KINSHIP NETWORKS THAT CROSS RACIAL LINES: THE EXCEPTION OR THE RULE?*

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I estimate the frequencies of interracial kin relations, an important indicator of the isolation of racial groups in the United States. I use two techniques to estimate the size and heterogeneity of extended families. First, I develop a simple model that takes account only of kinship network sizes and intermarriage levels by race. This model allows a crude estimation of the frequency of multiracial kinship networks. Second, I produce more precise empirical estimates using a new hot-deck imputation method for synthesizing kinship networks from household-level survey data (the June 1990 Current Population Survey and the 1994 General Social Survey). One in seven whites, one in three blacks, four in five Asians, and more than 19 in 20 American Indians are closely related to someone of a different racial group. Despite an intermarriage rate of about 1%, about 20% of Americans count someone from a different racial group among their kin.

> The two races [Black and White] are bound one to the other without mingling; it is equally difficult for them to separate completely or to unite.
>
> —de Tocqueville, *Democracy in America*

How separate are the lives of Americans of different races? Usually this question is asked from the perspective of neighborhoods, workplaces, and schools. In this paper I examine the racial heterogeneity of the extended family.

Interracial marriage has been rising slowly for several decades, but Americans still overwhelmingly choose spouses of the same race. Tabulations from the 1990 Current Population Survey (CPS) show that only about 1 in 100 people is married to someone who self-identifies with a different racial category. (The CPS classifies race as "white," "black," "American Indian," "Asian," and "other.") Even when intermarriages are relatively rare, kinship ties can multiply their effect. This, combined with an increase in the number of people who have more than one spouse over their lifetimes, suggests that a surprisingly large portion of American society may be living in a multiracial extended family.

Typically, racial and ethnic intermarriage has been studied as an outcome variable, a measure of the social divide between groups. Recent research on intermarriage between blacks and whites (Kalmijn 1993), between Hispanics and non-Hispanics (Schoen, Wooldredge, and Thomas 1989), and between white ethnic groups (Lieberson and Waters 1988; Pagnini and Morgan 1990) explores the ways in which intermarriage patterns can be used as measures of social distance. But intermarriage can also be viewed as an engine of social change. A growing multiracial population is formed by the offspring of intermarriages (Edmonston and Passel 1993). Furthermore, the voluntary union of two individuals creates a set of involuntary, but nonetheless real, kin relations. Spouses may choose their mates, but other kin—children-in-law, siblings-in-law, stepparents, grandchildren, affinal uncles and aunts—are not chosen. Kinship thus provides a unique mechanism for introducing heterogeneity into social networks. Although those related by blood or marriage are not guaranteed to form close emotional bonds, kinship ties increase the closeness of individuals who, because of different backgrounds, might otherwise have little to do with one another. The family may provide a means of integrating an otherwise racially divided society (cf. Massey 1996).

Neither the decennial census nor sample surveys are informative about the full extent to which kinship ties join people from different racial groups. Many kinship relations occur between, and not within, households. I use models in combination with survey data to estimate the frequency of interracial kinship relations. I start with a simple model of kinship network size and intermarriage levels, which provides crude estimates. I then develop more precise estimates by synthesizing extended families from household-level survey data using a hot-deck imputation technique similar to those used for treating missing data (Ford 1983; Hammel and Herrchen 1993; Little and Rubin 1987).

The formal kin relationships I address are not necessarily synonymous with one's socially defined family. For example, being related to a brother in-law does not imply regular contact or even a sense of a bond with him. At the same time, individuals to whom one is not related, either by blood or marriage, may be referred to in kinship terms, such as *uncle* and *aunt*. It is convenient, however, to limit the analysis to formal kinship relations for two reasons: First, formal relations are easy to specify (e.g., a daughter-in-law is the spouse of one's son). Second, formal kinship relations, for which there exist kinship terms, are thought to reflect prevailing cultural practices. This latter view is in line with the anthropological tradition (Romney and D'Andrade 1964; Schneider 1980), in which formal kin-

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ship structure and terminology reveal underlying social and cultural reality.[1]

Little research has been conducted on the consequences of the racial integration of family life, particularly at the level of the extended family. It is known that intermarriages have a direct consequence for the children that are born into them, creating a new set of mixed and multiple racial identities (Root 1992). For the extended family, perhaps the best source of knowledge is the experience of previous generations, for which intermarriage between white European groups is seen as a force that reduced social distance between ethnic groups. Spickard and Fong (1995, as cited in Waters 1997:447) point out that the whole family, not just the couple, was affected by the intermarriage: "Almost no White American extended family exists today without at least one member who has married across what two generations ago would have been thought an unbridgeable gap."

