the single-parent household requiring food stamps.

The relationship matrix data allows investigating the under-explored topic of public assistance receipt among children living with neither parent. The dearth of population-based research on the topic stems partly from the small numbers of children living with neither parent that are generated by household surveys. (See Table 1, for instance.) Since the 1996 SIPP provides relatively large numbers of children living with neither parent, however, the opportunity was ceased to examine the likelihood of children in these types of living arrangements receiving food stamps.

Repeating the now familiar analysis strategy, Models 1 through 3 contain alternative measures of children's living arrangements when neither parent is present. The measures are progressively disaggregated to better reflect children's specific relationships to the non-parental substitutes. Model 1 is a

simple contrast of the odds of a child living with a non-foster parent substitute receiving food stamps relative to the odds of a child living with a foster parent. By comparison, Model 3 contains more exact measures of the relationship between a child and his or her non-parental substitutes. It contrasts the odds of a child with a grandmother, another relative, or a non-relative receiving food stamps relative to the odds of a child living with a foster parent receiving food stamps.

The LR tests performed between pairs of the logistic models in Table 6 suggest that Model 3 fails to better explain the odds of food stamp receipt among children compared with Models 1 and 2. The hypothesis that the effects of more precise measures of children's non-parental living arrangements are simultaneously equal to zero is not rejected at conventional levels of statistical significance. Hence, the (unreported) LR tests are uninformative. Despite this lack of information, children with grandparents compared to children with foster parents had higher odds of food stamp receipt. The findings suggest that more research on public assistance receipt among children living with neither parent is needed.

The sets of models in Tables 4, 5, and 6 generate predicted probabilities of food stamp receipt for each particular type of child living arrangement.[9] Table 7 shows the extent to which these predicted probabilities are affected by the alternate measures of children's living arrangements. Panel B of Table 7, which has the predicted probabilities of food stamp receipt among children living with neither parent, is ignored because the predicted probabilities are uniform across models.

When children live with at least one parent, Panel A of Table 7 shows that finer-grained measures of children's living arrangements generate greater variation in the predicted probabilities of food stamps receipt among children. The measures specified in Model 3 lead to drops in the predicted probabilities of food stamp receipt among children living with: married biological fathers and stepmothers (-2.63 percentage points), cohabiting biological mothers with male partners (about -4.1 percentage points), cohabiting biological fathers with female partners (-9.70 percentage points), and for single fathers (about 38 percentage points). Conversely, the living arrangement estimates in Model 3 increase the predicted probabilities of

food stamp receipt among: married biological mothers and stepfathers, cohabiting biological parents, and single mothers.

Similarly, Panel C of Table 7 shows that more precise measures of children's living arrangements that include relatives when they live with single parents generate greater variation in the predicted probabilities of food stamps receipt. Measures in Model 3 decrease the predicted probabilities of food stamp receipt among children living with: single mothers and their mothers (-2.3 percentage points) and single fathers only (-1.1 percentage points). The reverse occurs for children living with single mothers and aunts or uncles, single fathers and aunts or uncles, and single fathers, grandmothers, and aunts or uncles. Thus, for modelling the odds of food stamp receipt among children, accounting for their relationships with the adults in the household besides their parents is found important for children living with parents and partners and for children living with only one parent.

The predicted probabilities for each child living arrangement suggest that among all children 14 years old and younger in the sample, 14.6 percent received food stamps, i.e., 7,794,871 children. Caseload numbers from the Department of Health and Human Services show that a larger proportion, 18.8 percent, of the total child population received food stamps, but this figure includes children 15 to 18 years old, as well (U.S. Department of Health and Human Services, 2003).

Moreover, simulations based on the multivariate logistic models provide insights into how the predicted probabilities would change, if a particular group of children in a particular type of living arrangement were given the average household characteristics of another group of children in another type of living arrangement. This "thought experiment" is certainly a more informative exercise to perform when more detailed measures of children's relationships to adults in a household are available from a relationship matrix. For example, if children living across the various types of living arrangements had the same household characteristics, on average, as children living with two married, biological parents, the probabilities of food stamp receipt would drop precipitously. The probability of food stamp receipt would drop from 27.5 to 6.8 percent for children with two cohabiting biological parents; 6.6 to 3.5 percent for those

with a married biological mother and stepfather; and 44.1 to 14.5 percent for those with a single mother. Or, if children with single mothers had the average household characteristics of children living with a married, biological mother and stepfather, the probability of food stamp receipt would drop from 44.1 to 13.3 percent. If these children had the household characteristics of children with biological mothers cohabiting with a male partner, the probability of food stamp receipt would drop from 44.1 to 20.7 percent. Lastly, if children with a biological parent who cohabits with an opposite sex partner shared the same household characteristics as children with both biological parents who cohabit, the probabilities of food stamp receipt would rise from about 9.2 to 13.4 percent for children with biological mothers who cohabit with a male partner and rise from 6.0 to 8.9 percent for children with a biological father who cohabits with a female partner. Hence, simulation results show how the characteristics associated with finer-grained measures of children's living arrangements can considerably affect the predicted probability of children receiving food stamps.

