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Beyond Household Walls: The Spatial Structure of American Extended Kinship Networks

Jonathan Daw[a,*], **Ashton Verdery**[a], **Sarah E. Patterson**[b]

[a]Department of Sociology and Criminology and Population Research Institute, The Pennsylvania State University

[b]Department of Sociology, University of Western Ontario

Abstract

How far do Americans live from their close and extended kin? The answer is likely to structure the types of social, instrumental, and financial support that they are able to provide to one another. Based on the Panel Study of Income Dynamics, kin pairs vary widely in odds of household co-residence, co-residence in the same administrative units, and inter-tract distances if they do not live in the same census tract. Multivariate regression tests show that family structure, educational attainment, and age are closely associated with kin proximity. Fixed effects models demonstrate that fam ily formation shapes spatial relations between kin.

Keywords

Co-Residence; Spatial Relations; Family Structure; Age; Educational Attainment

1. Introduction

How far do Americans live from their kin? American close confidante networks are dominated by kin (Marsden, 1987; McPherson, Smith-Lovin, and Brashears, 2006), which makes kin proximity a relevant question for understanding associational life. Kin proximity has repercussions for exchanges of time, money, and emotional support because kin provide far more social support than non-kin (Stack, 1975; Wellman and Wortley, 1990; Edin and Lein, 1997; Voorpostel and van der Lippe, 2007). Kin who co-reside are better positioned than kin who do not to provide assistance in person, but the distinction between co-resident kin and kin who live across the country is surely greater than the distinction between co-resident kin and kin who live across the street. For instance, proximate kin, even those who do not co-reside, can assist with routine child care and the activities of daily living. Conversely, distant kin may not be able to directly assist family in need, which might lead them to greater propensities of providing financial support (Sarkisian, Gerena, and Gerstel, 2007). If these patterns are stratified by demographic characteristics, group differences in spatial proximity to kin may be a component of stratification in the provision and receipt of social support. Despite the relevance of geographic proximity to kin, little is known about

*: Corresponding author. Jonathan Daw, Department of Sociology and Criminology, 211 Oswald Tower, The Pennsylvania State University, University Park, PA 16802, (814) 863-0096, jddaw@psu.edu.

how far Americans live from different types of kin, particularly non-nuclear family members, and how these distances vary by sex, race, or education level.

Direct sources regarding the distribution and predictors of distances between kin in the United States are limited because few surveys include questions about non-co-resident kin, especially non-immediate family members. These limitations have constrained previous studies toward a focus on the distances between a limited number of kin pair types like parents and children, grandparents and grandchildren, and sometimes siblings (Miner and Uhlenberg, 1997; Rogerson, Burr, and Lin, 1997; Compton and Pollak, 2015). Distances between other kin pairs like aunts and uncles with nieces and nephews, and cousins, who might be important sources of emotional, financial, and social support for some individuals, have not been well studied in research for the United States. Although Daw, Verdery, and Margolis (2016), Margolis and Verdery (2017), and Verdery and Margolis (2017) have studied what predicts having more or fewer, and trends in these topics, these authors have not studied spatial proximity between kin. Ruggles (1987, 2007) has studied trends in and predictors of kin co-residence, but he offers little guidance about how close people live to most kin because, in the contemporary United States, few adults co-reside with their parents, siblings, or other non-immediate kin types (Ruggles, 1988, 2015) and American adults express a growing preference to live alone (Klinenberg, 2012).

We use restricted-access data from the Panel Study of Income Dynamics to identify spatial patterns in proximity to kin in the United States. We compare group differences in these patterns across relationship types with a focus on how they vary by socio-demographic attributes like family formation, race, and educational attainment. We also test whether these factors are robust to the removal of unobserved heterogeneity using within-family fixed effects models. We find that the socio-demographic traits of both members of kinship pairs jointly shape the odds that kin live nearby and how far apart they live when they do not, and that in many cases this remains true when conducting within-family comparisons. We also find that childbearing and partnership play especially important but countervailing roles in shaping distances between kin, with parenthood associated with increased proximity and marriage or partnerships associated with decreased proximity.

2. Background

Mulder (2007) suggested researching whether family forms are associated with residential choices because kin proximity may be directly related to family organization, as social theorists have long postulated (Le Play, 1895; Wirth, 1938; Parsons, 1943; Parsons and Bales, 1956). This is different from assuming that proximity determines the existence of relationships rather than the reverse (Adams, Faust, and Lovasi, 2012). For instance, Hipp and Perrin (2009) take it for granted that proximity affects strong and weak ties; Festinger, Schachter, and Back (1963) and Mouw and Entwisle (2006) assume that proximity affects friendships; Loomis, Davidson, and Dwight (1939) assume that proximity affects acquaintanceships; Coombs (1973, 1975) assumes that proximity affects exchange; Faust et al. (2000) assumes that proximity affects the provision of help; and Kennedy (1943) and Morrill and Pitts (1967) assume that proximity affects marriage. For some of these outcomes these assumptions may be appropriate; for kinship, however, as Verdery et al. (2012: 112)

argue, “the literature tends to view spatial proximity as a factor affecting social ties, but it is also likely that social ties — in this case, kin ties — influence spatial arrangements.” In short, kin could modify the spatial patterning of proximate social relations.

Outside of the United States, although Ruggles and Heggeness (2008) focus on co-residence, research on explicit distances between family members is rarer because it requires either population register data or unique forms of surveys. However, exceptions include Verdery et al.’s (2012) analyses of Thai data, Shelton and Grundy’s (2000) analyses of British data, Michielin, Mulder, and Zorlu’s (2008) and van den Broek and Dykstra’s (2017) analyses of German data, Blaauboer, Strömgren, and Stjernström’s (2013), Chudnovskaya and Kolk’s (2017), and Kolk’s (2017) analyses of Swedish data, and van Diepen and Mulder’s (2009), Zorlu’s (2009), Smits’s (2010), Blaauboer, Mulder, and Zorlu’s (2011), and Pers and Mulder’s (2013) analyses of Dutch data. In the United States, most researchers focus on the effects of kin proximity, not its patterns or predictors. For instance, these authors indicate that living closer to family members increases resource support (Taylor, 1986; Hogan, Eggebeen, and Clogg, 1993; Gordon et al., 1997; Zissimopoulos, 2001) and increases individual well-being (Chase-Lansdale, Brooks-Gunn, and Zamsky, 1994; Kalil et al., 1998).

Proximity to kin may be stratified by socio-demographic characteristics (Mulder and van der Meer, 2009; van Diepen and Mulder, 2009; Blaauboer, Strömgren, and Stjernström, 2013) and vary across the life-course (Kolk, 2017). Proximity may also vary by the relationships between kin — for instance, siblings who have greater similarities on socio-demographic characteristics tend to live closer together in Sweden (Blaauboer, Strömgren, and Stjernström, 2013). We expect that comparable results will hold for proximity to aunts, uncles, and cousins, but they may be less relevant for closer kin ties like parents and children, where life-course factors may outweigh socio-demographic similarities.

Partnership and childbearing might determine proximity to kin. Partnered and married adults live farther from family members other than those to whom they are partnered, while non-marriage and divorce increase the likelihood of co-residence with parents and siblings (Aquilino, 1990; Michielin, Mulder, and Zorlu, 2008; Smits, 2010). In fact, Aquilino (1990) argue that marital status may explain the entirety of co-residence differentials between Black and White Americans. It is unclear if having children leads family members to be in closer proximity (Bonneuil, Bringé, and Rosental, 2008; Compton and Pollak, 2015), but recent births are predictive of moving closer to parents in the Netherlands (Smits, 2010). However, parents of multiple children are less likely to co-reside with each child than parents of only children, but they are no more likely to live farther from their children who do not live with them (Shelton and Grundy, 2000; Compton and Pollak, 2015).