A large body of research suggests that contact between people of different races in the school, neighborhood, and workplace improves intergroup relations and lessens the social distance between groups (see Amir 1969 and Stephan 1985 for reviews of this literature). The most important conditions that promote improvements in intergroup relations are (a) that contact be made in an equal-status setting; (b) that the occasions for contact be generally pleasant and rewarding; and (c) that contact be intimate rather than casual. The family appears to meet all three conditions. On the other hand, contact that is "unpleasant, involuntary, [or] tension laden" can strengthen negative intergroup attitudes (Amir 1969:338). The effect of having kin of another race thus probably varies from one family to another. In extended families with relatively egalitarian relations, in which family occasions tend to be happy and family bonds tend to be strong, racial intermarriage could be expected to have the most positive consequences. On the other hand, in families already fractured by dispute, intermarriage could worsen racial attitudes. Although this paper is limited to quantifying the frequency of interracial kinship relations, the consequences of such relationships remain a promising focus for future research.

In this paper, I address the following questions: How common is it to belong to a multiracial extended family? How do participation rates in multiracial families vary by the race of the individual? How much change in intermarriage rates would be required for most Americans to belong to multiracial kin groups, and what are the prospects of this change occurring?

1. In her study of kinship and support networks in a lower-class black community, Stack (1974:54) stresses that the "choice of which relatives an individual draws into her personal kindred is by no means mechanical." Despite this subjective component, kin relationships are fundamentally different from non-kin relations. "Members of domestic networks in The Flats are drawn from kin and friends. Of the two, the kin network is more enduring....Friendships end and that is to be expected; new friendships can be formed. But the number of relatives who can be called upon for help from personal kinship networks is limited. As a result a cluster of relatives from personal kinship networks have continuing claims on one another" (Stack 1974:61).

An important factor in answering all of these questions is how intermarriages are distributed across society. If intermarriages cluster into particular social strata, then even high levels of intermarriage will affect only a small proportion of the U.S. population. On the other hand, the more evenly distributed intermarriages are, the more people will be affected by them, either directly or indirectly.

Because the structure of the family has changed so much in recent decades, I include the stepkin and other relations produced by divorce and remarriage in defining the kin network. Remarriage introduces additional opportunities for the creation of multiracial families.

A SIMPLE MODEL

I begin by developing a simple model for the frequency of multiracial kinship. The simple model assumes (1) equal probabilities of intermarriage within racial groups; (2) independence among the marriage decisions of individuals in the same family; (3) similar family structures for all races; and (4) no variation in kinship network size. The imputation methods I use later will allow me to weaken these assumptions considerably by introducing empirical variability in kinship structure and intermarriage frequencies by sex, educational attainment, age, and geography.

The American kinship network consists of ties by marriage and ties through descent. (Schneider 1980). Assuming that there is no adoption and that race is an inherited characteristic, the only way one can belong to a multiracial kinship network is for someone in the network to intermarry. The chance that an individual belongs to a multiracial kin group is the complement of the chance that nobody in the individual's kin group intermarries. Independence between marriages then implies that the chance p_i that an individual of race i belongs to a multiracial kinship network is

$$p_i = 1 - \alpha_i^n, \tag{1}$$

where α_i is proportion of in-marriage of individuals in race i, and n is the number of marriages in the kinship group.[2]

Intermarriage Rates

Estimates of the levels of intermarriage in the contemporary population can be can be tabulated from census or survey

2. Variability in the size of kin networks will reduce the proportion of mixed networks. Eq. (1) is nonlinear: A marginal increase in network size will increase heterogeneity less than a marginal decrease in network size will reduce heterogeneity. To correct for this, a more precise formulation of the chance that the average kinship network is multiracial is

$$\bar{p} = \sum_n f(n) \times (1 - \alpha^n), \tag{FN1}$$

where $f(n)$ is the proportion of networks of size n. Using the mean kinship network size $\bar{n}$,

$$\hat{p} = 1 - \alpha^{\bar{n}} \tag{FN2}$$

will overstate the proportion of mixed networks unless all the networks are the same size. I use Eq. (FN2) for the crude model. An advantage of using the imputed kin networks is that they incorporate the full distribution of network sizes and the variability of the distribution by covariates such as race and education.

