

JOURNAL OF

COMPARATIVE

FAMILY STUDIES

VOL. 29 (3): 481-502

1998

Preserving Multiple Ancestry: Intermarriage And Mixed Births In Hawaii*

TERESA LABOV **

and

JERRY A. JACOBS **

A fundamental indicator of the extent to which cultural boundaries between groups are being preserved or being eroded is to be found in data on intermarriage. Many studies have taken an increase in intermarriage to indicate a decline in social distance between two groups (Muhsam, 1990; Pagnini and Morgan, 1990; Telles, 1993). Early work focused on intermarriage among European ethnics (Glenn, 1982; Gordon, 1978; Kennedy, 1944), while more recent studies have examined a broader range of intermarriage patterns (Root, 1992; Alba, 1990; Spickard, 1989). The extent of marriage between Whites and Asians (Lee and Yamanaka, 1990; Sung, 1990a) and between Whites and Hispanics (Fernandez, 1992; Murguia, 1982) has been increasingly prominent in recent research. Hawaii has long been a focus for studies of intermarriage because of its plural character (Adams, 1937; Ho and Johnson, 1992; Labov and Jacobs, 1986; Schmitt, 1968).

In examining state vital statistics data in Hawaii, a curious anomaly appears concerning the race of children. Three sets of figures are available for the number of births to each racial and ethnic group each year: one for each parent and one for the child.¹ For example, of the 20,438 live births in Hawaii in 1990, 5,805 births were to White mothers, 5,678 births were to White fathers, and 4,475 were listed as White births by race of child. The answer to the question, "How many White (or Samoan or Portuguese or Japanese) children were born last year?" thus depends on how membership in these groups is assigned. Regardless of which assignment rule is accepted, any mixed ancestry — whether of the child or its parents — is erased in the process. Any procedure which assigns individuals to a single category thus loses three things: the fact that the individual has a mixed heritage, the race or ethnicity of its parents, and whatever mixed heritage the parents might have. The assignment of a child to one race or ethnic group is clearly problematic in a context where almost half of all children have mixed ancestry.

This practice of ignoring family history is a common feature of most studies of intermarriage. They usually treat individuals as having a single race or ethnicity, thus ignoring whatever mixed ancestry an individual may bring to a marriage. This omission is the stalling point for our paper. We propose simple adjustments to recent birth and marriage data in order to reflect prior mixed births. By incorporating what we know about the mixing that

* We wish to thank Samuel H. Preston, and two anonymous reviewers, for their constructive suggestions.

** Department of Sociology, University of Pennsylvania, 3718 Locust Walk, Philadelphia, PA 19104-6299, USA

¹ Unless otherwise noted, all data on births and marriages are from the Annual Statistical Supplement issued by the State of Hawaii, Department of Health.

has already occurred in the adult population, the growth of different mixes in the population and the overall direction of mixing can be charted.

A second important goal of this paper is to highlight the recursive nature of intermarriage. It has been shown that the children of mixed marriages are themselves more likely to intermarry (Lieberson and Waters, 1988). They found that, for twenty of twenty-two groups in the U.S., individuals of mixed ancestry were more likely to intermarry than were their single-ancestry counterparts. We use the term recursive to refer to an additional way in which intermarriage is self-reinforcing. The larger the pool of individuals with mixed ancestry, the greater the chances of individuals marrying someone with at least some mixed ancestry. In this way, an increase in intermarriage tends to reinforce itself. The growth in the size of the mixed population creates increased chances for intermarriage. The recursive nature of our analysis takes this into account. We develop below specific predictions regarding trends in intermarriage and mixed births that follow from this idea.

It is important to know the extent of mixing between groups for both theoretical and practical reasons. First, mixing is evidence that boundaries have eroded between some groups. Secondly, extensive social mixing between groups reduces the chances for intergroup conflict, while the persistence of strong barriers to intermarriage is indicative of a high potential for social conflict. For example, Botev (1994) found in the former Yugoslavia that inter-ethnic marriages were rare, and suggests recent conflicts in that region are consistent with a pattern of deep social divisions between groups. Thirdly, mixed ancestry enables ethnicity to become optional for those groups that can pick and choose which of their ancestries to highlight, such as many descendants of European immigrants now do (Waters 1990). Lieberson and Waters (1988:250) have documented the fact that a growing number of individuals identify themselves as "Americans" or "unhyphenated White." Finally, the growing prevalence of individuals of mixed ancestry increases the need for statistics that capture the multifaceted nature of individuals' ancestries. The social reality we document is one of an increasingly mixed world. We believe that social scientists need to make provisions for the complex categories of mixing, as the simple heritage categories have become progressively less able to describe the actual social world in which we live.

One might assume that the solution to the problem of multiple ancestry lies in eliciting responses from individuals regarding all of their national, ethnic and racial ancestries. The 1980 and 1990 U. S. Censuses have solicited ancestry or ethnic origin information from respondents. The most extensive examinations of self-reported multiple ancestry information have focused on White ethnic identities (Alba, 1990; Farley, 1991; Lieberson and Waters, 1988). However, self-reported data on family ancestry produces under-reports of the actual level of mixing, since not all respondents list all of their ancestries. In other cases, self-reported ancestry exaggerates the size of a group. Hout and Goldstein (1994) have shown that the number of Irish Americans is greater than birth rates would allow, a result they attribute to the popularity of Irish ancestry (see also Lieberson and Waters, 1993). Our approach, in contrast, does not rely on the salience of individuals' ancestry to them, but rather estimates the size of the population for which multiple ancestry is a matter of personal history.

