Intermarriage Between American Indians and White Americans: Patterns and Implications

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Acknowledgements: This research was supported in part by the Center for Demography and Ecology, University of Wisconsin, which has core support from the National Institute of Child Health and Human Development (Grant #HD05876) and by funds awarded to the Institute for Research on Poverty from the U.S. Department of Health and Human Services. The authors also wish to acknowledge Robert Hauser, Robert Schoen, Douglas Gurak, Russell Thornton and Henry Walker for their helpful advice and comments.

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ABSTRACT

There is a long history of intermarriage involving some American Indian groups and white Americans. The impact of this intermarriage has been recognized in the definition of "American Indian" used by the United States Bureau of Indian Affairs: an Indian is a member of a federally recognized Indian tribe with one-quarter or more "degree of Indian blood." Currently, some American Indian tribes require less than "one-quarter" Indian blood from that tribe to be accepted as a tribal member. An analysis of intermarriage patterns with data from the 1980 Public Use Microdata Sample shows that there is considerably more intermarriage between Indians and whites than between blacks and whites. In fact, the results show that American Indians are just as likely to be married to white Americans as they are to be married to American Indians. Though black-white intermarriage is more likely to involve black men and white women than black women and white men, this pattern is not present in white/American Indian intermarriage. There is a pattern of "marrying up" in American Indian/white intermarriage, i.e., white/American Indian intermarriage is more likely to involve white spouses whose educational levels are less than those of their Indian spouses than to involve white spouses whose educational levels exceed those of their Indian spouses, or whites and Indians with equal educational levels. Finally, the results indicate that endogamous American Indians are more isolated and poorer than even endogamous black Americans, whereas there are few differences in the characteristics of intermarried blacks and intermarried American Indians.

Though there has been some research on contemporary patterns of intermarriage involving blacks and whites, there has been almost no research on contemporary patterns of American Indian and white intermarriage. Beginning with colonial days, miscegenation involving Indians and whites was of a quite different nature than miscegenation involving blacks and whites. Though there is some evidence of intermarriage between black slaves and white servants in the mid-1600's (Gordon, 1964), these marriages were almost universally condemned in the United States. In 1661, the General Assembly of the Colony of Maryland "deplored the fact that there were many intermarriages between white female servants and Negro slaves" and passed a law that made such women and their offspring slaves. In 1691, Virginia condemned "Negroe/English" intermarriage as did Massachusetts in 1705, North Carolina in 1715 and Pennsylvania in 1725.[1] Available data suggest that though intermarriage was strongly discouraged and subject to legal penalties, sexual relations involving whites and blacks were more common, resulting in a substantial population of mulattoes in the early colonial days (Johnston, 1970).

The laws that applied to white/black intermarriage also applied in most colonies to white/Indian intermarriage. Yet, economic and political reasons led to intermarriage between Indians and whites on the frontier (Lauber, 1913). Prior to the decision of the U.S. government in the early 1800's to "remove" most of the Indians who were east of the Mississippi to west of the Mississippi, good relations between Indians and whites were facilitated by intermarrige. The French were reputed to have no aversion to intermarrying with Indians (Lauber, 1913) and one celebrated intermarriage in the colony of New York involving a prominent

white man and a wife from the Five Nations was said to have greatly facilitated cooperation between the New York colonial government and the government of the Five Nations (Maury, 1872). Soldiers on the frontier intermarried with Indians; trappers, traders and agents were often intermarried. There were, in fact, some legal attempts to promote intermarriage between whites and Indians. In 1784, a bill was presented to the Virginia legislature providing that "every white man who married an Indian woman should be paid ten pounds, and five for each child born of such a marriage; and that if any white woman married an Indian she should be entitled to ten pounds with which the county court should buy them livestock...". In 1824, William H. Crawford advocated similar legislation before the U.S. Congress. Neither measure was passed, however (Beveridge, 1919), and the official policy of the U.S. government toward American Indians became one of forced removal and isolation.

There is also evidence of intermarriage between Indians and blacks, especially in the Southeast and mid-Atlantic states, and among Indians from these areas and blacks who moved with them during the removal period in the early 1800's (Berry, 1963). In some of the tribes that were removed from the Southeast, blacks were granted tribal citizenship during Reconstruction (Gibson, 1971). This intermarriage resulted in currently existing racial hybrid groups (to use the language of Berry) in the eastern United States, and the "red-black" people of Oklahoma (Wright, 1981). However, the small size of the black and Indian populations relative to the white population meant that intermarriage involving the former two groups had a smaller impact than white/black and white/Indian intermarriage and miscegenation. Further, after removal of most Indians

from east of the Mississippi, the opportunities for intermarriage between blacks and Indians declined a great deal. Since that time the isolation of Indians in the rural Southwest, West and North Central parts of the United States and the concentration of blacks in the South and Northeast have combined to impede the black/Indian marriage that might have otherwise taken place.

Legal or illegal unions between whites and Indians had much different implications than those between whites and blacks. First, whites were generally accepted into Indian societies upon establishing a cohabitative relationship with an Indian partner. In the case of white/black miscegenation, there was no reason for a white to want acceptance into a slave community and legal restrictions prevented acceptance of intermarried blacks into the dominant white community. Second, the offspring from white/Indian miscengenation often became established and accepted members of the Indian community, which in the 17th and early 18th centuries meant membership in viable political and economic entities. The offspring from white/black miscegenation were accepted into slave communities, but slave societies were not viable political and economic entities. In some instances intermarried whites and their offspring became leading men in the tribes, and moved with Indians when they were forced to relocate by the U.S. government (Office of Indian Affairs, 1832; Gibson, 1971; Champagne, 1983).

Not only was intermarriage historically important for American Indians in the U.S., but it has also continued to be an important phenomenon. Data from the 1960 Census showed that over 15% of Indian males were married to white wives (Carter and Glick, 1970), whereas only 1% of

black males were married to white wives. The 1970 Census showed that 33 percent of married Indian men were married to white wives and 35 percent of married Indian women were married to white husbands (Passel,1976). Data from the 1976 Survey of Income and Education showed that over 40% of Indian males between the ages of 24 and 54 were married to white wives, whereas around 2% of black males in the same age range were married to white wives (Sandefur and Scott, 1983).[2] The practical impact of Indian/white intermarriage was recognized in the definition of an Indian adopted by the United States Bureau of Indian Affairs, the federal agency with primary responsibility for dealing with Indians. In order to be considered an Indian, one need be one-quarter or more degree of Indian blood. Currently, some tribes consider an individual with any degree of Indian blood from that tribe to be a tribal citizen. Consequently there are individuals who "look white" (or "look black"), but who are recognized as Indians by a tribe and/or the U.S. government.

Though intermarriage involving Indians and whites has been an important phenomenon for the Indian population, there has been little research on the patterns of intermarriage and the characteristics of endogamous and intermarried Indian couples. This paper utilizes data from the 1980 Census to examine carefully the pattern of intermarriage involving whites and Indians and compares this to the pattern of intermarriage involving whites and blacks. Specifically, we compare the levels of intermarriage involving the two minority groups and whites, the association between gender, education and intermarriage, and the characteristics of endogamous and exogamous couples.

FACTORS ASSOCIATED WITH INTERMARRIAGE

Intermarriage and amalgamation (intermarriage on a large scale) have long been viewed as important parts of the assimilation of different ethnic and minority groups into American society. It is not necessary, however, to assume that intermarriage promotes the assimilation of minority groups in order to study or understand it. In fact, as we pointed out above, the offspring of intermarriages have generally been more readily accepted in the minority group than as members of the majority group.