TABLE 1. CROSS-CLASSIFICATION OF MARRIAGES IN THE 1990 CURRENT POPULATION SURVEY, BY RACE OF HUSBAND AND WIFE

	Race of Wife					
Race of Husband	White	Black	American Indian	Asian	Other	All
White	28,085	29	94	143	5	28,356
Black	71	1,848	5	10	4	1,938
American Indian	99	5	113	2	0	219
Asian	82	0	0	695	0	777
Other	8	1	0	2	47	58
All	28,345	1,883	212	852	56	31,348

data. Table 1 cross-classifies the 31,348 marriages by the racial identification of husband and wife, for wives aged 15 to 65 in the June 1990 Current Population Survey (CPS), Fertility, Birth Expectations, and Marital History Supplement (U.S. Bureau of the Census, Demographic Surveys Division 1991).

The prominence of the main diagonal shows that inmarriage is greatly preferred, with more than 98% of marriages between people of the same race. This overall figure is strongly influenced by the preponderance of whites, who have the lowest intermarriage rate, and masks much higher rates of intermarriage by minority men and women. Whites intermarry only 1.0% of the time. Blacks intermarry about 3.3% of the time, with the most common form of intermarriage being between black men and white women. Asians intermarry about 14.7% of the time, with the most common form of intermarriage being between Asian women and white men. American Indians intermarry at the highest rate, with almost half (47.6%) marrying individuals identifying with other groups.

These intermarriage levels reflect the stock of marriages among women aged 15 to 65 in 1990. Because intermarriage has been steadily rising over this period, the population levels are an underestimate of current intermarriage rates. For example, the percentage of black men marrying white women rose from 2.4% in the early 1970s to 5.4% in the mid-1980s (Kalmijn 1993:130).

Kinship Network Size

The number of marriages in the typical kinship network depends on how far one extends kinship status. The closest three-generational kinship group includes the individual's parents, spouse, and children. Adding lateral kinship ties—siblings, siblings-in-law, uncles and aunts, cousins, and nieces and nephews—produces what I call the group of *near kin*. All near kin would be considered relatives by most Americans, with kin terms existing for each individual as part of the American kinship system (Schneider 1980).[3]

Figure 1 illustrates the closest and near-kin networks for a hypothetical female. In this example, everyone marries exactly once and has exactly one son and one daughter. The close-kin network contains four marriages, and the near-kin network includes eight marriages. This schematization tends to overestimate the number of kin who are married at any point, as all three generations are depicted as both alive and married. On the other hand, the three-generational picture is an underestimate of the cumulative life course experience of an individual, who would typically encounter five generations: her grandparents', her parents', her own, her children's, and her grandchildren's. It is perhaps best to view the three-generational formulation of the kin network as a snapshot of the kinship structure of a middle-aged individual, young enough that both of her parents are still alive but old enough that her children have married.

One can refine the counts of marriages within the kin network by incorporating empirical estimates of the mean number of children ($\bar{N}$) and the mean number of siblings ($\bar{S}$). Assuming for the moment that everyone marries exactly once, the number of marriages in the closest-kin network can be written

$$(1) + (1) + (\bar{N}), \tag{2}$$

where the three parenthetical expressions represent, from left to right, the individual's parents' generation, own generation, and children's generation. The count of marriages in the near-kin network can be written in the same fashion:

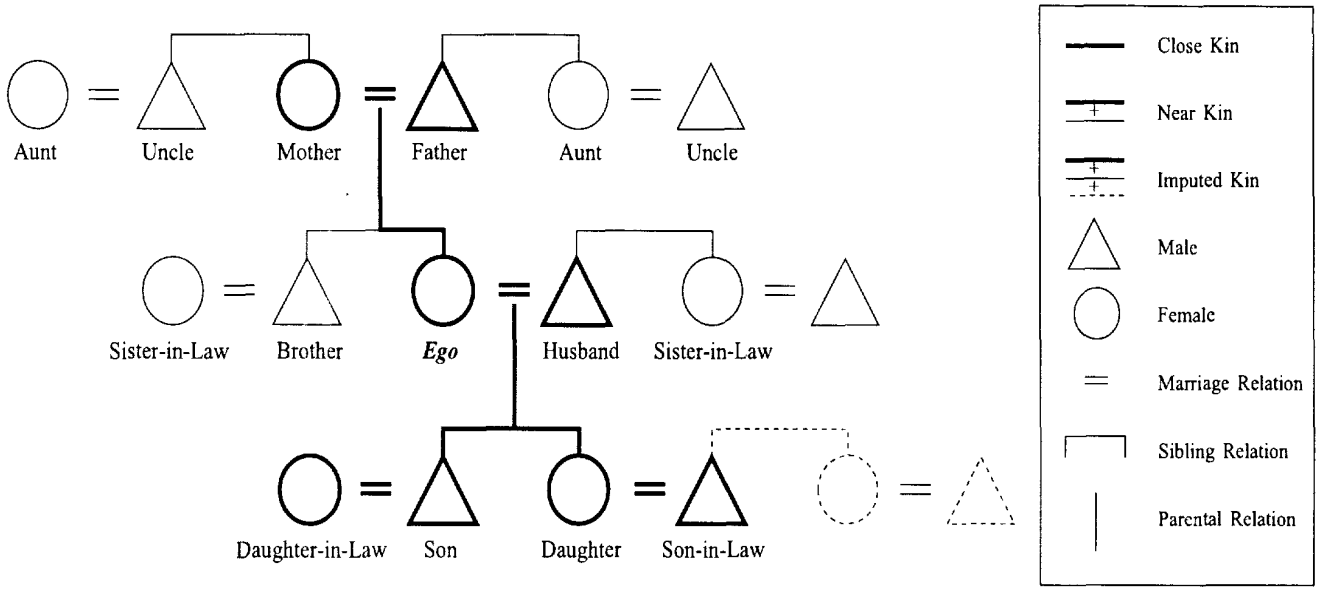
$$(2\bar{S} + 1) + (2\bar{S} + 1) + (\bar{N}). \tag{3}$$