Data on the extent of multiple ancestries can also be misleading if racial categories are not distinguished from ethnic categories. For example, in the case of Hawaii, 27.8 percent of residents reported multiple ancestries, which is less than the national average of 30.8 percent (U. S. Bureau of the Census, 1983). Further investigation showed that residents of Hawaii were far more likely to report multiple ancestries involving a mixed racial background, compared to the United States mainland, where ethnic mixtures were overwhelmingly reported.

THE MOMENTUM OF MIXING

When groups in the population mix at a significant rate for several generations, the mixing process begins to take on a momentum of its own. As Blau and his colleagues have shown, the more groups in a situation, the smaller each group is relative to the total, the more likely each group is to encounter others, and the more likely each is to intermarry (Blau and Schwartz, 1984). In essence, each mixed group constitutes an additional race or ethnic group, making an otherwise dichotomous situation into a plural one, and making multiple group situations even more plural. Thus, if the chances of intermarriage of a mixed group are equal to those of other groups in the population, the presence of a mixed group increases the likelihood of intermarriage, just as the presence of an additional ethnic group would. When, as is the case in Hawaii, half of the population is of mixed ancestry, the propensity toward further mixing of the population becomes quite strong.

We are not claiming that all individuals of mixed ancestry recognize their multiple identities. Of course, many are absorbed back into one or another of their ethnic groups. Nonetheless, individuals with mixed ancestry increasingly have the option of choosing from alternative racial and ethnic identities. We believe it is important to estimate the size of the groups in which multiple identification becomes possible.

Lieberson and Waters were well aware of the issue we are addressing here. They note that "... a model of intermarriage in which everyone has a single ancestry is progressively inadequate for describing the actual marriage patterns among Whites in the United States (1988:179). " This conclusion is especially evident in the case of Hawaii.

In this paper we estimate the impact of mixed ancestry on current mixed births and mixed marriages, and examine whether the extent of mixed ancestry among parents and spouses creates a pressure for further mixing. We expect that estimates of the true level of mixing that reflect even one generation of mixed ancestry will show substantially higher levels of mixing than are evident in published data. We further expect that the estimated level of mixing will grow more rapidly over time than the reported level. This divergence constitutes evidence in support of the momentum hypothesis just delineated.

TRENDS IN INTERGROUP MIXING IN HAWAII

Hawaii has a long history of tolerance for intermarriage. Public sanctioning of marriages between Hawaiians and foreigners was traced back to 1820 by Adams (1937). A degree of Anglo-conformity was assured by statehood, tempered by a particular culture by which residents of the islands, "locals," separate themselves from others, especially tourists from

the mainland. At the same time locals and tourists agree that a crucial aspect of the culture is a tolerance for dissimilar others (Grant and Ogawa, 1993; Haas, 1994).

Intermarriage is quite prevalent in Hawaii, with over one quarter (28.3 percent) of marriages in the 1990 Census involving brides and grooms from different ethnic and racial groups (U. S. Department of Commerce, 1990). The current rate of out-marriage is close to 30 %, and has been at least that since before statehood in 1959. About 45 % of births are to parents from different racial or ethnic groups (Parkman and Sawyer, 1967; Yamamoto, 1973; Schmitt, 1968; Ikeda, 1991; Labov and Jacobs, 1986; and Schoen and Thomas, 1989).

Hawaii is also of interest to students of intermarriage because of its plural composition. No group has comprised over fifty percent of the population since shortly after Europeans took over the island. The 1990 Census reports the distribution across groups as follows: 33.4 percent White; 22.3 percent Japanese, 15.2 percent Filipino, 12.5 percent Hawaiian, 7.3 percent Hispanic (of any race), 6.2 percent Chinese, and 2.5 percent African American. (U.S. Department of Commerce, 1990). As we note above, however, these data do not reflect the intermarriage and mixed births that occur every year. Many members of each of these groups are themselves of mixed ancestry. The categories of "Hawaiian" and "part-Hawaiian" refer to descendants of the original Hawaiian people. Starting in the 1960's their descendants have registered claims against the federal government for wrongs done to their ancestors by the U.S. annexation of the islands in 1898 (Lind, 1980:15). Activists' proposals for retribution include return of state lands, payments of reparations by the federal government, and rights to govern many of their own affairs.² Lind (1980:121) states that the group (the Hawaiians) which stresses a "unique heritage from one native source, is in fact the most racially mixed of all Hawaii's peoples." (see also Young, 1980 and Ho and Johnson, 1990). The practice of reporting vital statistics on "part-Hawaiians" was terminated in 1986 for marriages and in 1989 for births. In this case, official statistics are moving further from, rather than closer to social reality.

An estimate of the extent of mixing in Hawaii was made by Glick (1970), who reported an increase in mixed births from 31.2% to 36.8% between 1931-1950 and 1960-1969. Glick, however, relied on single-race categories and did not add in earlier mixed births to make adjustments in subsequent birth and marriage data. Other studies have focused on mixing by specific groups (Kikumura and Kitano, 1973; Kitano et al., 1984; Lee and Yamanaka, 1990; Leon, Brown and Weinstein, 1995; Leon and Weinstein, 1991; Monahan, 1977; Sung, 1990b; Wong, 1989). These informative studies nonetheless have the same limitation as Glick: single ancestry measures, with the exception of part-Hawaiian.