Sociological studies of intermarriage have focused on two distinct levels: (1) explanations of why some groups are more likely to intermarry with the dominant group than others; and, (2) explanations of why some individuals are more likely to intermarry with individuals in the dominant group than others.

Group-Level Determinants of Intermarriage

Theorists and researchers who have examined intermarriage at the group level suggest that the general nature of group interrelationships with the dominant group will be important in explaining group differences in the prevalence of intermarriage with the dominant group. One of these factors is the history of the interaction between the group and the dominant group. In Park's (1950) race cycle theory, he suggested that relations between racial groups go through a number of identifiable stages: contact, competition, accomodation and assimilation. One aspect of assimilation was assumed to involve the large scale intermarriage of members

of the focal groups. Park suggested that the character and nature of the initial stages in the race cycle had a tremendous influence on the subsequent stages in the race cycle. Consequently, if the initial stages of contact, competition and conflict and accomodation occurred more rapidly for one group than for another, or if the nature of these stages differed, the speed of amalgamation and assimilation might well differ even if initial contact had occurred at approximately the same time.

A careful analysis of the history of Indian/white and black/white relations is beyond the scope of this paper. There are, however, key differences in these histories that may be important in understanding current patterns of interracial interaction including intermarriage. First, as we pointed out above, there were practical political and economic reasons promoting intermarriage between whites and Indians that did not promote intermarriage between blacks and whites. Second, the threat posed by Indians to whites was largest during the late 18th and early 19th Century. A combination of disease and war, especially the former, drastically reduced the size of the Indian population from somewhere between 1 to 15 million at initial contact in 1492 to 248,253 in 1890 (Dobyns, 1966; U.S. Bureau of the Census, 1975). The size of the black population increased during this time to approximately 7.5 Million in 1890 (U.S. Bureau of the Census, 1979), largely because it was to the advantage of whites for the black population to increase during the slavery era. Third, Indians were forcibly relocated and isolated, so that by the beginning of the 20th Century Indians were well-removed from the major population centers of the U.S. Indians have only recently moved in large numbers to urban areas, and in no major metropolitan area do they

constitute more than 5% of the population of the area. The isolation of Indians and their small numbers mean that during the 20th Century there has been much less conflict between whites and Indians over the issues that have divided blacks and whites, including residential segregation, school desegregation and economic issues.

The fact that Indians have not posed a threat to white society in this Century may help explain why studies of social distance perceived by whites between themselves and other groups have consistently shown that whites are more favorably inclined to accept associations with Indians than with blacks (Bogardus, 1968). Whatever the reason, these studies show that whites at least say they would be more willing to marry Indians than they would be to marry blacks.

The current relative sizes of blacks and Indians are also important for another reason. Blau (1977) argues that the rate of intergroup associations is directly related to group size. More specifically, the proportion of group members that is intermarried is an inverse function of group size. Much of this effect is simply due to the numbers involved: the size of your ethnic or racial group sets a limit on the number of potential spouses from your group that are available.

Individual level determinants of intermarriage

There are a number of empirical findings regarding the individual determinants of intermarriage between whites and other groups that may be important in understanding Indian/white intermarriage. First, a great deal of research suggests that black men are much more likely to marry white women than black women are to marry white men (Davis, 1941; Heer,

1974). We do not know whether this gender effect also applies to intermarriages between whites and American Indians.

Second, research suggests that minority men are able to exchange nonracial status (e.g., occupation or education) for the racial status of white women. This option is assumed not to be open to minority women because men are not as interested in the occupation or education of potential spouses as are women (Blau, 1977; Davis, 1941; Merton, 1941; Schoen and Cohen, 1980). Schoen and Wooldredge (1985) argue that we should view this explicitly within the framework of exchange theory. The status of the minority group member becomes higher through marriage to a white spouse, and the status of the majority group member improves through marriage to someone with higher status on dimensions other than race. Other research shows, however, that education is related to greater tolerance of other racial groups and perceptions of smaller social distance between an individual and members of other racial groups (Bogardus, 1968). Based on this research, one would expect the occurrence of intermarriage to increase with the education of individuals regardless of their race. Others suggest that colleges provide one of the few settings in our still highly segregated society in which individuals from different racial groups come into contact as equals, and thus we should expect the level of intermarriage to be highest among the college educated.

Third, research indicates that generation is an important factor in determining the likelihood of intermarriage (Kikumaro and Kitano, 1973; Schoen and Cohen, 1980). The more extensive a minority group member's ancestry in this country, the more likely an individual is to intermarry.

This is impossible to apply in the case of Indians and blacks, however, since both groups have been in this country for some time.

Hypotheses

Previous research and theories of minority group interaction suggest, then, that the prevalence of intermarriage will vary across racial groups and that within racial groups, the prevalence of intermarriage will vary with gender, status and generation. In this paper we are most interested in intermarriage between Indians and whites, and we compare the prevalence of intermarriage involving these two groups to that involving blacks and whites. We also examine the effects of gender and status, with education serving as the measure of status. We use education since our data (the 1980 1% Public Use Microdata Sample) include the education of all individuals, but include occupational data only for those individuals who were in the labor force at some point between 1975 and 1980. As we mentioned above, generation would not be a meaningful variable in the case of Indians, and most blacks, so we do not attempt to include it in the analysis.

The theories and research outlined above allow developing a number of alternative hypotheses regarding the association between race, gender and education on the one hand and endogamy and intermarriage on the other. We develop alternative hypotheses in order of increasing complexity. We begin with hypotheses that involve only race, then move to those that involve gender, and finally consider those that involve race, gender and education.

The simplest hypothesis is one that states that there is no association between husband's and wife's race. Previous research and existing data suggest that this hypothesis is totally unrealistic, but it does provide a baseline to which to compare more realistic models of intermarriage. A second hypothesis is that endogamy is more common than exogamy. Past research suggests that this is indeed the case, and at least one of the classic definitions of minority group (Wagley and Harris, 1964) includes a tendency toward endogamy as part of the definition of a minority group. A third hypothesis is that the level of endogamy varies across racial groups, i.e., some racial groups may be more endogamous than others. A fourth hypothesis builds on this third hypothesis by assuming that in addition to differing levels of endogamy, the level of intermarriage between whites and blacks differs from the level of intermarriage between whites and Indians. There are good reasons to expect more intermarriage between whites and Indians than between blacks and Indians. These reasons are discussed above.

Each of the four preceding hypotheses deals only with the relationship between race of husband and race of wife. However, as the research discussed above has shown, intermarriage involving black women and white men seems to occur far less frequently than intermarriage involving black men and white women. So, the fifth hypothesis is that the frequency of intermarriage varies with the gender of the majority and minority group member involved. Marriages involving minority men and white women should be more frequent than marriages involving minority women and white men. This hypothesis builds on the fourth hypothesis since we can retain the assumption that the level of each type of intermarriage is higher for Indians than for blacks.

Finally, we consider three hypotheses that involve the effects of education. First, most of the previous work on intermarriage between whites and members of minority groups indicates that white women "marry up" in terms of education. This suggests that we should find that the prevalence of intermarriage is highest when the educational level of the minority man exceeds the educational level of the majority woman. Second, studies of social distance suggest that the social acceptance of members of other racial groups increases with education. This suggests that we should find that the likelihood of being intermarried increases with education for whites, blacks and American Indians. Finally, it could be that colleges do provide a setting that facilitates interracial contact, and this could mean that the likelihood of intermarriage could be highest among the college educated.