Potential cross-national comparisons of children's living arrangements: an example

The comprehensiveness of the SIPP relationship matrix shows that American children nowadays are found across a variety of living arrangements that differ along social and economic characteristics. These data also have potential for cross-national comparisons of children's living arrangements. Presently, comparisons are possible between the living arrangements of Australian and American children with some caveats.[10] The Australian data come from Wave 1 of the Household, Income, and Labour Dynamics in Australia (HILDA) Survey. HILDA contains a relationship matrix that aims to collect complete information about how each member of the household is related to every other member of the household (Watson and Wooden, 2002a).

Table 8 reveals that Australian and American children under 15 years of age have equal chances of living with two married biological parents. However, Australian children were over three-and-half times more likely to live with both biological parents in a cohabiting relationship compared with their American counterparts. Further, Australian children were over twice as likely to live with a biological parent and her or his partner as American children. These two significant differences perhaps reflect more liberal

Australian attitudes about adults living together and/or the more inclusive Australian social welfare system that, unlike public assistance programs in the United States, does not determine eligibility for income support based upon marital status and/or paternity (Moffitt, Reville and Winkler, 1998). Two other notable differences are shown in Table 8. First, American children are more likely to live with grandparents when they live with neither parent than Australian children. And second, there is nearly a three percentage-point difference between the two countries in the percentage of children living with lone mothers. Whereas 20.35 percent of American children younger than 15 years of age live with lone mothers only, 17.33 percent of Australia children live with lone mothers only.

Conclusions

By the U.S. Census Bureau implementing in the 1996 SIPP the recommendation of the National Research Council (NRC) that the SIPP "ascertain the relationships of children to all adults in the household and to add the category of 'partner' to identify consensual unions" (Citro and Kalton, 1993:76), more accurate measures of cohabitation are available and important topics, such as, paternity establishment and fatherhood outside of marriage, can be studied. Overall, the improvements to the 1996 SIPP and its successors will greatly enhance our understanding of children's living arrangements and the circumstances associated with those arrangements.

Although the re-design of the SIPP offers researchers more opportunities to better understand children's relationships to adults and household composition, further improvements are needed. Presently, the relationship matrix is included only once per SIPP panel and overlooks housing units with fewer than three persons (see footnote 3). Depending upon the length of a panel, the relationship matrix should be included annually rather than only once per panel and should be inserted into Wave 1 instead of Wave 2, which suffers from sample attrition. By initiating an annual accounting of all relationships within a household, the possibility is created to measure changes in child-to-adult relationships over time and generate an additional set of longitudinal statistics based upon relationships within housing units. Such an approach is conceptually different, (though computationally tedious), from developing longitudinal statistics

for types of families or households. (See Citro and Kalton [1993] for an in-depth discussion of using the SIPP to track the dynamics of children's living arrangements using monthly data.)

The HILDA survey in Australia has already implemented the suggestions for the SIPP so that changes in the composition of Australian households and the relationships within those households are annually quantifiable and so that attrition within and across households is ascertainable (Watson and Wooden, 2000b). This recommendation to add supplementary relationship matrices to other waves of the SIPP that are spaced 12 months apart could augment less-detailed cross-sectional measures of children's family types and month-to-month measures of changes in their relationships to a household head, and perhaps further assist with a primary aim of the SIPP of providing data on children's eligibility for and participation in government assistance programs.[11]

Also, more methodological work is needed to understand whether the categories for partner and unrelated individual suffer from reporting bias. This study shows that single parents distinguish between the two categories, but the accuracy of the reports are prone to misreporting. This latter issue alongside the problems of (a) imputing certain types of relationships, (b) missing data on adults' records contained on the core data file, and (c) losing about 13 percent of the original sample due to attrition between waves 1 and 2, signifies that the quality of the SIPP data is still compromised. These problems and a lack of pre-existing derived variables, which could be created from the relationship matrix by the U.S. Census Bureau and then added to public files, deserve immediate attention.

Clearly, a variety of multivariate approaches are feasible using the relationship matrix data, but it is useful before applying such approaches to have seen the versatility of data using only the most unpretentious of techniques, like univariate and bivariate analyses. Certainly more sophisticated analyses are needed to provide more insights in how America's children are faring and to develop effective social and child welfare policies. At a minimum, at least the prudent decision to collect relationship data through a relationship matrix once per SIPP panel permits researchers and policy analysts to cross-sectionally depict American children's living arrangements; estimate how many children are in each arrangement; identify the impact of

particular types of relationships between children and adults in the household on socio-economic outcomes; and, compare American children's living arrangements to those of Australian children.

Overall, data from the relationship matrix provide stronger evidence than that available from data linking children to a house head that America's children can grow up relating to many different types of adults. Future research should examine whether the exact type of relationship between children and adults in a household affects their access to household resources. Also underscored are the vast differences in the socio-economic conditions confronting children. Whether child outcomes, e.g., school achievement, teenage pregnancy, use of drugs, or behavioural problems, are associated with the broader array of living arrangements is yet another still unresolved question. Finally, compared to children in the United States, Australian children are more likely to live with adults who for one reason or another decide to remain unmarried. Interestingly, the choices of Australian adults to stay unmarried while raising children may be of no consequence to the amount of government income they receive. These sorts of questions spawned from the relationship matrix in the SIPP deserve further research.

