

**Socioeconomic stratification from within:
Changes within American Indian cohorts in the United States: 1990-2010**

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Abstract: Socioeconomic inequality in the United States has risen in recent years with large disparities in education, earnings and health across racial and ethnic groups. Somewhat less attention has been given to the stratification that occurs within racial and pan-ethnic categories. This paper considers the increasing divergence of socioeconomic status within the American Indian/Alaskan Native (AIAN) population in the United States. Decomposition analyses within synthetic cohorts drawn from US Census data demonstrate that the more advantaged status of multi-racial AIAN individuals has led to an overall improvement in the status of the AIAN adult cohorts over time.

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Socioeconomic inequality in the United States has risen in recent years with disparities in education, earnings and health are notable across racial and ethnic groups (e.g. Flores & Lin, 2013; Ross, et al., 2010; West Coast Poverty Center, 2010). Much of the research on social stratification compares across racial or pan-ethnic groups but less attention has been given to the stratification that may increase or decrease within racial and pan-ethnic categories. In addition, smaller groups are frequently neglected in these analyses. Yet many smaller racial and ethnic groups are growing in the United States and are also subject to this increased socioeconomic inequality and health disparities. Here we focus on the social stratification within one growing subgroup: The American Indian and Alaskan Native (AIAN) population in the United States.

There are several reasons why socioeconomic stratification may increase over time within a racial or ethnic group. First, there may be real differences in the social mobility of some individuals within the group. For example, if educational or economic opportunities increase for younger group members, the status of younger cohorts will improve while older group members remain disadvantaged. Conversely, barriers to upward mobility or curtailed opportunities during economic downturns could create situations with limited resources among younger group members that place them on a lower socioeconomic trajectory than older cohorts in the same group. Second, in addition to differences in individual mobility, socioeconomic stratification within the racial group may occur as new individuals join as group members. These individuals may physically move into the population (i.e. migration) or move into group membership through changes in their own self-identification. Thus, when the social construction of race and ethnicity changes and the new individuals identify as members of a minority group, the status of these ‘newcomers’ shifts the socioeconomic composition of the entire group. If these individuals’ socioeconomic status is comparatively high, we will observe improvement in the socioeconomic profile of the group overall even if there is little actual change in individual socioeconomic mobility and well-

being over time. And, this apparent improvement in the socioeconomic status of the group should not be attributed to improved access to resources by group members but rather to the re-definition of group membership itself.

In 2000, the United States Census allowed individuals to report more than one racial identification for the first time. Although only 2.4% of the entire US population chose more than one racial category at that time, some minority groups saw large increases in the size of their populations when multi-racial responses were included. For historically disadvantaged racial minorities, the increase of individuals who select to identify with the group may be a sign of decreased stigmatization. On the other hand, those who select more than one race may also have more options and can select their minority identification as symbolic rather than imposed from the outside (Gans 1979). If this ‘symbolic’ identification is chosen by those who are more advantaged, there will be an apparent improvement in the socioeconomic status of the group when multi-racial individuals are included in analyses.

One group clearly impacted by the changing social construction of race and ethnicity is the American Indian population in the United States. There has been significant increase in the size of the American Indian/Alaskan Native (AIAN) population from the 1960 US Census going forward with growth far outpacing what would have been expected from rates of natural increase alone (Eschbach, Supple & Snipp, 1998; Liebler & Ortyl, 2013). Shifts in racial and ethnic identification, adoption of previously stigmatized identities and the ability to select more than one racial category on the Census questionnaire have all contributed to this statistical growth. As this population increased into 2000, the characteristics of ‘new’ American Indians also appeared more socioeconomically advantaged. For example, there were greater increases in the number of American Indians with college education than would have been expected based on observations from 1990 (Liebler & Ortyl, 2013). This suggests that, although some of this increase occurs among those selecting AIAN as their only identification, the improved status of the AIAN population overall is due in large part to the inclusion of those who choose AIAN in combination with another racial identification. This paper carries these previous analyses forward by quantifying the amount of improvement in socioeconomic well-being among the American

Indian Alaskan Native population attributable to those who selected American Indian as one of multiple racial identities when compared to those who select AIAN alone. The analyses also identify the characteristics of these groups that account for the gap in well-being within the AIAN population. To do this, we follow synthetic cohorts of AIAN individuals in the United States from 1990 through 2010.

Background:

There is variation in socioeconomic status within the American Indian population in the United States. The same individual characteristics that predict higher socioeconomic status among other groups, are also associated with higher status among American Indians as well: Younger individuals, those who live in urban areas and those who live off reservations tend to have higher socioeconomic attainment than their counterparts (Huyser, Sakamoto & Takei, 2010; Eschbach, Supple & Snipp, 1998). However, Huyser, Sakamoto and Takei (2010) also demonstrate the persistent disadvantage in socioeconomic attainment experienced by single race American Indians. Using 2000 Census data, the authors show that those individuals who self-identify as American Indian in combination with another race are still disadvantaged relative to non-Hispanic Whites but their socioeconomic attainment is higher than those who self-identified as single-race American Indian. This suggests that any improvements in socioeconomic status over time among American Indians should be considered in light of the disparities within this population as well as in relation to other minority groups.

Race and ethnicity are largely socially constructed and therefore subject to re-definition across time and place (Harris & Sim, 2002; Nagel, 1994). Yet it is not clear how much changing racial/ethnic identification occurs and how this impacts the assessment of socioeconomic well-being across groups at the population level (Guo, et al., 2014). Passel (1997) noted the significant increase in the growth of the Native American population between 1960 and 1990 that went above natural increase. More recently, Perez & Hirschman (2009) demonstrate that the population of racial groups in the United States has shifted, rather dramatically in the case of smaller groups like American Indians, and this shift is only partially accounted for by the demographic drivers of population growth such as fertility or immigration.

Rather, a non-negligible portion of group growth or attrition is attributable to changing self-identification and movement across racial categories (Perez & Hirschman, 2009).

Changes in Data: U.S. Census data relies on self-reports of race and ethnic identification to quantify the size of these groups in the United States and over time. Population groups may change in size due to four factors: Births, Deaths, Immigration and Social Construction of identity. The first three of these factors are part of the fundamental equation of population growth. A straightforward analysis can identify how much change in a population subgroup we would expect based on the number of births to the group, minus the number of deaths of group members plus the addition of new immigrants. Previous analysis of the AIAN population suggested that only a minimal amount of the change in the population from 1960-1980 could be attributable to natural increase or net migration (Perez & Hirschman, 2009).

However, the fourth factor, the social construction of self-identification, is much more difficult to quantify (Hirschman, Alba & Farley, 2000). In the case of American Indian and Alaskan Natives (AIAN), social acceptance or awareness may motivate individuals who had previously not identified as AIAN to do so. This would result in an increase in the size of the group. Increases in intermarriage and appreciation of multi-racial backgrounds may increase the number of children identified as American Indian over time as well (Qian & Lichter, 2007). If this were the only thing to change, we could quantify the amount of change in group size resulting from new individuals self-identifying as AIAN by looking at the residual change that is *not* due to births, deaths or migration.