Socioeconomic status also stratifies proximity to kin. Of adults with children in the contemporary United States, living in the same household as grandparents is more common in times of financial crisis and for families with less money (Dunifon, Ziol-Guest, and Kopko, 2014; Keene and Batson, 2010). Among multi-generational households, economic resources affect the likelihood of remaining co-resident (Glick and van Hook, 2011). Child’s education is the most robust predictor of proximity to mothers, with college graduates least

likely to live near their mothers (Compton and Pollak, 2015). Pursuing and obtaining post-secondary degrees is highly predictive of distance from parents in Sweden, with highly educated children living farther from parents than those with less educational attainment (Chudnovskaya and Kolk, 2017). Such education effects may explain findings from spatial analyses in the Netherlands that indicate that parents who live in less urbanized areas are more likely to have their children living near them (Pers and Mulder, 2013), because the more educated tend to have better labor market opportunities in urban areas.

Age is also important, with older children in the United States living farther from parents (Compton and Pollak, 2015); however, this effect is difficult to interpret as it could reflect declining residential mobility across birth cohorts (Molloy, Smith, and Wozniak, 2011, 2014). Using German data, Konrad et al. (2002) suggest that these results may reflect age or birth-order effects because older children within sibling sets are more likely to live farther from parents. Adult children are more likely to live *with* older, unmarried, disabled mothers, but they are no less likely to live *near* them if they are not co-resident (Compton and Pollak, 2015).

There are also important race differences in the likelihood of living near kin in the United States. Race stratifies proximity to kin members, as White Americans are more likely to live farther from family than Black Americans, a pattern that may be driven in part by educational differentials (Zissimopoulos, 2001). Similarly, Blacks are more likely than Whites to co-reside with other family members (Aquilino, 1990; Glick and Hook, 2002; Ruggles and Heggeness, 2008; Keene and Batson, 2010; Glick and van Hook, 2011; Dunifon Ziol-Guest, and Kopko, 2014; Reyes, 2018). Among older adults, Black siblings live closer to one another than White siblings do (Miner and Uhlenberg, 1997). In the contemporary United States, White individuals are the least likely to live close to mothers and Black individuals are the most likely to do so (Compton and Pollak, 2015). Such patterns may underpin findings about racial disparities in the likelihood of giving and receiving inter-generational transfers, where Black families are consistently less likely to engage in such activities (Hogan, Eggebeen, and Clogg, 1993). Taylor (1986) document wide racial disparities in rates of transfer by geographic proximity.

It is unclear what to expect regarding sex differences in proximity in the U.S. International data provides some guidance, however: Blaauboer, Mulder, and Zorlu (2011) employ Dutch data to find that couples tend to live closer to the man’s parents than the woman’s, which may reflect men’s greater average contribution to household wages. On the other hand, in rural Thailand, newly married couples often move to the bride’s family’s village (Verdery et al., 2012).

3. Data and Method

We use data from the Panel Study of Income Dynamics Family Information Mapping System (PSID FIMS). The Panel Study of Income Dynamics began in 1968 and consists of a nationally-representative, longitudinal study of households through 2009 (at the time of analysis). As members of the original households left home, the study includes a follow-up of new households they formed in addition to the original households. All individuals who

co-resided with a core sample member while the survey was fielded (annually from 1968 to 1997 and biennially since). Because most households consist of bio-legal kin, biological, adoptive, and marital and partnership lineages are recorded over a 41-year span (through the last year of data we analyze). To date, more than 75,000 individuals have participated in the survey.

As a panel study running over decades, the Panel Study of Income Dynamics has maintained remarkably low levels of sample attrition, averaging approximately 2 to 3% wave-to-wave attrition (Fitzgerald, Gottschalk, and Moffitt, 1998), considerably lower than other longitudinal panel studies that average 4 to 7% (Schonlau, Watson, and Kroh, 2011). Attrition in the Panel Study of Income Dynamics is concentrated among individuals with lower socioeconomic status, minorities, and those who move (Fitzgerald, 2011). Nonetheless, the use of cross-sectional sample weights preserves the representativeness of the survey over time (Fitzgerald et al., 1998) and dyadic analyses of paired family members show little evidence of attrition bias (Fitzgerald, 2011). Second, the Panel Study of Income Dynamics added supplementary, refresher samples in 1997, 1999, and 2017 to improve representativeness of new immigrant groups. However, we do not use data from these supplemental samples because respondents to them have not participated in the survey long enough to have extensive measures of kin ties. Relatedly, because the non-refreshed data offer poor representation of Latinos, Asians, Pacific Islanders, and other racial ethnic groups in the United States due to these groups' high immigration rates since 1968, we restrict our analysis to families whose original head of household was White or Black in 1968. Third, the Panel Study of Income Dynamics runs prospectively, which means that respondents' kin are only surveyed if they descend from or co-reside with current or future core sample members. Daw, Margolis, and Verdery (2016) labeled this phenomenon the "missing half" problem. Because only the descendants of the originally-sampled households are followed, not the non-co-resident family members of those who "partner in" to this lineage, half of younger respondents' older relatives are not present in the data — the relatives of their parents who are not directly descended from the originally sampled households. For these reasons, respondents in the Panel Study of Income Dynamics often have only one measured grandparent set instead of two, and any aunts, uncles, and cousins to whom they are related through their "partner in" parent are unlikely to be measured.

It is worth considering how attrition and the missing half problem discussed above might affect the generalizability of our conclusions or bias our estimates of the spatial relationships between kin. While these are important limitations, they will only bias our calculations if the spatial relationships between kin differ systematically between those who are descended from households present in the United States in 1968 and those who are not.

3. 1. Kin pairs and kin sets

The Family Identification Mapping System provides linkage variables delineating parent-child (biological and adoptive) and sibling (distinguishing full-, half-, and step-siblings) ties among respondents; marital and, since 1993, long-term cohabiting ties are measured in the individual data file. In contrast to other work on kinship which primarily focuses on a small set of ties specific to the question being explored (child and parent ties, for instance), we

examine a broader set of kinship ties. We characterize kinship ties using a modification of previous methods (Verdery et al., 2012), incorporating information on biological, adoptive, and marital and partnership ties to characterize the full kinship networks within lineages. The key intuition is that all bio-legal kinship ties can be defined as a function of three elementary matrices: parent matrices (P, a non-reciprocal matrix in which person j is person i's parent if $P_{i,j}$=1 and =0 otherwise), sibling matrices (S, a reciprocal matrix in which j is i's sibling if $S_{i,j}$ =1), and partner matrices (E, a reciprocal matrix in which j is i's partner if $E_{i,j}$=1). For instance, one's grandparent is one's parent's parent, and one's aunt is one's parent's sister or the partner of one's parent's sibling (code available at http://sites.psu.edu/jddaw/code/). To address the fact that not all parental pairs are co-resident and married or long-term cohabiting, we supplement the partner tie measure obtained from the family data file with indicators of co-parenthood: if two individuals are not married but have a child together, we treat them as partners for purposes of constructing kinship networks. We are only able to examine heterosexual partnerships because of data availability, as this was not added to the measure until the 2017 wave. Using these methods, we characterize the following kinship pairs regardless of genetic relationship but excluding step-relationships: parent and child, sibling, grandparent and grandchild, aunt or uncle and niece or nephew, and cousins.

