"Utilizing Relationship Matrices to Study Romantic Unions: A Cross-Country Comparison"

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Abstract

Changes in families over the past thirty years have created methodological challenges for survey research on family variation. Some argue that standard household survey methods used for collecting data on families have been outpaced by the transformation of families and hence estimates of family variation are inaccurate and opportunities for cross-country comparisons of family variation are hampered. Rectifying this situation is possible through greater use of relationship matrices. This underutilized data collection method can precisely portray family variation and facilitate cross-country comparisons. To illustrate the usefulness of this method for family research, relationship matrices data on young persons from Australia and the U.S. are exploited to demonstrate that these matrices can: (1) depict individuals' living arrangements; (2) identify patterns in partnering and childbearing; (3) describe demographic diversity across types of couples; and, (4) aid cross-country comparisons of family variation.

Keywords: Family variation, consensual unions, household relationship matrices.

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Introduction

Since the 1970s, dramatic changes have reshaped families across many industrialized countries. The significant transformations that families in these countries have undergone have profound implications for how these countries study families and how they develop future social policies. Where changes in families have been striking, e.g., in the United Kingdom, the U.S., and Australia, some researchers contend that family changes and variations have outpaced the methodologies meant to accurately describe them and assess socio-economic outcomes. Critics further argue that without more advanced methods for measuring family variations and changes, industrialized nations will fail to understand the diverse needs of families, will fall short of developing effective social policies, and will have limited means for making cross-country comparisons of family diversity and change.

Many industrial countries recognize that new models are needed for understanding family variation and change and comparative studies of family change and variation depend upon shared theoretical and methodological advances. In the U.S. and Australia, federal agencies have charged scholars to develop coordinated programs of research that can build upon the last two decades of family research. Federal governments in both countries are especially interested in projects that address the following three broad areas or their derivations: (1) advancing new theoretical frameworks for understanding family variation and change; (2) developing new family surveys and methodologies for analyzing and collecting data; and, (3) identifying existing sources of data or survey designs that have been underutilized for the study of family variation and change.

This paper deals with the third area by demonstrating how relationship matrices in existing household panel surveys are valuable for studying family variation and change. Presently, relationship matrices are underutilized, yet they produce valuable data on family

variation and change. This paper's modest but focused goal is to show the usefulness of relationship matrices for measuring family variation and for conducting cross-country comparisons of family variation. Space limitations prevent showing the usefulness of relationship matrices for understanding family change.

Certainly the other two areas of interest to federal agencies are critical for advancing the study of family variation and change. However, data from relationship matrices can catalyse inductive theorizing about family variation and create opportunities for comparing family variation across countries.

In this paper, data collected from relationship matrices in Australia and the U.S. are used to show the usefulness of these data for better understanding partnering among persons between 15 and 30 years of age. For individuals in this age range, both countries' relationship matrices: (1) depict the diversity of living arrangements among Australians and Americans; (2) provide estimates of the alternative types of living arrangements of young Australian and American couples; and, (3) identify socio-demographic and economic variation across these couples in both countries. Findings show that this underused data collection method offers a new means for cross-country comparisons of partnering and offers empirical insights to advance models of family variation.

Background

Research documents the dramatic changes that have reshaped families across many industrial countries since the 1970s (U.S. Census Bureau, 1999a, 1999b, 1999c; Casper & Bianchi, 2002; Teachman, Tedrow, & Crowder, 2000; Bumpass & Lu, 2000; Bumpass & Sweet, 1989). Undoubtedly, the profound changes that families have undergone in the past three decades have significant implications for studying families and a range of future social policies (Federal Interagency Forum on Child & Family Statistics, 2001). Because relationships among members of a family have become more complex and can change

rapidly, sophisticated methodologies are needed to accurately describe family change and variation. Without greater use of advanced methods for describing family diversity and change, many industrial countries will fail to fully comprehend the diverse needs of today's families and will fall short of developing effective social and economic policies for the most vulnerable of families where change occurs often.