Characteristics of Intermarried and Endogamous Couples

Another way to examine intermarriage is to compare the characteristics of endogamous and intermarried couples. There has been relatively little research on this topic. For this purpose Census data have clear advantages since they contain a much wider variety of information than is available from marriage records. Heer (1974) found that black/white intermarried couples differed in a number of ways from endogamous couples. Specifically, individuals who were involved in interracial marriages were more likely to have been married before than individuals who were endogamous and intermarried couples had fewer children on the average than did black couples. Stevens (1985) found that individuals who were exogamous were less likely to use a non-English

language than were individuals who were endogamous. With cross-sectional data it is impossible to determine the direction of causality, e.g., it is impossible to know whether non-English speakers are more likely to be endogamous, or intermarriage leads to nonuse of non-English languages or the relationship is reciprocal. It is, however, worthwhile to compare the characteristics of intermarried and endogamous couples to gain some idea of how they differ. We do this below by examining the age, education, income, household size, residence, incidence of poverty and language usage for endogamous and intermarried American Indian, white and black couples.

DATA AND METHODS

Data

The data for this paper come from the 1980 1% Public Use Microdata Sample. These data were collected as part of the 1980 Census of the United States conducted by the U.S. Bureau of the Census. From this file we selected all households that contained an American Indian, 25% of the households that contained at least one person identified as black, and 3% of the households that contained at least one person identified as non-Hispanic white. In the 1980 Census, black, white and American Indian were racial categories and householders (household heads) were requested to identify the racial classification of each individual in the household. Thus, the basis for racial classification in this sample is self-identification. Further, since we were interested in black Americans, white Americans and American Indians, we did not attempt to extract a

representative sample of households of "other" racial groups. We do want to include marriages involving individuals in our three focal racial groups and "others" in the analysis. This leads to an unrepresentative sample of "Other/Other" marriages. This aspect of the sampling design is handled by weighting the Other/Other combination to zero in analyses where the results would otherwise be biased.

One of the problems in using Census or Census-type data for the study of intermarriage is that it provides no information on the incidence of intermarriage, but only on the prevalence of intermarriage at a particular point in time. Thus, we are more likely to sample marriages that are stable rather than a representative sample of all marriages. If endogamous and intermarried couples differ in their marital stability, we may gain a misleading picture of the incidence of intermarriage. For this and other reasons, many analyses of intermarriage use data from marriage records in particular locales or states. On the other hand, analyses of intermarriage in particular locales may not produce results that are generalizable to the United States in general. Further, with American Indians who made up only .6% of the U.S. population in 1980, it is difficult to find communities in which this group is large enough to allow analyses of the incidence of intermarriage. We do not argue that studying the prevalence of Indian intermarriage is more appropriate than studying the incidence of intermarriage, but we do feel that both kinds of analyses can produce beneficial results.

Methods

The analysis is divided into two major parts. First, we look at the prevalence of endogamy and intermarriage among the three racial groups

significance of differences in characteristics through the multivariate analysis of variance.

RESULTS

Prevalence of Endogamy and Intermarriage

Table 2 contains the proportions of men and women of each group who are intermarried or endogamous. Panel A of Table 2 contains the proportions of white, black and American Indian women who have married white, black, Indian and other spouses. Only .008 or .8% of black women were married to white men in 1980, whereas 48.4% of Indian women were married to white men in 1980. In Panel B, we see a similar pattern for men: 2.8% of black men and 49% of American Indian men were intermarried with white women in 1980. These figures show, then, that (1) American Indians are much more likely to be intermarried with whites than are blacks; (2) a greater percentage of black men than of black women are intermarried; (3) the percentages of American Indian men and women who are intermarried with whites are relatively equal. The results also show that American Indians are more likely to have married someone outside of their group than they are to have married an Indian.

[Insert Table 1 about here.]

Unfortunately, these results could be misleading since the proportions in Table 2 are affected by the size of each group and by the sex ratio of each group (Besancency, 1965). One way to examine the levels of intermarriage that adjusts for the effects of group size and the sex

and the determinants of endogamy and intermarriage. Here, we adopt the concepts and principles that have been widely applied in mobility table analyses to estimate measures of the prevalence of endogamy and intermarriage that are unaffected by the distribution of men and women in the three racial groups. These methods have also been used to study intermarriage (Alba and Kessler, 1979; Shavit, 1978; Travis, 1973). Within the general framework of log-linear analyses of contingency tables, we examine the association of education with endogamy and intermarriage among whites, blacks and American Indians.

The approach we use follows the procedures developed by Hauser (1978; 1979; Featherman and Hauser, 1978). To begin with, we examine only the relationship between the race of the husband and the race of the wife. The models we estimate are of the form

$$E[X_{ij}] = M_{ij} = \alpha\beta_i\gamma_j\delta_{ij} \qquad (1)$$

where X_{ij} is the observed frequency in cell ij of the cross-classification of wife's race (i) by husband's race (j), α is the grand mean, β is a row effect, γ_j is a column effect, and δ_{ij} is an interaction effect. The structure of the δ_{ij}'s can be specified to reflect the hypotheses outlined above, and tests of the model in (1) with alternative specifications of δ_{ij}'s can be used to determine which hypotheses can be rejected. To investigate the educational hypotheses, we estimate models similar to (1), but which also include estimates of the effects of husband's and wife's education. In these analyses, education is trichotomized into less than high school, high school graduate and some college.

The second part of the analysis involves examination of the characteristics of endogamous and intermarried couples. We test for the

ratio is to look at the "social distance" between each pair of the three focal groups (whites, blacks and Indians). This method is based on comparing the number of endogamous marriages to the number of intermarriages between two groups (Parkman and Sawyer, 1967; Gurak and Fitzpatrick, 1982). This index is computed as follows:

$$SD = \frac{10 \text{ X } \log_{10}(N(A,A) \text{ X } N(B,B))}{1/2[N(A,B) + N(B,A)]^2} \qquad (2)$$

where A and B refer to racial groups (e.g., white and black) and N refers to the number of marriages involving the specified pair of groups. When mate selection is random the value is unity; the less frequent intermarriage is, the larger the value of SD.

We computed these values for whites/blacks (45.82), whites/Indians (25.25), and blacks/Indians (42.39). These values show that after adjusting for size, the level of intermarriage involving whites and blacks is much lower than the level of intermarriage involving whites and American Indians. Further, the level of intermarriage involving blacks and Indians is substantially lower than the level of intermarriage involving whites and Indians. It is important to remember, however, that black/Indian intermarriage is probably affected by the geographical location of blacks and American Indians. The latter are much less likely to reside in urban or metropolitan areas than are blacks, and are concentrated in the North Central, West and Southwest, whereas blacks are concentrated in the South and Northeast. Geography as well as individual choices can affect patterns of intermarriage.

Another way to examine patterns of intermarriage and endogamy is to look at measures of endogamy that adjust for the sex-ratio and group

size. Rust and Seed (1985) suggest the use of kappas. Also, sex-specific measures (kappas) of endogamy can be constructed. A kappa is computed as follows:

$$K_i = \frac{Nx_{ii} - x_{i+}\, x_{+i}}{Ng_i - x_{i+}\, x_{+i}} \qquad (3)$$

where i refers to one of the three racial groups, N refers to the total number of couples, x_{ii} refers to the number of endogamous marriages for group i, x_{i+} and x_{+i} refer to the marginal totals for men and women of group i, and $g_i = x_{i+}$ for the male specific kappa and x_{+i} for the female specific kappa.