Geneticists have attempted to analyze the level of population mixing (Morton, Chung and Mi, 1967). While biological measures might appear to be ideal, there are in fact important limitations to the biological studies. The first is that they are usually cross-sectional—without an historical baseline we cannot estimate the rate of change over time (although comparisons across age groups would be informative). The second problem is that the analysis of blood

² For example, Paul Nussbaum, *Philadelphia Inquirer*, Sept. 29, 1989, "A Clamor for Hawaiian rights: Some natives demand land and sovereignty."

type produces only indirect evidence of mixing for some groups. For example, Morton et al.'s (1967) procedure compared the observed and expected level of blood type B for each group, yet intermarriages between two groups with similar levels of blood type B would not be detected by this procedure. Thus, Chinese, Filipino and Japanese intermarriages would produce children with similar levels of B type blood, so the levels of such intermarriages cannot be detected by this procedure. Groups that many would consider culturally distinctive are difficult to distinguish biologically. The biological studies of the mixed population in the state of Hawaii are thus neither as precise nor as comprehensive as one might wish. (See Hormann, 1982, for an informative discussion of these issues.)

Self-reported measures of ancestral background are an alternative approach to estimating the level of mixing. This strategy has the advantage of shedding light on the salience of family background for individuals. For example, Geschwender, Carroll-Seguin and Brill (1988; 1990) use self-reported ancestry data from the 1980 Census to attempt to distinguish Portuguese-Americans in Hawaii from "Haole" (generally, a temporary White visitor to Hawaii), a procedure objected to by Weinstein, Manicas and Leon (1990:305) who suggest that necessarily "social categories in use have fuzzy boundaries."

Others have probed ethnic heritage in Hawaii in interview questions. Spickard and Fong (1995) explored the basis of "Pacific Islander" identity and found ancestry, family, prestige and place determinant of which ethnicity was salient for people whose multiple identities included Hawaiian, Samoan, Tongan and Maori. This and other studies such as Jedlicka (nd), Johnson (1984), Stephan and Stephan (1989), and Schwertfeger (1982), which focus on factors leading to mixing, show an awareness of growing mixtures, but have not linked the mixed births directly with previous intermarriage (see also Stephan, 1992, and Hall, 1992). Thus, these self-reported multiple ancestry data give an unrealistically low estimate of the level of mixing in Hawaii.

MEASUREMENT ISSUES IN VITAL STATISTICS DATA

All of the issues connected with dividing up a population into social categories are magnified in the Hawaii data we use. "Race" and "ethnicity" are themselves not clear ideas: their use is further muddled by official regulations which include political and statistical considerations for a manageable total number of preferred categories.³ Our analysis makes use of a changing series of official categories for what we would characterize as culturally different groups, without quibbling over whether the categories are racially or ethnically discrete. In so doing, we accept the category "White" without regard for ethnic ancestry. The main point is that regardless of what possible identities a person could or might supply, only one blank is generally available on most forms, and so only one identity can be listed in it. Our analysis offers a method of retrieving information which has had to be omitted.

³ According to the Office of Health Statistics in Hawaii, "The concept of 'race' as meaning ethnic group or ancestral people is well known in Hawaii. The major ethnic groups in Hawaii are Hawaiian, Caucasian, Japanese, Chinese, and Filipino. Minority groups include Korean, Samoan, Puerto Rican, Negro, and others." (Hawaii State Department of Health, mimeo, undated, effective through 1978). A similar approach has continued to the present time, although the list of groups has changed several times.

Five main problems exist in any analysis using racial and ethnic designations in Hawaii Vital Statistics reports.

1. The number of race/ethnic categories available has changed from year to year. African American ("black") was added in 1963; Puerto Rican in 1965, etc. More recently (from 1987 on), categories used to report marriage data have been reduced: Hawaiian now includes part-Hawaiian (as noted above) and White includes Puerto Rican, Portuguese, Mexican and Cuban (1987 Statistical Report:62).

Unfortunately, comparable data are not available for earlier than 1956. In our analysis we use the maximum number of consistent categories.

2. The official assignment of the child to race/ethnic categories in cases where parents are of different categories has shown major changes over the years, ranging from using father's status to using mother's (Glick, 1970; Robinson and Gist, 1992). Generally, children of mixed marriages are coded today by the minority category, except that any Hawaiian mix is coded as a Hawaiian child. These changes do not impact our analysis, since the data for our calculations come from tables which give live births by racial and ethnic status of both father and mother.

3. All Hawaiian data include a share of temporary residents, some may be vacationing or other non-permanent visitors, including 10.4 percent who are military personnel or dependents (State of Hawaii, 1991a).⁴ Military personnel are more likely to be White than the overall state population, and to marry White partners from the mainland than are Whites who are not in the services (Leon and Weinstein, 1991). Schmitt (1980) cites a civilian birth rate of 20.5 in 1979; if military dependents are omitted, it is 17.6. In 1990 military births accounted for 4,091 of the 20,528 births, a crude birth rate of 35.1 for military births and 14.6 for civilian births. Our analysis could inflate the extent of mixing of Whites from the mainland if significant numbers of Whites marrying in Hawaii were not residents of the islands 25 years ago. We consequently report totals for all non-White groups for each of our analyses in order to see the impact of our estimates without this potentially confounding factor.

4. Another limitation in the estimates is that not everyone who is born in Hawaii stays there. Net migration from 1970 to 1980 was +77,014; from 1980 to 1990 was +31,390 (State of Hawaii, 1981; 1991b), of which less than half were military and their dependents. The modest level of this group suggests that our analysis of trends over time will not be undermined by changes in the size of this group.