Recognizing the increases in interracial marriage and childbearing as well as the increased social awareness of biracial and multi-racial identities, the United States Census also changed the way it asked about race in the 2000 decennial census. Allowing individuals to select more than one race had the advantage of reducing nonresponse and appeared to have little impact on the overall racial composition (Hirschman, Alba and Farley, 2000). Approximately 2.4% of the US population selected more than one racial identification in 2000 and 3% did so in 2010. Although this is a relatively small proportion of the population overall, including multi-racial individuals had a much larger impact on the size of minority groups in the United States. For smaller groups, groups with long histories of discrimination and groups

with high rates of interracial unions this methodological shift leads to more difficulty assessing the social and economic characteristics within the group.

Among those selecting American Indian and Alaskan Native as their racial identity, roughly 40% selected more than one racial group when answering the 2000 US Census (Liebler & Ortyl, 2013). There is considerable variation in the characteristics of those selecting AIAN as part of their racial identification including place of residence, intermarriage and poverty status (Liebler, 2010; Liebler & Ortyl, 2013). It may be that those who select AIAN as their only racial identification are closer to their own tribal origins. For example, those who select AIAN as one of multiple racial identities are far less likely to report a tribal identification when compared to those who choose AIAN alone (Liebler & Zacher, 2012). It seems likely, therefore, that the multi-racial AIAN population consists of individuals opting to identify as AIAN when given the opportunity to select more than one race but who would have selected a non-AIAN racial identification if they could only select one race. In this case, individuals will come into existing AIAN cohorts and alter the demographic and economic profile of the group overall.

This paper is focused on assessing the changes in the AIAN population from 1990-2010. We first document the change in the size of AIAN adult cohorts in the United States over this time period. We note that any increases in cohort size that are not accounted for by mortality or migration are due to changes in racial self-identification of cohort members. But our focus is not just on the relative size of the AIAN population but on the changing socioeconomic profile of this group as more individuals come into the population through a multi-racial identification. To assess changes in the socioeconomic status of cohort members who identify as AIAN we rely on multivariate decomposition techniques to examine trends in poverty. We ask how much of the improvement in socioeconomic status within the AIAN population is due to change in the underlying compositional characteristics of this population over time and which compositional characteristics are most important for explaining these trends. We focus on ‘synthetic cohorts’ and compare their size and changing characteristics over time. We focus on the socioeconomic status of adults in 10 year age cohorts who select AIAN in 1990 (the only option available for anyone wishing to identify as American Indian) and those who select AIAN in combination with

another race in 2000 and 2010. Because there may be important gender differences in the selection of a multi-racial identity rather than identifying as AIAN alone, we conduct the analyses separately for men and women.

Data and Methods:

To assess the importance of demographic and behavioral changes on the socio-economic status of the AIAN population from 1990-2010, the analyses proceed at two levels. The first analytic step is conducted at the aggregate level to describe the size and composition of adult AIAN cohorts in the United States. Focusing on synthetic cohorts allows us to observe the changes in the characteristics of the same group of individuals and focusing on working age adults helps somewhat limit the influence of other life course transitions on poverty (i.e. movement out of the parental home, completion of schooling, movement out of the labor force into retirement and other). We compare the characteristics of adults age 25-34 in 1990 to those of adults age 35-44 in 2000 and age 45-54 in 2010 and adults age 35-44 in 1990 to those age 45-54 in 2000 and 55-64 in 2010. We consider male and female cohorts separately. Our analyses follow the example of Perez & Hirschman (2009) who employ a revised version of traditional demographic accounting comprised of population size, birth, death, migration and unmeasured sources of population change (error of closure). Our focus is on the last element, error of closure, which represents the amount of change accounted for by factors other than fertility and mortality including any mobility in racial self-identification. In other words, changes in the composition of our cohorts not accounted for by mortality or migration are reflected in error of closure component of the decomposition.

Data for the first analytic step comes from the 1990, 2000 and 2010 decennial census summary file 2 (U.S. Census Bureau). Analyses adjusting for mortality rely on age specific death rates reported by the National Center for Health Statistics (NCHS). Life tables are created for adjustment purpose, and death rates in 1995 and 2005 are used. Each year is the middle year of each period, 1990-2000 and 2000-2010. Due to the lack of information about death rates specifically for AIAN in 1995, death rates for “other race” category in the same year is used for the calculation. For 2000, death rates for AIAN are

used. We do not consider births in our demographic accounting because we focus only on adults. We do adjust for in-migration to the AIAN population because foreign born adult cohort members may move into the United States and self-identify as AIAN thus increasing the size of the cohort. We rely on data from the nativity question in the IPUMS (i.e. foreign born) to assess the number of new AIAN arrivals during the decade.

The demographic accounting allows us to assess the expected size of the AIAN cohorts assuming no one changed their self-selected racial identification. This accounting cannot assess the characteristics of those who ‘become’ AIAN cohort members and the subsequent role of these changes on poverty within the cohorts. Therefore, the analyses proceed with a second analytic step conducted at the individual level. Here we compare the poverty status of AIAN individuals in 1990 (i.e. those who selected American Indian or Alaskan Native as their racial identification) with the poverty status of the same age cohort in 2000. For the 2000 observations, we consider individuals who identify only as AIAN and individuals who select AIAN in any combination with other racial identification. Comparing these two groups, referred to as ‘AIAN alone’ and ‘AIAN any’ throughout the text, demonstrates increasing disparities in socioeconomic status within the AIAN population. Data for these analyses come from five percent sample of the 1990 and 2000 decennial census provided by IPUMS (Ruggles, et al, 2010). Multivariate analyses of the socioeconomic disparities within the AIAN cohort then reveal which characteristics are associated the trends in poverty within the cohorts.

The focal outcome in these analyses is based on poverty status reported in the IPUMS. This is coded as a dichotomous measure that equals one if family income is at or below the poverty threshold and zero if family income is above this threshold. We compare the probability of living at or below poverty with logistic regression models for members of the same cohort in 1990 and 2000. The predictor variables in these models include measures that have been shown to be associated with a greater probability of reporting multi-racial AIAN identification (Huysler, Sakamoto & Takei, 2010). These include education (less than high school vs. higher levels of education), marital status (currently married vs. other marital status), nativity (birth place of the respondent in three categories: U.S.-born, Mexico / Central and South

America, and other countries, language use in the home (English only, any American Indian language, and other languages) and residential location. Residential location is important because individuals from traditional American Indian areas are more likely to report a single racial identification and a tribal identification than those living outside these traditional areas (Liebler, 2010). Here we include two dummy variables reflecting current residential location . First, we include a single indicator for residence in a metropolitan area vs. non-metropolitan areas. Second, we include an indicator for residence in a State with a historical American Indian presence. These include: include Alaska, Arizona, Idaho, Michigan, Minnesota, Montana, Nebraska, Nevada, New Mexico, New York, North Carolina, North Dakota, Oklahoma, Oregon, South Dakota, Utah, Washington, Wisconsin, and Wyoming. This same list of States is employed by Passel (1997).

