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Upward Mobility and Discrimination: The Case of Asian Americans
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ABSTRACT

Asian Americans are the only non-white US racial group to experience long-term, institutional discrimination yet today exhibit high income. I reexamine this puzzle. I focus on California, where most Asians settled historically. Asians achieved extraordinary upward mobility relative to both blacks and whites for every cohort born in California since 1920. This mobility stemmed primarily from gains in earnings conditional on education, rather than unusual educational attainment. Historical test score data suggest that low initial earnings for Asians—unlike blacks—primarily reflected prejudice rather than skills. Asian history is consistent with the view that closing racial skill gaps inherited from past educational discrimination would close racial earnings gaps in contemporary labor markets.

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Few white Americans today realize just how pervasive legal anti-Asian discrimination was before 1945.... In light of this history, the current problems of the Asian-American community seem relatively minor, and its success appears even more remarkable. Social scientists wonder just how this success was possible, and how Asian-Americans have managed to avoid the 'second-class citizenship' that has trapped so many blacks and Hispanics.

David Bell, *The New Republic*, July 15, 1985

1 Introduction

Asian American ("Asian") history represents a unique and puzzling case study because Asians are the only American racial group to experience long-term, institutional discrimination, yet still achieve group income levels similar to whites by the late 1960s.[1] In this paper I re-examine and provide a new explanation for this puzzle. Conventional wisdom often ascribes Asian success to extraordinary investments in children's educational attainment.[2] However, I show that Asian earnings growth stemmed primarily from gains *conditional* on education. I then document suggestive evidence that extraordinary post-war growth in Asian conditional earnings reflected high Asian skills that had remained

[1] While many other "white" immigrant groups such as Irish Americans, Italian Americans and Jewish Americans encountered some prejudice historically and exhibit high incomes in the modern period, they did not experience the qualitative degree of institutional discrimination reserved for "non-white" groups including blacks, Native Americans, Asians and Hispanics, and described below in Section 3 in more detail (Jensen, 2002; Kenny, 2006; Diner, 2006; Mangione, 1993; Chang, 2004; Page, 2004; Gonzalez, 2011). For example, Kenny (2006) states "The Irish experience of race in the United States does not belong in the same category as black slavery or Asian exclusion," while Diner (2006) states "As women and men considered among the privileged by virtue of their whiteness, [Jews] enjoyed relative tolerance," and that they experienced "relatively full political and civil rights" from the end of the 18th century. While Hispanic Americans have faced substantial institutional discrimination (e.g. Gonzalez, 2011), I do not focus on them in this paper for several reasons. First, I do not observe Hispanic Americans directly in my test score data described below. Second, IPUMS identifies Hispanic Americans in relatively complex ways related to nationality, language, and names that may be endogenous to some of the outcomes I study.

[2] The belief that minorities get ahead by investing in more education, rather than obtaining greater pay conditional on education, is widespread. Kristof (2015) focuses on high educational attainment of Asian children, which he partially attributes to "East Asia's long Confucian emphasis on education." President John F. Kennedy implicitly adopted this theory of group progress in 1963 when he told an assembly of black civil rights leaders, "it seems to me...that we could emphasize... which I think the Jewish community has done, on educating their children, on making them study, making them stay in school and all the rest" (Branch, 1989).

uncompensated in pre-war labor markets. Asian history can therefore be interpreted as a novel, dynamic confirmation of the old hypothesis that earnings gaps driven by prejudice rather than productivity will not persist in sufficiently open and competitive labor markets (Becker, 1957; Arrow, 1972; Goldberg, 1982).

I build this argument in multiple steps that make use of several, recently-available or new data sources. These sources include 100% 1940 census data (Minnesota Population Center and Ancestry.com, 2013), Army General Classification Test (AGCT) score data for over 500,000 WWII enlistees in 1943 (Ferrie et al., 2012; Aaronson and Mazumder, 2011; Carruthers and Wanamaker, 2016)[3], and early 20th Century survey data recording white prejudice against various racial and ethnic groups. I also rely on new methods to estimate intergenerational mobility of small groups in census data (Hilger, 2016). My richer data allow me to focus the analysis on California (CA), which contained over 80% of mainland Asians in 1940, and also fortuitously contained a small black minority that had voluntarily migrated from the South in pursuit of economic opportunity. I establish that these two groups faced similarly profound prejudice and institutional discrimination in early-mid 20th century CA; in fact Asians faced a harsher legal environment than local blacks. I also show how vastly different historical legacies imported to CA by these two groups would tend to predict sharp differences in human capital at time of arrival, especially among those selecting into parenthood. After establishing this context, I address four sequential questions.

Question 1: Does high Asian income reflect high dynastic income growth, or compositional effects of new immigration? To my knowledge even this basic question about Asian American history has not been addressed in prior literature. Using pseudo-panels by year, race, and birth in CA, I identify parental income when children are age 1-17 in a base year (when most children still live with parents) and track incomes of these children in later years once they enter the labor and marriage markets. Under assumptions that I partially verify, these intergenerational pseudo-panels yield two-generation group dynastic growth rates on balanced panels of dynasties.[4] I find that Asian dynastic growth rates exhibit upward "divergence" from blacks and upward "reversals of fortune" with respect to whites, and are therefore qualitatively inconsistent with neoclassical absolute convergence of groups to identical steady state incomes from different initial conditions (Ramsey, 1928; Solow, 1956). In this sense, Asians do exhibit unusually rapid dynastic growth relative to blacks and whites in every cohort born in

[3] I thank Bhashkar Mazumder for generously sharing his cleaned version of the WWII enlistee test score data.

[4] I place no restrictions on where children born in CA live later in life.

CA since 1920.[5] These high growth rates would have delivered high Asian incomes even in the absence of new high-skilled Asian immigration.

Question 2: Why did Asian dynastic income grow more rapidly than other groups? To shed light on this question I estimate an intergenerational decomposition of group earnings in each year into three terms: (1) parental income distributions, (2) children's educational attainment conditional on parental income, and (3) children's earnings conditional on education. I exploit the method developed in Hilger (2016) to estimate educational attainment conditional on parental income in cross-sectional census data. I find that all three components favor Asians over blacks historically, although these differences shrink dramatically and in some cases vanish when restricting to the CA-born. I quantify the relative importance of these three components by imputing counterfactual, steady-state black-white earnings gaps for all children born 1920-1980, assigning blacks each of the three components of Asian and white earnings separately. Contrary to popular perception, large gains in earnings *conditional* on education have played the primary role in Asian earnings growth, alongside a secondary role for greater educational attainment conditional on parental income, and virtually no role for higher parental income. In CA, the only white advantage over blacks has been greater white earnings conditional on education; educational mobility and parental income have played virtually no role.

Question 3: Why were CA-born Asians but not blacks able to close their conditional earnings gap? To shed light on this question, I examine determinants of conditional earnings gaps in 1940 by exploiting AGCT test scores for whites, blacks and Asians in CA. I find that Asians in 1943 already exhibit near-parity with whites in mean test scores both overall and within all education groups, while analogous black mean test scores lag behind both Asians and whites by nearly a full standard deviation, as has been found in more recent decades (Neal and Johnson, 1996; Johnson and Neal, 1998; Dickens and Flynn, 2006; Neal, 2006; Fryer, 2010). I quantify the contribution of these test score gaps to conditional earnings gaps by matching test score records to the 100% 1940 census to obtain a matched, national sample of 211,000 records containing test scores, earnings, and education for white and black men ages 18-35. Replicating specifications in Johnson and Neal (1998) I find that black-white skill gaps account for 40% of black-white earnings gaps in 1940, which is only slightly less than the 50% share of black-white earnings gaps accounted for by AFQT scores in NLSY data for the 1990s. As of 1940, these findings suggest a relatively much larger role for taste-based discrimination or misperception of skills in the Asian conditional earnings gap (Becker, 1957), and a relatively larger role for

[5]This upward mobility holds even when restricting to native-born parents of CA-born children, and therefore is unlikely to reflect weaker English fluency in the parent generation.

discrimination based on skills via basic pay for productivity or statistical discrimination (Aigner and Cain, 1977) in the black earnings gap.

It is these findings that bear on the question of whether taste-based discrimination or misperceptions of skill, by themselves, can generate persistent group earnings gaps in competitive labor markets. To my knowledge, Asian American history offers the most direct empirical evidence on this question to date, because Asians are the only persecuted non-white American minority to display test score parity—and hence plausibly skill parity—with whites in historical data. Asian American history therefore provides an important case study consistent with the notion that earnings gaps driven largely by prejudice or misperceptions are not sustainable in sufficiently competitive labor markets, such as those arguably emerging in the decades after World War II. These results raise a fourth question.

Question 4: Why might taste-based discrimination reduce earnings more persistently for some groups than others? Prior research has documented large black-white pay gaps that are only partly explained by test scores and educational attainment in recent decades (Neal and Johnson, 1996; Johnson and Neal, 1998; Fryer, 2010), and shown these residual gaps plausibly stem from employer prejudice (Charles and Guryan, 2008).[6] I discuss several theories—based on stereotypes (Bordalo et al., 2016), pay compression (e.g., Frank, 1984; Acemoglu and Pischke, 1999), labor market tightness (Biddle and Hamermesh, 2013; Baert et al., 2015), and prevalence of minority employers—in which group skill levels affect prejudice-driven components of earnings gaps as well as productivity-driven components. These theories all share in common a prediction that *market-level* group skills should have larger effects on group earnings than individual skills due to social multiplier effects. I present evidence consistent with this prediction using non-experimental variation in black-white test score and earnings gaps across labor markets defined by state and broad education categories. These findings reinforce the key lesson of Asian history as interpreted here: large group earnings gaps appear hard to maintain in sufficiently competitive labor markets without large group productivity gaps.

[6] Estimates in Charles and Guryan (2008) suggest that a large share of the negative black wage residual not explained by AFQT scores or education in Neal and Johnson (1996) may stem from employer prejudice. Many studies in recent decades document persistence of racial prejudice against blacks (e.g., Bertrand and Mullainathan, 2004; Pager et al., 2009) and surveys also suggest persistent prejudice against Asians (Committee of 100, 2001; The Gallup Organization, 2005).