One can obtain the effect of divorce and remarriage by multiplying each of the affinal ties by $\bar{M}$, the average number of times that individuals marry over their lifetimes.[4] This multiplier is slightly conservative because it applies only to the spouses, omitting consideration of the

3. A possible exception is whether spouses of parents' siblings are considered aunts and uncles. Schneider (1980:93) writes, "It is just as legitimate and just as proper [in the American kinship system] to affirm that such persons *are* relatives as it is to affirm that such persons *are not* relatives, since these are two alternate norms, each of which can be followed by different persons at the same time or by the same person at different times."

4. Just as a cohort has a parity distribution of the number of children it produces, it can also be thought of as having a "marity" distribution of the number of spouses its members have.

FIGURE 1. THREE-GENERATION CLOSE, NEAR, AND IMPUTED KIN NETWORKS FOR A HYPOTHETICAL FEMALE



Notes: Close kin are a subset of the larger, near kin group. Imputed kin includes all near kin, as well as the individual's spouse's siblings and the individual's child's spouse's siblings. In this example, all marriages produce exactly one daughter and one son, and everyone marries exactly once. Estimates in the paper take account of actual marriage and fertility patterns.

children that a remarrying spouse brings into the kinship network. Incorporating marital frequencies into the closest-kin network gives an average of

$$(2\,\overline{M}-1)+(\,\overline{M})+(\,\overline{M}\,\overline{N}\,) \tag{4}$$

marriages in the closest-kin network and

$$(2\,\overline{M}-1+2\,\overline{S}\,\overline{M})+(\,\overline{M}+\overline{S}\,\overline{M}+\overline{M}\,\overline{S}\,\overline{M}) +(\,\overline{M}\,\overline{N}\,) \tag{5}$$

marriages in the near-kin network.

From the June 1990 CPS, I estimate that $\overline{N}$ equals 2.1, $\overline{S}$ equals 1.8, and $\overline{M}$ equals 1.2, according to 1990 period rates. The average number of siblings is substantially more than 1 minus the average number of children because of the variance in family size (Preston 1976). Applying these estimates to Eqs. (2) through (5), I find that the average close-kinship network contains 4.1 marriages assuming everyone marries exactly once, and 5.2 marriages when remarriages are counted. The near-kin network includes 11.3 marriages assuming everyone marries exactly once, and 14.4 marriages when remarriages are counted.

Results of the Simple Model

Table 2 shows the percentage of individuals belonging to multiracial families estimated from the application of the race-specific intermarriage proportions and the kinship network sizes to Eq. (1). The exponential nature of the model is evident. For groups with low intermarriage rates, intermarriage (p) grows roughly linearly with the number of marriages (n). For whites, each additional marriage in the kinship network increases the percentage of multiracial kin groups by about 1%. For blacks, each additional marriage increases this percentage more than 3%. With increasing numbers of marriages, the impact of each additional marriage is lessened such that it would take an average kinship network size of about 69 marriages for half of whites to belong to a multiracial kinship network, and about 21 marriages for half of blacks to belong to multiracial kinship networks. For groups with higher intermarriage rates, very high levels of heterogeneous kinship networks are reached even when only the closest kin are considered. The crude model predicts that more than half of Asians belong to interracial extended families even if only closest kin are counted. Virtually all American Indians have non-Indians in their kin group.