To determine the extent to which changes in poverty among AIAN individuals between 1990 and 2000 are a result of the changing composition of the AIAN cohort as individuals change their racial identification (i.e. as ‘new’ AIAN cohort members join in 2000), we use a decomposition analysis to separate differences in poverty status 1) between 1990 AIAN-alone and 2000 AIAN-alone and 2) between 1990 AIAN-alone and 2000 AIAN-any. The Blinder-Oaxaca decomposition technique for non-linear regression model decomposes the differential in the prevalence of cohort members below the poverty line between the two comparison groups. This technique is counter-factual in that we decompose the observed difference between two groups into two effects; 1) endowment effect: the part that can be attributable to the differences in composition, such as the proportion of cohort members with less than a high school education, and 2) the residual effect: the part that can be attributable to the differences in coefficients, such as the influence of education on the probability of living below the poverty line (Sinning, Hahn, & Bauer, 2008; Coulson & Dalton, 2010; Powers, Yohioka, & Yun, 2011). We use `mvdcmp` function in STATA for this analysis with normalization option for categorical variables with more than three groups (Powers et al., 2011).

Results:

Cohort Size: The first task for our analyses is to follow the guidance from previous work identifying shifts in the size of the AIAN population (see Liebler & Ortyl, 2013 for a recent example) but to do so for specific adult cohorts rather than the overall population. We compare changes in the size of four age cohorts: (1) Individuals age 15-24 in 1990, 25-34 in 2000 and 35-44 in 2010; (2) Individuals age 25-34 in 1990, 35-44 in 2000 and 45-54 in 2010; (3) Individuals age 35-44 in 1990, 45-54 in 2000 and 55-64 in 2010 and (4) Individuals age 45-54 in 1990, 55-64 in 2000 and 65-74 in 2010. A cohort analysis helps identify where in the life course individuals are most likely to select a multi-racial identity and which cohorts have been most impacted by the inclusion of multi-racial individuals in the AIAN group.

Figure 1 presents the size of adult male AIAN cohorts for those selecting AIAN alone as their racial identification, the only option in 1990, and the size of the same cohort including anyone who selects an AIAN identification whether alone or by indicating more than one race including AIAN in the following years. The results replicate previous work done for the AIAN population as a whole. Here we observe that increases in the size of each cohort are largely attributable to the increase in individuals identifying as AIAN in combination with another race. More individuals self-identify as AIAN when there is an option to select more than one racial identification. All four cohorts see an increase in their size between 1990 and 2000 when we consider the combination category. For the younger cohorts, this increase continues into 2010 although not to the same extent it did between 1990 and 2000. For the older cohorts, there is little additional increase beyond 2000. The results are very similar when we examine the size of the same age cohorts for women (not shown).

<Figure 1 about here>

We next address the potential size of the AIAN cohorts if we only adjust the 1990 AIAN cohorts for changes in mortality and migration that occurred between 1990-2000 and 2000-2010. We then predict the cohort size based solely on these two conditions using residual method approach (Figure 2). These analyses indicate that only the youngest cohort would increase slightly in size, due to more in-migrants who identify as American Indian than deaths to the cohort, from 1990 to 2000. All of the other age

cohorts would have decreased in size over time if no one changed their racial identification. There are also more AIAN only individual in 2000 for the 25-34 (1990) cohort than would be predicted based on mortality and in-migration alone (See Figure 1) where there were 192,041 AI alone individuals in that cohort in 2000 when compared to the prediction of 182,649 individuals in 2000 based on mortality and in migration alone. This suggests that more individuals in the younger cohorts are electing to self-identify as AIAN alone for the first time in 2000 or 2010 as well as individuals who choose an AIAN identification in combination with some other group over time. Older cohorts, on the other hand, are increased mostly by new individuals who identify as AIAN for the first time in 2000 when allowed to select more than one racial group. For the most part, however, increases in the AIAN cohorts from 1990-2000 are largely the result of adding individuals to the cohort through shifts in individual selection of racial identification from the options available in Census questionnaire since 2000. Again, similar results are obtained when we focus on AIAN female cohorts (not shown).

<Figure 2 about here>

Socioeconomic well-being: The cohort analyses at the aggregate level demonstrate that changes in the 2000 census questionnaire with multiple choices for racial identification led to more people identifying as American Indian. The option to select AIAN in combination with other races contributed to the increase size of the AIAN cohorts, particularly young cohorts. This increase in the size of adult AIAN cohorts may also be associated with increasing socioeconomic status. If ‘new’ AIAN individuals in 2000 are more advantaged than their counterparts who opt to remain in the single race AIAN category over time, the average level of socioeconomic attainment will rise for the group.

Accordingly, the next step then is to analyze the socioeconomic well-being of AIAN cohorts and consider the extent to which those individuals who select AIAN in combination with other race groups are changing the socioeconomic profile of the adult AIAN cohorts. For this analysis, we focus on two young age cohort, 25-34 and 35-44 in 1990, which showed noticeable increases in the size between 1990 and 2000. The analysis will be at the individual level relying on data from the five percent samples of the

1990 and 2000 censuses in order to include the indicators that predict racial identification and socioeconomic status.

There are several differences in the characteristics of cohort members who identify as AIAN-alone and those who identify as AIAN-any (alone or in combination with another race). Table 1 presents the summary of descriptive statistics of two age cohorts by gender. We first note that the economic status of these young adult cohorts improves over time. In 1990, twenty-nine percent of AIAN men age 25-34 were living in poverty. By 2000, twenty-four percent of the men in this cohort who identified as AIAN alone (i.e. as their only racial identification) were in poverty. However, if we include all men in the cohort who identify as AIAN regardless of their other racial identities (i.e. the AIAN-any group), poverty appears even lower (20%). In other words, there is some apparent improvement in the economic status of young adult AIAN males but the improvement is largest when multi-racial AIAN men are included in the cohort. The same pattern is observed among men in the older cohort and among women (see Table 1B). And, these results are consistent with the socioeconomic patterns of mono- and multi-racial AIAN individuals observed by Huyser, Sakamoto & Takei (2010).

Just as the poverty status of the cohorts is different when multi-racial AIAN individuals are included in the cohort, the demographic and geographic distribution of the cohorts varies with and without these individuals. For example, there is little difference in the education levels of AIAN-alone individuals in the cohorts between 1990 and 2000. But, there is an improvement in education by 2000 if the definition of AIAN includes those who select AIAN in combination with any other racial identification. Twenty-two percent of men in the 25-34 year old cohort had less than a high school education and this drops to nineteen percent in 2000 but only when we include those who select any AIAN identification in the cohort. There is also a change in the nativity composition of the cohorts. The proportion US born declines regardless of racial definition, cohort or gender (ex: 95% for the 25-34 year old men in 1990 to 90% in 2000). There is a decrease in the use of American Indian languages across cohorts and gender as well. But we see a much larger decrease in the use of an American Indian language in the household when multi-racial AIAN individuals are included in the cohort (ex: 18% for the 25-34

year old men in 1990 to 7% for the ‘AIAN any’ group in 2000). A similar pattern is observed among those living in metropolitan areas. This increases overall across cohorts and gender but the proportion living in metropolitan areas increases most with the multi-racial definition. The number living in Indian states decreases between 1990 and 2000 but the decrease is more substantial for the ‘AIAN any’ group than the ‘AIAN alone’ group.