5. In this analysis we make distinctions among non-White ethnic groups, but do not distinguish among White ethnics. By and large the data do not allow us to do otherwise. Hawaii is the only state without a White majority: we take advantage of this to understand

⁴ According to The State of Hawaii Data Book (1981:37-38), in 1980 of the 35,098 armed forces, 26,527 were Caucasian, 3,621 Black and 1,604 mixed (659 part Hawaiian and 945 non-Hawaiian) with similar proportions among military dependents. In 1980, 33,082 armed forces were male and 1,932 female, whereas military dependents were 18,983 male and 44,410 female, with similar numbers of males and females under 19, and most over 20 year old dependents female.

processes which can not be examined in the rest of the United States. We believe that the same self-reinforcing character of intermarriage documented here could be found in marriages among groups of Whites with diverse European ancestry.

DATA AND METHODS

A body of useful data for exploring the issues of multiple ancestry is the birth and marriage records in Hawaii published annually by the Hawaii State Department of Health. The groups included for analysis in this study are: White, Hawaiian, Chinese, Filipino, Japanese, Puerto Rican, Korean, Samoan, African-American and Other. In some analyses we group all non-Whites together in order to contrast their experiences to those of Whites. We thus have a curious list of categories which include both racial and ethnic distinctions. These groups, however, represent cultural and social boundaries between people. Thus, our list of groups, inelegant as it is, represents an extensive if not exhaustive list of socially significant racial and ethnic groups in Hawaii.

We adjust intermarriage percentages by adding an estimate of the proportion of mixed births in the previous generation. The basic idea is to add to all official mixed marriages those marriages which are ostensibly endogamous but in fact involve one or more individuals of mixed ancestry. We recognize marriages within groups that involve one or more individual with mixed ancestry as mixed marriages. For example, in 1990 55.5 percent of brides of Japanese ancestry married non-Japanese partners. But some Japanese brides married Japanese grooms who had mixed ancestry. Adding this group to the total of mixed marriages will increase the rate of mixed marriages above the official 55.5 percent figure.

Our first estimation procedure assumes maximum homogamy among these individuals of mixed ancestry, in order to obtain an extremely conservative base-line adjustment of additional mixing. Our second estimation procedure relaxes this assumption to allow for a more realistic estimate of within group marriages that actually involve one or more mixed partners. In order to look at intermarriage and mixed births it is necessary to consider the ethnic and racial status of brides and grooms and of each parent separately.

For the conservative estimation of the number of intermarriages, let us assume that men and women of mixed ancestry marry each other as much as possible. The adjusted proportion of mixed brides for each group can be calculated as follows:

$$\text{Equation 1. } M' = M + (1-M)B_n$$

where M = the proportion of reported mixed marriages of brides for a given group; and B_n = the proportion of mixed births to mothers from a given group n years earlier.

M' is thus an estimate of the number of mixed marriages experienced by brides. This figure adds to the officially reported number of intermarriages the number of within-group marriages in which at least one of the partners was of mixed ancestry. The number of years lag time between the observed marriages and the earlier births is selected to reflect the average age at marriage. This procedure provides a very conservative estimate of additional mixed

marriages because it assumes that individuals of mixed ancestry marry only each other.

A more realistic adjustment assumes that, within a group, individuals of mixed ancestry marry others at random. An adjusted number of intermarriages reflecting this assumption can be calculated as follows:

$$\text{Equation 2. } M'' = M + (1-M)(1-(1-B_g)^2)$$

Here we assume that individuals of mixed ancestry marry others within their group in proportion to their representation within the group. This adjustment relaxes the conservative assumption of Equation 1 and consequently produces a more realistic set of estimates.

Figure 1 may be helpful in explaining our approach. In Panel A of Figure 1, the number of intermarriages for Japanese-American brides is given as B, while the number of intermarriages for Japanese-American grooms is given as C. The term D includes those cases in which neither the bride nor groom is of Japanese-American ancestry. Panel B allows for multiple ancestry. In this case, intermarriages of Japanese brides and grooms would include all partly mixed marriages — A2, A3, and A4. Estimates of the size of these groups depends on assumptions about the patterns of marriage among individuals with at least some Japanese ancestry.

FIGURE 1
A Comparison of Measures of Single and Multiple Ancestry

Panel A. Single Ancestry

BRIDES	GROOMS	
	Japanese American	Other
Japanese American	A	B
Other	C	D

Panel B. Multiple Ancestry

BRIDES	GROOMS		
	Japanese American	Part-Japanese American	Other
Japanese American	A1	A2	B1
Part-Japanese American	A3	A4	B2
Other	C1	C2	D

Working through an example should help to clarify how these adjustment procedures operate. Again we start with the 55.5 percent of Japanese intermarried in 1990, but assume

that one third of the Japanese individuals in this marriage cohort had some mixed ancestry themselves. Let's initially assume that individuals with mixed ancestry marry only each other, as does our "Homogamous Adjustment Factor" (Equation 1). Since one third of the Japanese-Japanese marriages involve individuals who have mixed ancestry, a minimum of 18.3 percent (55.5 percent times 33 percent) additional mixed marriages must be added to the original 55.5 percent intermarriage rate. Thus, the minimum adjusted rate of mixed marriage would be 73.8 percent instead of 55.5 percent.

If we allow for individuals of mixed ancestry to marry at random within their group, as does "Heterogamous Adjustment Factor" (Equation 2), then the rate of mixed marriages rises to 80.2 percent. This total is reached in the following way. The chances are 5 in 9 that within-group marriages would involve one or more individuals of mixed ancestry, because the proportion of marriages in which non-mixed individuals marry each other is 4 in 9 (2/3 squared). An additional 5 of 9 marriages (of the 44.5 percent within group marriages, or a total of 24.7 percent) must be added to the 55.5 percent mixed marriages we began with, for a total of 80.2 percent.