Despite the complex web of relationships often present in today's families, most surveys still only ask how an individual in a household is related to the person who owns the house, pays the mortgage, or signs the rental lease. This outdated way of portraying household relationships has been criticized because now more than ever before, this approach renders it difficult to exactly assess who individuals live with, how they are related to one another, and which relationships determine family variation and change. In contrast, relationship matrices identify how all individuals within households are specifically related to each other and thus have potential for measuring family configurations in greater detail and for comparing those configurations across countries.

This paper focuses on the inversion of relationship matrices data on *specific* relationships among household members to provide cross-country comparisons of the living arrangements and partnering patterns of younger adults. Although this paper is restricted to showing the usefulness of relationship matrices for identifying relationships between all members of a household, it is important to note that there are other advanced techniques for collecting data on relationships among household members. One such technique is randomly selecting a focal member and then studying his or her relationships to others in a household (Hofferth at al., 1999). So, future methodological studies should compare the effectiveness of alternative methodologies aiming to identify relationships among household members.

In any case, despite the value of relationship matrices for collecting precise data on family variation and change, household surveys rarely include them. The routine exclusion

of relationship matrices from household surveys will continue until research indicates that the exclusion is detrimental to advancing research on family change and variation. New research is necessary to demonstrate the "value-added" from using relationship matrices to study family-related issues over the methods that are currently used in household surveys. A program of methodological research may indicate that contemporary research on the family would gain from replacing the *status quo* with questionnaires designed to capture the complex, time-varying relationships among individuals within a household. Meantime, studies of families are conducted, and social policies are created, with incomplete data on the exact relationships among all individuals within a household. More informed policies and a better understanding of the changing nature of families would result if household surveys replaced questions about individuals' relationships to heads of households with relationship matrices. With few exceptions, however, adoption of this alternative data collection method in household surveys is negligible.

Despite the dearth of household panel surveys containing relationship matrix data, a table in Appendix A, (Table A.1), offers some information on four existing household panel surveys containing questionnaires that can generate relationship matrices. The questionnaires were intended to either replace questions about a person's relationship to a household head or complement such a question. Each of these household panel surveys selected nationally representative samples of households to follow for various periods of time.

For present purposes, this paper concentrates on showing the usefulness of the relationship matrix methodology for studying cross-sectional variations in the living arrangements and socio-demographic characteristics of young couples in Australia and the U.S. Though relationship matrices can also show family change over time, this added advantage is omitted due to space limitations.

Methods

Analysis Plan

Relationship matrices, at present, are most likely found in household panel surveys. Hence, first I describe the Household, Income, and Labour Dynamics in Australia (HILDA) Survey and the 2001 Panel of the Survey of Income and Program Participation (SIPP). These two household panel surveys provide the raw relationship matrix data that I manipulate. Next, I discuss the nature of the relationship matrices in these two panel surveys, the sort of data the matrices collect, and how details about family relationships can form the bases for family characterisations. Once assembled, these data can produce precise categories of living arrangements showing the presence or absence of partners, parents, other relatives and non-relatives, and children. Finally, I note that after the relationship matrix data was converted into couple data, I was still able to preserve nested individual identifiers so that merging person-level information was possible. This methodology, which is replicable for any group of individuals, makes possible what is essentially impossible any other way.

Description of Data

The sources of data for this study are the HILDA survey and the 2001 Panel of the SIPP. The samples selected for both HILDA and the SIPP are stratified multistage probability samples that are nationally representative of households in the civilian noninstitutionalized populations of both countries. SIPP respondents are followed for a 48-month period and interviewed every four months over that period. HILDA began surveying respondents in 2001 and will continue annual surveys until at least 2008. In both panel surveys, a household informant is asked to provide information for every member of the household for specific periods of time. In the SIPP, the period of time is the past four months (U.S. Census Bureau, 2001), whereas in HILDA it is the past 12 months.