<Table 1A and 1B about here>

The composition of the AIAN cohorts changes over time and we observe improvements in poverty status. However, the greatest improvements are observed when all AIAN individuals are included in the definition of the cohort by 2000. The next step in our analysis is to identify the characteristics that most strongly predict poverty status in 1990 and 2000. It is possible that those factors that predict poverty in 1990 changed over time. Table 2 shows the results of logistic regression on poverty status for male and female (panel a and b), respectively. We compare the coefficients across time and between AIAN groups to see the change in the effect of each predictor on poverty status. This is relatively straightforward since the predictors are all categorical variables and all results are presented as odds ratios.

Among males in the 25-34 year old AIAN cohort, the largest predictors of poverty status in 1990 are education and language use. The results show that having less than a high school and using languages other than English in a household significantly increase the likelihood of being under poverty line by more than 100%. Marital status is also a strong predictor such that those who are married are 42% less likely to live in poverty. Living in an Indian State is also associated with a higher likelihood of living in poverty. By 2000, when we look at the 25-34 year old male cohort (now age 35-44) and consider only those who select AIAN alone, education and marital status are slightly larger predictors of poverty and language use and living in an Indian State appear less important as predictors of poverty status. We see very similar results when we include all AIAN individuals in the cohort in 2000. In other words, the predictors of poverty may alter somewhat between 1990 and 2000 but they appear largely similar in 2000 for both AIAN cohort member definitions. The results show almost the identical patterns for females

overall although we note that education and marital status have stronger associations with the likelihood of living in poverty for women than for men across cohorts.

<Table 2A and 2B about here>

Decomposition: The logistic regression models predicting poverty suggest that there is some variation in the role of some characteristics on predicting poverty among AIAN individuals between 1990 and 2000. Education, for example, appears to be an even more important predictor in 2000 than in 1990 and living in an “Indian State” is less predictive of poverty. But, none of these characteristics appear to be very differentially predictive of poverty whether we constrain the cohorts to those who select AIAN alone or when we include AIAN in combination with other racial identifications. The decrease in poverty over time then is probably more related to changes in the composition of the AIAN cohorts brought about by including those identifying as AIAN in 2000 once the Census allowed individuals to select more than one racial identity as we observe in Table 1. In other words, it seems likely that the decreases in poverty among AIAN individuals over time is due, at least in part, to the new self-selection into AIAN cohorts than a real decline in poverty brought about by improved access to resources or human capital by individuals over time.

To quantify how much of the difference in poverty status between AIAN-alone in 1990 and AIAN-any in 2000 is due to the changes in compositional effects and coefficient effects we employ Blinder-Oaxaca decomposition technique. This decomposition technique assesses how much of the observed variation in poverty status between two selected groups is due to compositional differences (endowment effect) and differences in the effects of these characteristics (residual effect). For example, though the extent to which educational attainment affects poverty status (residual effect) could be the same over time, considerable changes in the educational composition across groups (endowment effect) will result in differentials in poverty status between two groups. Our expectation is that we will observe a considerably larger increase in endowment effect, not in residual effect, when 1990 AIAN alone is compared with 2000 AIAN any than when we restrict the 2000 cohort members to those who select AIAN as their only racial identification.

Table 3 summarizes the decomposition of the difference in poverty status between AIAN groups. Across all age cohorts, there is a larger endowment or compositional effect when we include the AIAN any individuals in the 2000 cohort than when the 2000 cohorts are restricted to AIAN only. For example, for the 25-34 year old male cohort, compositional differences in the predictor variables account for about 33% when AIAN alone population in 1990 is compared with AIAN alone population in 2000. However, composition or endowment effect explains about 46% of the observed difference in poverty status when AIAN alone population in 1990 is compared with AIAN population with multiple racial identification in 2000. The same pattern is observed in the other age cohorts, and it is more dramatic for 35-44 cohort for both male and female than 25-34 cohort. The differences are larger for the older cohorts who are unlikely to be going through as many life course transitions in the 10 years under observation.

<Table 3 about here>

The large compositional effects on changes in poverty stem from individual and family level predictors as well as the geographic distribution of the AIAN cohort members. We present the full detail on these measures in the appendix. Looking specifically at the 35-44 year old male cohort in 1990 compared to those now age 45-54 in 2000 including any AIAN individuals (multiracial and single race), we see significant changes in education (2% fewer individuals with less than a high school education) and home language use (10% fewer reporting that an American Indian language is spoken at home). But there is also large differences in the geographic distribution such that 13% more of the 2000 cohort are living in metropolitan areas while 13% fewer reside in states with traditionally large American Indian populations. These compositional shifts attributable to the changes in the definition of AIAN cohort membership help explain the declines in poverty in the cohort between 1990 and 2000.

Discussion:

As the social construction of race and ethnicity changes in the United States, so too does observed social stratification by race. The analyses presented here illustrate changes not only to the size of cohorts brought about by changing definitions of race but changes to the apparent improvement in socioeconomic

well-being brought about by these changing definitions as well. As demonstrated by other scholars, the American Indian population has grown throughout the latter half of the twentieth century more than would be expected by simply accounting for natural increase or even the arrival of new immigrants with origins from indigenous groups elsewhere in the Americas. Our analyses focus on specific cohorts reveal similar patterns: When adults were given the opportunity to select more than one racial identification in 2000, the size of the AIAN cohorts grew considerably over what we would expect based on the size of the AIAN cohorts in 1990 and the demographic drivers of population growth (i.e. mortality and migration). The cohort comparisons also demonstrate the similar increase in the AIAN population by the inclusion of the AIAN multiracial cohort members across age groups although it is clear that the youngest adult cohorts increased in membership the most. This likely demonstrates (1) a greater prevalence of AIAN individuals with parents from different racial backgrounds among younger cohorts and (2) a greater acceptance of a multi-racial identity among younger adults.

Along with changes in the size of these cohorts, our analyses also demonstrate that changes in the socioeconomic status of AIAN cohorts over time are larger than they would have been without the additions of new, apparently more advantaged, cohort members. All cohorts experienced a decrease in poverty between 1990 and 2000 with greater declines in poverty among women than men. But, for all male and female cohorts, the decrease in poverty is larger when we include multiracial individuals in the definition of the AIAN cohort in 2000. The multivariate decomposition indicates that ‘new’ cohort members have different characteristics from cohort members who identify as AIAN alone and these characteristics help explain the observed reduction in poverty between 1990 and 2000. Defining the AIAN population as including those who select more than one race means including individuals with more education, less likely to speak an American Indian language in the home, with more urban residence and less concentration in traditional American Indian areas. These characteristics are also associated with lower poverty levels.