2 Prior Literature

Prior research has suggested many qualitative explanations for high Asian incomes in the modern period including selective migration, intra-group spillovers, positive stereotypes, demographic imbalance, portability of human capital, and culture, among others (e.g., see arguments and literature reviews in Hirschman and Wong, 1986; Sue and Okazaki, 2009; Lee and Zhou, 2015). Suzuki (1995, 2002) documents a significant role for selection into migration and return-migration among Japanese Americans in accounting for high and rising Japanese American earnings. Murayama (1984) documents rapid occupational progress by Japanese Americans within Pacific Northwest railroad corporations in the early 20th century, despite significant prejudice of white employers and coworkers. Consistent with these authors, I infer a key role for Asian selection into migration and family formation, and attribute greater upward mobility of Asians to intergenerational transmission of this greater skill endowment in an increasingly open and competitive post-war CA labor market.

Borjas (1992, 1993, 1994, 1995); Leon (2005); Abramitzky et al. (2014) explore intergenerational convergence in education and income among ethnic groups, but due to data constraints these studies place most empirical emphasis on "white" European immigrants who were spared most forms of institutional discrimination; do not incorporate test scores; and do not assure geographic overlap across groups within the US. These studies find strong persistence of initial group earnings gaps across generations.[7] In contrast with the intergenerational persistence displayed by these predominantly white ethnic groups, I find that Asians' large initial earnings disadvantage does not persist, but rather disappears or reverses in one generation in every cohort of Asians born in CA since 1920. I argue that the severe prejudice and discrimination faced by Asians before WWII, combined with their high initial human capital, can account for this contrast with slower convergence for white ethnic groups. Interestingly, Borjas (1994) argues that blacks and lower-skilled white immigrants exhibited similar rates of convergence after 1940. A comparison with Asian history suggests a general lesson: earnings convergence conditional on group skills may be much faster than group skill convergence.

Chiswick (1983) documents advantageous labor market outcomes among Asian American men in the 1970 census and concludes that discrimination need not always result in worse labor market outcomes, but makes no distinction between discrimination based on prejudice and discrimination based on skills. Chiswick (1988) finds that Mincerian

[7] E.g., Borjas (1994, Table 5) estimates group-level intergenerational persistence in mean log occupational earnings around .6 - .7, and Abramitzky et al. (2014, Figure 6) also suggest very strong persistence.

returns to schooling are positively correlated with average schooling across various racial and ethnic groups in the 1970 census and attributes this to initial differences in the relative prices of child quality and quantity facing different groups. In contrast, when focusing on CA I find a much larger role for pay levels in explaining group income mobility, and less evidence for important differences in group fertility rates or Mincerian returns to schooling.

Duleep and Sanders (2012) document that Asians exhibit a substantial unexplained earnings gap in 1960 that largely vanishes by 1980, and suggest that this change likely relates to Civil Rights legislation. Darity Jr. et al. (1997) study impacts of observable ethnic group characteristics on occupational indices in national samples, and Cooper (2003) analyzes weekly wage residuals for Chinese, Japanese, Mexican and white males in CA from 1950-1990.[8] These and other authors (Daniels, 1990, pg 314-15) partly anticipate my findings that Asian conditional earnings increased over time. I show the Asian earnings gap was also not explained by cognitive test scores, and that this earnings convergence conditional on skills played the primary role in overall upward Asian mobility. My longer timeframe is consistent with a gradual trend in Asian earnings convergence from 1940-80, rather than a sharp increase following civil rights legislation passed by CA in 1959 and the U.S. in 1964. However, I lack statistical power to reject economically significant trend breaks within the 1940-80 window.

A large literature documents a major role for skill gaps in explaining racial wage and earnings gaps. Higgs (1977) presents evidence that skills play a significant role in black-white wage gaps in Virginia in 1900 and 1909. Carruthers and Wanamaker (2016) also find that skills explain a large share of black-white wage and earnings gaps in the South in 1940. Cutright (1973), analyzing a national sample of Korean enlistees, finds that skills account for only 25% of black-white wage gaps in 1964, and that blacks receive lower compensation for skill than whites. Research on labor markets since 1990 typically finds that black-white skill gaps account for 50-75% of black-white pay gaps (Neal and Johnson, 1996; Johnson and Neal, 1998; Neal, 2006; Fryer, 2010). Other work on data since the 1980s finds that observable measures of human capital account for low earnings of Mexican Americans (Trejo, 1997) and Native Americans (Hurst, 1997), and that factors related to raising children account for an increasingly large share of female pay gaps (Goldin, 2014; Kleven et al., 2015). Like prior authors, I find a significant role for skills as measured by AGCT scores in black-white earnings gaps, but do not find any role for skills in Asian-white earnings gaps for cohorts born in CA as early as 1920.

[8] Cooper (2003) is forced to drop 1940 from her analysis due to small sample size for Asians in CA in the 1940 1% sample, and her 1950 census sample for CA contains 109 Asians.

This large earnings gap without any observed skill gap makes CA-born Asians a unique historical case study in the discrimination literature.

In sum, I build on prior literature by exploiting 100% census data in 1940, historical test score data, historical survey data on white prejudice against blacks and Asians, intergenerational pseudo-panel methods, and intergenerational decompositions of group earnings estimated using new methods (Hilger, 2016). These innovations allow me to focus on the one state inhabited by significant historical black and Asian populations over a longer period from 1940-2000, document extraordinary upward earnings mobility of Asians relative to other local groups, decompose this earnings mobility into elements suggesting important roles for particular mechanisms, and then document a plausible explanation for Asian upward mobility based on the instability of prejudice-based group earnings gaps in sufficiently open and competitive labor markets.

3 On Comparing Asian and Black Outcomes

To clarify the purpose of group comparisons undertaken below it is useful to write down a stylized conceptual model. Suppose outcome vector $\mathbf{Y}_{rt}$ for generation t of group r is determined by "contemporary environment" denoted $\mathbf{CE}_{rt}$, "ancestral legacy" denoted $\mathbf{AL}_{rt}$, the interaction of these two terms, and other factors $\mathbf{u}_{rt}$:

$$\begin{aligned}\mathbf{Y}_{rt} \;=\; & \mathbf{B_0}\cdot\mathbf{CE}_{rt} \\ & +\mathbf{B_1}\cdot\mathbf{AL}_{rt}\left(\mathbf{CE}_{r,t-1},...,\mathbf{CE}_{r,0}\right) \\ & +\mathbf{B_2}\cdot\mathbf{CE}_{rt}\cdot\mathbf{AL}_{rt}\left(\mathbf{CE}_{r,t-1},...,\mathbf{CE}_{r,0}\right) \\ & +\mathbf{u}_{rt}.\end{aligned}$$

"Contemporary environment" includes factors such as types and degrees of contemporary social prejudice and discrimination in schooling, housing and labor markets. "Ancestral legacy" includes intergenerationally transmitted factors such as financial and human capital, location, social networks, preferences, and norms. Ancestral legacy also incorporates any factors affecting selection into group membership such as migration to the US, and selection into parenthood within groups. In this section I argue that Asians and blacks born in California in the early-mid 20th century—unlike Asians and blacks nationally—shared similar contemporary environments in terms of white prejudice and legal discrimination, and that their different subsequent outcomes can therefore shed

light on the importance of their radically different ancestral legacies.[9] In other words, I argue that after conditioning on birth in CA, $\mathbf{CE_{black,t}} \approx \mathbf{CE_{Asian,t}}$ and therefore $\mathbf{Y_{Asian,t}} - \mathbf{Y_{black,t}} \approx \frac{d\mathbf{Y_{rt}}}{d\mathbf{AL_{rt}}} = \mathbf{B_1} + \mathbf{B_2}$. I then present empirical evidence consistent with a primary role for human capital as a key differential legacy accounting for divergent economic progress of these groups in CA.

Migration, Abduction, and Slavery

Asians and blacks in the US carry radically different ancestral legacies. Asians in the US have always represented voluntary migrants and their descendents. These migrants have arrived from China, Japan and other Asian countries in pursuit of economic opportunity as prospectors, laborers, merchants, farmers, skilled professionals and students since the mid-19th Century.[10] In contrast, the vast majority of blacks in the US during the 20th century represent descendents of slaves imported to the US before the Civil War. These slaves were kidnapped in many parts of Africa, shipped to the US involuntarily, and often subjected to catastrophic trauma including starvation, torture, rape, and profound psychological abuse (e.g., Rediker, 2008).[11] Under slavery, the great majority of blacks were legally unable to accumulate education or financial assets, yielding extremely low black literacy and wealth as of 1870 (e.g., Margo, 2016).

Geography

Asians and blacks also inherited different geographic legacies. Most Asians arrived on the West Coast while most blacks arrived in the South, and these geographic origins have persisted over time. Figure I maps the number of native-born Asian and black children (age 0-18) living in every county in the mainland US in 1940. Panel (a) shows that Asians in 1940 were heavily concentrated along the West Coast and especially in CA. In 1940, CA had ten times more native-born Asians than any other mainland state, and still had four times more native-born Asians than any other state as of 1980.[12] Panel (b) shows that blacks in 1940 were still concentrated in the South and New England. However, the map highlights that a significant minority of blacks had migrated to CA by the early 20th century. CA therefore represents the only state in which it is possible to conduct detailed historical comparisons of Asians and blacks. I therefore focus on

[9] All tables and figures in this section reflect census data described in Section 4 unless stated otherwise.

[10] Cloud and Galenson (1987, 1991) argue that much of the late 19th century migration from China took place through extra-legal indentured servitude contracts, but was nonetheless voluntary in the vast majority of cases.

[11] Native Americans, as well as many Hispanics living on land annexed by the U.S., also "entered" the U.S. involuntarily under circumstances of violence and material expropriation.