Included in the demographic information for the household are the number of families in the household and the composition of each family in each of the preceding months. For all persons in HILDA and the SIPP, data is gathered on their ages, gender, races, and nativity. Original sampled members 15 years of age and older who move addresses are located, if possible, and retained (Watson and Wooden, 2001; U.S. Census Bureau, 2001). As this study restricts its focus to family variation at a point-in-time, only cross-sectional data collected on individuals aged between 15 and 30 years of age from Wave 2 of the SIPP and Wave 1 of HILDA are used.[1] (However, both surveys permit to varying degrees using the relationship matrix data for analyses of family change.)

HILDA and the SIPP yielded 4,208 and 15,418 sampled individuals between 15 and 30 years of age, respectively. Of the 4,208 individuals sampled in HILDA, 466 (11.1%) failed to complete a personal interview and were subsequently excluded from this study. This left 3,742 individuals with data from the HILDA relationship matrix for analyses. In the SIPP, no exclusions occurred because the household relationship matrix contained no missing relationship codes. Thus, data from the household relationship matrices in both surveys enabled me to precisely describe the relationships among persons aged 15 to 30 years and other household members and to make cross-country comparisons.

Measuring intra-household relationships

Although the main focus of HILDA and the SIPP is collecting information on labor force participation, jobs, income, and participation in government assistance programs, both surveys collect information on household relationships through household relationship matrices (Watson & Wooden, 2001; U.S. Census Bureau, 2001). Generally, the finer-grained data on household relationships in the SIPP is collected in Wave 2, which means collecting data on household relationships over the summer months. (This data collection period could yield lower estimates of household composition if family members are away over the summer

months for one reason or another.) In HILDA, the equivalent data is collected at the time of the annual interview for each wave.

After contacting members of a household, the exact relationships among all household members are pinpointed and recorded.[2] The relationship matrices establish arrays 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, couples in a household can be identified as living with no-one else, or with children, or with mixtures of people who may or may not be relatives. In the case of the latter, parents or parents-in-law can be identified, for example. Hence, HILDA and SIPP's household relationship matrices data permit constructiing measures of intra-household relationships, including intergenerational ones. Undoubtedly, using the household relationship matrices that potentially allow for matrices encompassing myriads of relationship categories surpasses a standard unidimensional survey questions that only ask about the relationship of a household member to the household reference person who has been designated as "head" of the household.[3]

Findings from Cross-Tabular Analyses

The living arrangements and prevalence of partnering among young persons

The detailed HILDA and SIPP relationship-matrix data allows estimating the proportions of individuals and couples in specific living arrangements. What is apparent is that, despite noticeable differences between living arrangements of non-partnered individuals across the two countries, similar proportions of Australians and Americans between 15 and 30 years of age are partnered, 33% versus 32%, respectively. (See Panel A of Table 1.) According to Table 1, nearly half as many Americans, (4.6%), compared with Australians,

(8.8%), live alone in this age grouping. Moreover, Americans compared with the Australian counterparts more often live with parents and raise children as sole parents.

[Table 1 about here]

The other clear message coming from Table 1 is that many more young Australian couples compared with American couples cohabit rather than marry. This result is found after taking the partnered individuals and precisely matching them with their partners to form country-specific samples of "couples." Panel B of Table 1 shows that nearly twice as many Australian couples as American couples cohabit rather than marry. Presumably, factors make marriage more attractive to American young couples than for Australian young couples; likewise, factors make cohabiting more attractive to Australian young couples than to American young couples.

Family Composition of Younger Couples

Subsequent analyses focus on the country-specific, couple samples, not the non-partnered individuals. Examining first families of the married young couples in Australia and the U.S., two points emerge from Panel A of Table 2: (1) American married couples compared with Australian married couples are more likely to have children; and, (2) higher proportions of American married couples' children are non-biological children compared with the Australian married couples. Overwhelmingly for the American married couples, when children are not their biological children, husbands are usually stepfathers of the wives' biological children, not the opposite. As stated, Australian married couples are less likely to have children, but when children are present they are more frequently the biological children of both partners. Differences in the presence of non-biological children is consistent with at least one of the partners among American married couples compared with at least one of the partners among Australian married couples being more likely to have been divorced, 20.9% and 13.2%, respectively.