There are some important caveats to these analyses. We cannot directly observe individual changes in racial identification. The reliance on synthetic cohorts from census data means we cannot

identify individual members of the cohort over time. We cannot determine, for example, whether some of the single race AIAN individuals in 2000 had identified as another race entirely in 1990. We cannot determine which AIAN multiracial individuals identified in 2000 also identified as AIAN alone in 1990 and which of these individuals are completely new cohort members by coming into the AIAN category in 2000 for the first time. But the analyses of adult cohorts are consistent with previous research for the entire AIAN population and indicate significant changes brought about by including multi-racial individuals in the AIAN population.

The results of this work confirm that any assessment of change in socioeconomic attainment and well-being by race and ethnicity must attend to the possible changes in the social construction of the very categories used to measure such stratification. Although disparities in income and health are still great across the racial divide regardless of the definitions employed, underlying changes in self-identification can alter the extent to which we would want to conclude that significant improvement in well-being is actually occurring. In the case of the analyses presented here, poverty may have declined among AIAN adults but a significant proportion of this improvement is due to change in the composition and membership of AIAN cohorts and not to real improvement in the well-being of individuals over time.

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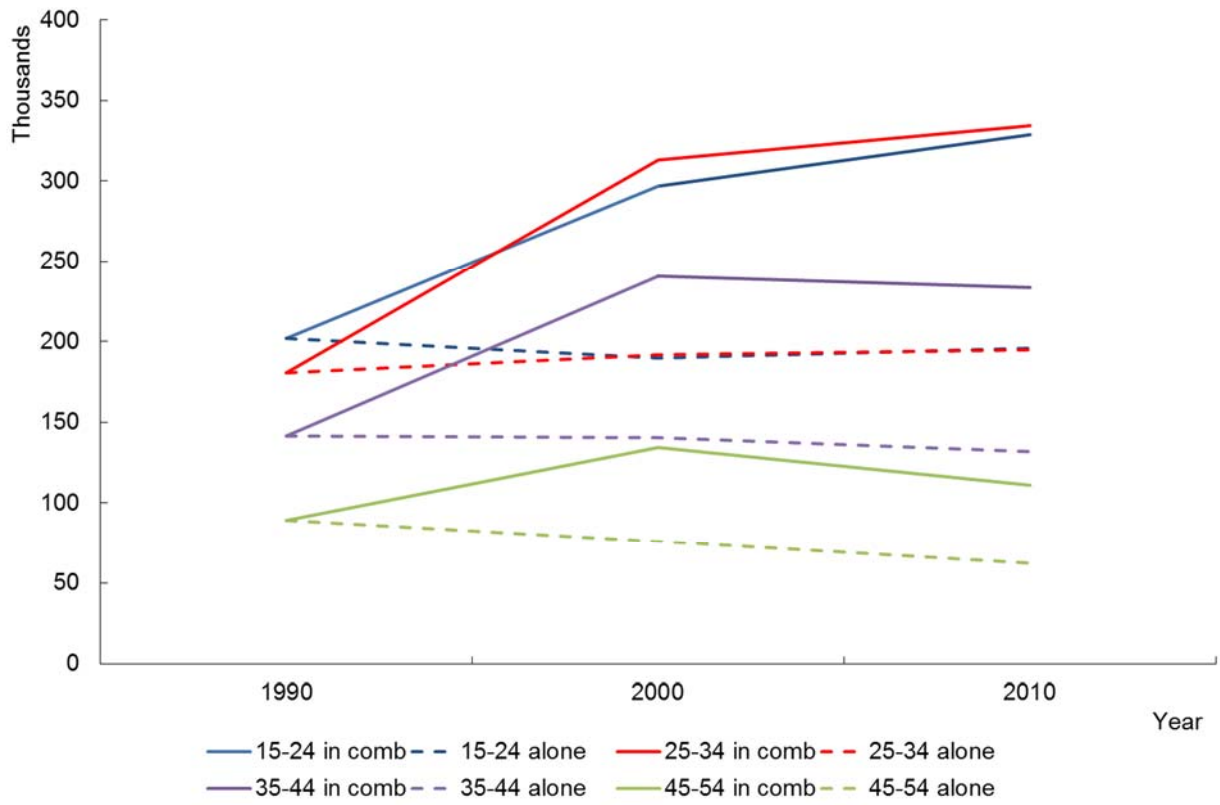
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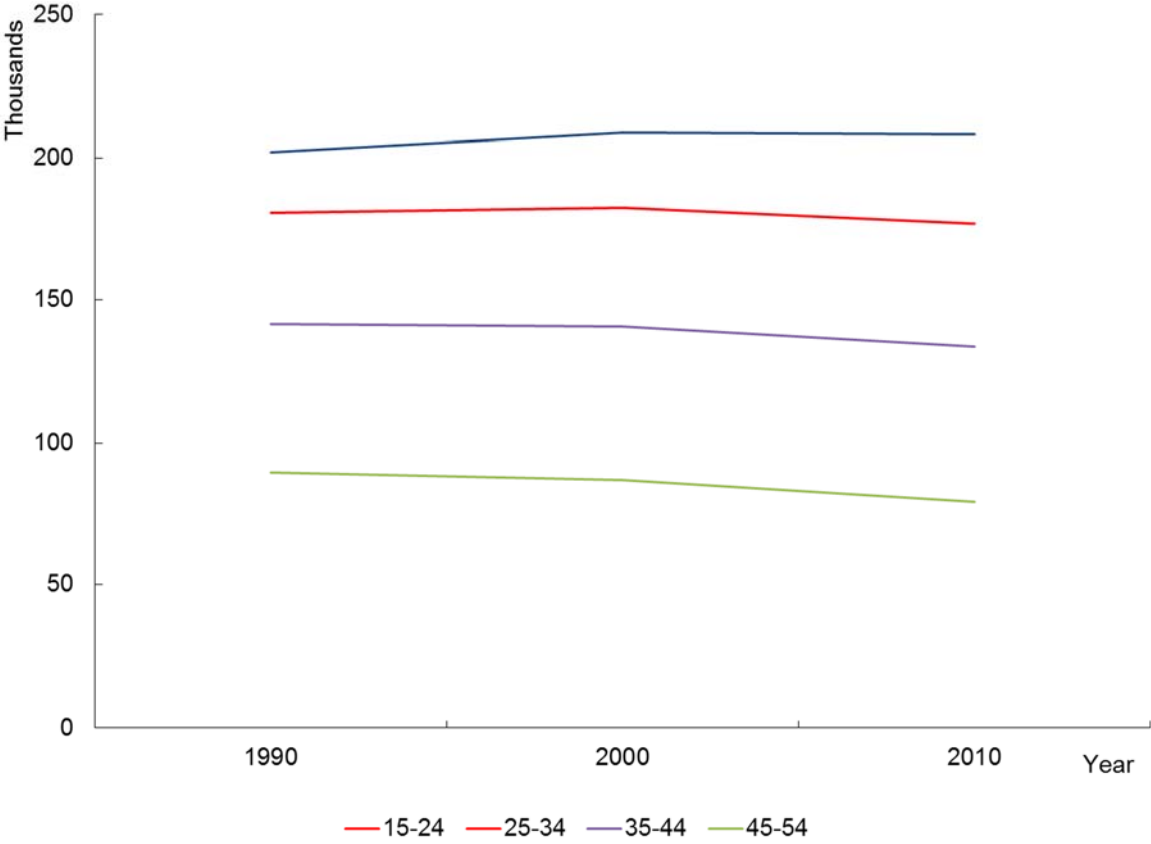
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<Figure 1> Size of American Indian cohorts, Male, 1990-2010