[12] Asians were also concentrated in Hawaii. I do not focus on Hawaii in in this paper because very few blacks have ever lived in Hawaii, and because Asians in Hawaii probably did not experience the same kinds of social prejudice or institutional discrimination as mainland Asians (Takaki, 1998; Daniels, 1990).

children born in CA in much of the analysis below. This sample restriction harmonizes the institutional and social environment facing blacks and Asians, which is critical given research documenting large spatial variation in upward intergenerational mobility that is largely common across races (Chetty et al., 2014; Chetty and Hendren, 2015; Hilger, 2016). Indeed, CA was viewed as a place of racial tolerance and opportunity *relative* to the South by many early black migrants (Graaf et al., 2001). Below I show that restricting to the CA-born also increases the similarity of Asian and black families along many dimensions. Like Asian families in CA, black families in CA represent a small group of voluntary migrants from distant and culturally distinct locations in pursuit of economic opportunities (Graaf et al., 2001).[13]

Racial Prejudice

Prejudice acts as an important feature of the contemporary environment faced by different demographic groups. Despite radically different origins and settlement patterns, blacks and Asians in CA plausibly faced comparable degrees of prejudice in the white US population in the early 20th century. This can be inferred using rich historical survey data gathered by social psychologists in the 1920s and 30s, who asked their subjects (typically white students at universities) to express preferences over various nationalities and races. These surveys are less likely to suffer from the self-censorship typically assumed to plague analogous modern survey data because, fortuitously, they predate social norms proscribing racial prejudice. The two primary methodologies for measuring prejudice at this time were "social distance" scaling based on how much intimacy with particular groups a person deemed acceptable (Bogardus, 1926), and pairwise group comparison scaling based on distributional assumptions about preferences (Thurstone, 1927a,b). Table I presents the rank of blacks, Chinese and Japanese in 23 different samples from 10 published studies spanning 1926-1956. Several clear patterns emerge from these survey data. In the US generally, whites express profound prejudice against Chinese, Japanese and blacks, with slightly stronger prejudice against blacks and Chinese at the national level. Prejudice in the two West Coast samples is even stronger against both Chinese and Japanese than blacks, which is consistent with the central role of CA as the cultural and political center of historical anti-Asian activism. Moreover, these prejudicial preferences appear relatively stable over the entire 1926-56 period, with temporary deviations in 1946 associated with WWII national allegiances. These data therefore support the idea that Asians and blacks in CA faced similarly profound degrees of racial prejudice among

[13] Black families in 1940 had migrated to CA primarily from Texas and Louisiana, and to a lesser extent Arkansas, Mississippi and Alabama. A majority of blacks in CA had been born in other states until 2000.

whites throughout the early 20th century and likely well after WWII.[14]

Other facts are also consistent with pervasive white prejudice against both Asians and blacks in early 20th Century CA. Well under 5% of Asians or blacks of either gender living in CA married whites in every census before 1970. And in 1920, 75% of CA voters, both major political parties, and the state Governor all supported a direct ballot initiative to increase legal discrimination against Japanese farmers by closing loopholes in prior legislation (Daniels, 1990). Examination of hundreds of discrimination complaints filed with CA regional offices of the Fair Employment Practices Committee set up to enforce non-discrimination by military contractors during WWII also suggests widespread reluctance to hire or work alongside "non-whites" including both blacks and Asians. Consistent with these preferences, data on employment of whites and non-whites in a sample of several hundred firms employing over 300,000 workers throughout the Bay Area indicate a large share of firms—even large firms—with zero or 1-2 non-whites, and concentration of non-whites in a few firms.[15]

Institutional Discrimination

Given the above evidence on racial preferences, it is not surprising that Asians were subject to harassment and institutional discrimination. At times these policies resembled a "Jim Crow" regime such as that imposed on blacks in many parts of the U.S. I here describe some of the key discriminatory practices and policies at the Federal level and in CA specifically.[16] Two key implications are that Asians experienced similar or worse

[14]By presenting ranks, I ignore the cardinal scales employed in the original studies, although these cardinal scales plausibly contain some information about strength of preferences and strongly reinforce the ordinal scale patterns. "Social distance" studies include Bogardus (1926), Katz and Allport (1931), Katz and Braly (1935), Bogardus (1928), Hartley (1946), and Bogardus (1959). These studies ask individuals to place racial groups on a "social distance scale" containing 7 allegedly ordered categories: "would marry into group", "would have as close friends," "would have as next door neighbors," "would work in same office," "have as speaking acquaintances only," "have as visitors only to my nation," and finally "debar from my nation." Respones were shown to be robust to various perturbations of the survey instrument Bogardus (1959, pg. 92-94). Pairwise comparison studies include Thurstone (1928), Chant and Freedman (1934), and Guilford (1931). These studies ask individuals "which of the following two nationalities/ethnicities would you prefer to associate with?" in many pairwise comparisons, and then construct a scale based on distributional assumptions about individuals' underlying racial preferences. Young (1927) asks subjects to rank nationalities/ethnicities by "innate ability"; this study also finds that prejudice does not respond to a semester-long course advancing more modern, opportunity-based theories of racial outcome differences.

[15]Records on discrimination complaints and firm employment accessed in Administrative Files of collection RG 228 Committee on Fair Employment Practice Region XII - San Francisco, HMS Record ID SB-877, held at the San Bruno, CA branch of the National Archives and Records Administration. Data on white and non-white employment by firm comes from ES 270 forms used by the War Manpower Commission to assess labor requirements of specific firms and catalogue workforce characteristics, and provided in some cases to Fair Employment Practices Commission administrators. Data available from author upon request.

[16]This section draws on several sources, including Daniels (1990); Chan (1991a); Sandmeyer (1991);

harassment and legal discrimination than blacks living in CA, and that discriminatory US immigration policy likely generated positive selection of Asians both into migration and family formation.

Asians have long faced severe political discrimination. Foreign-born Asians were barred from naturalization by the Naturalization Act of 1790. This Act excluded Asians from citizenship and voting except by birth, and created the important new legal category of "aliens ineligible for citizenship" that would prove useful in crafting future discriminatory laws. Asians experienced mob violence including lynchings and over 200 "roundups" from 1849-1906 (Pfaelzer, 2008), and hostility from anti-Asian clubs much like the Ku Klux Klan (*e.g.*, the Asiatic Exclusion League, Chinese Exclusion League, Workingmen's Party of CA), to an extent that does not appear to have any counterpart for blacks in CA history. Both Asians and blacks in CA could not testify against a white witness in court from 1853-73 (*People v. Hall*, 1853, see McClain, 1984), limiting Asians' legal defense against white aggression. The Chinese Exclusion Act of 1882 and the "Gentlemen's Agreement" in 1907 barred further immigration of all "laborers" from China and Japan, with exceptions for Asian "merchants," diplomats, students, and teachers and in some cases the wives of prior Asian residents. Subsequent laws and practices served to encourage return-migration and facilitate deportation of lower-skilled Asians, while still allowing certain higher-skilled and higher-wealth Asians to stay in the US and bring in wives and children from Asia (McKenzie et al., 1927; Hutchinson, 1947; Lee, 2005; Daniels, 1990; Chan, 1991b).[17] Below, I show direct evidence on skill-biased positive selection of Asians into both migration and parenthood, consistent with these institutional constraints.

Asians have also faced intense economic discrimination. Many cities and states levied discriminatory taxes and fees on Asians (1852 Foreign Miner's Tax, 1852 Commutation

Takaki (1998); Chang (2004); Azuma (2005); Graaf et al. (2001).

[17] Amendments to the Chinese Exclusion Act from 1882-1932 excluded many other smaller-scale merchants from exempted classes, eventually requiring proof of international trade with one's country of origin (Lee, 2005, pg. 90-91). The Scott Act of 1888 deported over 20,000 Chinese laborers who happened to be abroad at time of the law's passage. The Geary Act of 1892 required all Chinese to prove lawful status on demand or face punishment and deportation. The US Supreme Court case *United States v. Ju Toy* 1905 restricted due process and *habeas corpus* petitions for anyone entering the US including Chinese with US citizenship. The Gentlemen's Agreement of 1907 caused the Japanese to screen potential migrants on wealth, occupation, and other characteristics, implemented in part through the Japanese Associations of America. The Immigration Act of 1917 created an "Asiatic Barred Zone" excluding other East Asian countries (not Japan) with broader exceptions for some highly-skilled workers (lawyers, physicians, chemists, civil engineers, etc.), introduced literacy requirements for any immigrant over age 16, and expanded discretionary powers of US immigration officials to reject immigrants on these and other grounds. The National Origins Act of 1924 barred immigration of all foreign-born Asians, including Japanese, as "aliens ineligible for citizenship," yet continued exceptions for wives and children of Chinese merchants.

Tax, 1860 Fishing License, 1862 Police Tax, 1870 "queue" ordinance, 1870 sidewalk ordinance, and many others). Many professional schools and associations in CA excluded Asians (e.g., State Bar of CA), as did most labor unions (e.g., Knights of Labor, American Federation of Labor), and many employers declined to hire Asians well into the 20th century (e.g., Mears, 1928, p. 194-204). From 1913-23, virtually all western states passed increasingly strict Alien Land Acts that prohibited foreign-born Asians from owning land or leasing land for extended periods.[18] Asians also faced laws against marriage to whites (1905 amendment to Section 60 of the CA Civil Code) and U.S. citizens (Expatriation Act 1907, Cable Act 1922). From 1942-46, the US forcibly relocated over 100,000 mainland Japanese Americans (unlike other Axis nationalities, e.g. German or Italian Americans) to military detention camps, in practice destroying a large share of Japanese American wealth. In contrast, blacks in CA were eligible for citizenship and suffrage, were officially (though often not *de facto*) included in CA professional associations and labor unions that excluded Asians, were not covered by the Alien Land Acts, and were not confined or expropriated during WWII.