For a subset of our analyses (the fixed effects models described in section 3.4), we convert these pairwise kinship ties into "sets" of intergenerational kin indexed around a focal person. For each parent, we create a child set consisting of a parent and all of their children; for each grandparent, we create a grandchild set consisting of a grandparent and all of their grandchildren; and a niece and nephew set consisting of an aunt or uncle and all of his or her nieces and nephews). Figure 1 shows an example of these kin sets. Panel A depicts a three-generation family; Panel B identifies all three child sets in the graph; Panel B highlights the lone grandchild set in the graph; and Panel C links the two niece and nephew sets in the graph.

We restrict our analysis to kin pairs and kin sets that contain individuals who are over 18, alive, and still participating in the study in 2009 (the most recent wave of geospatial data that we have available). When describing individuals in these kin pairs, we distinguish either between each pair members' role (for intergenerational ties) or between the older and younger member of the pair (for intra-generational pairs) — where the "older" kin is of a higher-generation relative to the other respondent in the pair regardless of chronological age for intergenerational pairs (parents and children, grandparents and grandchildren, and aunts or uncles and nieces or nephews), and the kin with the higher chronological age for intra-generational pairs. When intra-generational pairs are the same age, they are randomly assigned to "older" or "younger" status.

3. 2. Spatial relationships between kin

Because the spatial information provided in the Panel Study of Income Dynamics is only available at the census tract (not home address) level, this information is left-truncated, as we cannot calculate distances between kin who do not co-reside but do live in the same census tract. Accordingly, we measure kin spatial proximity in a variety of ways. For

descriptive purposes, we distinguish between individuals co-residing in the same household, in the same tract (but different household), in the same county (but different tract), same state (but different county), and different states. For purposes of regression analyses, we analyze the same outcomes with the exception of counties and states (in the appendix). For inter-tract distance, we assign individuals a geographic location based on the spatial centroid of the census tract in which they reside. Distances between these centroids are calculated using the user-written command "geodist" in Stata/SE 14.0, with which we compute geodesic distances between these centroids by tracing the shortest curved path along the earth's surface based on the World Geodetic System 1984 projection and equations supplied by Vincenty (1975).

3. 3. Sociodemographic variables

We assign each respondent's race on the basis of the reported race of the head of household in the original 1968 family from which the respondent is descended. Using this definition, *Black* is a dichotomous measure that equals 1 if the respondent is Black and 0 if the respondent is White. Although race may vary within families, in the data we examine this is relatively rare. Respondent race is the only trait that we do not define separately for each member of the kin pair. *Women* is a dichotomous measure that equals 1 if the respondent is a woman and 0 if the respondent is a man. We measure *College education* as the most recent valid response (through 2009) to the question, "What is the highest grade or year of school that (he/she) has completed?"; we assign a value of 1 to those who respond that they attended at least some college or more and a value of 0 to those who report never attending college. We use this simplified measure of educational attainment so that there are adequate cell sizes for cross-kin education interactions.

To allow for flexible functional forms of the relationship between age and distance, we focus on four categories of *Age* that measure respondents' age in 2009: 18–35, 36–50, 51–65, and 66+. For specific relationship pairs, however, we exclude some age categories from our analyses because they are uncommon in our analytical sample: we omit 18–35 for parents and 66+ for children; 66+ for siblings; 18–35 and 36–50 for grandparents and 51–65 and 66+ for grandchildren; 66+ for aunts and uncles and 51–65 and 66+ for nieces and nephews; and 51–65 and 66+ for cousins. By and large, these restrictions are logical because, for instance, nearly no one becomes a grandparent prior to age 35 and not enough do before age 50 to be included in the analysis. A second reason that necessitates these restrictions owes to the Panel Study of Income Dynamics data structure. Because of the aforementioned missing half problem and because all respondents are descended from or "partnered into" originally-sampled households in 1968, siblings were nearly always children living at home in 1968 or later, and cousins are their children. Identifiable sibling and cousin pairs are younger on average than would be expected in the full population of sibling and cousin pairs.

We also look at two measures of family structure. *Relationship status* measures the respondents' partnership status in 2009 and is coded as 1 if the respondent has a measured partner tie in the dataset and as 0 if they do not. Similarly, *Parental status* measures whether the respondent has a measured parent-child tie in which they are the parent in 2009 and is

coded as 1 if they have a child tie in the data set and as 0 if they do not. (The associations of this variable are not modeled for parents.)

3. 4. Statistical analyses

We stratify all descriptive and multivariate analyses by kinship. That is, we calculate separate statistics for parent and child, sibling, grandparent and grandchild, aunt or uncle and niece or nephew, and cousin pair category. We conduct analyses in three steps. First, for each kinship type, we describe the un-weighted probability of co-residence in households, tracts, counties, and states, as well as inter-tract distance in miles. Second, we analyze distance to kin as a function of the socio-demographic characteristics described in section 3.3 using the un-weighted logistic (for categorical outcomes) or linear (for inter-tract distance) regression model:

$$D_{ijf} = \alpha + \beta_1 R_f + \sum_{p=2}^{6} \beta_p X_{pi} + \sum_{p=7}^{11} \beta_p X_{pj} + e_{ijf}, \quad (1)$$

where f indexes family membership, i indexes traits of older kin, j indexes traits of younger kin, D_{ijf} is a measure of distance between kin, R_f family race, X_{if} are a set of older kin attributes (sex, age, relationship status, parental status, education), and X_{jf} are the same set of attributes for younger kin.

We present the results in the form of marginal predictions of the probability of co-residence in the geographic unit in question derived from logistic regression, or in expected miles between census tract centroids, using linear regression. We present the marginal means in the tables to aid interpretability but refer to the ames (with associated coefficients for logit models and sds for all models) in the text. Because all of our independent variables are dichotomous, the ames are simply the differences between the marginal means of the reference and comparison categories. Ames are preferable to logistic coefficients because we compare coefficients across models and populations, which is not valid using logit coefficients (Mood, 2010).

Third, we test the robustness of the associations identified in the second step. Confounding is an issue of concern when examining associations between distance between kin and individual attributes. For instance, individuals in some families may be more likely to attend college, get married, or have children than others, and for unrelated reasons be more likely to live close to their family members. To test robustness to such concerns, we run fixed effects models at the kin set level (described in section 3.1) for three intergenerational ties — parents and children, grandparents and grandchildren, and aunts or uncles and nieces or nephews. For categorical dependent variables, these are conditional logit models (estimated using “xtlogit, fe” in Stata 14), whereas for the continuous distance dependent variable, we use standard linear fixed-effects models (estimated using “xtreg, fe” in Stata 14). The conditional logit model derives the predicted probability of categorical proximity measures by conditioning on the total number of proximate pairs in the group in question and their values of the dependent variable. Following Hamerle and Ronning (1995), these probabilities are:

$$\Pr\left(y_k | \sum_{i,j} y_{ijk}\right) = \frac{\exp\left(\sum_{i,j} y_{ijk} x_{ijk}\beta\right)}{\sum_{d_k \epsilon S_k} \exp\left(\sum_{i,j} d_{ijk} x_{ijk}\beta\right)}, \quad (2)$$

where k indexes kin sets, d_k is the sum of the dependent variable among the younger kin in a kin set, and $S_k \equiv \{0, 1, 2, \ldots n_k\}$ – which is the set of all possible values of d_k for a kin group of that size.