Similarly, an adjustment was made in the mixed birth percentages to reflect past birth patterns in Hawaii by adding an estimate of the proportion of past mixed births. The formulae are the same as in Equations 1 and 2, except the correction is applied to mixed births instead of mixed marriages. The formulae assume that a proportion of births shown as within-group births were actually mixed births, as in the case of mixed marriages. Median age of mothers at birth was fairly constant over this period, at 26, so our selection of a 25 year adjustment factor is appropriate here.

Our procedure requires an estimate of the proportion of brides and grooms who have mixed ancestry. This estimate is derived from data pertaining to the period in which these married couples were born. Median age of marriage for brides was fairly constant, at 27 (including remarriages), over the period examined. We utilized estimates from birth data 20, 25 and 30 years prior to the event. We refer to these as T-20, T-25, and T-30 adjustments. We calculated this range of adjustments for two reasons. First, the T-20 adjustment factor gives us a longer historical time frame and covers more groups than either T-25 or T-30. This enables us to see more clearly the divergence of actual and adjusted rates. Second, since the T-20 adjustment reflects the greater mixing in the population in recent years, it will be useful for previewing the rates of adjustment likely to occur in the immediate future.

Our estimates assume intermarriage is independent of mixed ancestry. This assumption may inflate the size of our adjustments. For example, if all part-Japanese brides married non-Japanese grooms, then no adjustments would be needed. We believe the true rate is somewhere between our two estimates, the minimum and the random. We offer the estimate based on random association because other alternatives would clearly be arbitrary, and because we believe we understate the adjustment by only factoring in one generation of mixed ancestry.

FINDINGS

The adjustments in all cases showed a greater degree of mixing than the unadjusted data.

TABLE 1
Estimates of Mixed Births Born to Mothers, Based on T-25 Year Adjustment,
Assuming Maximum Homogamy Among Individuals of Mixed Ancestry.

		1982	1984	1986	1988	1990
Total	Estimated	.566	.570	.575	.614	.632
	Actual	.449	.446	.450	.452	.448
	Difference	.117	.124	.125	.162	.184
White	Estimated	.407	.408	.409	.422	.444
	Actual	.320	.310	.310	.307	.300
	Difference	.087	.098	.099	.115	.143
Hawaiian	Estimated	.838	.834	.825	.818	.805
	Actual	.612	.619	.590	.588	.542
	Difference	.225	.215	.235	.230	.263
Chinese	Estimated	.722	.701	.693	.688	.728
	Actual	.574	.531	.508	.493	.509
	Difference	.148	.169	.185	.195	.220
Filipino	Estimated	.596	.631	.633	.649	.650
	Actual	.433	.460	.451	.458	.459
	Difference	.163	.171	.182	.191	.191
Japanese	Estimated	.526	.543	.590	.618	.622
	Actual	.416	.425	.470	.487	.492
	Difference	.110	.117	.120	.131	.130
Puerto Rican	Estimated	.879	.865	.866	.933	.922
	Actual	.696	.667	.672	.787	.765
	Difference	.183	.198	.194	.146	.157
Korean	Estimated	.874	.894	.906	.929	.906
	Actual	.638	.653	.639	.661	.640
	Difference	.236	.240	.267	.268	.266
Samoan	Estimated	-	-	-	.674	.737
	Actual	.376	.446	.468	.439	.517
	Difference	-	-	-	.236	.221
African American	Estimated	-	-	-	.217	.261
	Actual	.157	.164	.163	.175	.220
	Difference	-	-	-	.042	.041
Other	Estimated	.657	.680	.729	.803	.881
	Actual	.514	.570	.617	.587	.600
	Difference	.143	.111	.112	.216	.281
Non-White	Estimated	.636	.642	.650	.699	.708
	Actual	.503	.507	.512	.514	.507
	Difference	.133	.135	.138	.185	.201

Birth rates and marriage rates will be discussed in turn.

1. Mixed Births

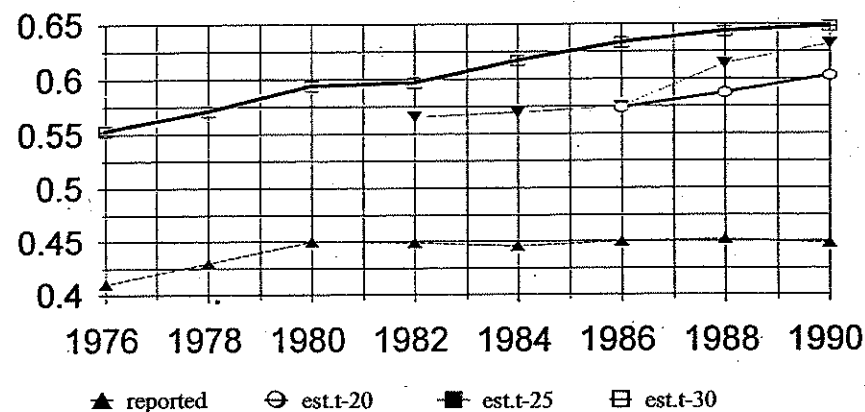
Mixed births in Hawaii as reported in official statistics have seen a steady increase, rising from 27% in 1956 to 45% in 1990. In Figure 2 we show the effect on this trend of our adjustments that reflect multiple ancestry.