<Figure 2> Observed AI population in 1990 and Predicted Size of American Indian Adjusted for Mortality and Migration who identify as AI alone, Male, 2000 and 2010



<Table 1A> Summary Statistics by Age Cohort, Male

		Cohort 25-34					Cohort 35-44				
		A1	A2	A3	Dif.	Dif.	B1	B2	B3	Dif.	Dif.
		1990 AIAN alone	2000 AIAN alone	2000 AIAN any	A2-A1	A3-A1	1990 AIAN alone	2000 AIAN alone	2000 AIAN any	B2-B1	B3-B1
Poverty (≤ 100)	Mean	0.29	0.24	0.20	-0.05	-0.09	0.23	0.19	0.16	-0.04	-0.07
	S.D.	(0.45)	(0.43)	(0.40)			(0.42)	(0.39)	(0.37)		
Education (\leq high school)	Mean	0.22	0.22	0.19	0.00	-0.03	0.19	0.20	0.17	0.01	-0.02
	S.D.	(0.41)	(0.41)	(0.39)			(0.39)	(0.40)	(0.38)		
Married	Mean	0.48	0.56	0.56	0.08	0.08	0.63	0.62	0.62	-0.01	-0.01
	S.D.	(0.50)	(0.50)	(0.50)			(0.48)	(0.49)	(0.48)		
<i>Nativity</i>											
US-born	Mean	0.95	0.91	0.90	-0.04	-0.05	0.96	0.93	0.93	-0.03	-0.03
	S.D.	(0.22)	(0.29)	(0.29)			(0.19)	(0.25)	(0.26)		
Mexico, C./S. America-born	Mean	0.02	0.07	0.07	0.05	0.05	0.01	0.05	0.04	0.04	0.03
	S.D.	(0.13)	(0.26)	(0.25)			(0.11)	(0.22)	(0.20)		
Other	Mean	0.03	0.02	0.03	-0.01	0.00	0.02	0.02	0.03	0.00	0.01
	S.D.	(0.18)	(0.12)	(0.17)			(0.16)	(0.13)	(0.16)		
<i>Language</i>											
English	Mean	0.74	0.69	0.75	-0.05	0.01	0.75	0.70	0.77	-0.05	0.02
	S.D.	(0.44)	(0.46)	(0.43)			(0.43)	(0.46)	(0.42)		
American Indian	Mean	0.18	0.12	0.07	-0.06	-0.11	0.17	0.13	0.07	-0.04	-0.10
	S.D.	(0.39)	(0.33)	(0.26)			(0.38)	(0.34)	(0.26)		
Other	Mean	0.08	0.18	0.17	0.10	0.09	0.08	0.17	0.16	0.09	0.08
	S.D.	(0.26)	(0.39)	(0.38)			(0.27)	(0.38)	(0.36)		
<i>Residence</i>											
in Metropolitan area	Mean	0.51	0.56	0.64	0.05	0.13	0.51	0.56	0.64	0.05	0.13
	S.D.	(0.50)	(0.50)	(0.48)			(0.50)	(0.50)	(0.48)		
in Indian states	Mean	0.61	0.57	0.47	-0.04	-0.14	0.58	0.55	0.45	-0.03	-0.13
	S.D.	(0.49)	(0.49)	(0.50)			(0.49)	(0.50)	(0.50)		

Note: Numbers are weighted.

<Table 1B> Summary Statistics by Age Cohort, Female

		Cohort 25-34					Cohort 35-44				
		A1	A2	A3	Dif.	Dif.	B1	B2	B3	Dif.	Dif.
		1990 AIAN alone	2000 AIAN alone	2000 AIAN any	A2-A1	A3-A1	1990 AIAN alone	2000 AIAN alone	2000 AIAN any	B2-B1	B3-B1
Poverty (≤ 100)	Mean	0.33	0.23	0.20	-0.10	-0.13	0.25	0.19	0.17	-0.06	-0.08
	S.D.	(0.47)	(0.42)	(0.40)			(0.43)	(0.39)	(0.37)		
Education (\leq high school)	Mean	0.20	0.19	0.16	-0.01	-0.04	0.19	0.19	0.15	0.00	-0.04
	S.D.	(0.40)	(0.39)	(0.36)			(0.39)	(0.39)	(0.36)		
Married	Mean	0.53	0.57	0.56	0.04	0.03	0.60	0.57	0.57	-0.03	-0.03
	S.D.	(0.50)	(0.50)	(0.50)			(0.49)	(0.50)	(0.50)		
<i>Nativity</i>											
US-born	Mean	0.97	0.93	0.93	-0.04	-0.04	0.97	0.94	0.94	-0.03	-0.03
	S.D.	(0.18)	(0.25)	(0.26)			(0.18)	(0.23)	(0.23)		
Mexico, C./S. America-born	Mean	0.01	0.05	0.05	0.04	0.04	0.01	0.04	0.03	0.03	0.02
	S.D.	(0.11)	(0.22)	(0.21)			(0.10)	(0.19)	(0.18)		
Other	Mean	0.02	0.02	0.03	0.00	0.01	0.02	0.02	0.02	0.00	0.00
	S.D.	(0.15)	(0.12)	(0.16)			(0.15)	(0.14)	(0.16)		
<i>Language</i>											
English	Mean	0.77	0.72	0.78	-0.05	0.01	0.76	0.71	0.79	-0.05	0.03
	S.D.	(0.42)	(0.45)	(0.41)			(0.43)	(0.45)	(0.41)		
American Indian	Mean	0.17	0.12	0.07	-0.05	-0.10	0.17	0.13	0.07	-0.04	-0.10
	S.D.	(0.37)	(0.33)	(0.26)			(0.37)	(0.33)	(0.25)		
Other	Mean	0.06	0.15	0.15	0.09	0.09	0.07	0.16	0.14	0.09	0.07
	S.D.	(0.25)	(0.36)	(0.36)			(0.26)	(0.37)	(0.35)		
<i>Residence</i>											
in Metropolitan area	Mean	0.50	0.56	0.64	0.06	0.14	0.51	0.55	0.64	0.04	0.13
	S.D.	(0.50)	(0.50)	(0.48)			(0.50)	(0.50)	(0.48)		
in Indian states	Mean	0.63	0.58	0.48	-0.05	-0.15	0.58	0.57	0.46	-0.01	-0.12
	S.D.	(0.48)	(0.49)	(0.50)			(0.49)	(0.49)	(0.50)		

Note: Numbers are weighted.