Table 1. Distribution of Living Arrangements among American Children Under the Age of 15 Years				
Child lives with:	Unweighted	Weighted	Estimated weighted percent[a]	Standard error[b]
A. Adoptive father only, N.M.P, N.P.P	4	11,212	0.021%	0.0109
B. Foster parents, N.P.P	76	201,508	0.377%	0.06
C. Grandparents, N.P.P	405	1,021,494	1.915%	0.1287
D. Siblings older than 15 but younger than 18, N.P.P	18	36,994	0.069%	0.0219
E. Non-siblings older than 15 but younger than 18, N.P.P	1	3,213	0.006%	0.006
F. Biological father only, N.M.P	279	782,921	1.467%	0.1201
G. Biological father with female partner†	39	97,378	0.182%	0.0412
H. Biological father with unrelated female†	67	168,471	0.315%	0.0486
I. Biological mother only, N.F.P	2782	7,246,1251	13.590%	0.3631
J. Biological mother with male partner†	229	560,028	1.050%	0.0979
K. Biological mother with unrelated male†	612	1,453,585	2.725%	0.1589
L. Two biological parents	12611	36,472,619	68.383%	0.4849
M. Biological mother and step-father	584	1,555,626	2.916%	0.1599
N. Biological mother and adoptive father	59	163,909	0.307%	0.0459
O. Biological mother, grandparents, N.F.P	809	2,046,199	3.836%	0.1825
P. Biological father and step-mother	111	306,916	0.575%	0.0671
Q. Adoptive mother only, N.F.P, N. P. P.	39	105,755	0.198%	0.0344
R. Biological father and adoptive mother	3	9,325	0.017%	0.0101
S. Adoptive mother and step-father	3	8,936	0.016%	0.0129
T. Two adoptive parents	106	314,999	0.590%	0.0665
U. Biological father, grandparents, N.M.P	74	179,001	0.335%	0.0474
V. Relatives older than 18 other than grandparents, N.P.P	137	339,483	0.636%	0.0782
X. Non-relatives, no family members present	102	249,771	0.468%	0.0556
Totals =	19,150	53,335,469	100.00%	

Source: SIPP (1996 Panel, Wave 2, Topical Module on Household Relationships). Notes: [a]Estimated weighted and unweighted proportions of children in each living arrangement are similar; [b]Standard error of the weighted percent based on primary sampling units. N.M.P = no mother present; N.P.P = neither parent present; N.F.P = no father present; †Partner or unrelated person of the opposite sex sharing household is reported to be aged 18 years or older.

Table 2. Distribution of Living Arrangements among Children Under the Age of 15 Years[a]

Child lives with:	Weighted N's	Weighted Percent	Standard error[d]
Lone biological mother only, no grandparent present[b]	8,805,465	16.51	0.3883
Lone biological mother only, a grandparent present	2,046,199	3.84	0.1825
Lone biological father only, no grandparent present[b]	962,604	1.80	0.1299
Lone biological father only, a grandparent present	179,001	0.34	0.0474
Married biological or adoptive mother and father	36,085,868	67.66	0.4918
Married biological mother and a stepfather	1,556,048	2.92	0.1603
Married biological father and a stepmother	304,078	0.57	0.0669
Cohabiting biological mother and father	874,984	1.64	0.1287
Cohabiting biological mother and male partner[c]	568,542	1.07	0.0995
Cohabiting biological father and female partner[c]	100,217	0.19	0.0422
Foster parents only	201,508	0.38	0.06
Grandparents only	1,021,494	1.92	0.1287
Other relatives only	376,477	0.71	0.0812
Non-relatives only	252,983	0.47	0.0559
Total =	53,335,468	100.00	

Source: SIPP (1996 Panel, Wave 2, Topical Module on Household Relationships, N = 19,150). Notes: [a]See endnote 6 in text for details on groups from Table 1 that were combined to construct groups in Table 2; [b]Other adult relatives are possibly present; [c]Partner of the opposite sex sharing household is reported aged 18 years or older; [d]Standard error of the weighted percent based on primary sampling units.