The results for each group using the 25 year adjustment are presented in Table 1.⁵ These estimates assume maximum homogamy among individuals of mixed ancestry, as is reflected in Equation 1. Whereas official statistics report nearly half (44.8 percent) of births in Hawaii were to mothers whose race or ethnic group differed from the father, our estimates reveal that a clear majority (63.2 percent) involve either parents from different racial and ethnic groups or some mixed ancestry among at least one parent. Indeed, throughout the 1980's our estimates indicate that the majority of newly born children in Hawaii had some mixed ancestry. Thus, our procedure of factoring in multiple ancestries of mothers and fathers significantly changes our understanding of the composition of mixed births in Hawaii. This is true even when we make the extremely conservative assumption that all individuals of mixed ancestry marry each other.

Our estimates are not only higher than official reports, but they differ by a growing

FIG. 2.

Trends in Mixed Births Using 20, 25 and 30 Year Adjustments.



⁵ We used several birth lag times because data limitations severely restrict the time frame which may be covered using the longest lag time. The greatest correction occurred using births from 20 years before the event, the least correction is evident when births of 30 years are factored in. The adjustment is intermediate when births occurring 25 years ago are used. The more recent the time frame, the larger the mixed population, the larger the adjustment.

TABLE 2
Estimates of Mixed Births to Mothers, Based on t-25 Year Adjustment, Assuming Heterogamy Among Individuals of Mixed Ancestry

		1982	1984	1986	1988	1990
Total	Estimated	.720	.727	.737	.748	.763
	Actual	.449	.446	.450	.452	.448
	Difference	.271	.280	.287	.296	.315
White	Estimated	.483	.492	.493	.518	.558
	Actual	.320	.310	.310	.307	.300
	Difference	.162	.182	.183	.211	.257
Hawaiian	Estimated	.932	.928	.925	.919	.917
	Actual	.612	.619	.590	.588	.542
	Difference	.320	.308	.335	.332	.375
Chinese	Estimated	.818	.809	.808	.808	.850
	Actual	.574	.531	.508	.493	.509
	Difference	.245	.278	.301	.315	.341
Filipino	Estimated	.713	.748	.755	.773	.774
	Actual	.433	.460	.451	.458	.459
	Difference	.280	.288	.304	.315	.315
Japanese	Estimated	.616	.636	.682	.715	.719
	Actual	.416	.425	.470	.487	.492
	Difference	.200	.210	.212	.228	.227
Puerto Rican	Estimated	.952	.945	.945	.979	.974
	Actual	.696	.667	.672	.787	.765
	Difference	.256	.279	.273	.192	.209
Korean	Estimated	.956	.967	.976	.985	.975
	Actual	.638	.653	.639	.661	.640
	Difference	.318	.314	.336	.324	.335
Samoan	Estimated	-	-	-	.811	.857
	Actual	.376	.446	.468	.439	.517
	Difference	-	-	-	.372	.341
African American	Estimated	-	-	-	.257	.300
	Actual	.157	.164	.163	.175	.220
	Difference	-	-	-	.082	.080
Other	Estimated	.758	.762	.808	.906	.965
	Actual	.514	.570	.617	.587	.600
	Difference	.243	.193	.191	.319	.365
Non-White	Estimated	.797	.803	.818	.827	.831
	Actual	.503	.507	.512	.514	.507
	Difference	.293	.296	.306	.313	.325

amount. In 1982, our figures were 11.7 percentage points higher than the official reports; by 1990, they are 18.4 percentage points higher. In other words, not only is the adjusted rate higher, but reported and adjusted curves increasingly diverge over time as the adjustment factor gradually grows larger. The divergent rates support the notion of momentum by showing that the presence of a significant proportion of individuals with mixed ancestry in the population reinforces the trend toward increased mixing.

The largest correction was for Koreans, for whom the proportion of mixed births would have been 26.6 percentage points higher in 1990 once mixed ancestry is factored in. The smallest correction factors in 1990 were evident for African Americans (4.1 percentage points), Japanese (13.0 percentage points) and Whites (14.3 percentage points).

The results calculated in Table 2 relax the conservative assumption of Table 1, and assume instead that the rates of intermarriage among individuals of mixed ancestry are the same as those observed in the population as a whole. In other words, it allows for heterogamy among individuals of mixed ancestry, as is reflected in Equation 2. These estimates reveal an even higher proportion of mixed births in Hawaii. Fully three quarters (76.3 percent) of births in Hawaii are to couples of difference racial and ethnic groups or involve at least one parent of mixed ancestry.

Here as in Table 1, our results exceed official estimates and diverge over time, with a 27.1 percentage point differential in 1982 growing to a 31.5 percentage point spread in 1990.

For every group other than African Americans, a majority of children are of mixed ancestry, and even for African Americans, nearly one third of children born are of mixed ancestry. A majority of births to White mothers (55.8 percent) and the great preponderance of births to Non-White mothers (83.1 percent) involve intermarriage or mixed ancestry.

2. Mixed Marriages

As the number of marriages in Hawaii has more than trebled since before statehood, the proportion of marriages by Whites has assumed a greater share of all marriages. For brides, the proportion White rose from 22 % in 1950 to 35.7 % in 1990; for grooms, from 30.6 % in 1950 to 40.7 % in 1990. Although their data do not go back as far, African Americans are the only other group to have increased their share of marriages in Hawaii for both brides and grooms (.7 % in 1965 to 2.8 % in 1990 and 1.2% in 1965 to 5.2% in 1990, respectively). We have shown elsewhere that the decline in intermarriage in Hawaii is a reflection of the growth in the size of the White population in Hawaii (Labov and Jacobs, 1986). Since Whites are the least likely to intermarry, the larger this group grows, the smaller the rate of intermarriage will be. When the relative size of groups is adjusted statistically, it becomes clear that the tendency to intermarry has continued to increase over time, even though the proportion of mixed marriages has declined in recent years. We present homogamous and heterogamous results using a 25 year adjustment factor.