The percentage intermarrying is strongly influenced by relative group size, with smaller groups having higher intermarriage rates (Blau, Blum, and Schwartz 1982; Schoen 1986). Part of the reason for this is that one intermarriage represents a larger proportion of a minority group than it does of a majority group. But it also appears to result from the structure of marriage markets: It is more difficult for individuals from smaller groups than for those from large groups to find same-race spouses (Becker, Landes, and Michael 1977).

When intermarriage rates are low, as for whites, small increases in the rate of intermarriage can have a much larger effect than more substantial changes in kinship network size. Holding network size constant, one can ask what inter-

TABLE 2. ESTIMATED PERCENTAGE OF INDIVIDUALS BELONGING TO MULTIRACIAL KINSHIP GROUPS: CRUDE MODEL

Racial Identity of Individual	Number of Marriages in Kin Group				
	1	4.1	5.2	11.4	14.4
White (%)	1.0	4.1	5.1	10.8	13.4
Black (%)	3.3	13.0	16.0	31.8	38.2
Asian (%)	14.7	48.2	56.3	83.7	89.8
American Indian (%)	47.6	93.1	96.5	99.9	100.0
All (%)	2.1	7.2	8.7	16.3	19.4

Notes: The "All" category is an average of the race-specific values, weighted by 1990 population sizes for each racial group (U.S. Bureau of the Census 1994: tables 11 and 12, p. 13). The intermarriage rates are calculated from the 1990 CPS, but do not incorporate individual weights.

marriage rates would be required in order for half of all whites to be in multiracial kinship networks. Given an average network size of 14.4, the answer is a surprisingly small 4.7%.

If 4.7% of whites were to intermarry with nonwhites, 24.0% of nonwhites would marry whites, given the proportions of the population in 1990. As the relative size of the white population shrinks over the next half-century, a 4.7% intermarriage rate by whites will imply even lower intermarriage rates for nonwhites. Based on U.S. Bureau of the Census (1994) forecasts of the relative size of racial groups,[5] this intermarriage rate by whites would imply an intermarriage rate by nonwhites (with whites) of 15.7% in 2025 and 12.3% by 2050. The plausibility of these latter rates suggests that more than half of whites, and thus an even larger share of the U.S. population, may well belong to multiracial kin groups within the lifetimes of people born today. A definition of racial intermarriage that counts marriages between Hispanics and non-Hispanics will hasten the time when most Americans belong to multiracial kin groups.

KINSHIP NETWORK IMPUTATION

The simple model makes a number of strong assumptions of independence. In the rest of this paper, I weaken these assumptions by taking account of the contours of family structure and intermarriage by age, sex, educational attainment, and region. This procedure allows me to piece together extended families from a combination of household-level surveys and individual demographic histories. The imputation process allows me to replace assumptions of general independence with a much more limited conditional independence, which depends on a large number of covariates.

Which Kin Are Missing?

A large-scale household-level survey (like the CPS) contains records for every individual in every household surveyed. Kin relationships are specified for those who live together, but not for family members living outside of the household. A large variety of kin can find themselves living apart. By and large, current spouses live together, whereas ex-spouses do not. Parents may or may not live with their children. Child siblings may or may not live together, but adult siblings rarely do. A person rarely coresides with affinal kin such as siblings-in-law, uncles and aunts by marriage, and parents-in-law. In addition to life cycle effects such as the departure of children from the parental home, divorce and remarriage can separate siblings, half siblings, stepsiblings, stepparents, children, and stepchildren. The potentially overwhelming task of imputing each of these relationships separately is made possible by a reduction of all of the relations in the American kinship system to four elementary kinship relationships. If one knows (1) the biological children, (2) the biological parents, (3) the current spouse, and (4) the ex-spouses of every person in the population, then one can construct all kinship relations as a chain of elementary relationships (Atkins 1984; Liu 1986). For example, an uncle or aunt is a person's parent's parent's child or a person's parent's parent's child's spouse; a stepparent is a person's parent's spouse who is not that person's biological parent;[6] a half sibling is the child of only one of the individual's parents.

A complete imputation of kin networks would match persons with these four categories of kin for every individual in the population. I impute only spouses, ex-spouses, and siblings (full, half, and stepsiblings), all of which are the same generation as the index individual. I then extrapolate the multiracial frequencies of this same-generation kin group to estimate the heterogeneity of the multigenerational kin group.

Data

The data sources used in the analysis are the marital history supplement of the June 1990 CPS and the sibling inventories in the 1994 General Social Survey (GSS). The 1990 CPS marital history supplement was asked of 97,464 individuals aged 15 to 65 sampled from the "civilian non-institutional population living in households" (U.S. Bureau of the Census 1991:1-1). Each respondent was asked, "How many times has...been married?"; the number of marriages up to three was recorded. The characteristics of coresident spouses are given in accompanying household records. Race was categorized as white, black, American Indian or Aleut Eskimo, Asian or Pacific Islander, and other.