Table 3. Some Selected Characteristics of the Living Arrangements of Children under the Age of 15 Years							
	Panel A: Living Arrangement When at Least One Biological Parent Present						
	Single mothers only	Single fathers only	Married biological mothers and fathers	Married biological mothers and stepfathers	Married biological fathers and stepmothers	Two biological cohabiting parents	Biological parents cohabiting with partners[a]
Proportion living with at least:[b]							
One grandparent	0.189	0.156	0.032	0.035	0.081	0.019	0.000
One uncle or aunt	0.139	0.090	0.022	0.017	0.000	0.034	0.007
One non-relative adult	0.062	0.086	0.007	0.005	0.000	0.021	0.801
One biological sibling	0.639	0.569	0.780	0.495	0.429	0.553	0.644
One cousin	0.047	0.039	0.005	0.000	0.000	0.000	0.000
Proportion of children are males	0.500	0.575	0.512	0.469	0.592	0.514	0.481
Proportion of children Non-Hispanic white versus other racial categories[c]	0.572	0.830	0.867	0.836	0.853	0.759	0.836
N =	4,242	424	12,458	584	110	321	272

	Panel B: Living Arrangement When Neither Biological Parent Present			
	Grandparents	Other relatives	Non-relatives	Foster Parents
Proportion living with at least:[b]				
One grandparent	1.000	0.000	0.000	0.000
One uncle or aunt	0.337	1.000	0.000	0.000
One non-relative adult	0.068	0.047	1.000	0.615
One biological sibling	0.007	0.300	0.316	0.291
One cousin	0.000	0.000	0.000	0.000
Proportion of children are males	0.522	0.517	0.522	0.585
Proportion of children Non-Hispanic white versus other racial categories[c]	0.487	0.559	0.856	0.626
N =	405	155	103	76

Source: *Source: SIPP (1996 Panel, Wave 2, Topical Module on Household Relationships, N = 19,150).* Notes: Weighted tabulations; [a]Combines groups of children living with male or female biological parent cohabiting with partner of the opposite sex; [b]Indicates the presence of at least one or more; [c]The other official racial categories defined in the core data of the SIPP are: Black, American Indian, Aleut, or Eskimo, and Asian or Pacific Islander.

Table 4. Coefficients from Regressions Estimating the Odds of Food Stamp Receipt Among Children Living in Different Types of Living Arrangements with at least One Parent Present						
	Logit Regressions					
	Model 1		Model 2		**Model 3**	
Independent Variables	Coefficient	S.E.	Coefficient	S.E.	Coefficient	S.E.
Single parent	**6.37*** **	**0.45**	—		—	
Cohabiting couple	**3.31*** **	**0.52**	—		—	
Married, a bio. parent and a step	—		**1.38***	**0.28**	—	
Single mother	—		**7.20*** **	**0.53**	—	
Single father	—		**1.69** **	**0.38**	—	
Cohabiting, both biological parents	—		**3.12*** **	**0.60**	—	
Cohabiting, one bio. parent only	—		**4.02*** **	**1.01**	—	
Married mother and step father	—		—		**1.54** **	**0.32**
Married father and step mother	—		—		**0.64**	**0.43**
Single mother	—		—		**7.20*** **	**0.53**
Single father	—		—		**1.69*** **	**0.38**
Cohabiting, both biological parents	—		—		**3.12*** **	**0.60**
Cohabiting, a bio. mother only	—		—		**4.28*** **	**1.09**
Cohabiting, a bio. father only	—		—		**2.72**	**1.85**
Grandparent present	1.48***	0.18	1.48***	0.18	1.48***	0.18
Adult uncle or aunt present	0.79*	0.11	0.79*	0.11	0.79*	0.11
Adult non-relative present	1.31	0.20	1.31	0.23	1.31	0.23
Female child	0.99	0.06	0.99	0.06	0.99	0.06
Non-Hispanic black child	2.01***	0.18	2.01***	0.17	2.01***	0.17
Mexican child	0.90	0.11	0.90	0.11	0.90	0.11
Puerto Rican child	3.52***	0.76	3.52***	0.75	3.52***	0.75
Other Hispanic child	1.01	0.19	1.01	0.18	1.01	0.18
Asian child	1.62***	0.24	1.62***	0.24	1.62***	0.24
Native American child	1.80***	0.39	1.80***	0.37	1.80***	0.37
Age of child	0.94***	0.01	0.94***	0.01	0.94***	0.01
Age of household head	0.99***	0.01	0.99***	0.01	0.99***	0.01
Head: High school graduate	0.53***	0.04	0.53***	0.04	0.53***	0.04
Head: Some college	0.39***	0.04	0.39***	0.04	0.39***	0.04
Head: College plus	0.22***	0.02	0.22***	0.02	0.22***	0.02
Head: Disabled	0.93	0.11	0.93	0.11	0.93	0.11
Head: Working part-time	1.00	0.10	1.00	0.10	1.00	0.10
Head: Working full-time	1.03	0.07	1.03	0.07	1.03	0.07
Log of household income	0.97	0.03	0.97	0.03	0.97	0.03
At or below the poverty line	11.27***	0.98	11.27***	0.96	11.27***	0.96
Number of children <=14 years	1.19***	0.03	1.19***	0.03	1.19***	0.03
Log-likelihood	-4055.5481		-4026.0591		-4024.7215	
Number of observations	N = 18,282		N = 18,282		N = 18,282	

**p < .10 **p < .05 ***p < .01 (two-tailed tests). Source: SIPP (1996 Panel, Wave 2, Topical Module on Household Relationships and core data from forth reference month).* Notes: — = not applicable to particular model being estimated; Results for controls for state fix effects (unreported) are available upon request.