For intermarriages as for births, our estimates substantially exceed official reports. In

TABLE 3
**Estimates of mixed Marriages For Brides, Based on T-25 Year Adjustment,
 Assuming Maximum Homogamy**

		1982	1984	1986	1988	1990
Total	Estimated	.465	.451	.426	.436	.477
	Reported	.357	.334	.307	.286	.301
	Difference	.108	.117	.119	.150	.176
White	Estimated	.261	.265	.243	.260	.299
	Reported	.153	.144	.117	.113	.119
	Difference	.108	.121	.126	.147	.181
Hawaiian	Estimated	.837	.824	.817	.810	.814
	Reported	.611	.597	.573	.570	.564
	Difference	.226	.227	.245	.240	.250
Chinese	Estimated	.776	.757	.804	.808	.815
	Reported	.657	.620	.686	.688	.664
	Difference	.119	.137	.118	.120	.150
Filipino	Estimated	.672	.691	.706	.713	.773
	Reported	.539	.547	.560	.557	.648
	Difference	.133	.143	.146	.156	.124
Japanese	Estimated	.572	.583	.634	.654	.669
	Reported	.472	.476	.528	.536	.555
	Difference	.100	.107	.107	.118	.114
Puerto Rican	Estimated	.876	.922	.919	-	-
	Reported	.688	.807	.803	-	-
	Difference	.188	.115	.117	-	-
Korean	Estimated	.916	.930	.947	.946	.921
	Reported	.758	.773	.798	.745	.698
	Difference	.158	.157	.150	.201	.223
Samoan	Estimated	-	-	-	.655	.713
	Reported	.440	.354	.428	.406	.472
	Difference	-	-	-	.249	.241
African American	Estimated	-	-	-	.211	.237
	Reported	.117	.207	.197	.168	.195
	Difference	-	-	-	.042	.042
Other	Estimated	.805	.798	.797	.868	.896
	Reported	.723	.729	.713	.723	.650
	Difference	.081	.070	.084	.145	.246
Non-White	Estimated	.665	.670	.681	.710	.737
	Reported	.552	.553	.566	.550	.553
	Difference	.113	.117	.115	.160	.184

1990, less than one-third (30.1 percent) of marriages of brides reported in vital statistics were to husbands of a different race or ethnic group. In contrast, our estimates reveal that nearly half (47.7 percent) of marriages of brides were either intermarriages or involved individuals of mixed ancestry. Moreover, the trend in intermarriages differs when the more expansive definition is considered. Our estimate reveals a slight increase in intermarriages during the 1980's, whereas official vital statistics data indicate a modest decline in intermarriages. Thus, taking account of mixed ancestry in estimating the rate of intermarriages in this case not only results in a higher level of intermarriage, but also shows that Hawaii continues to experience an increase in mixed marriages despite the offsetting increase in the number of White marriages.

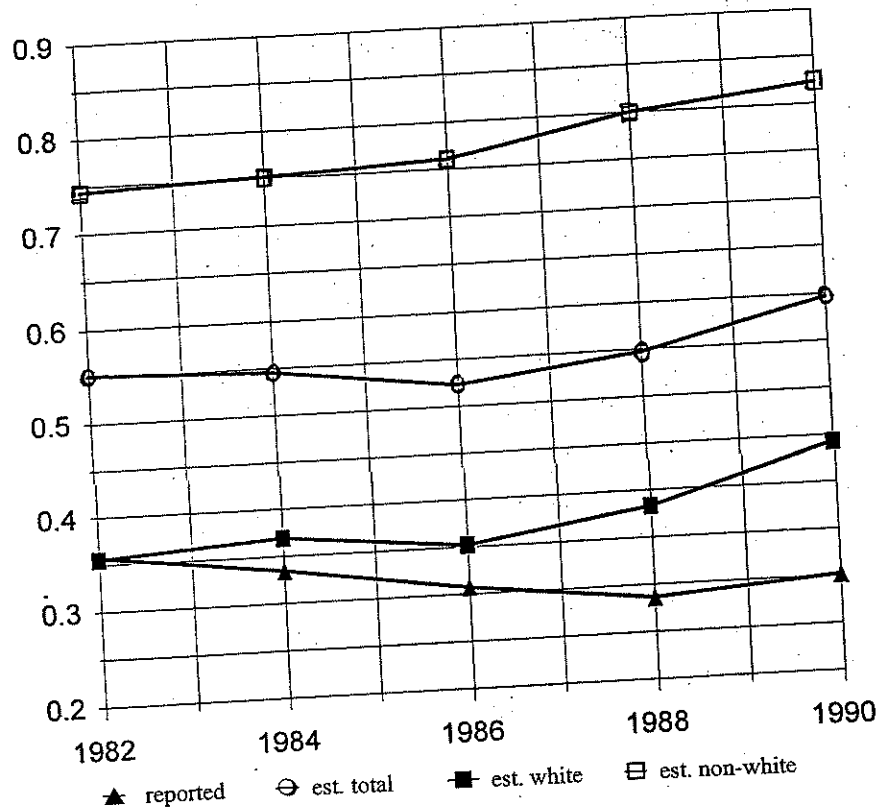
The data presented in Table 3 adjust marriage data using estimates derived from birth data 25 years earlier, and assume complete homogamy among individuals of mixed ancestry. The adjustments in Table 4, which allow for heterogamy among individuals of mixed ancestry, indicate that nearly 60 percent (59.7) of marriages of brides are intermarriages or involve individuals of mixed ancestry. The majority of marriages for each group, except Whites and African Americans, involved at least one individual with mixed ancestry. For Whites, the estimate was 44.3 percent and for African Americans, 27.7 percent.