For linear fixed-effects models of inter-census-tract distance, the coefficients are obtained through mean differencing all parameters in Eq. (1), as in:

$$\begin{aligned}\left(D_{ijk} - \overline{D_k}\right) = \alpha + \beta_1(R_{fk} - \overline{R_{fk}}) + \sum_{p=2}^{6} (\beta_p(X_{pik} - \overline{X_{pk}})) \\ + \sum_{p=7}^{11} \left(\beta_p(X_{pjk} - \overline{X_{pk}})\right) + e_{ijf}\end{aligned} \quad (3)$$

where k indexes kin sets, i older kin, j younger kin, and f families. In family lineages where race is assigned based on the head of household's race in 1968, race is constant within kin sets, and we drop it from Eq. (3).

These models allow us to compare siblings (for parents and children models), cousins (for grandparent and grandchild models), and a mixture of siblings and cousins (for aunts or uncles and nieces or nephews models) against each other in terms of the independent and dependent variables. It is not possible to use fixed-effects models for intergenerational ties, because there is no appropriate common relative to define each individual against. Because these models condition on a common relationship with a relative of an older generation, we cannot model the effects of older kin traits directly. We display fixed-effects results as logit coefficients because our focus stage is on the direction and statistical significance of the variables after accounting for unobserved heterogeneity; in addition, predicting outcomes within the kin set sometimes leads to unrealistic predicted values.

To adjust for non-independence of observations, we use the "sandwich" estimator (Rogers, 1994) to calculate sds using the "robust" option in Stata 14.1. We use the "margins" command in Stata to obtain predicted probabilities and conditional expected values, which we calculate using average values for all other covariates while assigning each individual in the data to have the trait in question. We use the kin pair or kin set as the unit of observation because spatial distance to kin is inherently a pair- or a set-level characteristic. Because we work at the kin pair or at the set level, we do not use weights or survey commands in Stata.

4. Results

4. 1. Descriptive Statistics

Table 1 presents the distribution of kinship ties in the dataset, as well as the sociodemographic characteristics of the pairs (where attributes of parents, grandparents, and aunts or uncles are described for co-resident units where applicable). The dataset includes 4,243 parent and child pairs, 2,129 sibling pairs, 2,101 grandparent and grandchild pairs,

4,731 aunt or uncle and niece or nephew pairs, and 1,772 cousin pairs. Parent and child and sibling pairs on average live much closer to one another than do other kin pairs. 30.8% of parent and child pairs in the data live in the same household and 14.7% live in the same tract (but not the same household), compared to 11.5% and 13.2% for sibling pairs, 3.4% and 9.7% for grandparent and grandchild pairs, 0.1% and 7.4% for aunt or uncle and niece or nephew pairs, and 0.3% and 5.7% for cousin pairs. However, non-parent-and-child kin pairs frequently reside somewhat nearby — 34.5% of sibling pairs reside in the same county (but not the same tract or household), and 23.8% reside in the same state (but not the same county, tract, or household). Similar figures apply for grandparent and grandchild pairs (29.3% in same county but not same tract or household and 28.0% in same state but not same county, tract, or household), aunt or uncle and niece or nephew pairs (31.3% in same county but not same tract or household and 30.6% in same state but not same county, tract, or household), and cousin pairs (30.8% in same county but not same tract or household and 31.7% in same but not same county, tract, or household).

Kin proximity cannot be fully summarized by co-residence in administrative units at different geographic levels of aggregation. After all, one may live right across the state line from one's child, or be up to 2,892 miles apart in the continental U.S. (the distance between Point Arena, California and West Quoddy Head, Maine), but both would be treated as a "different state" kin pair in the categorical measures just described. Accordingly, we also describe inter-centroid distance in miles for those who do not co-reside in the same census tract. On average, parent and child pairs who do not reside in the same household or tract live 181.3 miles apart, sibling pairs live 157.5 miles apart, grandparent and grandchild pairs live 262.0 miles apart, aunt or uncle and niece or nephew pairs live 238.6 miles apart, and cousin pairs live 236.8 miles apart.

Other traits vary just as strongly with the type of kin pair. Age distributions by type of kin pair follow straightforwardly from each member's place in the family structure. Also as would be expected, younger kin in intergenerational and intra-generational pairs are far more likely to be single and childless than their elder kin; they are also more likely to have attended college in intergenerational pairs and less likely to have done so in intra-generational pairs. All groups show somewhat higher representation of women than men, but this is more pronounced among the older members of intergenerational pairs, likely owing to the higher life expectancy of women.

4. 2. Parent and Child Associations

Table 2 presents margins of responses from regression models predicting different levels of geographic co-residence as well as inter-tract distances between parent and child pairs as a function of family race and socio-demographic characteristics of individual kin. All effects are expressed in ames, defined as the difference between the marginal means or predicted probability associated with the reference and comparison categories of the independent variable. Family race, parent and child sex, and parental relationship status are not associated with any measure of their spatial proximity. Among parents' socio-demographic traits, compared to parents aged 66 or older, parents aged 36–50 are significantly more likely to live in the same household (average mean effcet=0.08; coefficient=0.58; standard

deviation=0.22), and less likely to live in the same census tract (ame=−0.05; coefficient= −0.46; sd=0.19), as their children. Parents who attended college are less likely to live in the same tract (ame=−0.07; coefficient=−0.60; sd=0.10) and live farther away (ame=65.8; sd=17.8) from their children.

Turning to children's socio-demographic traits, age is an important predictor of proximity to parents. Compared to children aged 18–35, children aged 36–50 are less likely to live in the same household as their parents (ame=−0.16; coefficient=−1.18; sd=0.20), children aged 51–65 are less likely to do so (ame=−0.17; coefficient=−1.29; sd=0.29), and children aged 36–50 (ame=58.8; sd=24.1) or 51–65 (ame=122.3; sd=39.6) live farther away from their parents when they do not reside in the same tract. Compared to not partnered children, partnered children are less likely to live in the same household as their parents (ame=0.33; coefficient= −2.46; sd=0.13). Compared to childless children, children with their own children are less likely to live in the same household (ame=−0.20; coefficient= −1.37; sd=0.11), but more likely to live in the same tract as their parents (ame=0.06; coefficient=0.52; sd=0.12), and live in a closer tract when they do not (ame=−66.0; sd=18.3). Finally, child educational attainment predicts proximity to parents as well, as compared to children who did not attend college, children who attended college are less likely to live in the same household as their parents (ame=−0.05; coefficient=−0.41; sd=0.09), less likely to reside in the same tract as them (ame=−0.03; coefficient=−0.25; sd=0.09), and live farther away when they do not reside in the same tract (ame=39.8; sd=15.7).

4. 3. Sibling associations

Table 3 presents results from identical models to Table 2, applied to sibling pairs: family race, younger sibling sex, younger sibling age, and younger sibling education do not have statistically significant associations with the geographic proximity of siblings in these models. Among older siblings' socio-demographic characteristics, compared to older brothers, older sisters are less likely to live in the same tract as their younger sibling (ame= −0.03; coefficient=−0.29; sd=0.14). Compared to single older siblings, partnered older siblings are less likely to live in the same household (ame=−0.14; coefficient=−3.22; sd=0.47) and tract (ame=−0.07; coefficient=−0.63; sd=0.15) as their younger siblings. Older siblings who have children are also less likely to live in the same household (ame=−0.12; coefficient=−1.89; sd=0.25), but more likely to live in the same tract (ame=0.07; coefficient=0.65; sd=0.17), as their younger siblings. Additionally, compared to older siblings who did not attend college, older siblings who attended college are less likely to live in the same tract as their younger siblings (ame=−0.05; coefficient=−0.48; sd=0.15) and live farther away on average from them (ame=74.4; sd=19.5).