We computed kappas for white men (.955), white women (.937), black men (.968), black women (.990), Indian men (.481) and Indian women (.468). These results show that the most endogamous group is black women who have a kappa of .990. The least endogamous group is Indian women who have a kappa of .468. In general, American Indians are much less endogamous than are whites or blacks. Further, among white Americans and American Indians, women are slightly less endogamous than men, whereas among black Americans, women are slightly more endogamous than men.

Together these results show that after adjusting for possible differences due to group size and the sex ratio, American Indians are less endogamous than either blacks or whites, and are more likely to intermarry with whites than are blacks. It is important to recognize, however, that these results are based on assuming that there is a specific relationship between husband's and wife's race. The social distance computations assume that hypothesis 4 is true, i.e., they are based on the assumption that the prevalence of intermarriage involving two groups

intermarriage involving whites and Indians. The prevalence of all other types of endogamy is assumed to be equivalent. Q_8 refers to hypothesis 5 and it suggests that there are racial differences in endogamy, that the prevalence of intermarriage with whites is different for blacks and Indians, and that the prevalence of such exogamous marriages differs depending on the sex of the white spouse and the sex of the minority spouse. When we test this hypothesis, we test for a gender effect on white/Indian and white/black intermarriage separately so that the actual tests employ a seven level design matrix. Design Matrix Q_{6B} will be discussed below.

Table 3 contains a summary of the statistical tests of Hypotheses 1 through 5. L^2 can be interpreted as a Chi-squared statistic. As one moves down the table each model may be compared to a preceding model or models through a Chi-squared test of improvement. The first model is the model of independence which assumes that there is no relationship between the education and race of spouses. The second model assumes that the education of women varies with their race, that the education of men varies with their race and that the education of men and women are associated. This model represents a significant improvement over Model 1 as indicated by the Chi-squared test of improvement. The remaining models in Table 3 use this model as the baseline model. The test of improvement for Model 3 indicates that it is appropriate to assume that the levels of endogamy and exogamy differ. Allowing endogamy to vary across the three racial groups (Model 4) improves the fit even more. A great deal of what is happening with racial intermarriage is explained by differing levels of endogamy across racial groups. This model is known as the model of

varies, but that gender and education have no effects. The kappa computations are based on a variant of hypothesis 3, i.e., they assume that endogamy varies with race and also with gender, but they tell us little about exogamy or intermarriage.

An alternative way of measuring prevalence is to compute what Hauser (1978) has referred to as "new" mobility ratios. In this paper they become endogamy and exogamy ratios. A major advantage of this approach is that it provides a statistical framework for testing the hypotheses outlined above, and then provides a mechanism for examining the prevalence of intermarriage based on assumptions that are supported by the data. This is done by specifying interactions (δ_{ij} from Equation 1) among the race of husband and the race of wife that reflect hypotheses to be tested. For example, to test whether the level of endogamy varies across the three groups we may compare a model that constrains endogamy to be equal across groups to a model that allows it to vary. If the latter model represents a statistical improvement this suggests that there are differing levels of endogamy. Once the most appropriate model is discovered, the coefficients of this model may be used to construct intermarriage ratios that are unaffected by the size and sex composition of the three racial groups in the table. These ratios are computed as follows:

$$R_{ij} = \delta_{ij}\, e_{ij} \tag{4}$$

where the δ_{ij} comes from equation 1 and e_{ij} is equal to the observed frequency in a cell divided by the frequency predicted by the model (Featherman and Hauser, 1978). When the e_{ij} are very small (as they are

in our analyses), the δ_{ij} may be used to compare the levels of endogamy and intermarriage.

Tests of Hypotheses Involving Race and Gender

Testing the hypotheses involves specifying a design matrix that reflects the hypothesized relationships between the race of the husband and the race of the wife. Table 2 contains the design matrices for Hypotheses 2-5 and an additional design matrix that we will discuss below. We do not include a design matrix for Hypothesis 1 since it implies that each element in the matrix would be equal to 1. The design matrix for hypothesis 2 (Q_2) indicates that the prevalence of endogamy should be different from the prevalence of exogamy, i.e., the diagonal elements are 1 and the off-diagonal elements are 2. The subscript 2 in Q_2 refers to the number of levels in the design matrix. We could just as easily have chosen any other two integers for the design matrix, since it specifies nominal rather than ordinal or interval independent variables. The diagonal element for Other-Other is excluded since this category is not used in the analyses.

[Insert Table 2 about here.]

Design Matrix Q_4 represents hypothesis 3. This matrix specifies that the prevalence of endogamy for the three racial groups will be different, but that the prevalence of all types of exogamy will be equivalent. Design Matrix Q_{6A} represents Hypothesis 4; it specifies that the prevalence of endogamy will vary with race, and that the prevalence of intermarriage involving whites and blacks will differ from the prevalence of

intermarriage involving whites and Indians. The prevalence of all other types of endogamy is assumed to be equivalent. Q_8 refers to hypothesis 5 and it suggests that there are racial differences in endogamy, that the prevalence of intermarriage with whites is different for blacks and Indians, and that the prevalence of such exogamous marriages differs depending on the sex of the white spouse and the sex of the minority spouse. When we test this hypothesis, we test for a gender effect on white/Indian and white/black intermarriage separately so that the actual tests employ a seven level design matrix. Design Matrix Q_{6B} will be discussed below.

Table 3 contains a summary of the statistical tests of Hypotheses 1 through 5. L^2 can be interpreted as a Chi-squared statistic. As one moves down the table each model may be compared to a preceding model or models through a Chi-squared test of improvement. The first model is the model of independence which assumes that there is no relationship between the education and race of spouses. The second model assumes that the education of women varies with their race, that the education of men varies with their race and that the education of men and women are associated. This model represents a significant improvement over Model 1 as indicated by the Chi-squared test of improvement. The remaining models in Table 3 use this model as the baseline model. The test of improvement for Model 3 indicates that it is appropriate to assume that the levels of endogamy and exogamy differ. Allowing endogamy to vary across the three racial groups (Model 4) improves the fit even more. A great deal of what is happening with racial intermarriage is explained by differing levels of endogamy across racial groups. This model is known as the model of

quasi-perfect mobility in the study of occupational mobility; so, it is appropriate to refer to it as the model of quasi-perfect intermarriage.

[Insert Table 3 about here.]

The model of quasi-perfect intermarriage does not explain all of the association between race of husband and spouse. Hypothesis 4 stated that the level of black/white intermarriage would differ from the level of white/Indian intermarriage. We first tested to see if assuming that black/white and Indian/white intermarriage were equally likely to each other, but not equally likely to the other types of intermarriage (e.g., white/other, black/Indian) represented an improvement over the model suggested by Hypothesis 3. Model 5 is a test of this model and the test statistics indicate that this is an improvement over Model 4. We then tested the model suggested by Hypothesis 4 (Model 6) and the test statistics indicate support for Hypothesis 4. As one would expect given the discussion above and the proportions in Table 1, the estimated coefficients (not shown) of Model 5 indicate that intermarriage between whites and Indians is much more prevalent than intermarriage between whites and blacks.

The fifth hypothesis stated that the likelihood of intermarriage would be higher for minority men and majority women than for majority men and minority women. We tested this hypothesis separately for blacks and American Indians. Model 7 gives the results of testing this hypothesis for black/white intermarriage. The test statistics for Model 7 indicate that it represents an improvement over Model 6. The estimated coefficients for this model (not shown) indicate that black male/white female

intermarriage is significantly more likely to occur than black female/white male intermarriage. Model 8 gives the results of testing Hypothesis 5 for Indian/white intermarriage. This test shows that Model 8 does not fit the data better than Model 6. Consequently, the evidence suggests that there is no gender effect on white/Indian intermarriage.