<Table 2A> Logistic Regression on Poverty Status by Age-Cohort, Male

Variables	Cohort 25-34						Cohort 35-44					
	'90 AIAN alone		'00 AIAN alone		'00 AIAN any		'90 AIAN alone		'00 AIAN alone		'00 AIAN any	
	O.R.	S.E.	O.R.	S.E.	O.R.	S.E.	O.R.	S.E.	O.R.	S.E.	O.R.	S.E.
Education (\leq high school)	2.25 **	0.03	2.71 **	0.03	2.59 **	0.03	2.27 **	0.04	2.47 **	0.04	2.66 **	0.03
Married	0.58 **	0.01	0.46 **	0.01	0.43 **	0.00	0.37 **	0.01	0.33 **	0.00	0.30 **	0.00
Nativity												
Mexico, C./S. America-born	0.65 **	0.03	0.70 **	0.02	0.78 **	0.02	0.83 **	0.05	1.21 **	0.04	1.05	0.03
Other	1.12 **	0.04	0.70 **	0.04	0.77 **	0.02	0.68 **	0.03	1.42 **	0.07	1.35 **	0.04
<i>Language</i>												
American Indian	2.16 **	0.03	1.95 **	0.03	2.18 **	0.03	2.43 **	0.04	2.13 **	0.04	2.29 **	0.04
Other	1.78 **	0.04	1.71 **	0.03	1.75 **	0.02	1.61 **	0.04	1.23 **	0.03	1.27 **	0.02
<i>Residence</i>												
In metro	0.67 **	0.01	0.65 **	0.01	0.59 **	0.01	0.80 **	0.01	0.68 **	0.01	0.66 **	0.01
In Indian states	1.47 **	0.02	1.19 **	0.02	1.19 **	0.01	1.34 **	0.02	1.16 **	0.02	1.06 **	0.01
Constant	0.33 **	0.00	0.34 **	0.01	0.33 **	0.00	0.33 **	0.01	0.32 **	0.01	0.33 **	0.00
Pseudo R ²	.08		.08		.08		.09		.10		.10	
N	179,782		197,363		342,531		138,611		142,200		259,799	

Note: * $p < .05$; ** $p < .01$, two tailed. Numbers are weighted.

<Table 2B> Logistic Regression on Poverty Status by Age-Cohort, Female

Variables	Cohort 25-34						Cohort 35-44					
	'90 AIAN alone		'00 AIAN alone		'00 AIAN any		'90 AIAN alone		'00 AIAN alone		'00 AIAN any	
	O.R.	S.E.	O.R.	S.E.	O.R.	S.E.	O.R.	S.E.	O.R.	S.E.	O.R.	S.E.
Education (\leq high school)	3.30 **	0.04	3.55 **	0.05	3.62 **	0.04	3.79 **	0.06	3.58 **	0.06	3.70 **	0.05
Married	0.25 **	0.00	0.25 **	0.00	0.23 **	0.00	0.22 **	0.00	0.26 **	0.00	0.22 **	0.00
<i>Nativity</i>												
Mexico, C./S. America-born	1.25 **	0.07	0.88 **	0.03	0.94 *	0.02	0.61 **	0.05	0.76 **	0.03	0.62 **	0.02
Other	0.79 **	0.03	1.34 **	0.06	1.12 **	0.03	0.85 **	0.04	1.14 **	0.05	1.02	0.03
<i>Language</i>												
American Indian	1.84 **	0.03	1.81 **	0.03	1.94 **	0.03	1.88 **	0.03	2.27 **	0.05	2.31 **	0.05
Other	1.17 **	0.03	1.21 **	0.02	1.38 **	0.02	1.36 **	0.04	1.40 **	0.03	1.42 **	0.02
<i>Residence</i>												
In metro	0.65 **	0.01	0.71 **	0.01	0.69 **	0.01	0.60 **	0.01	0.69 **	0.01	0.64 **	0.01
In Indian states	1.36 **	0.02	1.15 **	0.01	1.18 **	0.01	1.49 **	0.02	1.09 **	0.02	1.02	0.01
Constant	0.64 **	0.01	0.43 **	0.01	0.40 **	0.00	0.44 **	0.01	0.31 **	0.01	0.34 **	0.00
Pseudo R ²	.14		.12		.13		.16		.13		.13	
N	185,863		204,560		363,435		149,530		149,695		281,722	

Note: * $p < .05$; ** $p < .01$, two tailed. Numbers are weighted.

<Table 3> Blinder- Oaxaca Decomposition Results

		Cohort 25-34				Cohort 35-44				
		'90 AIAN alone vs. '00 AIAN alone		'90 AIAN alone vs. '00 AIAN any		'90 AIAN alone vs. '00 AIAN alone		'90 AIAN alone vs. '00 AIAN any		
<i>Decomposition, Male</i>										
Compositional effect	Coef.	-0.0152 **	32.8%	-0.0389 **	46.1%	-0.0020 **	4.8%	-0.0204 **	30.4%	
	S. E.	(0.0004)		(0.0004)		(0.0003)		(0.0004)		
Coefficient effect	Coef.	-0.0312 **	67.2%	-0.0455 **	53.9%	-0.0401 **	95.2%	-0.0469 **	69.6%	
	S. E.	(0.0014)		(0.0013)		(0.0015)		(0.0014)		
Total	Coef.	-0.0464 **	100.0%	-0.0844 **	100.0%	-0.0421 **	100.0%	-0.0673 **	100.0%	
	S. E.	(0.0014)		(0.0012)		(0.0015)		(0.0013)		
<i>Decomposition, Female</i>										
Compositional effect	Coef.	-0.0193 **	20.1%	-0.0363 **	29.6%	-0.0003	0.5%	-0.0199 **	24.9%	
	S. E.	(0.0003)		(0.0004)		(0.0003)		(0.0004)		
Coefficient effect	Coef.	-0.0765 **	79.86%	-0.0863 **	70.4%	-0.0562 **	99.5%	-0.0600 **	75.1%	
	S. E.	(0.0014)		(0.0013)		(0.0014)		(0.0013)		
Total	Coef.	-0.0958 **	100.0%	-0.1225 **	100.0%	-0.0565 **	100.0%	-0.0799 **	100.0%	
	S. E.	(0.0013)		(0.0012)		(0.0014)		(0.0012)		

Note: Numbers are weighted.