Table 2 displays that Australian married couples with children compared with American married couples with children are more likely to have preschool-aged children. No wonder, therefore, that Panel A indicates that the oldest children of Australian married couples are younger than the oldest children of American married couples. Although the oldest Australian children were still younger than the oldest American children, married Australian mothers were themselves older than married American mothers when they gave birth to the oldest co-residing child by nearly 2.5 years. Yet, the average number of years until giving birth to the next oldest child for Australian married mothers is less than the number of years until giving birth to the next oldest child for American married mothers.

[Table 2 about here]

Panel B of Table 2 contains analogous results for the two samples of cohabiting couples. While Table 1 revealed that young American couples cohabit less, among those cohabiting they are more likely compared with Australian cohabiting couples to have coresiding children. Again reflecting the higher rate of marital dissolution, American cohabiting couples compared with Australian ones have higher proportions of children who are the non-biological children of either partner. On the other hand, the probability of American and Australian cohabiting couples having only biological children is equivalent. Furthermore, across cohabiting couples most of the children who are not the biological children of both partners are predominantly male partners' stepchildren.

Repeating patterns from Panel A of Table 2, Australian cohabiting couples are less likely to have children, but when children are present they are usually the biological children of both partners. Among cohabiting Australian and American couples, Australian couples' children compared with American couples' children are more likely to be preschool-aged children. Though differences are less pronounced, compared with their American cohabiting counterparts, the oldest coresident children of the Australian cohabiting couples are again

younger, Australian cohabiting mothers were older when they gave birth to the oldest coresiding child, and the average spacing between the oldest and next oldest children's births was again less.

Demographic and socio-economic characteristics of younger couples

Besides differences concerning the presence and mix of children between Australian and American couples, socio-demographic and economic differences are also apparent. Panel A of Table 3 shows that Australian married couples with children are less likely compared with their American counterparts to both work full-time and work two jobs. Australian married couples with children are more likely than the American married couples to have only one full-time worker or have a partner studying or receiving training. While Australian wives raising children work fewer hours than American wives raising children, their Australian husbands work more hours than the American husbands. Further, Australian married couples with children are more likely compared with American married couples with children to receive welfare payments and own or be paying off a mortgage.

[Table 3 about here]

Still on Panel A of Table 3, Australian married couples without children are more likely compared with their American counterparts to both work full-time, though still less likely to work two jobs. Australian married couples without children are now less likely compared with American married couples without children to have only one full-time worker, but remain more likely to have a partner studying or receiving training. The Australian wives without children now work about the same number of hours as the American wives without children; their Australian husbands, however, work even more hours than the American husbands. Furthermore, Australian married couples without children are again more likely compared with the same American married couples to own or be paying off a mortgage.

For the Australian and American cohabiting couples Panel B of Table 3 shows again that the labor force participation of these couples is different. Though the sample size for the Australian subsample is relatively small, the Australian cohabiting couples with children are much less likely compared with their American counterparts to both work full-time and work two jobs. Australian cohabiting couples with children are more likely than the American cohabiting couples with children to have only one full-time worker, but share the same likelihood of having a partner enrolled in study or training. While the Australian female cohabitors with children work far fewer hours than the American females, the Australian cohabiting males with children now work about the same number of hours as the American cohabiting males with children. And, Australian cohabiting couples with children are more likely compared with American cohabiting couples with children to receive welfare payments; across both countries, cohabitors with children are equally likely to own homes or be paying off mortgages.

Panel B of Table 3 shows that again the labor force participation of cohabiting couples without children is different. Australian cohabiting couples without children are more likely now compared with their American counterparts to both work full-time, but still not have a second job. Australian cohabiting couples without children are less likely than the American cohabiting couples without children to have only one full-time worker and have a higher likelihood of having a partner enrolled in study or training. Australian female cohabitors without children work similar hours as the American females and the Australian males cohabitors also work equivalent hours as the American males. Lastly for these two groups, Australian cohabiting couples without children like the Americans do not receive welfare payments, but are equally likely to rent.