Turning to younger sibling socio-demographic characteristics, relationship and parental status are also important predictors of proximity to older siblings. Compared to single younger siblings, partnered younger siblings are less likely to live in the same household (ame=−0.10; coefficient=−1.98; sd=0.43) or tract (ame=−0.05; coefficient=−0.44; sd=0.16) as their older siblings, and live farther away from them when they do not reside in the same tract (ame=55.6; sd=18.0). Similarly, compared to younger siblings without children,

younger siblings with children are less likely to live in the same household (ame=−0.07; coefficient=−1.28; sd=0.29), but more likely to live in the same tract (ame=0.04; coefficient=0.37; sd=0.16), as their older siblings.

4. 4 Grandparent and grandchild associations

Table 4 presents results from identically specified models as in Tables 2 and 3, applied to grandparent and grandchild pairs. Family race and sex of grandparent are not associated with grandparent and grandchild spatial proximity in these models. Among grandparent sociodemographic characteristics, compared to those aged 66+, grandparents aged 51–65 are more likely to live in the same household as their grandchildren (ame=0.09; coefficient=1.84; sd=0.26) and live farther away from them (ame=−76.4; sd=28.9). Compared to single grandparents, partnered grandparents are less likely to live in the same household (ame=−0.03; coefficient=−0.88; sd=0.26) and tract (ame=−0.05; coefficient=−0.57; sd=0.16) as their grandchildren, and live farther away from them when they do not reside in the same tract (ame=61.0; sd=23.4). In contrast, compared to grandparents without a measured child tie in the dataset, grandparents with measured child ties are more likely to live in the same tract as their grandchildren (ame=0.06; coefficient=0.88; sd=0.30) and live closer to them when they do not (ame=−110.2; sd=35.1). Grandparent education is also an important predictor of geographic proximity to grandchildren: compared to grandparents who did not attend college, grandparents who attended college are less likely to live in the same tract as their grandchildren (ame=−0.06; coefficient=−0.88; sd=0.22), and live farther away from them when they do not (ame=62.6; sd=24.8).

Turning to grandchildren's sociodemographic predictors of geographic proximity to grandparents, compared to grandsons, granddaughters are more likely to live in the same tract as their grandparents (ame=0.03; coefficient=0.35; sd=0.16). Compared to single grandchildren, partnered grandchildren are less likely to live in the same household (ame=−0.03; coefficient=−1.10; sd=0.34) or tract (ame=−0.04; coefficient=−0.49; sd=0.17) as their grandparents. Similarly, compared to grandchildren without children, grandchildren with children are less likely to live in the same household (ame=−0.02; coefficient=−0.63; sd=0.30) or tract (ame=−0.03; coefficient=−0.42; sd=0.17) as their grandparents, and live closer to them when they do not reside in the same tract (ame=−53.0; sd=22.8). Additionally, compared to grandchildren who did not attend college, grandchildren who attend college live farther away from their grandparents (ame=85.3; sd=20.7) when they do not reside in the same tract.

4. 5. Aunt-uncle and niece-nephew associations

Table 5 presents results from identical models as in Tables 2 through 4, applied to aunt or uncle and niece or nephew pairs. However, because household co-residence is uncommon for these (and cousin) pairs, we only present models predicting tract co-residence and inter-tract distance. Sex of aunt or uncle and niece or nephew, age of aunt or uncle, and parental status of aunt or uncle are not predictive of the geographic proximity between aunt or uncle and niece or nephew in these models. Family race is associated with the probability that aunts or uncles and nieces or nephews live in the same tract, with members of Black families more likely to do so than Whites (ame=0.02; coefficient=0.26; sd=0.11). Compared to single

aunts or uncles, partnered aunts or uncles live closer to their nieces or nephews (ame=−43.6; sd=13.7). And compared to aunts or uncles who did not attend college, those who did attend college are less likely to reside in the same tract as their nieces or nephews (ame=−0.034; coefficient=−0.53; sd=0.12) and live farther away when they do not (ame=93.7; sd=14.5).

Turning to socio-demographic characteristics of nieces or nephews, compared to nieces or nephews aged 18–35, those aged 36–50 live closer to their aunts or uncles (ame=−70.3; sd=19.8). Compared to single nieces or nephews, partnered ones are less likely to live in the same tract as their aunts or uncles (ame=−0.051; coefficient=−0.87; sd=0.15) and live farther away when they do not (ame=74.0; sd=16.8). Compared to childless nieces or nephews, those with children live closer to their aunts or uncles when they do not reside in the same tract (ame=−88.9; sd=15.3). Furthermore, compared to nieces or nephews who did not attend college, those who attended college live farther away from their aunts or uncles when they do not reside in the same tract (ame=90.4; sd=14.3).

4. 6. Cousin Associations

Table 6 presents results from identically specified models as in Tables 2 through 5, applied to pairs of cousins. Sex of older and younger cousins and age of younger cousins are not associated with geographic proximity to cousins in these models. Family race is associated with the odds that cousins reside in the same tract, as Black cousins are more likely to do so than White cousins (ame=0.03; coefficient=0.57; sd=0.21). Compared to older cousins aged 18–35, those aged 36–50 who do not co-reside in the same tract live closer to their younger cousins (ame=−99.4; sd=23.2). Compared to single older cousins, partnered ones are less likely to live in the same tract as their younger cousins (ame=−0.026; coefficient=−0.52; sd=0.24). Compared to older cousins without children, those who are parents live closer to their younger cousins when they do not reside in the same tract (ame=−52.4; sd=23.3). Additionally, compared to older cousins who did not attend college, those who did and do not reside in the same tract as their younger cousins live farther away from them (ame=89.8; sd=20.7).

Turning to the socio-demographic traits of younger cousins, younger cousins' relationship status is a significant predictor of proximity to older cousins: compared to single younger cousins, partnered ones are less likely to reside in the same tract as their older cousin (ame=−0.03; coefficient=−0.69; sd=0.33), and live farther away from them when they do not (ame=64.4; sd=28.5). In contrast, compared to childless younger cousins, those with children live closer to their older cousins when they do not reside in the same tract (ame=−80.5; sd=25.4). Finally, compared to younger cousins who did not attend college, those who did live farther away from their older cousins when they do not reside in the same tract (ame=92.3; sd=21.9).

4. 6. Kin set fixed effects

Table 7 presents kin set fixed effects models for younger kin traits effects on kin proximity for parents and children, grandparents and grandchildren, and aunts or uncles and nieces or nephews. The effects of older kin traits are differenced out of the fixed-effects model. Results for same county and same state status are presented in Table B in the appendix. For

sex, nieces reproduce their associations from the non-fixed-effects models, as they are less likely to live in the same county, more likely to live in the same state (but different county), and live farther from their aunts or uncles than nephews. However, the fixed-effects models indicate that the associations between women with proximity to parents or grandparents are not robust to removal of family-specific unobserved heterogeneity.

In these models, age is strongly associated with the odds of living with one's parents, as children aged 36–50 and 51–65 are significantly less likely than 18–35 year olds to do so. However, 51–65 year-old children are more likely to live in the same county (but not tract) as their parents, reproducing findings from the non-fixed-effects models in Table 2. The only other age effect found in the fixed-effects analysis is that older grandchildren are less likely to live in the same tract as their grandparents.

The relationship status of kin is also a significant determinant of proximity to older kin within kin sets. In these models, partnered children are significantly less likely to live in the same household or tract as their parents compared to their single siblings, but are more likely to live in the same county or state. In aunt or uncle and niece or nephew kin sets, partnered nieces or nephews are less likely to live in the same tract or county as their aunts or uncles, and live farther away from their nieces or nephews, than their single counterparts. No relationship status effects among cousins in the grandparent and grandchild kin set fixed-effects models were found.