The 1994 GSS is a much smaller survey of 2,992 individuals drawn from a sample of "English-speaking persons 18 years of age or over, living in noninstitutional arrangements within the United States" (Davis and Smith 1994). Sibling inventories were taken of all respondents, with age, sex, and sibling type (full, adopted, step-, and half sibling)

5. The forecasts are based on fertility and mortality and migration differentials and are conservative in assuming no increase in minority populations due to intermarriage. See Edmonston and Passel (1993) for forecasts of the size of the mixed-race populations.

6. Stepparents are, strictly speaking, only spouses of the individual's parents that are subsequent to the individual's birth.

recorded for up to nine siblings. Educational and occupational information is available for one sibling selected at random from among the respondent's living siblings born before 1976. Race in the GSS was categorized as white, black, or other.

I create sibling and ex-spouse links for all individuals in the CPS. I estimate sibling number and characteristics by matching individuals in the CPS with their counterparts of similar age, race, and education in the General Social Survey. For ex-spouses I impute directly within the CPS by selecting as ex-spouse the current spouse of an individual similar to the respondent in terms of sex, age, race, region, and education. I impute both siblings and ex-spouses using hot-deck techniques, with a different algorithm for each kin category.

In the discussion that follows, I use the term *Ego* for the individual in the CPS whose kin are being imputed. *Alter* is an individual with characteristics similar enough to Ego to be judged a match. The imputation procedure is carried out 97,464 times, as each record in the CPS supplement represents a separate Ego.

Imputing Siblings

The imputation of siblings involves three stages. First, the Ego's number of siblings is imputed. Second, for each sibling, individual characteristics are imputed. Third, individuals matching these sibling characteristics are found within the CPS.

Step 1. To find the number of siblings of each Ego in the CPS, I find a matching alter in the GSS. A match is defined as being of the same race, being of the same sex, having the same educational degree, and being in the same 10-year age group. The search for a match in the GSS begins with a random individual record and continues until a match is found. If no match is found after a complete search of the GSS sample, the match is based only on age.

Step 2. With the number of siblings known, the same ego-alter matching algorithm is repeated until the characteristics of each sibling are imputed. I complete a separate search for each sibling, finding an alter and attributing the age, sex, and education characteristics of alter's selected sibling to Ego's sibling. Because the GSS does not give the race of the selected sibling, all siblings are assumed to be the same race as Ego. I place an upper bound of nine on the number of siblings.

Step 3. Finally, individuals in the CPS who match the characteristics imputed to Ego's siblings are specified. Sibling matches are defined as being (1) of the same sex, same educational degree, and same 10-year age group as imputed for Ego's sibling and (2) in the same CPS racial category as Ego.

The sibling-imputation technique has several advantages. First, the method takes account of fertility differences by race, birth cohort of the index sibling, and education. Second, because the GSS inventory includes adopted siblings, half siblings, and stepsiblings, the hot-deck procedure also accounts for marriage and remarriage differences across race, education, and birth cohort. Third, the degree of educational and age diversity within sibling groups is accounted for by hot-decking from actual sibling dyads. Among the drawbacks of the procedure is that the GSS does not specify the race of siblings; thus, no racial heterogeneity is introduced at the sibling level. Further, because only one dyad is listed for each alter in the GSS, it is impossible to take account of interactions between dyads.

Imputing Ex-Spouses

Unlike for siblings, the GSS contains no information on the characteristics of ex-spouses. The CPS, however, lists the number of times each person has been married. The imputation thus uses the set of intact marriages as the pool from which the characteristics of ex-spouses are drawn. First, I find a currently married alter who matches Ego's individual characteristics. I then impute the characteristics of this alter's spouse to Ego's ex-spouse. The matching criteria are race, sex, region (Northeast, Midwest, South, and West, according to Census Bureau definitions), five-year age group, and a four-category measure of education. I search for a match starting with a random individual record in the CPS and continue until a match is found. If no match is found after a complete search of the CPS sample, I search based only on race and sex. I impute multiple ex-spouses independently, ruling out repeated marriages to the same individual.

The imputation method in effect assumes that the marginal distribution of characteristics among ex-spouses is the same as that among current spouses. There is evidence that mixed marriages end in divorce more often than same-race marriages (Becker et al. 1977). As a result, there may be fewer intermarriages in the population of extant marriages than in the population of ex-marriages. On the other hand, this higher divorce rate among mixed marriages may be offset slightly by the fact that extant marriages, especially remarriages, tend to have occurred more recently, when intermarriages were more common.