In education as well, Asians in CA faced legal disadvantages relative to blacks after 1890, when the CA Supreme Court ruled in *Wysinger v. Crookshank* (83 California 593, 1890) that CA school laws allowed *de jure* segregation of Asians and Native Americans but not blacks or other racial groups (Stephenson, 1910; U.S. Commission on Civil Rights, 1977; Wollenberg, 1978). In keeping with this decision, after 1890 a small minority of Asians in CA did attend *de jure* segregated schools in San Francisco and Sacramento (Kersey, 1933, pg. 429;Wollenberg, 1978). Evidence suggests that these few cases of formal segregation did reduce educational quality. Financial reports show the Commodore Stockton "Oriental school" segregating Chinese students in San Francisco ranked near the bottom of 106 district elementary schools in per-pupil spending during the 1920s, with spending around 80% of the median school San Francisco (California) (1924, 1925, 1926, 1927, 1928, 1929).[19] Likewise Bell (1935) finds slightly worse outcomes for Japanese students segregated into Oriental schools in Sacramento County. In contrast, there is no documentation of any *de jure* segregated black schools in CA after 1890. Indeed, Graaf et al. (2001, e.g., pages 14, 137) suggests that access to relatively high-quality (Ayres, 1920), racially integrated public schools attracted many Southern blacks to CA.[20]

[18] Higgs (1978) argues that Alien Land Laws had little practical effect on Asians due to a variety of loopholes, though Azuma (1994) provides a case study suggesting otherwise.

[19] Japanese students in San Francisco were not segregated. An attempt to segregate Japanese students in San Francisco at the start of the 20th Century led to the Gentleman's Agreement in 1907, in which CA agreed not to segregate Japanese students, and Japan agreed to prevent further immigration of Japanese laborers to the U.S. (Wollenberg, 1978).

[20] Consistent with the cited references, I find no documentation of any "black" schools in CA in the

De facto educational segregation of non-white minorities did take place in CA, though less comprehensively than in the South (Hendrick, 1975; U.S. Commission on Civil Rights, 1977; Wollenberg, 1978; Graaf et al., 2001; Torres-Rouff, 2012). The primary instruments of segregation were "restrictive covenants" excluding non-whites from residential neighborhoods along with "manipulation of school boundaries, the location of new schools, and a selective transfer policy" (Hendrick, 1975, pg. 190-191). Los Angeles contains the only pre-war survey of racial composition across *de jure* integrated schools, including Asians and blacks, of which I am aware. This survey was conducted confidentially in 1938 by the School Board and discussed in Hendrick (1975, pg. 194). I digitize and link this survey to data on school inputs from annual financial reports (Board of Education of the City of Los Angeles, 1938). Table II characterizes schools attended by whites, blacks, Hispanics and Asians (predominantly Japanese Americans) in these data. All minorities attended schools containing many whites. While Asians attended schools with higher white shares than blacks, group variation in class size and spending per pupil is minimal. Why might Asians have gained greater access to predominantly white schools than other minorities, despite similarly strong white prejudice against Asians? Evidence below suggests one reason: Asian and white children would have tended to possess similar cognitive preparation for schooling, while blacks would have tended to lag behind and potentially pose greater problems of classroom management.

Beyond San Francisco and Los Angeles, it is not likely that Asians faced dramatically more favorable educational environments than blacks in pre-war CA. Asian and black school-age children lived largely in the same counties in CA for most of the 20th century.[21] And within counties Asians and blacks likely faced similar residential restrictions. Two unverified sources report that 80% of homes in Southern CA were unavailable for occupancy by blacks (U.S. Commission on Civil Rights, 1973, pg. 4) or Asians (Lotchin, 2011, pg. 174, footnote 57); Mangum (1940, pg. 149) asserts that restrictions in CA "gen-

following additional sources: "Accredited Secondary Schools in the United States" from every available year 1928-1944 (Phillips and United States Office of Education, 1929; Carr and United States Office of Education, 1930; United States Office of Education, 1933; Carr and United States Office of Education, 1934; United States Office of Education, 1937; Carr and of Education, 1939; United States Office of Education, 1943; Carr and of Education, 1944) in which "Negro schools" are indicated with superscripts, the "Directory of Secondary Day Schools" from years 1949 and 1952 (Rice and United States Office of Education, 1949, 1952), the Sears Sacramento School Survey Volume II (1928), Auditor's annual financial reports 1924-42 for Los Angeles, Annual Report of the Fresno Public Schools 1900-37, and Annual report of the public schools of the City and County of San Francisco 1906-29.

[21] Over the 1920-40 period, Asians were slightly more concentrated in San Francisco and Sacramento, and blacks were slightly more concentrated in Los Angeles, Alameda (Oakland) and San Diego. In future research, it would be useful to compare exact residential patterns for blacks and Asians in CA 1900-1940, but processing residential address in the 100% census data for CA is beyond the scope of this paper.

erally include [Asians] as well as the Negro"; and many covenants quoted in publications exclude both blacks and Asians or all non-whites (e.g., *Shelley v. Kraemer* (334 U.S. 1, 1948)). Finally, minorities tend to face more harsh educational segregation in places where they compose a larger share of the local school-age population (e.g., Margo, 1990; Card and Krueger, 1992b), and this factor would have disadvantaged Asians relative to blacks in CA up through the 1940s.[22]

Many aspects of institutional discrimination against minorities in CA weakened after 1940 and well before the federal Civil Rights Act of 1964. In 1941, President Roosevelt issued Executive Order 8802 prohibiting discrimination by race among government agencies and their contractors in defense industries, and related antidiscrimination Executive Orders were issued by Presidents Truman, Eisenhower, Kennedy, and Johnson. In 1943, Congress overturned the Chinese Exclusion Acts and granted Chinese Americans eligibility for naturalization. In 1946, CA Governer Earl Warren repealed state laws permitting segregated schooling of Asians and Native Americans after federal courts declared *de jure* school segregation for Mexicans illegal under CA state law (Wollenberg 1974, *Mendez* et al *v. Westminister [sic] School District of Orange County, et al*, 64 F.Supp. 544 (S.D. Cal. 1946), affirmed, 161 F.2d 774 (9th Cir. 1947)). Also in 1946, 59% of CA voters rejected Proposition 15 seeking to strengthen the 1920 anti-Japanese Alien Land Law, contrasting with only 25% of CA voters who had rejected a similar proposition in 1920. In 1948 the US Supreme Court invalidated restrictive covenants (*Shelley v. Kraemer* 334 U.S. 1) and extended equal protection to "aliens ineligible to citizenship" in cases such as access to commercial licenses (*Takahashi v. California Fish and Game Commission*, 334 U.S. 410), while the CA Supreme Court struck down all state laws barring inter-racial marriage (*Perez v. Sharp*, 32 Cal.2d 711). In 1952, the CA Supreme Court declared all prior Alien Land Laws unconstitutional (*Fujii v. California* 38 Cal 2nd 718). CA legislators began introducing bills to prohibit racial and religious discrimination in employment starting in 1945, and in 1959 CA passed the Fair Employment Practices Act prohibiting discrimination by employers, labor unions, and employment agencies on the basis of race, religion, color, national origin, or ancestry.

These changes before 1960 all would have tended to increase competition in the labor market by removing legal barriers to employment of minorities; by inducing voluntary racial integration by firms and unions anticipating future legal developments or seeking

[22]While Asians in CA were a larger share of local populations than blacks before 1940, they were still very sparse compared to blacks in the South at this time. For example, black and white school resource gaps were very large in Southern states in 1920 where black population shares exceeded 50%, but were nearly equal in states with black population shares under 10% (Card and Krueger, 1992b, Figure II). For comparison, in 1920 CA was 3.4% Asian.

excuses to end costly exclusionary policies preferred by some workers; and by eroding broad social norms required to sustain high levels of racial exclusion (e.g., Heckman and Payner, 1989; Donohue and Heckman, 1991). I do not attempt to pin down causal effects of any *specific* change in legislation or social norms on racial outcomes. Rather, I argue that all these changes suggest a gradual relaxation of previously severe labor market restrictions on minority workers over the decades after 1940.

Ethnic Organizations

Asians may have had one advantage in their contemporary environment over blacks in CA: ethnic community organizations such as the Chinese Six Companies and family "clans," and the Japanese Associations of America Daniels (1990). These organizations lobbied on behalf of their communities at all levels of governments to curtail discriminatory legislation, with limited success. They also provided some social insurance and law enforcement services, at points helped to screen potential migrants to comply with US exclusion laws and home countries' national interests, and in the Japanese case openly advanced a cultural agenda of high educational attainment and model citizen behavior. It is difficult to assess the advantages imparted to Asians by these organizations in any quantitative way. However, it is important to note that blacks in CA also had many organizations serving similar purposes, including NAACP chapters, community groups, churches, and media outlets. Moreover, while Asians may have benefitted from political support of their home countries, blacks in CA benefitted more directly from the right to vote, which CA fully granted to black citizens both *de jure* and *de facto* unlike many Southern states (Graaf et al., 2001).

Summary

CA in the late 19th and early-mid 20th centuries can be viewed as a place where small, advantageously selected subsets of blacks and Asians migrated in pursuit of economic opportunities. Once in CA, these groups faced surprisingly similar contemporary environments of harsh prejudice and discrimination that fell *more* heavily on Asians than blacks in most respects. Asians faced equal or greater legal discrimination in citizenship and suffrage, due process, employment, membership in professional associations and labor unions, land ownership and leasing, housing markets, public education, and abridgment of personal freedom and property rights during WWII. The key difference between these groups is that blacks brought with them to CA long dynastic histories of enslavement, extreme educational and labor market discrimination, and persecuted minority status, whereas many Asians brought with them skills that had been required to migrate and form families under selective US immigration laws. Comparisons of CA-born Asians and blacks therefore offer a unique opportunity to shed light on the relative importance of

these extremely different ancestral legacies operating in an environment of comparably harsh prejudice and discrimination.

4 Data

The decennial census is the only data set large enough and extending back far enough in time to conduct detailed historical comparisons of Asians with other groups.[23] I rely on census data from 1940-2000, when income and education are both available (Ruggles et al., 2015). Critically, I rely on newly a digitized full count (100% sample) 1940 census data, making it possible to examine minorities in CA in these early years, and to match census data with test score data. I rely on census data spanning the longer period of 1850-2000 in order to examine longer-term aggregate group trends. I define "Asians" broadly as Chinese, Japanese, and "Other Asian or Pacific Islander"; almost all Asians up through 1970 were Chinese or Japanese. Asians have been identified in the census race variable through "enumerator observation" (1850-1950) and self-reporting (1960-2000) in every year back to 1850.[24]

I focus on household annual labor earnings (head + spouse) as my primary measure of income for several reasons: non-labor income is not available in the 1940 census, hourly wages not suffer from measurement error in reported hours[25] (Baum-Snow and Neal, 2009); both earnings of head and hourly wages do not capture total resources available for investments on children's education; and household wages allow pooling of male and female children on a comparable footing in order to maximize sample size. I exclude parents reporting zero income from my primary analyses. In Section 11, I show key results are robust to imputing incomes for these households, and also robust to use of

[23] The Current Population Survey is another large, long-standing survey. For this paper, census data are preferable to CPS data because the March CPS begins in 1962, only introduces "Asian/Pacific Islander" to its racial classification in 1988, and excludes military and incarcerated individuals from its sample.