Table 5. Coefficients from Regressions Estimating the Odds of Food Stamp Receipt Among Children Living in Different Types of Generational Living Arrangements with Only Single Parents						
	Logit Regressions					
	Model 1		Model 2		**Model 3**	
Independent Variables	Coefficient	S.E.	Coefficient	S.E.	Coefficient	S.E.
Single father only	**0.26*** **	**0.06**	**—**		**—**	
Single mother and adult relatives	**—**		**1.21**	**0.15**	**—**	
Single father only	**—**		**0.28*** **	**0.06**	**—**	
Single father and adult relatives	**—**		**0.25*** **	**0.13**	**—**	
Single mother, adult sibling only	**—**		**—**		**1.08**	**0.23**
Single mother, mother only	**—**		**—**		**1.67*** **	**0.28**
Single mother, both[a]					**0.85**	**0.16**
Single father	**—**		**—**		**0.28*** **	**0.06**
Single father, adult sibling only	**—**		**—**		**0.10***	**0.14**
Single father, mother only					**0.30***	**0.21**
Single father, both both[a]					**0.30**	**0.25**
Adult non-relative present	1.37*	0.25	1.41*	0.26	1.41*	0.26
Female child	1.00	0.08	1.00	0.08	1.00	0.08
Non-Hispanic black child	1.90***	0.19	1.91***	0.19	1.91***	0.19
Mexican child	1.23	0.22	1.27	0.22	1.27	0.23
Puerto Rican child	3.70***	1.03	3.76***	1.03	3.76***	1.07
Other Hispanic child	1.56*	0.39	1.60*	0.39	1.60*	0.41
Asian child	1.36	0.32	1.36	0.32	1.36	0.32
Native American child	2.02**	0.66	1.88**	0.65	1.88**	0.62
Age of child	0.95***	0.01	0.95***	0.01	0.95***	0.01
Age of household head	0.98***	0.01	0.98***	0.01	0.98***	0.01
Head: High school graduate	0.60***	0.07	0.62***	0.07	0.62***	0.07
Head: Some college	0.46***	0.06	0.47***	0.06	0.47***	0.06
Head: College plus	0.35***	0.05	0.37***	0.05	0.37***	0.05
Head: Disabled	0.87	0.14	0.88	0.14	0.88	0.14
Head: Working part-time	0.94	0.12	0.92	0.12	0.92	0.12
Head: Working full-time	0.99	0.09	1.00	0.09	1.00	0.09
Log of household income	1.05	0.04	1.05	0.04	1.05	0.04
At or below the poverty line	10.38***	1.17	10.84***	1.26	10.84***	1.27
Number of children <=14 years	1.21***	0.04	1.23***	0.04	1.23***	0.04
Log-likelihood	-2,038.79		-2,037.26		-2,030.12	
Number of observations	N = 4,602		N = 4,602		N = 4,602	

**p < .10 **p < .05 ***p < .01 (two-tailed tests). Source: SIPP (1996 Panel, Wave 2, Topical Module on Household Relationships and core data from forth reference month).* Notes: [a]"both" meaning child lives with mother's mother and aunts or uncles as well; — = not applicable to particular model being estimated; Results for controls for state fix effects (unreported) are available upon request.

Table 6. Coefficients from Regressions Estimating the Odds of Food Stamp Receipt Among Children Living in Different Types of Living Arrangements with Neither Parent Present						
	Logit Regressions					
	Model 1		Model 2		**Model 3**	
Independent Variables	Coefficient	S.E.	Coefficient	S.E.	Coefficient	S.E.
Parental substitutes, other than foster parents	**1.98***	**0.79**	**—**		**—**	
Relative substitutes	**—**		**1.97***	**0.80**	**—**	
Non-relative substitutes	**—**		**2.03**	**1.10**	**—**	
Grandparent substitutes	**—**		**—**		**2.19***	**9.92**
Other adult relative substitutes	**—**		**—**		**1.59**	**0.77**
Non-relative adult substitutes	**—**		**—**		**2.04**	**1.11**
Female child	1.27	0.35	1.27	0.35	1.27	0.35
Non-Hispanic black child	1.33	0.36	1.33	0.34	1.33	0.34
Mexican child	0.95	0.54	0.95	0.54	0.95	0.54
Puerto Rican child	4.23*	3.80	4.23*	3.70	4.23*	3.39
Other Hispanic child	3.29	3.34	3.29	3.11	3.29	3.11
Asian child	0.95	0.73	0.95	0.62	0.95	0.62
Native American child	0.84	1.01	0.84	0.94	0.84	0.94
Age of child	0.94**	0.03	0.94**	0.03	0.94**	0.03
Age of household head	1.00	0.01	1.00	0.01	1.00	0.007
Head: High school graduate	0.37***	0.12	0.37***	0.12	0.37***	0.12
Head: Some college	0.11***	0.06	0.11***	0.06	0.11***	0.06
Head: College plus	0.54	0.21	0.54	0.21	0.54	0.21
Head: Disabled	2.98***	1.33	2.98***	1.82	2.98***	1.28
Head: Working part-time	1.12	0.50	1.12	0.50	1.12	0.50
Head: Working full-time	1.58*	0.42	1.58*	0.42	1.58*	0.42
Log of household income	0.77	0.12	0.77	0.12	0.77	0.12
At or below the poverty line	6.93***	2.23	6.93***	2.21	6.93***	2.21
Number of children <=14 years	1.37***	0.12	1.37***	0.12	1.37***	0.12
Log-likelihood	-222.92		-222.92		-222.52	
Number of observations	N = 668		N = 668		N = 686	