Parental status shows evidence of similar effects to relationship status in the kin set fixed-effects models. Children who have children are less likely than their non-parent siblings to live in the same household as their parents, and more likely to live in the same county (but not the same tract). Grandchildren with children are more likely than their cousins who are not parents to live in the same state (but not the same county) as their grandparents, and live closer to them. Among nieces or nephews, those with children are more likely to live in the same tract or county as their aunts or uncles, and live closer to them than their non-parent counterparts in the same kin set.

Finally, the strong education effects observed in non-fixed effects are largely not reproduced. The only association between education and kin proximity that remains within kin sets is the negative association between college attendance and living in the same household as one's parents.

5. Conclusion

Kin proximity is an essential component of the potential to provide social support, at least in terms of regular day-to-day help with tasks that require physical presence (such as childcare and elder care). Prior work in the United States context has focused almost exclusively on only the most immediate form of proximity — co-residence — to the neglect of other relevant measures of distance. It has also ignored proximity to a large set of kin, focusing narrowly on proximity to parents, children, and only very occasionally siblings and grandparents. We contribute by analyzing patterns of spatial distance between a large set of extended kin relationships in a large population-based subset of the U.S. population.

We find that kin pairs vary widely in their odds of residence in the same household, census tract, and inter-tract distances if they do not live in the same tract. Comparing the most proximate kin groups for each of our spatial proximity measures, parents and children have a 0.31 higher probability of living in the same household than do aunts or uncles and nieces or nephews and a 0.09 higher probability of living in the same tract but in a different household than do cousins; siblings have a 0.10 higher probability of living in the same county but not the same tract than do parents and children; cousins have a 0.15 higher probability of living in the same state but not the same county than do parents and children; and siblings who do not live in the same census tract live in tracts with centroids 104.5 miles closer to each other than do grandparents and grandchildren. Altogether, parents and children have the highest probabilities of living very close to one another (same household or census tract), siblings are the most proximate to one another among those who do not live in the same tract, and grandparents and grandchildren live the farthest apart from one another when they do not live in the same tract.

The demographic and socioeconomic characteristics of both members of kin pairs are associated with the odds of these same outcomes: age, education, marital status, and parental status are consistently significantly associated with kin proximity across relationship types and measures of proximity. Surprisingly, race and sex have relatively weak associations with proximity to kin. These findings hold after controlling for potential confounds such as education, race, age, and sex. Fixed-effects models show that not all of these factors are robust to the removal of within-family unobserved heterogeneity.

Childbearing and partnership status are critical factors influencing how far people live from their kin, and therefore likely influence kinship patterns of contact and exchange. While having a partner greatly decreases the probability of co-residence with kin (by 0.33 for parents and children, for example), having a child increases the odds of propinquity (increasing the probability of living in the same county as one's parent by .06 and reducing inter-tract distance between parents and children by 66.1 miles, for example), which has implications for the exchange of social support at a time when it is most needed for young families. For instance, single individuals are more likely than partnered kin to co-reside with and live near their kin. Thus, for both older and younger kin, secondary kinship ties can attain stronger importance when partner co-residence is not present. Thus the absence of a partner may constrain individuals' willingness to move away from the close ties that they have, or conversely, losing a partner to separation, divorce, or death may prompt many individuals to move near kin (or their kin to move near them).

Among limitations, first, our measure of spatial distance between kin is subject to left-truncation, such that the distance between persons in the same tract is unmeasured if these persons do not reside in the same household. Second, our measurement of kinship networks is limited by the fact that the families of persons who join the focal lineage through marriage or co-resident partnership are unmeasured unless they live with a member of the focal lineage at some point during the survey. These data have biases in terms of the kin that we record; although procedures exist to correct for these biases (Daw, Verdery, and Margolis, 2016), they cannot be employed here. Relatedly, a consequence of relying on a sample that longitudinally tracks households since 1968 is that the data do not have strong external

validity for groups who migrated to the United States in subsequent years. Because of this, we limit our analyses to households where the head of household in 1968 was identified White or Black.

Appendix

Table A:

Same-county and same–state models, by kin pair relationship

	Parents and children		Siblings		Grandparents and grandchildren		Aunts or uncles and nieces or nephews		Cousins	
Family traits	**County**	**State**	**County**	**State**	**County**	**State**	**County**	**State**	**County**	**State**
Race:										
White (ref.)	0.25	0.17	0.33	0.25	0.28	0.28	0.30	0.32	0.29	0.35
Black	0.25	0.16	0.37*	0.22	0.31	0.27	0.34**	0.28**	0.33	0.27**
Older										
Sex:										
men (ref.)	0.24	0.17	0.33	0.22	0.28	0.27	0.30	0.30	0.32	0.30
women	0.25	0.17	0.36	0.25	0.30	0.28	0.33*	0.31	0.30	0.33
Age:										
18–35	--	--	0.33	0.21	--	--	0.44	0.23	0.31	0.31
36–50	0.23	0.12	0.35	0.28*	--	--	0.33**	0.32**	0.27	0.39*
51–65	0.26	0.18**	0.37	0.25	0.33	0.25	0.28**	0.31**	--	--
66+	0.25	0.18	--	--	0.29	0.29	--	--	--	--
Relationship status:										
single (ref.)	0.28	0.14	0.33	0.19	0.31	0.26	0.29	0.29	0.35	0.28
partnered	0.23**	0.18**	0.36	0.29**	0.28	0.30	0.33**	0.32	0.26**	0.37**
Parental status:										
non-parent (ref.)	--	--	0.28	0.26	0.26	0.25	0.29	0.36	0.26	0.34
parent	0.25	0.17	0.39**	0.22	0.30	0.28	0.32*	0.29**	0.35**	0.30
Education:										
<=high school (ref.)	0.25	0.16	0.36	0.23	0.29	0.28	0.35	0.31	0.35	0.32
>high school	0.26	0.17	0.32	0.26	0.30	0.29	0.26**	0.30	0.26**	0.31
Younger kin traits										
Sex:										
men (ref.)	0.24	0.15	0.33	0.24	0.30	0.30	0.32	0.28	0.34	0.29
women	0.26	0.18*	0.36	0.24	0.29	0.27	0.31	0.33**	0.27**	0.34*
Age:										
18–35 (ref.)	0.24	0.16	0.38	0.22	0.29	0.28	0.32	0.30	0.31	0.32

	Parents and children		Siblings		Grandparents and grandchildren		Aunts or uncles and nieces or nephews		Cousins	
Family traits	**County**	**State**	**County**	**State**	**County**	**State**	**County**	**State**	**County**	**State**
36–50	0.26	0.18	0.33	0.27	0.27	0.29	0.26	0.36	0.35	0.27
51–65	0.26	0.17	0.25*	0.25	--	--	--	--	--	--
Relationship status:										
single (ref.)	0.20	0.12	0.33	0.23	0.29	0.27	0.35	0.29	0.33	0.29
partnered	0.31**	0.21**	0.37	0.25	0.29	0.30	0.25**	0.35**	0.24*	0.38**
Parental status:										
non-parent (ref.)	0.18	0.15	0.32	0.23	0.30	0.25	0.30	0.30	0.31	0.31
parent	0.32**	0.18	0.37*	0.24	0.29	0.32**	0.34*	0.31	0.31	0.33
Education:										
<=high school (ref.)	0.25	0.14	0.36	0.22	0.33	0.29	0.33	0.32	0.32	0.34
>high school	0.25	0.19**	0.32	0.27**	0.26**	0.27	0.29**	0.29	0.28	0.28**
N	4,243	4,243	2,129	2,129	2,101	2,101	4,731	4,731	1,772	1,772