[24] Carter (2015) documents significant over- and under-counts of Chinese Americans in the 1940 full count data at the national level, but not in California (she reports a 3% under-count of Chinese Americans in California). The over-count problem is generally much more severe. I adjust for this problem in the 1940 full count data by setting the race variable to missing for individuals identified as Chinese (Japanese) in states where fewer than 30% of Chinese (Japanese) report "mother tongue" of Chinese (Japanese). This results in dropping all Chinese Americans in Delaware, Ohio, Kansas, Missouri, Alabama, North Carolina, Oklahoma, and Tennessee and all Japanese Americans in Michigan, Minnesota, North Dakota, Alabama, Oklahoma, and Tennessee. This adjustment has very little impact on national statistics because these states are a small share of all Asians in the US at this time. Of course, this adjustment has minimal impact on results restricting to children born in California, since only a trivial minority of such children migrate to these states after 1940.

[25] Neal (2006) imputes hours from CPS data. The CPS does not separately identify Asians in its race variable before 1988 and is too small to provide useful imputations for Asians in later years.

male earnings rather than total household earnings. In Hilger (2016), I address several additional concerns related to the adjustment of statistics for independent children that cannot be linked directly to parents after ages of school completion.

I also make use of recently-discovered World War II enlistment data containing Army General Classification Test (AGCT) scores for a large sample of enlistees in 1943 (Ferrie et al. (2012); also see Aaronson and Mazumder (2011); Carruthers and Wanamaker (2016)). The AGCT was intended to measure "ability to learn" in the army environment (not "innate" abilities) and contained 140-150 multiple-choice questions on vocabulary, arithmetic, and block counting. The test correlated strongly with IQ scores, displayed high reliability and validity, strongly predicted in-service and post-service occupations, and strongly correlated with satisfactory completion of military assignments. Importantly, the AGCT sample contains a positively selected sample of enlistees because the test was only administered to individuals who passed brief preliminary examinations of physical, educational, and emotional fitness (Bingham, 1946; Ginzberg, 1959). Overall, only 73% of white enlistees and 53% of black enlistees took the AGCT.[26] Low educational attainment and quality, roughly associated with sub-4th grade levels of literacy in spoken and written English, accounted for most of this racial discrepancy, though discrimination by white examiners and possibly greater ambivalence toward military service by blacks also played some role (Ginzberg, 1959; Smith, 2013).[27] Despite lower initial pass rates for blacks, the military and hence the AGCT test score sample maintained approximate racial balance by increasing the number of initial black enlistees (Ginzberg, 1959, p. 120).[28] Therefore AGCT scores almost surely understate black-white gaps in education and cognitive skills in the broader population, and this should be kept in mind when discussing results below.

Despite these selection problems, this extraordinarily large sample of cognitive test scores allows me to conduct three novel empirical exercises. First, I separately examine test scores of Chinese, black and white enlistees born in the 1920s and living in CA in 1943, during a period when many Jim Crow laws were still in effect.[29] Second, I match

[26] Previous work making use of these test scores does not appear to recognize this selection problem.

[27] Malcolm X, for example, feighned a mental disorder during his psychological examination to avoid military service (X et al., 1992).

[28] Pre-AGCT preliminary exams took place on one-day visits of potential enlistees to "induction stations." Only individuals passing these tests would return several weeks later to "reception centers" for multiple days of more detailed testing including the AGCT intended to guide their occupational assignment in the military (Hershey 1943, pg. 52-53 shows order of events, pg 50-51 documents share of whites and blacks reaching reception centers for AGCT testing, also seeLew 1944; Ginzberg 1959). I have been unable to obtain the rejection rate for Chinese enlistees; Ginzberg (1959, p. 120 footnote) claims the military only published rejection rates for blacks and non-blacks separately.

[29] Japanese Americans are almost entirely unrepresented among WWII enlistees in 1943 due to the

these test score data to 100% individual census data in 1940 to assess cross-sectional effects of individual test scores on earnings. Third, I use test score and earnings data separately on full unmatched samples to compare black-white test score and earnings gaps across labor markets defined by state of residence and broad education category.

I match AGCT and census data on exact state of birth, race, first name and last name, and year of birth plus or minus one year.[30] I obtain a match rate of nearly 40%, which is high by the standards of census matching, most likely due to the short time interval between the two datasets.[31] Summary statistics for men in the 1940 census sample, the 1943 enlistment records sample, and the matched data, for both US and CA residents are presented in Table IV. The test score data are reasonably representative of the US and CA population as contained in census data, though for reasons discussed above the data are nonetheless likely to understate skill differences between blacks and whites. Chinese American men ages 18-38 represent 0.8% of all CA residents in both the 1940 census and the test score data, consistent with overall composition of WWII servicemen (Smith, 1947). Blacks are over-represented in the test score data among CA residents, but under-represented at the national level as among servicemen generally (Smith, 1947). Some of this discrepancy between US and CA samples may reflect rapid migration of blacks to CA between 1940 and 1943 (Graaf et al., 2001). Overall, the test score data contain about 3% of men ages 18-38 in the 1940 census, both for the US and CA. Table IV also indicates that the matched sample is fairly representative of the AGCT data. Test scores are slightly higher in the matched sample, but similarly dispersed. Age, education, and race are also similar in the matched sample, with the exception that I match almost no Chinese-Americans, most likely due to difficulties matching Chinese names. I therefore only examine Asians in *unmatched* test score data.

5 Basic Historical Trends

In this section I plot national aggregate outcomes by race over all available years of data, reweighted to match the white age and gender distribution in each year and restricting to ages 25-65. I focus on national trends with no further restrictions, rather than trends restricting to those born in the US or in CA, because national trends may have informed broader perceptions of Asian American history. To further illustrate the importance

Japanese Internment policy following Pearl Harbor.

[30] I drop individuals who would be under age 23 in 1940 to assure that most individuals are no longer in school, and individuals with reported education under 5 years, which is the 2nd percentile of education in this year.

[31] For example, Long and Ferrie (2013); Abramitzky et al. (2014) match males across multiple decennial censuses and obtain match rates around 10-15%.

of ancestral legacy, results in this section incorporate Native Americans as a second "involuntary immigrant" group that has undergone multiple centuries of institutional discrimination in human capital and labor markets (Page, 2004).

These comparisons furnish broad historical context, but they are not a focus of this paper because they confound intergenerational group mobility with compositional changes from migration (Borjas, 1987; Chen, 2011; Suzuki, 1995, 2002). Figure II illustrates the magnitude of this problem by plotting gross immigration flows into the U.S. from various Asian countries since 1820. The Chinese Exclusion Act, the Gentlemen's Agreement, and the 1965 Immigration Act are all discernable. On the right-hand axis, the dashed line labeled "Share" plots total Asian immigrant flows as a share of the total Asian population stock in the US in the previous decade, and indicates that migration flows were large relative to stocks even before the 1965 Immigration Act, and enormous thereafter. Return-migration flows also affect the composition of Asians between censuses (Suzuki, 1995). Below I develop comparisons that address these problems.

Figure IIIa plots basic literacy rates (ability to read and write in any language) by race and year, which captures some low minimum level of schooling.[32] Asians had much higher literacy rates than blacks and Native Americans in 1870, but this gap had closed by 1900. Figure IIIb plots average educational attainment by race and year. In every year 1940-2000, Asians exhibit significantly higher education than all other groups, followed by whites, followed by blacks and Native Americans.

Figure IV plots log earnings of men 1940-2000. All three minorities reduce their earnings gaps with whites after 1940. Black and Native American earnings have both fluctuated around 60-80% of Asian earnings for 60 years. I also impute log earnings in earlier periods based on occupation.[33] Figure IVb displays imputed log earnings of men from 1880-2000. All minorities exhibit convergence toward whites over most of the last 150 years. However, blacks and Native Americans do not display any clear convergence toward Asians.

Table III presents the most common occupation for each race by year, and sketches out the different occupational trajectories underlying Figure IVb. In 1860-80, many Asians were "mine operatives and laborers." Later Asians tended to work on farms as

[32] Only free blacks were asked about literacy by census enumerators through 1860, and only "taxed" Native Americans were asked about literacy up through 1870. I therefore drop these observations from the figure due to concerns about selection. A fire destroyed the 1890 census.

[33] I follow Smith (1984) and Margo (1990) and impute earnings back to 1860 based on earnings in occupations in 1940, allowing earnings to differ by native-born status and restricting to men ages 25-65. I do not allow earnings to differ by race within occupations in this imputation. By fixing earnings within occupation the imputation provides a simple index of occupational quality. To harmonize occupations across years I rely on the IPUMS variable OCC1950.

wage laborers, rather than tenants, again reflecting differences in regional economies. Asians then worked in restaurants, laundries and other service industries before shifting into more white-collar positions in late 20th century. In comparison, blacks and Native Americans tended to work on farms as tenants after the Civil War, and have remained in lower-skilled agriculture and manufacturing throughout the 20th century.

Unsurprisingly given the different ancestral legacies discussed above, these aggregate national trends characterize Asians as higher-skilled than native U.S. minorities at every point over the past 150 years. The perception that Asians began their history in the U.S. disadvantaged by lower skills and earnings could potentially be true relative to whites, but is not plausible when comparing Asians to blacks or Native Americans at the national level. In contrast, trends in human capital and earnings among the CA-born are more consistent with this perception, as shown in Appendix Figures A.1-A.2. Among the CA-born, Asians and blacks appear similarly disadvantaged in 1940, but Asians rapidly overtake both blacks and whites in education and earnings over subsequent decades. Unfortunately, these figures also confound effects of intergenerational group mobility with time-varying selective migration, now to an even greater extent due to inter-state migration of blacks and whites in addition to international migration of Asians.