There are, of course, a number of alternative models that could be tested, but which were not suggested by our hypotheses. Some of these models might fit as well as Model 6 but be more parsimonious, whereas others might fit better than Model 6. The data in Table 1 suggest that it is appropriate to test for whether Indian/white intermarriage is just as likely as Indian/Indian marriage. Model 9 is a model in which the level of Indian/white intermarriage is assumed to be equal to the level of Indian endogamy. This model is presented above as design matrix Q_{6B} in Table 2. This model is a statistical improvement over Model 6, and it provides an extra degree of freedom relative to Model 7. A comparison of the Chi-squared values for Models 7 and 9 indicate that Model 7 does not improve the fit relative to Model 9. Therefore, the results indicate that not only is there no gender effect on Indian/white intermarriage, but Indian/white intermarriage is equally likely to Indian/Indian intermarriage.

The estimated endogamy and intermarriage parameters from Model 9 are displayed in Table 4. Contrasts between these parameters reflect the different levels of the types of intermarriage and endogamy. These parameters show that black endogamy is most prevalent, followed by white endogamy. The equal prevalences of Indian endogamy and Indian/white intermarriage reflect the specification of levels in the design matrix

Q_{6B}. The results also show that intermarriage involving black men and white women is more prevalent than intermarriage involving black women and white men.

[Insert Table 4 about here.]

Tests of Hypotheses Involving Education

Previous research suggested three possible effects of education on intermarriage between Indians and whites, and between blacks and whites. To test for the presence of these effects we compare models that assume education has no effect to models that assume additive or interactive effects of male and female education on each of the four focal types of intermarriage: black male/white female, white male/black female, Indian male/white female and white male/Indian female. Table 5 contains the test statistics for these models, and Table 6 contains the estimated effects of male and female education on each of the four types of intermarriage.

[Insert Table 5 about here.]

Panel A in Table 5 gives the results for tests of the effects of education on intermarrriage between black men and white women. There are a number of alternative ways of testing these effects. We begin with the model of quasi-perfect intermarriage (Q_4 in Table 2) and add a level parameter for black male/white female intermarriage. This is the first model in Panel A. The second model tests for an effect of education on this type of intermarriage by allowing the likelihood of it to vary with

the education of black men. The Chi-squared test of improvement indicates that the education of black men does affect the likelihood of marrying a white woman. The third model tests for an effect of female education; the results suggest that the education of white women does affect the likelihood of marrying a black man. The fourth model in Panel A combines the two additive effects and the test of improvement indicates that including both effects is an improvement over any of the previous models. The fifth model in Panel A suggests that we do not gain anything by allowing an interaction effect between the education of black men and white women beyond what is explained by the full additive model.

Panel B contains the results of tests of the effects of education on intermarriage between black women and white men. Again the baseline model is Q_4 in Table 4 with an additional level parameter for black female/white male intermarriage. A comparison of Model 2 in Panel B with Model 1 indicates that white male education has no significant effect on this type of intermarriage. The results for Model 3 indicate that black female education does have a significant effect, and neither Model 4 nor Model 5 significantly improve over this model. Therefore, we can conclude that the likelihood of marrying a white man varies with education for black women, but that the likelihood of marrying a black woman does not vary with education for white men.

Panel C contains the results of tests of the effects of education on intermarriage between American Indian men and white women. Model 1 is constructed as above. A comarison of Model 2 with Model 1 indicates that this type of intermarriage does vary with the education of Indian men. The results for Model 3 indicate that the education of the white woman

also has an effect. Model 4 is no improvement over Model 2, but the results for Model 5 indicate that there are interactions between male and female education in their effects on intermarriage. The pattern of results is similar in Panel D, i.e., the results indicate the presence of interaction between male and female education as determinants of intermarriage between Indian women and white men.

In order to assess the direction of the relationships between education and intermarriage, it is necessary to examine the actual effects of education on the intermarriage parameters. Table 6 contains the estimated effects of male and female education on the four types of intermarriage of interest. These effects were estimated using GLIM (Baker and Nelder, 1978). Instead of normalizing so that the effects of a particular variable sum to zero, GLIM sets the effect of the first category of a categorical variable equal to zero. The estimated effects indicate the deviation of the effects of the other categories from the excluded category. In the case of the interaction between education and an intermarriage parameter, the effects are the differences in the intermarriage parameter for that category from the category of less than high school education. This also allows us to examine contrasts across the other categories.

[Insert Table 6 about here.]

We consider the types of intermarriage from left to right. The results for intermarriage between black men and white women show that this type of intermarriage increases with education for black men and is higher for college educated white women than for white women in the other

two educational groups. These results do not completely support the marrying-up hypothesis. Though the prevalence of intermarriage increases with black male education, it is not higher when black male education exceeds white female education. In fact the prevalence of intermarriage is highest among college educated black men and white women. This seems to support the view that college attendance facilitates interracial contact, but the consistent effect of black male education provides some support for a modified exchange view.

The effects of education on intermarriage between black women and white men indicate that there is no association between the education of white men and the prevalence of this type of intermarriage, but that this type of intermarriage is significantly more frequent among college educated black women. This again suggests that college provides a setting in which black women have contact with white men, though this type of intermarriage is not more prevalent among college educated white men than among white men who have not attended college.

The pattern of educational effects on white/Indian intermarriage is much different. The results provide clear support for the Davis and Merton exchange view, but also suggest that it applies to Indian women as well as to Indian men. Within each educational category of white women, the likelihood of intermarriage increases with the education of Indian men and the the likelihood of intermarriage is highest in those three instances in which white women are clearly marrying up: a white woman with less than a high school education marrying either a high school educated or college educated Indian man, and a white woman with a high school education marrying a college educated Indian woman. The results

for Indian women and white men are very similar. Within each educational category of white men, the likelihood of intermarriage increases with the education of Indian women. The likelihood of intermarriage is highest in those three instances where white men clearly marry up educationally.

Taken as a group these results provide a considerable amount of support for the exchange view of intermarriage. Though intermarriage between whites and Indian is more prevalent than that between whites and blacks, there is an even clearer pattern of "marrying up" taking place in Indian/white intermarriage than in black/white intermarriage. There is also evidence of college serving as a setting in which black/white interracial contact facilitates intermarriage. There is little evidence of education leading to a greater receptivity on the part of whites of interracial marriage. These conclusions must be tentative, however, given the problematic elements of this analysis. First, there is overlap in the predictions of these hypotheses. It is impossible to reject two and accept the other given the results of the analyses above. Second, we lack knowledge about the social psychological "calculus" involved in choosing marriage partners. We do not know how individuals weigh their education and the education of potential spouses in deciding whom to marry. Finally, we do not know what an individual's educational level is prior to marrying, so part of the relationship between intermarriage and education may be due to the effect of intermarriage on education rather than the effect of education on intermarriage.

Characteristics of Endogamous and Intermarried Couples

Though it is clear that the level of intermarriage is higher for American Indians than for blacks (or whites), we do not yet know whether

intermarried couples differ in substantively and statistically significant ways from endogamous couples, and whether endogamous black and Indian couples differ significantly from each other. The possibility of differences between intermarried and endogamous couples is especially significant in the case of American Indians since intermarried Indians make up such a large proportion of the total Indian population.