Living arrangements of younger couples

Finally, Table 4 presents results for the presence of other adults living with Australian and American couples. Panel A of Table 4 suggests that American married couples are much more likely than Australian married couples to live in three-generation households. American parents, (especially mothers), who live with their married daughters or sons are younger and more likely to work full-time compared with Australian parents living with their married daughters or sons. Although the proportions are trivially small, the percentages of other adult relatives and non-relatives living with married couples is also higher among the Americans, regardless of children, compared with the Australian. And, Australian married couples with and without children are also more likely to live in public housing than American married couples with and without children.

[Table 4 about here]

As panel B of Table 4 shows, American cohabiting couples with and without children, as well, compared with Australian cohabiting couples are more likely to live in three-generation households. The parents, however, of Australian and American cohabiting couples are about the same age, (late 40s to early 50s), and both sets of parents are no more or less likely to work full-time. Again numbers are small, but for completeness the percent of other adult relatives and non-relatives living with cohabiting couples with and without children is higher for American cohabiting couples than for Australian cohabiting couples.

Discussion

The primary purposes of this study are to: (1) heightened awareness of relationship matrices; (2) demonstrate the versatility of these data for understanding family variation; and, (3) display results from a cross-country comparison using this data collection method. As the purpose was not to present glamorous models of family dynamics, only the most unpretentious of analytical techniques are used. Clearly, more sophisticated multivariate

approaches can and should be used to analyse these relationship matrix data to isolate determinates of family variation. Nonetheless, by at least having relationship matrices data from household panel surveys in two countries, the contingency tables have depicted couple's living arrangements; shown how many children live with couples in each country; suggested correlations between certain types of family configurations and socio-economic outcomes; and, compared the living arrangements of couples in two nations. Mindful of the advanced multivariate techniques available, results suggest several fruitful avenues of research, including a few highlighted below.

The contingency tables suggest that Australia's younger adults prefer living alone compared with American younger adults and Australian young couples clearly perceive cohabiting as a viable alternative to marriage. Essentially, across the countries the rates of partnering are about equal, but rates of partnering types differ. Culturally, Australians for at least two decades have sanctioned and recognized cohabiting as a legitimate consensual union. Structurally, Australia's social, financial, and legal institutions make no distinctions between cohabitation and marital unions, regardless of whether children are involved.

Further, the composition of the younger couples' households also appears to differ across the two countries. Firstly, Australian couples, married and cohabiting delay childbearing, compared with American couples. Possibly, Australian couples want to invest more in their own human capital and in their relationship before having children. More work hours among male partners, higher enrolments in schooling and training, and higher rates of home ownership among Australian couples compared with American couples could indicate that person- and couple-specific investments determine the timing of having children. Moreover, Australian married couples are less disposed to living in three-generation households, or those containing other adult relatives and non-relatives. Fascinatingly, even among these relatively young couples, American couples are much more likely compared

with Australian couples to have formed blended families and families where a partner, mostly females, has experienced a prior marriage. Intuitively, American couples seem to cycle through first unions more rapidly than Australian couples.

There are two hypotheses that are left unexplored here, but which might help explain why some findings for American couples differ from those for Australian young couples. First, ethnicity has been ignored in this study. In the U.S. case, results are no doubt sensitive to the much greater ethnic diversity in the U.S. There is much less ethnic diversity in the Australia, although the immigrant population is large. As well, the safety net in Australia is essentially universal, generous, and not based on marriage or paternity establishment. If government transfers and poverty are key determinants of union formation and living arrangements, U.S. couples should be much more responsive to these incentives. Future research should explore these sorts of hypotheses with advanced multivariate models. Relationship matrices promote such questions and provide the data to answer them.