6 Intergenerational Group Mobility: Pseudo-Panels

I now present historical outcome trends that isolate variation in group intergenerational mobility, excluding changes in group composition due to migration. To do so I construct pseudo-panels that link adult outcomes to parental characteristics during childhood, exploiting the fact that most children live with their parents until age 17. Consider children age 1-17 in 1940 with known state of birth in the US. For this 17-year cohort block of children we can observe parental characteristics such as income and education. We can then observe outcomes of these children at ten-year intervals in later censuses using self-reported state of birth. This strategy delivers balanced pseudo-panels if individuals report race, age, and place of birth consistently across decades, and if families with U.S.-born children rarely emigrate. Pseudo-panels permit calculation of "group mobility" as $\frac{\mathbb{E}[y_{i,r,t}]}{\mathbb{E}[y_{i,r,t-1}]}$, where $y_{i,r,t}$ denotes household earnings of person i in group r in generation t. I construct these pseudo-panels for 17-year cohort blocks still living with parents in each decade 1940-2000.[34]

[34] I pool all children ages 1-17 to maximize statistical power, weighting families by number of children in household. I omit cohorts age 1-17 in 1950 because earnings and education in 1950 are only observed for one member of each household.

I can partially test the assumptions required to obtain valid pseudo-panels by testing for anomalous changes in the size and gender composition of cohorts defined by place of birth.[35] Figures V-VI plot log frequencies for these cohort-blocks born in the US and CA, respectively. In a truly balanced pseudo-panel, cohort size weakly declines over time due to death and out-migration. While this restriction is approximately satisfied in most cases, cohort size does increase between some censuses for some races. These violations may reflect inconsistencies in census sampling techniques or individuals' self-reported age, place of birth or race. However, the violations are typically small in comparison to the massive changes in Asian population size and composition displayed in Figure II.[36]

I also assess the validity of these pseudo-panels by tracking their gender composition over time. Earlier cohorts of Asians reporting U.S. birth exhibit "excess" males due to mass falsification of U.S. nativity records by largely male Asian migrants after the destruction of immigration records in the 1906 San Francisco earthquake, and possibly due to widespread incentives to avoid restrictions on foreign-born Asians through false nativity papers (Bureau of the Census, 1914; Chang, 2004). If this "paper sons" phenomenon somehow continued into later cohorts we would expect to see excess men or excess volatility of gender ratios. Appendix Figures A.3 and A.4 plot the share of men in each of these cohorts and races for native-born and CA-born cohorts, respectively. The figures document a male share very close to 50%, falling slightly as cohorts age, which is exactly the pattern that would arise from valid pseudo-cohorts due to the greater longevity of women. While there are some anomalies for certain cohorts in certain years, the selected pseudo-cohorts appear reasonable based on both stable frequencies and gender balance over time.

These pseudo-panels yield one parental income observation for each cohort, and one child earnings observation for each cohort-year after children have reached ages of labor market entry. This combination of multiple observations on every cohort serves as a further test of internal consistency. Figure VII illustrates how I present these data to compare dynastic growth rates across groups parsimoniously. The figure plots parental household earnings ratios with respect to Asians on the X-axis, and children's household earnings ratios with respect to Asians on the Y-axis. The 45-degree line represents the benchmark of identical earnings ratios across generations, and divides the pseudo-panel estimates into evidence distinguishing two broad families of models. In the "neo-classical absolute convergence" region of this figure, Asian IM can be rationalized by inter-group

[35] These are imperfect tests because consistent cohort size may conceal changes in the composition of the cohort.

[36] I have experimented with reweighting the pseudo-cohorts to maintain a fixed age distribution over time, with no significant change in the results.

mean-reversion of groups with identical preferences and technologies from different initial conditions (Ramsey, 1928; Solow, 1956).[37] In the "Divergence" region, relatively rich Asian parents have children who are relatively even richer, or poor Asian parents have children who surpass previously richer groups. Points in this region suggest that Asians are converging to higher steady-state income levels than comparison groups.[38] Differential steady states across groups are consistent with (1) "conditional convergence" models with group variation in preferences and technologies (Barro and Sala-i Martin, 1992), and (2) "new growth" models with identical groups under departures from neo-classical assumptions. Leading examples of non-neoclassical growth models include human capital externalities (Azariadis and Drazen, 1990; Borjas, 1992), knowledge spillovers (Romer, 1986), and credit constraints (Galor and Zeira, 1993).

Figure VIII presents this figure with data for black, white and Asian cohorts age 1-17 in 1940, 1960, 1970 and 1980. Panel (a) restricts to children born in the U.S., and panel (b) restricts to children born in CA. Nationally, Asian cohorts overtake whites, and do not exhibit any significant convergence toward poorer blacks. Results for children born in CA strongly reject neo-classical absolute convergence with respect to both blacks and whites in every cohort born in CA since 1920. These results suggest that Asian dynasties raising children in CA either benefit from more advantageous preferences or technologies than other groups, or benefit from some growth externality or non-convexity that violates the assumptions of the neo-classical growth model. Importantly, this pattern is *not* driven by English fluency differences between parents and native-born children; 50-80% of Asian parents are native-born in all years 1940-80, and restricting to only native-born parents yields nearly identical results.

I now turn to understanding what factors might account for this unusually rapid dynastic earnings growth among Asians. Given the extraordinary pace of this growth, explanatory factors should involve differences in group preferences or technologies affecting state income, or group-specific externalities or non-convexities that depart from the neoclassical model.

[37] Ethnic groups can be thought of approximately as small open economies with mobile labor. Rappaport (2005) shows that mobile labor has a surprisingly small effect on the rate of convergence predicted in neoclassical growth models. The intuition is that worker mobility may increase productivity, but can also discourages capital flows into the home economy.

[38] The upper unlabeled region of the graph would suggest that Asians are diverging to *lower* steady-state income, and is never empirically relevant.

7 Intergenerational Earnings Decomposition

Why have Asian dynasties in CA been converging toward higher group earnings than blacks and whites? To shed light on this question I estimate a simple, intergenerational decomposition of group earnings in the spirit of Conlisk (1974). Let $y_{r,t}$ indicate average adult log earnings in group r in generation t, and $h_{r,t}$ indicate average adult education. Let $f_r(y_{t-1})$ indicate the probability density function of parental income in group r. Mean earnings of group r in generation t can then be written non-parametrically as:

$$\mathbb{E}[y_{r,t}] = \int_{y_{t-1}} y_{r,t}(h_{r,t}(y_{t-1}))\, f_{r,t}(y_{t-1})\, dy_{t-1}. \tag{1}$$

This decomposition breaks mean group earnings into three terms. The term $f_{r,t}(y_{t-1})$ captures a group's parental income distribution and can be thought of as resource "endowments." The term $h_{r,t}(y_{t-1})$ captures educational attainment conditional on parental income. This "investment" relation can vary across races due to many factors including, for example, discrimination in human capital markets, anticipated discrimination in labor markets, information and beliefs about the value of education, and parental preferences. This relation could also be highly nonlinear if families with low incomes face sharp liquidity constraints on educational investments. The term $y_{r,t}(h_{r,t})$ captures children's earnings conditional on education. These "earnings functions" can differ across races due to factors such as school quality, labor market discrimination, or family skills not captured by educational attainment.

After examining these terms non-parametrically, I also make use of a linearized version of this decomposition. This version is easier to work with empirically, and also sheds light on multigenerational implications of group differences at any point in time. Write educational investments as $h_{f,t}(y_{r,t-1}) = \theta_{r,t} + \gamma_{r,t} y_{r,t-1}$ and adult earnings functions as $y_{r,t}(h_{r,t}) = \alpha_{r,t} + \beta_{r,t} h_{r,t}$, implying

$$\mathbb{E}[y_{r,t}] = \alpha_{r,t} + \beta_{r,t}\theta_{r,t} + \beta_{r,t}\gamma_{r,t} E[y_{r,t-1}] \tag{2}$$

and yielding the steady state relation

$$y_{r,SS} = \frac{\alpha_r + \beta_r \theta_r}{1 - \beta_r \gamma_r}. \tag{3}$$

These decompositions allow me to state how group outcome gaps in the subsequent generation, or in steady state, would mechanically be affected by replacing each of these three components for one group with the corresponding component of another group.

For example, I can estimate the share of the black-white earnings gap that would be closed if blacks adopted Asian investment behavior $h_{asian,t-1}(y_{t-1})$ or white parental income $f_{white,t-1}(y_{t-1})$. These counterfactuals provide a simple way to quantify the "importance" of group differences in three broad components of group mean earnings.[39]

I estimate these three components in each year for whites, blacks and Asians born in CA.[40] Parental income distributions and children's earnings conditional on schooling can be estimated directly in census data. I rely on the method developed in Hilger (2016) to estimate children's final education conditional on parental income, which addresses the longstanding problem that many children can no longer be linked to their parents at ages of school completion (e.g., Cameron and Heckman, 1993). The key assumption required to make this adjustment, verified in detail in Hilger (2016), is that dependent and independent children in their mid-to-late 20s exhibit similar relationships between final schooling and parental income. While this assumption cannot be verified directly for Asians due to small samples in panel datasets, it appears to be a reasonable approximation for whites, blacks, men, women, and all time periods spanning 1940-2000.

Even as a purely descriptive, reduced-form exercise, this decomposition has many limitations. Some of the more important examples are that two-generation mobility statistics likely overstate multi-generational mobility (e.g., Clark, 2014; Olivetti et al., 2014; Stuhler, 2014; Braun and Stuhler, 2015; Solon, 2015); final educational attainment is a highly imperfect measure of human capital as I discuss in more detail below; and annual group earnings variation likely understates *lifetime* group earnings variation due to reversion toward different group means (Rothstein and Wozny, 2014). Nonetheless, the exercise provides a useful diagnostic exercise for assessing the most likely potential causes of variation in group dynastic income growth rates.