The imputation of siblings and ex-spouses is similar to open microsimulation, in which individuals are created when demographic events require them. Rather than create an individual from scratch, however, I use the CPS to define the pool of candidates. When a relationship is imputed, it is recorded only on Ego's kin list. This procedure makes the matching much easier, as there is much less need for consistency. For example, the siblings of an Ego with four siblings are not required to have four siblings.

Combining Generations

To extend the single-generation results to three generations, I combine the single-generation results for three age groups, each representing a different generation. Because the CPS supplement covers only individuals aged 15 to 65, generations must be compressed somewhat: The three generations are represented by the age groups 25 to 30, 40 to 45, and 60 to 65, ages that were chosen in order to separate the generations by as many years as possible while remaining within the CPS age range. This generational squeeze preserves the main objective of the generational linking: taking account of

the change both in family size and intermarriage rates over the last 40 years. Multiracial proportions of three-generation kin groups are estimated assuming independence between generations of the same race.

Linking generations brings up the interesting question of the race of the children who are born within mixed marriages. No answer is needed for the definition of a multiracial kin group in this paper, where having at least one family member of a different race distinguishes multiracial from monoracial families. An answer would be needed, however, if one wanted to differentiate between networks with only one member of a different race as opposed to multiple members of different races.

Each of the single-generation networks is Ego oriented. This does not pose a problem with the parents' generation and Ego's generation, but it is incorrect when applied directly to frequencies for Ego's offspring because larger families are overrepresented in sibling counts (Preston 1976). To correct for this, I reweight both the numerator and denominator of the sibling-based index by $1/(x + 1)$, where x is the number of siblings an individual has.

Imputation Results

Table 3 shows the multiracial percentages of the imputed kin networks, broken down by race. Most striking is the similarity between the imputation results and the crude predictions shown in Table 2. The crude model predicted that 13.4% of whites would belong to multiracial kin groups. The imputation of intermarriage rates and kinship network size by age, sex, education, and region produces essentially the same result: 14.6%. The estimates are also quite close for blacks; where the crude model predicted 38.2%, the imputation estimates 36.1%. Imputed networks of American Indians are 98.4% multiracial, only slightly less than the essentially complete heterogeneity predicted by the crude model. The imputation differs most from the crude model for Asians, whose imputed kin networks are almost 5% less multiracial (85.4%) than the 89.8% predicted by the crude model. The relatively large share of immigrants among the Asian population may partially explain why accounting for socioeconomic and geographic heterogeneity makes more of a difference for this population than for the others.

Because it reflects heterogeneity in intermarriage rates among different segments of society, the imputation method generally predicts a lower number of multiracial kin networks than the simpler independence model. Whites, however, show a slight increase in intermarriage rates. This may be partly because the imputed kin networks are slightly larger than the near-kin networks used in the crude model. On average, there were 15.0% marriages in the imputed network, as opposed to 14.4% in the simple model. Substituting a value of 15 for n in Eq. (1) results in 14.0% of the networks being multiracial, only marginally different from the value produced by the imputation. Very little change in whites' exposure is to be expected as a result of the imputation. The relative rarity of interracial marriage among whites means that even the introduction of large socioeconomic and geographic variation does not produce the clustering of multiple intermarriages into the same families.

In the absence of real-world data, it is not possible to verify with certainty the results of the imputation methods used here. The similarity between the results of the simple model and those of the crude model provides some reassurance that there are no large errors in the imputation method. An additional test can be made to determine if the conditional independence assumptions of the imputation method succeeded in preserving socioeconomic differences in the data.

Table 4 shows the single-generation multiracial kinship percentages by race and by educational level. Blacks' membership in multiracial kinship networks increases with education, confirming the status-exchange patterns observed with relatively well-educated black men marrying relatively less-educated white women (Kalmijn 1993). American Indians' multiracial kin rates also increase markedly with education, perhaps linked to urban/rural residence patterns. Even

TABLE 3. IMPUTED PERCENTAGE OF INDIVIDUALS BELONGING TO A MULTIRACIAL GROUP OF NEAR KIN, BY RACE

Racial Identity of Individual	Extent of Kin Network	
	Current Kin (%)	Current and Ex-Kin (%)
All	16.0	20.5
White	10.4	14.6
Black	29.6	36.1
American Indian	97.0	98.4
Asian	82.0	85.4