**p < .10 **p < .05 ***p < .01 (two-tailed tests). Source: SIPP (1996 Panel, Wave 2, Topical Module on Household Relationships and core data from forth reference month).* Notes: — = not applicable to particular model being estimated; Results for controls for state fix effects (unreported) are available upon request.

Table 7. Predicted Probabilities of Food Stamp Receipt and Differences in the Predicted Probabilities Across Models, By Children's Living Arrangements[a]					
	Panel A				
	Predicted P_j's of Food Stamp Receipt			Differences in Predicted P_j's	
Children live with at least one parent:	Model 1	Model 2	Model 3	Model 2 - Model 1	Model 3 - Model2
Two married biological parents	0.0557	0.0557	0.0557	0.0000	0.0000
Married bio. mother and stepfather	0.0557	0.0604	0.0662	0.0047	0.0057
Married bio. father and stepmother	0.0557	0.0604	0.0294	0.0047	-0.0310
Two cohabiting biological parents	0.2307	0.2748	0.2748	0.0441	0.0001
Cohabiting bio. mother and male partner	0.2307	0.1814	0.1900	-0.0493	0.0085
Cohabiting bio. father and female partner	0.2307	0.1814	0.1329	-0.0493	-0.0486
Single mother	0.4090	0.4412	0.4412	0.0322	0.0000
Single father	0.4090	0.0861	0.0861	-0.3229	0.0000
	Panel B				
	Predicted P_j's of Food Stamp Receipt			Differences in Predicted P_j's	
Children live with neither parent:	Model 1	Model 2	Model 3	Model 2 - Model 1	Model 3 - Model2
Foster parents	0.1582	0.1583	0.1582	0.0000	0.0000
Grandparents	0.2382	0.2423	0.2412	0.0041	-0.0011
Other adult relatives	0.2382	0.2423	0.2457	0.0041	0.0034
Adult non-relatives	0.2382	0.2143	0.2148	-0.0239	0.0005
	Panel C				
	Predicted P_j's of Food Stamp Receipt			Differences in Predicted P_j's	
Children live with single parent only: [b]	Model 1	Model 2	Model 3	Model 2 - Model 1	Model 3 - Model2
Single mother only	0.4397	0.4437	0.4437	0.0040	0.0000
Single mother, adult sibling only	0.4397	0.4274	0.4544	-0.0123	0.0270
Single mother, mother only	0.4397	0.4274	0.4168	-0.0123	-0.0106
Single mother, both	0.4397	0.4274	0.4231	-0.0123	-0.0043
Single father only	0.0858	0.0747	0.0749	-0.0111	0.0002
Single father, adult sibling only	0.0858	0.1330	0.1239	0.0472	-0.0091
Single father, mother only	0.0858	0.1330	0.0939	0.0472	-0.0391
Single father, both	0.0858	0.1330	0.2005	0.0472	0.0675

Source: SIPP (1996 Panel, Wave 2, Topical Module on Household Relationships and core data from forth reference month). Notes: [a]Predicted probabilities in panels A, B, and C are calculated from estimated coefficients presented in tables 4, 5, and 6; respectively; [b]There were no single fathers living with other adult relatives only. P_j's = particular living arrangement, j = 1 ,…, N.

Table 8. Distribution of Living Arrangements among Children in Australia and the United States Under the Age of 15 Years		
	Source of Data	
Child lives with:	HILDA	SIPP
Two married biological parents	67.79%	67.66%
Two cohabiting biological parents	5.80%	1.64%
A married biological parent and a stepparent	2.83%	3.49%
Unmarried biological parent and partner	3.04%	1.26%
Lone biological mother only	17.33%	20.35%
Lone biological father only	2.00%	2.14%
Grandparent only	0.72%	1.92%
Foster parents only	0.30%	0.38%
Other relatives only	0.19%	0.71%
Other non-relatives	0.00%	0.47%
Total =	100.00%	100.00%
Sources: HILDA (N = 4,711) and SIPP (1996, N = 19,150). Notes: Weighted Comparisons, Totals rounded up.		

Endnotes:

[1] SIPP panels are divided into waves with the household relationship matrices usually, though not always, inserted into the Wave 2 data collection period.

[2] A further 200 child records were lost due to missing data on parents' or head of household records.