[39] It is also straightforward to solve for the transition path of the linear decoposition for any generation T as

$$\mathbb{E}[y_T] = (\alpha + \beta\theta)\sum_{j=1}^{T}(\beta\gamma)^{j-1} + (\beta\gamma)^T \mathbb{E}[y_0]. \tag{4}$$

[40] In practice it is important to estimate these relationships over bounded regions of income and education variables, because the linearity assumptions break down outside the main support. I therefore drop children with education below the bottom 2% of the population education distribution in each year as in Card and Krueger (1992a), and I use mean log of parental income within population parental income deciles in each year, bounding income at the mean of the top and bottom deciles. Therefore in practice I estimate $\mathbb{E}[y_{r,t}] = \alpha_{r,t} + \beta_{r,t}\theta_{r,t} + \beta_{r,t}\gamma_{r,t}E[y_{r,t-1}] - \beta_r\gamma_r y_{\min} - \beta_r h_{\min}$ and $y_{r,SS} = \frac{\alpha_r + \beta_r\theta_r - \beta_r\gamma_r y_{\min} - \beta_r h_{\min}}{1-\beta_r\gamma_r}$, where $y_{\min}$ and $h_{\min}$ are as described.

7.1 Estimates

Figure IX plots parental income distributions by race in 1940 for children born in the US and CA. Parental incomes are grouped into population deciles. Panel (a) shows that Asian and black children in 1940 grew up with extremely different parental income distributions at the national level, with black children concentrated in the bottom deciles. Panel (b) shows this contrast is much milder when restricting to black and Asian children born in CA, likely due to positive selection of black CA-born children's parents into voluntary long-distance migration.

Figure X plots educational investments conditional on parental income, and again illustrates the key role of geography in Asian American history. Panel (a) shows that, among all native-born in 1940, Asian dynasties invest in higher levels of children's schooling than whites, whites invest in higher levels of schooling than blacks, and these patterns are especially pronounced among lower-income families. However, panel (b) shows that as of 1940 these differences completely vanish when restricting to CA-born. Among the CA-born, all races display high and income-insensitive educational investment relative to to national trends. Panel (c) shows that CA-born Asians do exhibit a higher investment schedule than other CA-born groups in later years, while white and black educational investment schedules remain virtually identical. Given that these relations are approximately linear, Table V presents estimated intercepts and slopes of linear investment schedules for the CA-born in order to summarize these time trends parsimoniously.[41] As the figure suggests, Asians do not display any advantage in 1940, but display significantly higher educational investment schedules than both whites and blacks in later years.

Finally, I estimate group earnings conditional on educational attainment. Figure XI displays log earnings for men by educational attainment in 1940 and 1980, restricting to the CA-born. In 1940, Asians and blacks both received about $0.4 - 0.6$ log points lower pay than whites at every level of education. By 1980, Asians closed this gap entirely while blacks still lag far behind, especially at lower levels of education. Table V presents intercepts and slopes of linearized conditional earnings functions by race and year in Columns (7)-(12), and shows that estimates are not sufficiently precise to pinpoint the exact timing of Asian convergence before 1980. The slopes of these lines, i.e. the Mincerian return to schooling, rise rapidly after 1980 for all groups, especially for blacks.[42]

[41] There is insufficient data on CA-born blacks and Asians to fit lines to these curves with any precision in 1960, barely enough in 1970, and the curves cannot be estimated at all in 1950 due to collection of census data from only one member of each household.

[42] Non-parametric earnings functions reveal that all three races exhibit sharp "convexification" of the returns to schooling after 1970 (Lemieux, 2006; Heckman et al., 2006).

7.2 Counterfactual Black-White Earnings Gaps

All three elements of the decomposition—parental income, educational investments, and earnings conditional on education—favor Asians relative to blacks historically in CA. In order to assess the relative contribution of these three components I construct counterfactual estimates of the black-white earnings gap over time. I consider counterfactuals in which I assign to black dynasties each of these three components from whites and Asians, one component at a time, still restricting to the CA-born.

I permute Asian components to whites and blacks using linear estimates of intercepts and slopes reported in Table V in two ways. Table VI reports actual and counterfactual log earnings by race based on Equation (2), which takes only one generation of transmission into account. Table VII reports actual and counterfactual log earnings by race based on steady-state income in Equation (3), which takes all future generations of transmission into account. Figure XIII displays one-generation counterfactual black-white earnings gaps constructed from estimates in Table VI as well as similar estimates permuting white components to blacks rather than Asian components.[43] Panel (a) shows that the overwhelmingly most important black disadvantage relative to *whites* is lower earnings conditional on education. Lower parental income and differential educational mobility play almost no role. Panel (b) repeats this exercise but imputes *Asian* components to black dynasties. Once again, conditional earnings gaps are the most quantitatively important factor, although high educational mobility plays a large secondary role. However, even this secondary role for high Asian educational attainment is largely driven by the fact that by giving blacks higher educational mobility shifts more blacks into the region of their earnings function that has converged more successfully toward whites over time. Therefore convergence of group earnings *conditional* on education has played the most important role in differential upward mobility of Asians relative to whites and blacks in California.

High educational mobility of CA-born Asian children after 1940 could be driven by a number of mechanisms, including higher unobserved parental skills, group-level human capital externalities (Borjas, 1992; Lee and Zhou, 2015), or Asian cultural preferences for education Brandt et al. (2014). However, in the next section I discuss potential explanations for the more important driver of Asian economic growth: earnings conditional on education.

[43] Results for steady-state estimates are nearly identical.

8 Why Did the Asian Conditional Earnings Gap Disappear?

Why did Asians, but not blacks, close their conditional earnings gaps with whites? A large literature distinguishes two broad explanations for group earnings gaps: (1) productivity differences observed by firms but not researchers and (2) prejudice.

Group productivity differences not observed by researchers can account for group earnings gaps if firms reward individual productivity, or if firms accurately observe *mean* group productivity and use group membership to proxy for individual productivity, which is known as "statistical" discrimination (Aigner and Cain, 1977). Paying individuals for productivity and statistical discrimination are both profit-maximizing firm behavior, and both theories predict that mean skill gaps drive mean group earnings gaps. Because these types of discrimination are profit-maximizing, theory predicts they can yield stable group earnings gaps as long as group skill gaps persist.

Explanations for group earnings gaps based on prejudice can take the form of "taste-based" discrimination stemming from racial preferences of employers, workers or customers (Becker, 1957; Arrow, 1971); "mistaken statistical" discrimination based on employer misperceptions of group skill differences (e.g. exaggerated stereotypes as in Bordalo et al. 2016); and "institutional" discrimination based on laws that tax or prohibit employment of certain groups in certain jobs. Theory predicts that markets will attenuate the impacts of prejudice on group earnings by sorting minority workers toward firms with unprejudiced employers, workers, and customers. In a context such as post-war CA in which minorities are a small share of the population and institutional discrimination has declined, theory predicts that even high levels of average prejudice may fail to generate large group earnings gaps. And when prejudice does yield group earnings gaps, it implies that someone–employers, workers, or consumers–has been forced to pay a cost to indulge their prejudice. For these reasons, economic theory predicts that competitive labor and capital markets tend to eliminate earnings gaps driven by prejudice, in sharp contrast to earnings gaps driven by productivity (Becker, 1957; Arrow, 1971, though see Goldberg, 1982).

Empirical work using data from more recent decades has indicated that cognitive test scores—interpreted as measures of productivity not captured by educational attainment—can account for a large share of black-white wage and earnings gaps (Neal and Johnson, 1996; Johnson and Neal, 1998; Fryer, 2010; Carruthers and Wanamaker, 2016). This literature documents large black-white test score gaps that emerge very early in childhood (Fryer and Levitt, 2013), persist into adulthood, and appear to reflect genuine skills related to labor market productivity rather than racial bias in the testing instrument (Neal

and Johnson, 1996). While these modern score gaps have not been fully accounted for by measured background characteristics (Neal, 2006; Fryer and Levitt, 2006; Fryer, 2010), they likely relate to suppressed black skill acquisition during slavery and subsequent educational discrimination against blacks spanning multiple generations (Margo, 2016). This literature suggests a primary role for productivity-based discrimination in accounting for black-white earnings gaps. However, some evidence suggests that taste-based employer discrimination against blacks may account for the residual share of the black-white wage gap that is not accounted for by measured skills (Charles and Guryan, 2008; Lang and Lehmann, 2012).

One reasonable conjecture, therefore, is that Asians closed their conditional earnings gaps more quickly than blacks after 1940 because Asians primarily faced a different type of problem, namely prejudice or misperceptions rather than skill deficits. A basic requirement of this hypothesis is that Asians in 1940 posessed greater skills than blacks, conditional on education.[44] In fact, previous research on Japanese Americans in CA support this theory. Evidence from a variety of cognitive tests given to students in CA in the early 20th century suggest test score parity of Japanese Americans with local whites after accounting for linguistic and cultural discrepancies, and superiority of Japanese Americans in academic performance in grades 7-12 (Ichihashi, 1932; Bell, 1935).[45] I am not aware of similarly rich published evidence on cognitive or academic achievement for early 20th century cohorts of Chinese or black Americans in CA. Fortunately, these groups' cognitive test performance can be studied using AGCT scores in WWII enlistment records from 1943. Remarkably, these data are large enough to compare Chinese, blacks and whites living in CA for these earlier cohorts.[46] In addition, this sample contains enough young men past their early 20s to compare test scores conditional on final educational attainment, which can help to shed light on mechanisms underlying the

[44] Taste-based discrimination by employers or workers yields additional predictions about the distribution of Asian workers across firms, and across occupations within firms over time, but I am unable to test these predictions in my data due to a lack of data on racial composition of firms in panels or repeated cross sections. Murayama (1984) explores some of these predictions for Japanese Americans within Pacific Northwest Railroad companies from 1898-1911. Higgs (1977) also explores these predictions in the context of black-white wage gaps in the South. I am not aware of any such evidence on Asian Americans in CA during the critical post-1940 period of rapid earnings convergence documented above.

[45] Bell (1935) also claims that white anti-Japanese attitudes in the early 20th century acknowledge high Japanese skill levels, citing as "typical" the following quote of V.S. McClatchy, Secretary of the CA Joint Immigration Committee during a 1920 hearing: "It will be agreed...that the facts now before us conclusively establish that the Japanese are undesirable as immigrants and as citizens, not because they are of inferior race, but because they are superior in certain characteristics....Their racial characteristics would soon give them economic control of this country if they secured a foothold...."