TABLE 4. SINGLE-GENERATION MULTIRACIAL KINSHIP PERCENTAGES, BY RACE AND EDUCATIONAL LEVEL

Racial Identity of Individual	Less Than High School Diploma (%)	High School Diploma (%)	Some College Education (%)	College Degree (%)	Postgraduate Degree (%)
White	4.2	5.3	6.1	5.0	5.9
Black	8.9	15.2	13.7	18.8	16.2
American Indian	61.0	77.1	87.3	81.9	100.0
Asian	35.7	51.3	46.3	47.0	46.4

TABLE 5. SINGLE-GENERATION MULTIRACIAL KINSHIP PERCENTAGES, BY RACE AND REGION

Racial Identity of Individual	Region			
	Northeast (%)	Midwest (%)	South (%)	West (%)
White	4.4	5.3	5.7	5.6
Black	16.2	11.7	13.1	18.2
American Indian	64.6	79.3	79.4	72.1
Asian	43.1	54.6	45.8	46.0

among whites and Asians, for whom the overall association between education and multiracial kinship participation rates appears weak, those with the lowest levels of education belong to the most homogeneous networks, mixing less often with individuals outside of their group.

As shown in Table 5 kinship network heterogeneity on a regional level (Table 5) shows substantial differences by race, generally consistent with the arguments regarding relative size put forward by Blau et al. (1982) and Schoen (1986). After all races are combined, some differences in multiracial kinship participation rates can be still be seen: The rates are 6.6% for the Northeast, 6.7% for the Midwest, 8.0% for the South, and 9.6% for the West.

CONCLUSION

Continued immigration, differential birth rates, and intermarriage contribute to increasing racial diversity in America. Even well into the next century, however, whites will remain more than two thirds of the population.

This paper shows that, even with a low rate of racial intermarriage, a substantial portion of Americans already belong to multiracial extended families. Roughly one fifth of adult Americans currently belong to multiracial kinship groups. For Asians and American Indians, the exception is not the multiracial family but the monoracial one. Fewer than one in five Asians belong to an all-Asian kin group and only a few percent of American Indians belong to a kin network in which everyone has the same racial identity. Although blacks and whites retain the most homogeneous kin groups, one in seven whites and more than one in three blacks have close relatives of a different race. These estimates actually understate the racial and ethnic diversity of American kinship groups because I have not considered Hispanic–non-Hispanic intermarriage in this paper.

Multiracial kinship cannot be estimated through tabulations of existing survey results. Instead, my approach has been to piece together information from several household-level surveys—first in simple fashion, with large assumptions of independence, and subsequently with a more refined method involving the imputation of specific kin. This imputation method accounts for variation in intermarriage rates and family structure by age, race, sex, educational level, and region of residence. The result of the imputation supports the estimates made with the crude model, with the introduction of socioeconomic and geographic heterogeneity reducing slightly the frequencies of multiracial kin groups, particularly for Asian Americans.

The data and methods used in this paper have necessitated a view of both race and kinship that is in some ways quite limited. For example, the data I use include only single-race identities and do not allow multiracial identification. As a result, the estimates of the multiracial kinship networks are conservative: Kin networks that include both multiracial and monoracial individuals are counted as racially homogeneous as long as the multiracial individuals chose the same race as the other members in their family. The recent revision of the standards guiding racial and ethnic statistics requires that respondents be given the option of marking more than one race (U.S. Office of Management and Budget 1997), creating the possibility of using a more complex notion of individual racial identity in future research. My methods have also prevented an analysis of the frequencies of interracial adoption.

Although this paper provides a quantitative estimate of multiracial kinship group membership, it does not fill the need for research on the social effects of the racial integration of American family life. For example, the impact of having multiracial kin on one's own racial identity and political and social attitudes remains open for study. The social psychological literature (Amir 1969; Stephan 1985) suggests a set of general conditions under which interracial contact results in changed attitudes between groups. But there are a number of issues specific to the family setting that remain to be investigated. For example, how does the effect of an interracial kinship depend on the kinds of kinship ties that are operating? Are those who decide to intermarry more socially distant from their families, perhaps even before they marry? Even without the answers to such questions, the nature of kinship, whereby relations are created not by one's own choice but by the choice of others in the network, makes the family an important setting for the creation of multiracial social networks. The involuntary nature of most kinship relations means that individuals may find themselves related to people of a different race regardless of, or even in spite of, their own preferences.

Social institutions are less rigid about race than they were even a few decades ago. Racial intermarriage is slowly but steadily increasing, while the rise of divorce and remarriage has made the family less stable. But this increasing instability can also be seen in a more positive light as offering increased individual mobility. This paper has shown that one consequence of this increasing mobility is that the circle of kin surrounding an individual over the life course has become remarkably diverse, crossing America's strongest barrier: that of race.

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