Table 7 displays selected characteristics of seven types of couples. Table 8 summarizes the tests of significance for differences in characteristics among these types of couples. These tests are based on a multivariate analysis of variance. The four contrasts in Table 8 are orthogonal, but they are not a complete set of orthogonal contrasts.

[Insert Tables 7 and 8 about here.]

One way to approach the differences among these types of couples is to ask whether the characteristics of endogamous couples differ significantly from those of intermarried couples. This contrast compares endogamous white, black and Indian couples on the one hand to intermarried white, black and Indian couples on the other. Table 8 shows that these two groups of couples differ significantly for each characteristic except for household income and percapita household income. If we look at Table 7, we see that intermarried couples are younger and more educated than endogamous couples. The differences in age are probably due to a cohort effect: more recent cohorts in American society are probably less opposed to interracial contact, including intermarriage, than are older cohorts. The educational levels of intermarried couples are higher than those of endogamous couples with the black female/white male couples

having the highest level of education. Endogamous white couples, however, have the next highest level of education and the couples involving Indians are less educated, with endogamous Indian couples having a startling low level of education--less than ten years of completed schooling for endogamous Indian men and women. Given the analyses above we know that these descriptive statistics oversimplify what is a more complex pattern of relationships between education and intermarriage.

The significant difference in household size is largely due to the comparatively large households of endogamous black and Indian couples. Endogamous white couples have the smallest households. The significant difference in South/Nonsouth location is largely due to 55% of endogamous black couples living in the South, compared to 20% of white female/black male couples and 32% of black female/white male couples. Intermarried blacks and whites are more likely to live in metropolitan areas than are endogamous blacks or whites, and intermarried Indians are more likely to live in metropolitan areas than are endogamous Indians.

The language variables refer to whether the individual sometimes uses a non-English language in the home. This clearly occurs most often among endogamous Indians, but intermarried couples are generally more likely to do so than are endogamous whites and blacks. Finally, the significant differences in the level of poverty are due to the comparatively high incidence of poverty among endogamous blacks and Indians.

The second contrast in Table 8 tests for significant differences between endogamous whites on the one hand and endogamous blacks and Indians on the other. This contrast shows that these two groups differ significantly on all the characteristics in Table 7. The third contrast tests

for significant differences beween endogamous blacks and endogamous Indians. This contrast shows that these two groups differ in female education, household size, location, language usage, percapita household income and the prevalence of poverty. Considered together, these two contrasts show that endogamous whites are older than endogamous blacks and endogamous Indians; they are also more educated. The average level of education of endogamous Indian women is lower than that of endogamous black women. The households of endogamous whites are smaller than those of endogamous blacks and Indians, and the households of endogamous Indians are larger than those of endogamous blacks. Endogamous blacks are most likely to live in the South, and endogamous Indians are much less likely to live in metropolitan areas than the other two endogamous groups. We discussed the language use of endogamous Indians above. The household income of endogamous blacks and Indians is significantly lower than that of endogamous whites, and when we adjust for household size, the percapita income of endogamous Indians is significantly lower than that of endogamous blacks. Finally, endogamous whites are least likely to live below the poverty line and endogamous Indians are significantly more likely than endogamous blacks to live below the poverty line.

The final contrast in Table 8 compares intermarried black/white couples with intermarried Indian/white couples. These couples differ significantly only in the education of the wife and residence in metropolitan areas. Women in black/white couples have a significantly higher level of education than women in Indian/white couples; black/white couples are significantly more likely to reside in metropolitan areas than are Indian/white couples.

The results in Tables 7 and 8 clearly indicate that endogamous Indian couples enjoy a substantially lower standard of living than the other types of couples. Endogamous black couples are significantly better off than endogamous Indians, but are not as well off as endogamous white couples and intermarried couples. It is, of course, important not to make "too much" out of these results. These analyses do not allow us to attribute causality to endogamy and intermarriage, i.e, we are in no position to say that marrying a white person improves one's life chances. It is likely that intermarriage and the other factors in Table 7 are interrelated in a number of ways that are difficult to study with cross-sectional data. It is particularly important to be cautious about our finding of very low socioeconomic status among endogamous Indian couples. This may very well be due to what is known as the "reservation effect". Endogamous Indians are probably more likely to live on reservations and in isolated rural areas with quite limited contact with whites, but also with few opportunities for obtaining good jobs. Thus, it is probably their isolation that explains both endogamy and low incomes.

SUMMARY AND CONCLUSIONS

This analysis shows that among married individuals who identified themselves as American Indians in the 1980 Census the likelihood of being married to a white individual is just as high as the likelihood of being married to an Indian individual. This pattern of intermarriage is vastly different from that involving blacks and whites and that involving Indians and blacks. Education has a significant effect on the patterns

of intermarriage. The results suggest that the likelihood of intermarrying increases with education for black men, and is higher for college educated black women than for black women who do not attend college. The likelihood of marrying a black man is higher for college educated white women than for white women with less than no college. The likelihood of intermarriage between Indians and whites is highest in those situations in which whites have "married up".

The results also indicate that the characteristics of endogamous and intermarried white, black and American Indian couples vary considerably. Endogamous Indian couples are poorer, less educated and more isolated than even endogamous black couples. Intermarried black/white couples and intermarried white/Indian couples vary only in that the level of education of women in black/white marriages is higher and black/white couples are more likely to live in metropolitan areas.

Of the three racial groups considered in this analysis, intermarriage is having the largest impact on the American Indian population. In order to understand better the impact of intermarriage, it is necessary to consider it within the context of other changes in the American Indian population in recent years. First, there has been an increase in the number of people who identify themselves as American Indians. This is obvious if one examines the Census count of Indians in the 1950, 1960, 1970 and 1980 Censuses. In 1950 the Census counted 357,499 American Indians; the 1960 Census counted 523,591 American Indians; the 1970 Census counted 792,730 American Indians and the 1980 Census counted 1,418,195 American Indians (U.S. Bureau of the Census, 1975, 1983). Part of the increase between 1950 and 1960 is due to the inclusion of Alaska in the 1960

Census. It is literally impossible for the remaining increase to be due to high fertility or immigration. In 1960 the Census Bureau allowed individuals to identify their own race and this has been the policy since that time. Passel (1976) has shown that approximately 67,000 people changed their self-identification from white to Indian between 1960 and 1970, and it is likely that a similar phenomenon occured between 1970 and 1980. Thus, a substantial proportion of individuals who report being married to a white spouse in 1980 are perhaps people who identified themselves as whites in a previous Census or Censuses. This helps account for the change from an intermarriage rate with whites of around 15% in 1960 to 45% in 1980. Many of these individuals are probably the products of intermarriages or a succession of intermarriages. As we suggested earlier in the paper, the impact of intermarriage on American Indians has been recognized by the federal government and individual tribes for some time.[3]

Second, the American Indian population is becoming increasingly urbanized. In 1980 for the first time in American history, approximately 50% of American Indians lived in urban areas (U.S. Bureau of the Census, 1983). The continuing urbanization of the Indian population is important since the identity of individual Indians has always revolved around tribal or sub-tribal affiliations rather than "Indian-ness". Thus, urbanization has altered the close ties to community and tribe that have been the traditional basis of Indian identity, and has facilitated intermarriage between Indians and other groups.