[3] An underestimate of the total count of children is introduced as only the exact relationships are pinpointed for households of three or more members (www.sipp.census.gov/sipp/chap3-4.htm). Interviewers show the respondent, who must be the reference person, a flashcard defining the various possible types

of specific relationships, but only for households of three or more members. Thus, an obvious omission is a child living with a single mother or a grandmother. Most likely, the number of children is small, but they are an important group that designers of the SIPP relationship matrix should plan to include in future SIPP household relationship matrices.

[4] Many other surveys (e.g., the British Household Panel Survey and the Panel Study of Income Dynamics) ask how each household member is related to a reference person, usually the person who maintains the household. The HILDA survey, highlighted later in the paper, and the SIPP are notable exceptions as they directly code relationships between all household members.

[5] The appropriate weight is the person cross-sectional weight for the forth reference month. According to national intercensal estimates of the resident population of the United States on July 1, 1996, there were 58,703,911 children 14 years of age and younger (U.S. Census Bureau, 2002). Using the cross-sectional weight for the forth reference month in Wave 2, the estimated number of children in this age range, before the lose of cases, is smaller, numbering 53,635,079, which is 8.64 percent lower than the U.S. Census Bureau estimate. Many factors could explain the difference between the estimated population counts, including sample attrition that averaged about 14.5 percent between Waves 1 and 2 of the 1996 panel (U.S. Census Bureau, 2001). http://eire.census.gov/popest/data/national/tables/intercensal/US-EST90INT-04.php

[6] For Table 2, the following alphabetic categories from Table 1 have been combined: I, K, and Q form "Lone biological mother only, no grandparent present"; A, F, and H form "Lone biological father only, no grandparent present"; L, N, R, and T form "Married biological or adoptive mother and father"; D and V form "Other relatives only"; and, lastly, E and X form "Non-relatives only." Sampling weights from the topical module file were then applied to produce weighted counts and percentages presented in Table 2.

[7] The food stamp program provides benefits in the form of food coupons or electronic cards so that low-income, eligible households can increase their food purchasing power. Mostly, the food stamp recipient unit is the same as the census household. But, sometimes subfamilies and multiple families within a

household are possible (Doyle et al., 1987). To a large extent controlling for the array of relationships of children to adults, (their own "subfamilies"), and the number of children within a household remedies this possibility, although the approach cannot redress instances where adult members of a household do not purchase or share meals together.

[8] LR tests are for selected coefficients all simultaneously equalling zero. Clearly other statistical tests are possible of individual coefficients or pairs of coefficients equalling one another. As this study aims to examine a collection of relationship measures among adults and children, tests of individual coefficients are unreported, though possible.

[9] For each living arrangement, the predicted probabilities shown in Table 7 were similar to weighted proportions generate from these data. For instance, without controls, 7.89 percent of children living with single fathers receive food stamps whereas with controls 8.61 percent of children were estimated to receive food stamps.

[10] Firstly, the SIPP data were collected about three years before the HILDA data were collected. Secondly, there are slight differences in the relationship matrices' questions. In HILDA, the term "de facto" spouse is used to describe a romantic, ongoing relationship between two unrelated adults whereas in the SIPP, the term "partner" is used to describe such a relationship. Notwithstanding these cautions, analyses remain valid and reliable.

[11] Many public assistance programs that cover children have very complicated eligibility rules regarding which household members are considered part of a family and whether or not their contributions to the household are countable for the determination of benefits.

References:

Agresti, A. (1990) *Categorical Data Analysis*. New York: John Wiley and Sons.

Allison, P. D. (1999) *Logistic Regression Using SAS System: Theory and Application.* Cary NC: SAS Institute Inc.

Baughman, R., S. Dickert-Conlin, and S. Houser. (2002) "How Well Can We Track Cohabitation Using the SIPP? A Consideration of Direct and Inferred Measures" *Demography* 39(3): 455-465.

Bauman, K.J. (1999) "Shifting Family Definitions: The Effect of Cohabitation and Other Nonfamily Household Relationships on Measures of Poverty." *Demography* 36: 315-325.

Brandon, P. and L. Bumpass (2001) 'Children's Living Arrangements, Co-residence of Unmarried Fathers, and Welfare Receipt' *Journal of Family Issues* 22(1): 3-26.

Brandon, P. (2003) 'Entries onto Welfare among Children Living with Grandparents in the United States' mimeo University of Massachusetts, Amherst.

Bumpass, L.L. and H.-H. Lu. (2000). "Trends in Cohabitation and Implications for Children's Family Contexts." *Population Studies* 54:29-41.

Bumpass, L. L. and J.A. Sweet. (1989). "National Estimates of Cohabitation." *Demography* (26): 615-625.

Casper, L. and S. Bianchi. (2002). *Continuity and Change in the American Family*, Thousand Oaks, CA: Sage Publications.

Casper, L. and K. Bryson. (1998) 'Co-resident Grandparents and Their Grandchildren: Grandparent Maintained Families.' Population Division Working Paper No. 26, Population Division, Bureau of the Census, Washington, DC.

Casper, L. and P.N. Cohen. (2000). "How Does POSSLQ Measure Up? Historical Estimates of Cohabitation," *Demography* (37): 237-245.