Conclusions

Researchers should consider using relationship matrices for depicting family variation rather than using data predicated on identifying household heads. Accurately enumerating all relationships among household members will encourage new questions about determinants of family variation. New knowledge about variability in families is possible now at low-cost because the issue is underutilization of matrix data, not availability.

This study illustrates that data generated from relationship matrices have advantages. An obvious advantage is that no relationships among family members are necessarily formed around relationships to household heads. Nowadays, assigning a household member as "household head" is dubious since families change rapidly, have two income-earners, contain multi-generations, represent gay unions, and jointly decide household matters. With all relationships enumerated, not just those tied to an identified household head, more accurate

measures of cohabitation are available and important topics, such as, paternity establishment, fatherhood outside of marriage, step-fatherhood, multiple family units, and intra-household transfers can be studied. Moreover, inversions of matrix data permit researchers to investigate families from any member's perspective, while other sorts of data manipulations permit researchers to test theories about family types within households.

Another overlooked advantage of relationship matrix data, which space limitations prevent demonstrating here, is that accounting for changes in relationships among family members over time is possible. This accounting includes measuring changes in child-to-child, child-to-adult, and adult-to-adult relationships over time and generating news sets of longitudinal statistics based upon relationships within households. For example, annually-collected relationship matrix data in household panel surveys could augment less-detailed, cross-sectional measures of children's family types and measures of changes in their relationships to household heads.

Yet, if relationship matrices offer so much for understanding family variation and change, why are they used so little? Inconsistent data explain part of the underutilization. Sometimes relationships within a household are inaccurately entered. Finding errors in relationship codes is painstaking and difficult, especially since most errors occur in larger families and those that are multi-generational.

Besides data transcription and coding errors, inverting the matrices is computationally daunting and prone to programming mistakes, including lapses when changing analytical units. Also, relationship matrix data is poorly documented. Documentation is generally vague and codebooks are usually not "user-friendly", e.g., prototypes of programming code, definitions of relationships, and write-ups of pre-existing derived variables from the relationship data. Thus, poor user-interfaces have inhibited use of relationship matrix data.

Another reason why relationship matrices are avoided in household surveys is that much information is possible to gain by randomly selecting only a focal member from a household and investigating that one member's relationships with everyone else in a household. This data collection method is less expensive to implement than a relationship matrix and the data is far less cumbersome to process. The trade-off is a smaller amount of information on all individuals in a household and possessing the entire array of specific relationships among all household members. Many analysts agree, however, that more informed policies and better studies would eventuate if household surveys replaced "one dimensional" questions about household member's relationships to heads of households with relationship matrices or relationship questions for a focal member.

In summary, the standard method of distinguishing how individuals in the household are related to a person who heads a household offers little help for advancing our understanding of family change and variation. Now more than ever before, this approach renders it difficult to assess with any precision whether individuals live in consensual unions, whether coresiding children and other adults are related biologically to the couple, and whether relationships are based solely on kinship or mutual obligations. This outdated data collection method of linking persons to a household head should be replaced by an alternative method that can reflect the present realities of families across industrialized countries.

This study argues that questionnaires generating "relationship matrix" data permits analyses from unitary or dyadic perspectives, which is superior to data constructed from data based on household headship. Findings suggest that countries' federal statistical collections on families would benefit from use of the household panel relationship matrices. Federal agencies needing national level data on family variation and change should encourage the adoption of multi-dimensional relationship matrices for collecting data on relationships

among members of households rather than relying on existing “one dimensional” methods for collecting such information.

Appendix A.

Table A.1, below, lists four household panel surveys containing relationship matrices. This list is limited, but presently I could only identify these four data sources. However, besides these four household panel surveys, there are cross-sectional household surveys and cohort surveys that contain relationship matrices, as well. I am currently examining the potential of these other sorts of surveys for studying family change and variation.

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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. In HILDA they are collected at each wave.

[2]Interviewers in both surveys show the respondent a flashcard defining the various possible types of specific relationships.

[3] 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 and the SIPP are notable exceptions as they directly code relationships between all household members.