Table B:

Same-county and same-state fixed effects models, by intergenerational kin pair relationship

	Parents and children		Grandparents and grandchildren		Aunts or uncles and nieces or nephews	
Younger kin traits	**County**	**State**	**County**	**State**	**County**	**State**
Sex:						
Men (ref.)	--	--	--	--	--	--
Women	0.08	0.25	−0.02	−0.08	−0.38**	0.70**
Age:						
18–35 (ref.)	--	--	--	--	--	--
36–50	0.19	0.63	−0.05	−0.15	−0.15	0.04
51–65	0.90*	0.29				
Relationship status:						
single (ref.)	--	--	--	--	--	--
partnered	0.66**	0.92**	0.08	−0.28	−0.65**	0.28
Parental status:						
non-parent (ref.)	--	--	--	--	--	--
parent	0.88**	0.34	−0.06	0.74**	0.51**	−0.07
Education:						
<=high school (ref.)	--	--	--	--	--	--
>high school	0.29	0.33	−0.30	−0.10	0.14	−0.17
Intercept	--	--	--	--	--	--

	Parents and children		Grandparents and grandchildren		Aunts or uncles and nieces or nephews	
Younger kin traits	**County**	**State**	**County**	**State**	**County**	**State**
N (younger kin)	1,157	771	853	860	1,648	1,731
N (older kin)	437	297	144	156	347	364

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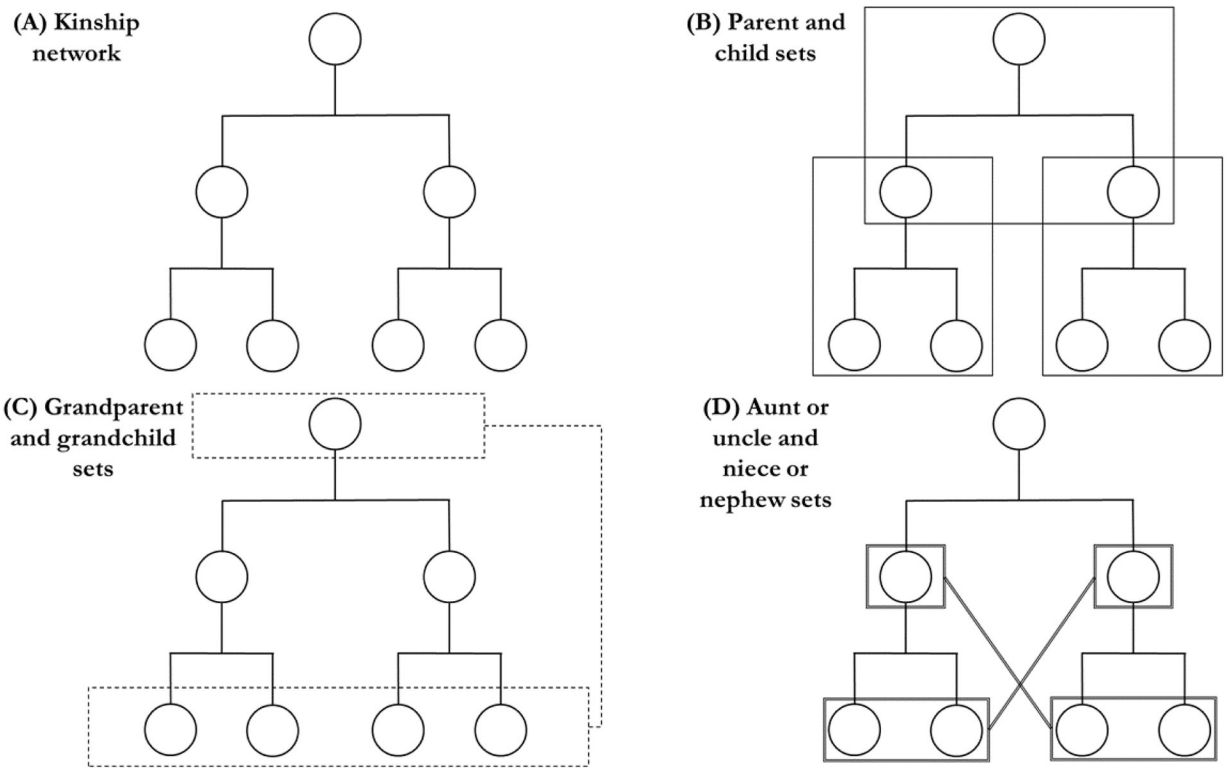

Figure 1:
Kin sets

Table 1:

Sample descriptive statistics, panel study of income dynamics

Variable	Parents and Children (*N*=4,243)	Siblings (*N*=2,129)	Grandparents and Grandchildren (*N*=2,101)	Aunts or Uncles and Nieces or Nephews (*N*=4,731)	Cousins (*N*=1,772)
Same household	0.31	0.12	0.03	0+	0+
Same tract, different household	0.15	0.13	0.10	0.07	0.06
Same county, different tract	0.25	0.35	0.29	0.31	0.31
Same state, different county	0.17	0.24	0.28	0.31	0.32
Inter-centroid distance (miles), different tract	181	158	262	239	237
Race:					
White	0.68	0.63	0.69	0.64	0.61
Black	0.32	0.38	0.31	0.36	0.39
Older kin traits					
Sex:					
Men	0.39	0.43	0.34	0.43	0.44
Women	0.61	0.57	0.66	0.57	0.56
Age:					
18–35	0.00	0.51	0.00	0.06	0.88
36–50	0.31	0.24	0.00	0.46	0.12
51–65	0.44	0.26	0.14	0.48	0.00
66+	0.25	0.00	0.86	0.00	0.00
Relationship Status:					
single	0.35	0.50	0.46	0.41	0.57
partnered	0.65	0.50	0.54	0.59	0.43
Parental status:					
non-parent	0.00	0.41	0.13	0.26	0.41
parent	1.00	0.59	0.87	0.74	0.59
Education					
<=high school	0.65	0.59	0.73	0.61	0.55
>high school	0.35	0.41	0.27	0.39	0.45
Younger kin traits					
Sex:					
men	0.45	0.47	0.49	0.47	0.48
women	0.55	0.53	0.51	0.53	0.52
Age:					
18–35	0.68	0.59	0.92	0.95	0.99
36–50	0.23	0.29	0.08	0.05	0.01
51–65	0.10	0.12	0.00	0.00	0.00
66+	0.00	0.00	0.00	0.00	0.00
Relationship status:					
single	0.57	0.59	0.61	0.66	0.74

Variable	Parents and Children (*N*=4,243)	Siblings (*N*=2,129)	Grandparents and Grandchildren (*N*=2,101)	Aunts or Uncles and Nieces or Nephews (*N*=4,731)	Cousins (*N*=1,772)
partnered	0.43	0.41	0.39	0.34	0.26
Parental Status:					
non-parent	0.53	0.50	0.56	0.60	0.66
parent	0.47	0.50	0.44	0.40	0.34
Education:					
<=high school	0.53	0.65	0.50	0.58	0.63
>high school	0.47	0.35	0.50	0.42	0.37

Source: Panel Study of Income Dynamics 2009.