Citro C. and G. Kalton. (1993). *The Future of the survey of Income and Program Participation Panel to Evaluate the Survey of Income and Program Participation*. Committee on National Statistics, Commission on the Behavioral and Social Services and Education, National Research Council, Washington, D.C.: National Academy Press.

Dench, G. and K. Thomson (1999) 'Family Breakdown and the Role of Grandparents' *Family Policy*. Winter. pp. 7-21.

Doyle, P. J. Czajka, P. Boldin, H. Beebout, and S. Hirabayashi. (1987). "Conceptual Studies of SIPP-Based Simulation of the Food Stamp Program, Part 1. Uniform Eligibility Measures. Final Report to the Food and Nutrition Service, U.S. Department of Agriculture. Washington D.C.: Mathematica Policy Research Inc.

Federal Interagency Forum on Child and Family Statistics (2001) 'Counting Couples: Improving Marriage, Divorce, Remarriage, and Cohabitation Data in the Federal Statistical System' Writing Subcommittee of the Data Collection Committee of the Forum, *The National Institutes of Health*, Bethesda, MD.

Furukawa, S. (1994). "The Diverse Living Arrangements of Children: Summer 1991." U.S. Bureau of the Census, *Current Population Reports*, Series P70, No. 38. U.S. Government Printing Office, Washington D.C.

Hernandez, D. (1993). *America's Children: Resources from Family, Government, and the Economy.* NY: Russell Sage Foundation.

Hernandez, D. H. and P. D. Brandon. (2002). "Who Are the Fathers of the 1990s?" in C. Tames-LeMonda and N. Cabrera, Eds. *Fatherhood Involvement: Multidisciplinary Perspectives*. Mahwah, N.J.: Lawrence Earlbaum Associates, Publishers, 33-62.

Iceland, J. (2003). *Poverty in America.* Berkeley, CA: University of California Press.

Iceland, J. (2000). "The Family/Couple/Household Unit of Measurement in Poverty Estimation." *Journal of Economic and Social Measurement* 26: 1-13

Long, J. S. and J. Freese (2003). *Regression Models for Categorical Dependent Variables Using Stata*. College Station, TX: Stata Press Publications.

Manning, W.D. and D.T. Lichter. (1996). "Parental Cohabitation and Children's Economic Well-Being." *Journal of Marriage and the Family* (58): 998-1011.

McLanahan, S. (1988). "Family Structure and Dependency: Early Transitions to Female Household Headship." *Demography* 25: 1-16.

McLanahan, S. and G. Sandefur. (1994). *Growing Up with a Single Parent: What Hurts, What Helps.* Cambridge, MA: Harvard University Press.

Moffitt, R., R. Reville and A. Winkler (1998) 'Beyond Single Mothers: Cohabitation and Marriage in the AFDC Program' *Demography,* (35) 3, pp. 259-278.

Teachman, J., L. Tedrow and K. Crowder (2000) 'The Changing Demography of America's Families' *Journal of Marriage and Family* 62(4): 1234-1246.

U.S. Census Bureau (2001) *The Survey of Income and Program Participation (SIPP) Users' Guide, Third Edition*. Washington, DC: U.S. Government Printer.

—— (1998) *SIPP Quality Profile, Third Edition*. Washington, DC: U.S. Government Printer.

——. (2000) Table US-EST90INT-04 - Intercensal Estimates of the United States Resident Population by Age Groups and Sex, 1990-2000: Selected Months, Source: Population Division, Release Date: September 13, 2000

——. (1999a). "Living Arrangements of Children Under 18 Years Old: 1960 to Present." Internet Historical Time Series of Living Arrangements of Children, Table CH-1. Available on-line at http://www.census.gov/population/socdemo/ms-la/tabch-1.txt

——. (1999b). "Living Arrangements of Black Children Under 18 Years Old: 1960 to Present." Internet Historical Time Series of Living Arrangements of Children, Table CH-3. Available on-line at http://www.census.gov/population/socdemo/ms-la/tabch-3.txt

——. (1999c). "Living Arrangements of White Children Under 18 Years Old: 1960 to Present." Internet Historical Time Series of Living Arrangements of Children, Table CH-2. Available on-line at http://www.census.gov/population/socdemo/ms-la/tabch-2.txt

U.S. Department of Health and Human Services, 2003. Indicators of Welfare Dependence Annual Report to Congress 2003, U.S. Government Printing Office, Washington D.C.

Watson, N. and M. Wooden (2002a) 'The Household, Income, and Labour Dynamics In Australia (HILDA) Survey: Wave 1 Survey Methodology,' HILDA Project Technical Paper Series No. 1 /02, Melbourne Institute of Applied Economic and Social Research, University of Melbourne.

Watson, N. and M. Wooden (2002b) 'Assessing the Quality of the HILDA Survey: Wave 1 Data,' HILDA Project Technical Paper Series No. 4 /02, Melbourne Institute of Applied Economic and Social Research, University of Melbourne.

Weinberg, D. (2002). The Survey of Income and Program Participation—Recent History and Future Developments. No. 232. U.S. Census Bureau.