Continuing intermarriage, changes in the self-identification of individuals from white to Indian and continuing urbanization have created a

dilemna for American Indian tribes. From a societal standpoint, it is probably healthy that Indian/white intermarriage is increasing, that people no longer feel as uncomfortable identifying themselves as Indians as they once did, and that, in addition to the 1.4 million Americans who identified themselves as Indians, almost 8 million people in 1980 claimed that they had some Indian "ancestry" (U. S. Bureau of the Census, 1983). Yet, from the Indian point of view, it is difficult to know how to deal with the resurgence of Indian identity and the continual accumulating impact of intermarriage. Though social scientists have traditionally viewed Indians as a "racial" group, and anthropologists have studied individual tribes as distinct cultural entities, tribes in recent years have not used physical appearance or "culture" criteria as criteria for assessing tribal membership. Tribes view themselves as semi-sovereign "nations" and from their point of view, a tribal member is someone who is entitled to the benefits and responsibilities involved in being a tribal citizen. These benefits may include health care, educational assistance and in a few cases percapita payments funded by a settlement with federal or state governments over past mistreatment of the tribe. Responsibilities include voting and participation in tribal government. The criteria used to define tribal citizenship vary widely. Some tribes require only some Indian blood from that specific tribe; at least one requires 5/8 Indian blood from that tribe, but no tribes require more than that (U.S. Bureau of Indian Affairs, 1981). Tribal definitions of who is a tribal member often reflect the history of tribal relations with whites. Those tribes that continue to be isolated and have experienced little intermarriage tend to have more restrictive definitions of who is an Indian than those tribes who have had a history of intermarriage.

Some tribes have different categories of membership, so that tribal membership is open to many, but other privileges such as opportunities to hold tribal office are restricted to individuals with a certain degree of Indian blood and/or who live on the reservation or in a traditional tribal area. For example, the Chickasaw Tribe of Oklahoma allows any individual with any Chickasaw ancestry to belong to the tribe, but allows only individuals with one-quarter or more Chickasaw blood and who reside within the "traditional tribal boundaries" to hold office in tribal government. Statistics released by the Bureau of Indian Affairs Office in Ardmore, Oklahoma show that 46% of those individuals registered with that office as Chickasaws had less than one-quarter Chickasaw blood. This means that only 54% of tribal members are eligible to hold tribal office. Further, the Bureau of Indian Affairs recognizes only those with 1/4 or more Indian blood as eligible for its services, whereas the Indian Health Service allows the Chickasaw Tribe to decide on who is eligible to receive free medical care that was promised to Chickasaws in treaties.

"Life-long" Indians have always been concerned about "instant" Indians--individuals who assert their Indian identity when it is to their benefit to do so (Yinger and Simpson, 1978). Such individuals are viewed with a great deal of suspicion. Vine Deloria Jr, one of the most respected national Indian leaders, has called for the exposure of such "fakes" who try to influence the course of Indian affairs (Deloria and Lytle, 1985). Unfortunately, from the Indian point of view, it will become increasingly difficult to decide who is real and who is fake. For example, if we think of a "one-half blood" Indian who "looks like" an Indian, but grew up in a middle class home in Chicago, and a "one-eighth

blood" Indian who grew up on a reservation, which of these, if either, is a "fake"?

How Indians resolve the identity question will determine not only the nature of the Indian population in the future, but how Indians are perceived by American society. Most Americans hold to the view of Indians as presented in movies and history books. Both the public and social scientists have thought of Indians as a racial group. Currently, however, many tribes might be more correctly viewed as groups of mixed racial heritage. This creates some tough choices for American society and its public policy. If Indians are viewed as a disadvantaged group, how does society decide who is and who is not an Indian deserving of special help? Should treaty rights be expanded or contracted based on new defintions? How do we apply affirmative action policies and programs to American Indians?

Perhaps the most serious problem for Indians and society alike is how to identify those Indians who continue to suffer from the consequences of past and/or current mistreatment, and target aid in ways that will be most effective. For a division (or divisions) of the Indian population is taking place similar to the division of the black population outlined by Wilson (1978). This division however, is along a different set of dimensions--intermarriage, mixed racial descent and urbanization as well as economic status. Since Indians are such a small group (.6% of the population in 1980), these changes and this division have gone relatively unnoticed by the nation at large. In some parts of the country, though, segments of the public and some politicians have begun to question the nation's promises and commitment to its indigenous peoples. The danger

is that those Indians on reservations, those in isolated rural areas and poor urban Indians (regardless of their "degree" of Indian blood) may be neglected and ignored as fairly well-off urbanized and intermarried Indians capture the attention of the nation. So, the important point is not that there are "real" Indians and "fake" Indians, but that there are some Indians in real need, and it is these Indians toward which society's efforts to help should be directed.

Perhaps the proper attitude to take is rejoicing in the mutual acceptance of Indians and whites by each other as reflected in intermarriage patterns, and a continued commitment to identify and remedy the problems faced by American Indians. At the same time, we need to examine carefully why black/white intermarriage is still so low compared to the level of Indian/white intermarriage.

Notes

[1]Pennsylvania repealed its law in 1780 and so did Massachusetts prior to the Civil War (Wirth and Goldhammer, 1944).

[2]Part of this dramatic increase in Indian intermarriage is undoubtedly due to the increasing propensity of mixed blood Indians to identify as Indian rather than white when reporting to the Census.

[3]The effect of previous intermarriage on current American Indians probably cannot be judged from the ancestry information collected in the 1980 Census. Only 22 percent of individuals who identified themselves as American Indians in 1980 reported multiple ancestries (Snipp, 1984). The wording of the ancestry question is, however, designed to encourage people to identify with one ancestry. Only individuals who "cannot identify with a single group should print their multiple ancestry."

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Table 1

Endogamy and Exogamy Proportions

MALE RACE	FEMALE RACE White	Black	Indian	Other	Total
A. Proportions of Women Marrying Men of Different Races					
White	.989	.008	.484		
Black	.002	.988	.025		
Indian	.003	.001	.453		
Other	.006	.004	.037		
Total	1.000	1.001	.999		
B. Proportions of Men Marrying Women of Different Races					
White	.990	.001	.003	.007	1.001
Black	.028	.963	.002	.007	1.000
Indian	.490	.013	.471	.026	1.000

Table 2

Alternative Specifications of Endogamy and Intermarriage Parameters

MALE RACE	FEMALE RACE White	Black	Indian	Other
A. Q_2 Endogamy and Exogamy Differ [Hypothesis 2]				
White	1	2	2	2
Black	2	1	2	2
Indian	2	2	1	2
Other	2	2	2	-
B. Q_4 Racial Differences in Endogamy [Hypothesis 3]				
White	1	4	4	4
Black	4	2	4	4
Indian	4	4	3	4
Other	4	4	4	-
C. Q_{6A} Differing Black and Indian Intermarriage With Whites [Hypothesis 4]				
White	1	4	5	6
Black	4	2	6	6
Indian	5	6	3	6
Other	6	6	6	-
D. Q_8 Race and Gender Differences in Intermarriage With Whites [Hypothesis 5]				
White	1	4	6	8
Black	5	2	8	8
Indian	7	8	3	8
Other	8	8	8	-
E. Q_{6B} Indian Endogamy Equals Indian Intermarriage With Whites				
White	1	4	3	6
Black	5	2	6	6
Indian	3	6	3	6
Other	6	6	6	-