TABLE 4
**Estimates of mixed Marriages For Brides, Based on T-25 Year Adjustment,
 Assuming Heterogamous Marriages**

		1982	1984	1986	1988	1990
Total	Estimated	.551	.545	.523	.547	.597
	Reported	.357	.334	.307	.286	.301
	Difference	.194	.211	.216	.261	.296
White	Estimated	.355	.369	.352	.383	.443
	Reported	.153	.144	.117	.113	.119
	Difference	.202	.225	.235	.270	.324
Hawaiian	Estimated	.932	.923	.922	.91	.921
	Reported	.611	.597	.573	.570	.564
	Difference	.321	.327	.349	.346	.357
Chinese	Estimated	.854	.845	.878	.882	.898
	Reported	.657	.620	.686	.688	.664
	Difference	.197	.225	.192	.194	.233
Filipino	Estimated	.766	.789	.804	.815	.853
	Reported	.539	.547	.560	.557	.648
	Difference	.227	.241	.244	.258	.205
Japanese	Estimated	.653	.668	.717	.742	.754
	Reported	.472	.476	.528	.536	.555
	Difference	.180	.192	.189	.206	.199

FIG. 3

Trends in Mixed Marriages For Totals, Whites and Non-Whites



Trends for heterogamous estimates for Whites and Non-Whites are depicted in Figure 3. Figure 3 reveals an increasing trend toward mixed marriages among both Whites and Non-Whites. It is the growth in the proportion of marriages involving Whites that is responsible for the slight decline in intermarriages in official reports during the 1980s.

The largest change was for Hawaiians (35.7 percentage points), while the smallest was for African Americans (8.2 percentage points). Most groups experience at least a 20 percentage point increase in intermarriage of brides when multiple ancestry is taken into account.

For nearly all groups, the rate of intermarriage differs for brides and grooms. We do not show data for grooms in this paper, but they are higher than brides for Whites, African Americans, Puerto Ricans and Samoans, while the reverse is true of all the other groups. The same pattern is reflected in the adjusted estimates: the procedures employed in our

estimates do not alter these within group differences between brides and grooms. We are intrigued by the general pattern of excess intermarriages among Asian brides compared with Asian grooms (the sole exception being Samoan). We explore this topic in a related paper (Jacobs and Labov, 1995).

CONCLUSIONS

The adjustments to the data on mixed births and mixed marriages more accurately document the increasing tendencies toward mixed heritages. The adjusted figures reveal larger proportions of mixed births overall than are shown in the official data. This differential is especially true for Hawaiians, Koreans, Filipinos and Samoans, all groups with high proportions of mixed ancestry in earlier generations and all with long-standing representation on the Hawaiian islands. The adjustments have the least impact on African Americans and Whites, both groups with lower intermarriage rates and more recent migrations to Hawaii. Depending on the assumptions used, births involving some mixed ancestry represented from three-fifths to as much as three-quarters of all births in Hawaii in 1990. Marriages involving some mixed ancestry represent nearly fifty percent of marriages based on more conservative estimates or nearly sixty percent of marriages, using the more realistic adjustment procedure.

The data also support the idea that significant intermarriage creates a momentum for continued mixing of the population. In other words, over time the presence of a substantial proportion of the population with mixed ancestry will tend to reinforce the tendency toward further mixing. Evidence for this idea can be seen from the fact that the adjusted rates of mixing diverge over time from the observed rates. This indicates that intermarriage data which ignore mixed ancestry become increasingly removed from reality. They increasingly underestimate the rate of mixed marriages because a substantial and growing proportion of the population has mixed ancestry and is consequently necessarily involved in mixed marriages. We estimated the minimum adjustment needed to acknowledge the existence of mixed ancestry, and we then proceeded to provide a more accurate estimate based on a procedure which allowed for heterogamy among those with mixed ancestry.

There remains, however, another important underestimated factor. In all of these data, there is a recursive feature in that some of those listed in single ethnic categories as parents 25 years ago were themselves mixed, and so the estimates suggested here could only be higher if the extent of these earlier mixes were taken into account.

The retention of a single parental category rather than the adoption of hyphenated ones, although a practical necessity, does not give a full picture of the extent and direction of mixed births. It is interesting to note that Hawaii data for the late 1980s have moved in the direction of less information, by dropping the one mixed category, part-Hawaiian, and expanding White to include several of the smaller categories. Sociologists may still continue to be bothered by the combination of racial, ethnic, and national labels used, but their use has permitted closer tracking of changes in the size of racial and ethnic groups in Hawaii, especially since statehood, than would have been possible with any smaller set of categories.

It is certainly not possible to report official data on every possible combination of backgrounds in each individuals' family history. However, it is possible to report the number

of individuals with some mixed ancestry. Thus, adding to official data such categories as part-Japanese, part-Hawaiian, etc., would not result in an impossibly large number of categories, and would substantially improve the validity of these statistics.

The growth of more permeable educational and occupational barriers throughout the United States suggests that contacts will continue to increase among individuals of different races in situations of equality. Increasing intermarriage rates are one piece of evidence of that. A concomitant increase in the proportion of mixed births can also be expected. Although the numbers of individuals in mixed categories will grow, the numbers of mixed categories probably will not. Thus, the mainland pattern will continue, as it does in Hawaii, to understate the full extent and direction of mixing. Our results point to the importance of developing social and vital statistics that reflect the diversity and complexity of social ancestry in the United States.

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