<Appendix 1> Blinder- Oaxaca Decomposition Results in Detail, Male

	Cohort 25-34				Cohort 35-44				
	'90 AIAN alone vs. '00 AIAN alone		'90 AIAN alone vs. '00 AIAN any		'90 AIAN alone vs. '00 AIAN alone		'90 AIAN alone vs. '00 AIAN any		
	Coef.	S. E.	Coef.	S. E.	Coef.	S. E.	Coef.	S. E.	
<i>Due to Difference in Compositions</i>									
Education (\leq high school)	0.0001 **	0.0000	-0.0046 **	0.0000	0.0015 **	0.0001	-0.0031 **	0.0000	
Married	-0.0112 **	0.0002	-0.0116 **	0.0001	0.0031 **	0.0003	0.0012 **	0.0000	
<i>Nativity</i>									
US-born	-0.0018 **	0.0001	-0.0013 **	0.0001	0.0013 **	0.0002	0.0006 **	0.0001	
Mexico, C./S. America-born	-0.0013 **	0.0002	-0.0006 **	0.0001	0.0001	0.0003	-0.0003 **	0.0001	
Other	0.0003 **	0.0001	0.0000 **	0.0000	-0.0003 **	0.0001	0.0001 **	0.0000	
<i>Language</i>									
English	0.0037 **	0.0001	-0.0008 **	0.0000	0.0043 **	0.0005	-0.0010 **	0.0000	
American Indian	-0.0029 **	0.0001	-0.0062 **	0.0002	-0.0042 **	0.0004	-0.0071 **	0.0002	
Other	0.0027 **	0.0002	0.0019 **	0.0002	-0.0026 **	0.0002	-0.0014 **	0.0002	
<i>Residence</i>									
In metro	-0.0039 **	0.0001	-0.0117 **	0.0002	-0.0045 **	0.0004	-0.0081 **	0.0002	
In Indian states	-0.0010 **	0.0001	-0.0040 **	0.0002	-0.0008 **	0.0001	-0.0012 **	0.0002	
<i>Due to Difference in Coefficients</i>									
Education (\leq high school)	0.0069 **	0.0006	0.0049 **	0.0005	0.0024 **	0.0006	0.0040 **	0.0005	
Married	-0.0177 **	0.0012	-0.0227 **	0.0010	-0.0104 **	0.0017	-0.0176 **	0.0013	
<i>Nativity</i>									
US-born	0.0214 **	0.0045	0.0098 **	0.0036	-0.0508 **	0.0049	-0.0385 **	0.0041	
Mexico, C./S. America-born	0.0006 **	0.0001	0.0007 **	0.0001	0.0000	0.0001	-0.0001	0.0001	
Other	-0.0018 **	0.0002	-0.0016 **	0.0002	0.0013 **	0.0002	0.0012 **	0.0001	
<i>Language</i>									
English	0.0057 **	0.0016	0.0002	0.0014	0.0142 **	0.0017	0.0098 **	0.0014	
American Indian	-0.0017 **	0.0005	0.0003	0.0004	0.0000	0.0005	0.0009 *	0.0004	
Other	0.0001	0.0002	-0.0001	0.0002	-0.0015 **	0.0003	-0.0014 **	0.0002	

Residence

In metro	-0.0021	0.0015	-0.0102 **	0.0012	-0.0119 **	0.0016	-0.0126 **	0.0013
In Indian states	-0.0214 **	0.0019	-0.0201 **	0.0016	-0.0122 **	0.0019	-0.0175 **	0.0015
Constant	-0.0211 **	0.0055	-0.0066	0.0044	0.0288 **	0.0059	0.0249 **	0.0049

Note: Numbers are weighted.

<Appendix 2> Blinder- Oaxaca Decomposition Results in Detail, Female

	Cohort 25-34				Cohort 35-44				
	'90 AIAN alone vs. '00 AIAN alone		'90 AIAN alone vs. '00 AIAN any		'90 AIAN alone vs. '00 AIAN alone		'90 AIAN alone vs. '00 AIAN any		
	Coef.	S. E.	Coef.	S. E.	Coef.	S. E.	Coef.	S. E.	
<i>Due to Difference in Compositions</i>									
Education (\leq high school)	-0.0044 **	0.0000	-0.0104 **	0.0001	0.0003	0.0003	-0.0081 **	0.0001	
Married	-0.0077 **	0.0001	-0.0072 **	0.0000	-0.0012	0.0016	0.0088 **	0.0001	
<i>Nativity</i>									
US-born	0.0003 **	0.0001	0.0001	0.0001	0.0000	0.0000	-0.0006 **	0.0001	
Mexico, C./S. America-born	-0.0013 **	0.0002	-0.0004 **	0.0001	0.0002	0.0002	-0.0012 **	0.0001	
Other	-0.0002 **	0.0000	0.0001 **	0.0000	0.0000	0.0000	0.0001 **	0.0000	
<i>Language</i>									
English	0.0020 **	0.0001	-0.0006 **	0.0000	-0.0005	0.0006	-0.0018 **	0.0000	
American Indian	-0.0026 **	0.0001	-0.0053 **	0.0002	0.0004	0.0006	-0.0070 **	0.0002	
Other	-0.0011 **	0.0002	-0.0001	0.0001	0.0001	0.0002	-0.0005 **	0.0001	
<i>Residence</i>									
In metro	-0.0032 **	0.0001	-0.0084 **	0.0002	0.0004	0.0005	-0.0092 **	0.0002	
In Indian states	-0.0011 **	0.0001	-0.0041 **	0.0002	0.0000	0.0000	-0.0004	0.0002	
<i>Due to Difference in Coefficients</i>									
Education (\leq high school)	0.0026 **	0.0007	0.0031 **	0.0006	-0.0018 *	0.0007	-0.0007	0.0006	
Married	0.0001	0.0015	-0.0080 **	0.0013	0.0137 **	0.0021	-0.0004	0.0016	
<i>Nativity</i>									
US-born	-0.0096	0.0050	-0.0034	0.0042	-0.0266 **	0.0058	-0.0098 *	0.0049	
Mexico, C./S. America-born	-0.0009 **	0.0001	-0.0006 **	0.0001	0.0001	0.0001	-0.0001	0.0001	
Other	0.0018 **	0.0002	0.0012 **	0.0001	0.0004 *	0.0002	0.0004 *	0.0001	
<i>Language</i>									
English	-0.0005	0.0017	-0.0089 **	0.0015	-0.0089 **	0.0018	-0.0092 **	0.0015	
American Indian	-0.0007	0.0005	-0.0006	0.0005	0.0031 **	0.0005	0.0030 **	0.0005	
Other	0.0003	0.0002	0.0010 **	0.0002	-0.0005	0.0003	-0.0004	0.0002	

Residence

In metro	0.0077 **	0.0015	0.0054 **	0.0013	0.0119 **	0.0018	0.0048 **	0.0014
In Indian states	-0.0185 **	0.0020	-0.0151 **	0.0016	-0.0294 **	0.0022	-0.0317 **	0.0017
Constant	-0.0589 **	0.0060	-0.0604 **	0.0051	-0.0182 *	0.0070	-0.0159 **	0.0058

Note: Numbers are weighted.