Table 3

Test Statistics for Models of Intermarriage

Model	L^2	df	Compared to:	Test of Improvement
1. Hypothesis 1: Independence (F)(M)(A)(B)	42,050	124	----------	----------
2. (FA)(MB)(AB)	30,750	108	Model 1	11,300,df=16
3. Hypothesis 2: Equal Endogamy, Equal Exogamy (FA)(MB)(AB)(Q2)	5,449	107	Model 2	25,301,df=1
4. Hypothesis 3: All Endogamy Differs, Equal Exogamy (FA)(MB)(AB)(Q4)	701.1	105	Model 3	4,749,df=2
5. B/W and I/W Differ From Other	543.5	104	Model 4	157.6,df=1
6. Hypothesis 4: Racial Differences in Intermarriage (FA)(MB)(AB)(Q6A)	432.5	103	Model 5	111.0,df=1
7. Hypothesis 5: Gender Differences in B/W Intermarriage	424.4	102	Model 6	8.1,df=1
8. Hypothesis 5: Gender Differences in I/W Intermarriage	432.1	102	Model 6	.3,df=1
9. Racial Differences; Indian Endogamy= White/Indian Intermarriage (FA)(MB)(AB)(Q_6B)	422.1	103	-------	--------
10.Model 7 vs. Model 9	-2.3	1		

F= Female Race, M=Female Race, A= Female Education, B= Male Education,

Table 4

Endogamy and Intermarriage Parameters
[Based on (FA)(MB)(AB)(Q_{6B})]

MALE RACE	FEMALE RACE White	Black	Indian	Other
White	3.739	- .642	1.455	-1.485
Black	.004	4.412	-1.485	-1.485
Indian	1.455	-1.485	1.455	-1.485
Other	-1.485	-1.485	-1.485	----

Table 5

Test Statistics for Models of Intermarriage
Including Education

	L^2	df	Compared to:	Test of Improvement
A. Black Male/White Female Intermarriage				
1. (FA)(MB)(AB)(I)	442.4	104	-------	--------
2. (FA)(MB)(AB)(IA)	407.2	102	Model 1	35.2, df=2
3. (FA)(MB)(AB)(IB)	387.0	102	Model 1	55.2, df=2
4. (FA)(MB)(AB)(IA)(IB)	381.0	100	Model 3	6.0, df=2
5. (FA)(MB)(AB)(IAB)	374.6	96	Model 4	6.4, df=4
B. Black Female/White Male Intermarriage				
1. (FA)(MB)(AB)(I)	546.3	104	------	------
2. (FA)(MB)(AB)(IA)	530.6	102	Model 1	15.7,df=2
3. (FA)(MB)(AB)(IB)	542.4	102	Model 1	3.9,df=2
4. (FA)(MB)(AB)(IA)(IB)	530.0	100	Model 2	.6,df=2
5. (FA)(MB)(AB)(IAB)	528.5	96	Model 2	2.1,df=6
C. Indian Male/White Female Intermarriage				
1. (FA)(MB)(AB)(I)	498.8	104	------	------
2. (FA)(MB)(AB)(IA)	492.7	102	Model 1	6.1,df=2
3. (FA)(MB)(AB)(IB)	455.5	102	Model 1	43.3,df=2
4. (FA)(MB)(AB)(IA)(IB)	453.5	100	Model 2	2.0,df=2
5. (FA)(MB)(AB)(IAB)	417.9	96	Model 2	37.6,df=6
D. Indian Female/White Male Intermarriage				
1. (FA)(MB)(AB)(I)	546.2	104	------	------
2. (FA)(MB)(AB)(IA)	511.5	102	Model 1	34.7,df=2
3. (FA)(MB)(AB)(IB)	533.7	102	Model 1	12.5,df=2
4. (FA)(MB)(AB)(IA)(IB)	501.3	100	Model 2	10.2,df=2
5. (FA)(MB)(AB)(IAB)	468.5	96	Model 4	32.8,df=4

F=Female Race, M=Male Race, A=Male Education, B=Female Education, $I=Q_4$ as defined in Table 2 + an additional parameter for the focal type of intermarriage in each panel.

Table 6

Effects of Male and Female Education on Endogamy and Intermarriage Parameters [Based on Models in Table 5]

Female Educ	Male Educ	Black Men/ White Women (From Table 5,Model A.3)	Black Women/ White Men (From Table 5, Model B.2)	Ind Men/ White Women (From Table 5, Model C.5)	Ind Women/ White Men (From Table 5, Model D.5)
College	College	1.4772	1.183	.6664	.4779
College	High Sch	1.1509	1.183	.6127	.9049
College	No Hi Sc	.4960	1.183	.6114	1.1840
High Sc	College	.9812	-----	1.0387	.5730
High Sc	High Sch	.6549	-----	.4575	.6746
High Sc	No Hi Sc	-----	-----	.2864	.8422
No Hi S	College	.9812	-----	1.069	.3889
No Hi S	High Sch	.6549	-----	.8299	.4689
No Hi S	No Hi Sc	-----	-----	------	------

The numbers refer to the deviation of the intermarriage parameter for the category from the intermarriage parameter for men and women with less than a high school education.

Table 7

Selected Characteristics of Endogamous and Intermarried Households

Variables	WhiF/ WhiM	BlaF/ BlaM	IndF/ IndM	WhiF/ BlaM	WhiF/ IndM	BlaF/ WhiM	IndF/ WhiM	Other
Male Age	46.7 (15.7)	45.5 (15.5)	42.6 (14.8)	37.8 (12.0)	39.8 (13.7)	40.0 (14.2)	40.7 (14.3)	37.3 (12.3)
Female Age	43.9 (15.3)	42.3 (14.8)	39.5 (14.3)	33.3 (10.2)	37.0 (13.4)	36.8 (13.8)	37.6 (13.4)	35.1 (12.0)
Male Education	12.4 (3.5)	10.4 (4.1)	9.7 (4.8)	12.7 (2.9)	11.9 (3.4)	13.0 (3.6)	11.9 (3.1)	12.3 (3.8)
Female Education	12.1 (2.7)	11.2 (3.4)	9.8 (4.4)	12.5 (3.0)	11.9 (2.5)	13.2 (2.6)	11.6 (2.8)	11.9 (3.5)
Household Size	3.3 (1.4)	3.9 (1.8)	4.6 (2.2)	3.6 (1.5)	3.6 (1.5)	3.4 (1.5)	3.6 (1.5)	3.9 (1.7)
South	.32	.55	.28	.20	.34	.32	.34	.21
Metro	.78	.84	.44	.95	.75	.91	.72	.87
Male Language	.06	.03	.46	.09	.08	.13	.06	.41
Female Language	.07	.04	.46	.18	.05	.10	.10	.44
Household Income	24845 (15283)	19358 (12787)	16760 (13046)	21043 (12516)	21149 (14018)	23666 (17533)	20775 (12942)	21797 (14065)
Percapita HH Income	8436 (6029)	5644 (4358)	4261 (3837)	6710 (4525)	6694 (5152)	7921 (6901)	6594 (4853)	6461 (4733)
Poverty	.05	.14	.25	.07	.10	.06	.10	.10

Table 8

Tests of Significance for Selected Contrasts Among Exogamous and Endogamous Couples

VARIABLES	CONTRASTS			
	Endogamous vs. Exoga.	Endogamous Whites vs. End. Minority	Endogamous Black vs. End. Indian	Exogamous Black vs. Exo.
Indian				
Male Age	***	**		
Female Age	***	***		
Male Education	***	***		
Female Education	***	***	***	**
Household Size	***	***	***	
South		***	***	
Metro	***	***	***	**
Male Language	***	***	***	
Female Language	***	***	***	
Household Income		***		
Percapita HH Income		***	*	
Poverty	***	***	***	

* .01 < p <- .05

** .001 < p <- .01

*** p <- .001