Table 2:

Margins of responses for geographic proximity, parent and child pairs

Family traits	Household	Tract	Distance
Race:			
White (ref.)	0.31	0.15	180
Black	0.31	0.15	184
Parent traits			
Sex:			
men (ref.)	0.31	0.14	196
women	0.31	0.15	172
Age:			
36–50	0.35**	0.12*	220
51–65	0.28	0.16	173
66+ (ref.)	0.27	0.17	171
Relationship status:			
single (ref.)	0.30	0.16	167
partnered	0.31	0.14	189
Education:			
<=high school (ref.)	0.31	0.17	156
>high school	0.30	0.10**	222**
Child traits			
Sex:			
men (ref.)	0.31	0.16	175
women	0.31	0.14	186
Age:			
18–35 (ref.)	0.34	0.15	147
36–50	0.18**	0.16	206*
51–65	0.17**	0.13	270**
Relationship status:			
single (ref.)	0.41	0.15	177
partnered	0.08**	0.14	184
Parental status:			
non-parent (ref.)	0.37	0.12	222
parent	0.17**	0.18**	156**
Education:			
<=high school (ref.)	0.33	0.16	160
>high school	0.28**	0.13**	200*
N	4,243	4,243	2,311

Source: Panel Study of Income Dynamics 2009.

Table 3:

Margins of responses for geographic proximity, sibling pairs

Family traits	Household	Tract	Distance
Race:			
White (ref.)	0.11	0.14	156
Black	0.13	0.13	161
Older sibling traits			
Sex:			
men (ref.)	0.12	0.15	158
women	0.11	0.12*	157
Age:			
18–35 (ref.)	0.13	0.17	153
36–50	0.09	0.10*	155
51–65	0.03*	0.10	166
Relationship status:			
single (ref.)	0.15	0.17	152
partnered	0.01**	0.10**	162
Parental status:			
non-parent (ref.)	0.16	0.09	172
parent	0.04**	0.16**	150
Education:			
<=high school (ref.)	0.12	0.15	126
>high school	0.11	0.10**	200**
Younger sibling traits			
Sex:			
men (ref.)	0.11	0.15	159
women	0.12	0.12	157
Age:			
18–35 (ref.)	0.12	0.12	159
36–50	0.09	0.15	143
51–65	0.16	0.17	186
Relationship status:			
single (ref.)	0.13	0.15	131
partnered	0.03**	0.10**	186**
Parental status:			
non-parent (ref.)	0.13	0.11	177
parent	0.06**	0.15*	143
Education:			
<=high school (ref.)	0.12	0.14	157
>high school	0.10	0.12	158
N	2,129	2,129	1,604

Source: Panel Study of Income Dynamics 2009.

Table 4:

Margins of responses for geographic proximity, grandparent and grandchild pairs

Family traits	Household	Tract	Distance
Race:			
White (ref.)	0.03	0.10	250
Black	0.04	0.10	290
Grandparent traits			
Sex:			
men (ref.)	0.04	0.10	274
women	0.03	0.10	256
Age:			
51–65	0.11**	0.11	195**
66+ (ref.)	0.02	0.10	271
Relationship status:	0.05	0.12	228
single (ref.)	0.02**	0.07**	289**
partnered			
Parental status:	0.05	0.05	357
non-parent (ref.)	0.03	0.10**	247**
parent			
Education:	0.04	0.11	244
<=high school (ref.)	0.02	0.05**	307*
>high school			
Grandchild traits			
Sex:			
men (ref.)	0.04	0.08	256
women	0.03	0.11*	268
Age:			
18–35 (ref.)	0.03	0.10	257
36–50	0.04**	0.08	312
Relationship status:			
single (ref.)	0.04	0.11	264
partnered	0.02**	0.07**	260
Parental status:			
non-parent (ref.)	0.04	0.11	287
parent	0.02*	0.08*	234*
Education:			
<=high school (ref.)	0.04	0.10	219
>high school	0.03	0.10	304**
N	2,101	2,101	1,826

Source: Panel Study of Income Dynamics 2009.

Table 5:

Margins of responses for geographic proximity, aunt or uncle and niece or nephew pairs

Family traits	Tract	Distance
Race:		
White (ref.)	0.07	235
Black	0.09*	246
Aunt or uncle traits		
Sex:		
men (ref.)	0.07	249
women	0.08	231
Age:		
18–35 (ref.)	0.08	234
36–50	0.08	228
51–65	0.07	249
Relationship status:		
single (ref.)	0.07	264
partnered	0.08	221**
Parental status:		
non-parent (ref.)	0.07	236
parent	0.08	240
Education:		
<=high school (ref.)	0.09	201
>high school	0.05**	295**
Niece or nephew traits		
Sex:		
men (ref.)	0.08	250
women	0.07	228
Age:		
18–35 (ref.)	0.08	242
36–50	0.06	172**
Relationship status:		
single (ref.)	0.09	213
partnered	0.04**	287**
Parental status:		
non-parent (ref.)	0.07	275
parent	0.08	186**
Education:		
<=high school (ref.)	0.08	200
>high school	0.07	290**
N	4,731	4,375

Source: Panel Study of Income Dynamics 2009.

Table 6:

Margins of responses for geographic proximity, cousin pairs

Family traits	Tract	Distance
Race:		
White (ref.)	0.05	223
Black	0.08**	259
Older cousin traits		
Sex:		
men (ref.)	0.07	252
women	0.05	225
Age:		
18–35 (ref.)	0.06	249
36–50	0.04	149**
Relationship status:		
single (ref.)	0.07	233
partnered	0.04*	241
Parental status:		
non-parent (ref.)	0.05	268
parent	0.06	216*
Education:		
<=high school (ref.)	0.06	196
>high school	0.06	286**
Younger cousin traits		
Sex:		
men (ref.)	0.05	231
women	0.06	242
Age:		
18–35 (ref.)	0.06	237
36–50	0.10	259
Relationship status:		
single (ref.)	0.06	220
partnered	0.03*	284*
Parental status:		
non-parent (ref.)	0.06	265
parent	0.06	184**
Education:		
<=high school (ref.)	0.06	202
>high school	0.05	294**
N	1,772	1,666

Source: Panel Study of Income Dynamics 2009.

Table 7:

Fixed effects models of intergenerational kin pair proximity

	Parent and child			Grandparent and grandchild			Aunt or uncle and niece or nephew	
Younger kin traits	**Household**	**Tract**	**Distance**	**Household**	**Tract**	**Distance**	**Tract**	**Distance**
Sex:								
men (ref.)	--	--	--	--	--	--	--	--
women	−0.03	−0.16	11	−0.99	0.25	6	−0.36	−28**
Age:								
18–35 (ref.)	--	--	--	--	--	--	--	--
36–50	−4.52**	−0.02	55	0.38	−1.41*	30	−0.19	−4
51–65	−5.64**	−0.29	97	--	--	--	--	--
Relationship status:								
single (ref.)	--	--	--	--	--	--	--	--
partnered	−4.22**	−0.51**	−5	−17.30	−0.54	−27	−1.27**	73**
Parental status:								
non-parent (ref.)	--	--	--	--	--	--	--	--
parent	−1.93**	0.32	−38	−0.80	−0.39	−72**	0.48*	−75**
Education:								
<=high school (ref.)	--	--	--	--	--	--	--	--
>high school	−1.00**	−0.02	−3	−0.78	0.06	21	−0.07	8
Intercept	--	--	174**	--	--	291**	--	255**
N (younger kin)	877	827	2,311	67	485	1,826	760	4,375
N (older kin)	339	306	1,617	16	84	613	143	1,703

Source: Panel Study of Income Dynamics 2009.