[46] I restrict to residence rather than birth in CA in this exercise due to some documentation or coding anomalies in the state of birth variable in the test score data. Results are similar using state of birth.

conditional earnings gap documented above.

Figure XII plots the distribution of normalized test score residuals by race from an OLS regression of test z-scores on dummies for education and age. Chinese Americans and whites have strikingly similar conditional skill distributions, while the black skill distribution lags behind by nearly a full standard deviation. Table VIII shows that this pattern holds separately within broad educational categories. These high test scores of Chinese Americans provide strong evidence that the AGCT was not hopelessly biased against non-whites, as Neal and Johnson (1996) also find for the AFQT (the successor to the AGCT) in more recent cohorts.

Can these black-white score gaps account for a large share of conditional earnings gaps in 1940, as they do in the more recent period? To address this question I turn to the matched national sample of AGCT scores linked to earnings and educational attainment in census data, restricting to individuals over age 23 in 1940 to allow school completion and labor market entry. Table IX reports estimates from regressions of log earnings on a dummy for black and AGCT scores, replicating specifications in Johnson and Neal (1998) on data fifty years earlier in time. Column (1) documents a large 0.633 log point raw black-white earnings gap controlling for age. Column (2) indicates that AGCT scores reduce this gap by 38% to 0.39 log points, or somewhat less than the 50% share of black-white earnings gaps accounted for by AFQT scores in the early 1990s in Johnson and Neal (1998). Given that these data likely understate black-white skill differences due to the lower pass rate of blacks in pre-AGCT examinations, results suggest that skills as measured by one test explain a substantial share of black-white earnings gaps at this time. Column (3) shows that educational attainment is likely an important channel by which AGCT scores increase earnings, but does not further reduce the unexplained share of the black-white earnings gap. Columns (4)-(7) show that, relative to whites, blacks exhibit significantly lower returns to AGCT scores, age and education.[47] These lower returns are qualitatively similar to results in Cutright (1973) for 1964, and with a large role for both skills and labor market discrimination in black-white earnings gaps at this time.

Why would Asians have so much higher levels of human capital than blacks in 1943? Did Asians arrive with these high skills, or did they somehow build them more quickly

[47] Formal tests reject equality of coefficients on age and AGCT in columns (4) and (6) and in analogous regressions (not shown) replacing AGCT with education. I also reject equality of coefficients on age in columns (5) and (7), as well as joint equality of both AGCT and education across races. Additional controls for hours and weeks worked in these regressions are highly significant but do not reduce the black-white earnings gap further in my sample. Using levels rather than logs, and imputing low earnings for observations with missing earnings, do not change any of the qualitative results discussed here. Quadratic terms are underpowered so I omit them for brevity.

than other groups after they arrived? As discussed in Section 3, Exclusion Laws from 1882-1965 would have disproportionately admitted Asians with higher-skilled occupational status, and would have disproportionately allowed higher-skilled Asian men to bring foreign-born wives and hence start families in the US (McKenzie et al., 1927; Chan, 1991b). This would suggest that Asians achieving parenthood in the US arrived with high skills already in place. Table X examines selection into migration, and shows that Japanese and especially Chinese American migrants were much more highly educated than non-migrants in their home countries at least as far back as 1940. The table also documents significant positive educational selection of blacks migrating to CA from other parts of the US. Table XI presents evidence on occupational selection into fatherhood by race and year, defining fatherhood as co-residence with own children.[48] The table shows that Asians indeed exhibit much stronger positive selection on occupational status into fatherhood of US-born children than both whites and blacks living in CA. This positive selection was quantitatively large until 1960. These patterns suggest an important role for positive selection into migration and parenthood in accounting for high skill levels of Asian American parents and hence native-born Asian American children through intergenerational skill transmission.

In summary, group test score patterns in 1943 suggest that similarity of Asian and black conditional earnings gaps in 1940 belied very different underlying problems. Low earnings for Asians likely reflected labor market discrimination or white misperceptions of Asian productivity, whereas low earnings for blacks likely reflected lower black skills in addition to labor market discrimination. Because prejudice and misperceptions tend to constrain rather than facilitate profit-maximization, economic theories of discrimination would have tended to predict faster elimination of Asian conditional earnings gaps than black conditional earnings gaps in the decades after WWII once institutional and monolithic forms of discrimination declined (e.g., Becker, 1957; Arrow, 1972). To my knowledge, Asian history represents a novel empirical test of this longstanding intuition. Asians are a unique test case because their large earnings disadvantage cannot be explained by education, test scores, English language fluency, or other characteristics associated with productivity in U.S. labor markets, unlike all other groups previously studied in the discrimination literature including blacks (Neal and Johnson, 1996; Johnson and Neal, 1998; Fryer, 2010; **?**), Mexican Americans (Trejo, 1997; Johnson and Neal, 1998), and Native Americans (Hurst, 1997). Asians in 1940 therefore represent the most compelling

[48]The census only asks women, not men, about number of children ever born, and many Asian men historically were in fact married but did not to bring their wives with them to the US. Therefore co-residence is the only available measure of fatherhood. The quality of this proxy for fatherhood likely deteriorates somewhat in more recent decades as the rate of single motherhood has risen.

case of large earnings gaps driven by pure labor market discrimination that we are likely to find in American history.[49]

9 Can Other Groups Close Earnings Gaps by Closing Skill Gaps?

If Asians apparently eliminated earnings gaps based on prejudice or misperceptions, why does some research suggest that prejudice still contributes to black-white earnings gaps (see reviews in Charles and Guryan, 2011; Lang and Lehmann, 2012)? Why might earnings gaps driven by taste-based labor market discrimination persist for some groups but not others? This question is important to understand whether elimination of group skill gaps will eliminate group earnings gaps even in the presence of continued prejudice.

As documented above, Asians display dramatically higher skill distributions than blacks as early as 1943. For many reasons, it is possible that high group skill levels would tend to alleviate effects of taste-based and mistaken statistical discrimination on group earnings, in addition to its direct effect on productivity-based pay gaps. For example:

- Racially prejudiced beliefs may represent exaggerated stereotypes causally dependent on a "kernal of truth" about lower-skilled groups (Bordalo et al., 2016).
- Employers may find it more costly to *categorically* exclude higher-skilled groups if firms earn greater profits on higher-skilled workers due to pay compression (e.g., Frank, 1984; Acemoglu and Pischke, 1999), or if markets for higher-skilled workers are tighter (Biddle and Hamermesh, 2013; Baert et al., 2015).[50]
- Higher-skilled groups may contain more managers and business owners who act as unprejudiced employers of their own group members.

Interestingly, all of these theories entail intra-group spillovers in which a group member's earnings depend on her group's *market-wide* or *aggregate* skill levels rather than just her

[49] Women's earnings gaps in contemporary labor markets have also been tied to productivity gaps in the sense that women still tend to bear a larger share of childrearing responsibilities and all the constraints that these entail (e.g., Goldin, 2014; Kleven et al., 2015).

[50] For example, Bain (2000) suggests that railroad employers were highly prejudiced against Asians in the late 19th century, but nonetheless rapidly hired large numbers of Asian workers after observing their high productivity first-hand. This intuition might not go through with worker prejudice, since firms may compete by offering their white workers more homogenously white colleagues. Many employers in the Fair Employment Practices Committee discrimination complaint records argue that they cannot afford to alienate their scarce white labor pool by hiring additional minorities.

own. A key implication of such theories is that variation in group skills at the market level should account for a greater share of group earnings than variation in skills at the individual level due to "social multiplier" effects.[51] These theories therefore violate the no-externalities assumption of the neoclassical growth model.

This point can be formalized heuristically using a linear-in-means peer effects framework (e.g., Borjas, 1992; Glaeser et al., 2003). For log earnings y_{ijr} and test score x_{ijr} of individual i in market j and race $r \in \{w, b\}$, let log earnings be determined by the true relation

$$y_{ijr} = \alpha + \gamma_b 1\{r = b\} + \beta x_{ijr} + \delta \bar{x}_{jr,-i} + e_{ijr}, \tag{5}$$

where γ_b denotes the residual black-white log earnings gap, and $\bar{x}_{jr,-i} \equiv E[x_{ijr}|j, r, -i]$ or mean test scores of an individual's own-race peers within a market. I assume $e_{ijr} \perp j, r$ to abstract from endogenous sorting. Consider the short linear predictor $y_{ijr} = \tilde{\alpha} + \tilde{\gamma}_b + \tilde{\beta} x_{ijr} + \tilde{e}_{ijr}$, as estimated above and in Neal and Johnson (1996); Johnson and Neal (1998) on national samples. If blacks tend to have lower-skilled peers such that $Cov(1\{r = b\}, \bar{x}_{jr,-i}) < 0$, then two results obtain. First, $\tilde{\gamma}_b < \gamma_b (\leq 0)$ implying the short regression overstates the share of black-white earnings gaps not accounted for by measured skills. Second, $\tilde{\beta} < \beta + \delta$, implying that the coefficient on skills in the short regression understates the impact of a mean-shift in group skills on group earnings due to social multipliers. Two approaches can recover γ_b and $\beta + \delta$. First, I can run a version of the short regression on data aggregated to the level of market and race: $\bar{y}_{jr} = \check{\alpha} + \check{\gamma}_b + \check{\beta} \bar{x}_{jr} + \check{e}_{jr}$, which yields $\check{\gamma} = \gamma$ and $\check{\beta} = \beta + \gamma$. This approach does not require microdata, and therefore allows me to use the full, unmatched versions of the test score and earnings data. Second, I can include $\bar{x}_{jr,-i}$ in the regression on matched microdata to approximate the true relation.

I am unable to rigorously test for social multiplier effects due to a lack of exogenous variation in group skills, implying potential violations of the maintained assumption $e_{ijr} \perp j, r$. However, I can assess whether non-experimental correlations are consistent with an important role for social multipliers. I first divide the U.S. into "labor markets" defined by state and four broad education categories: no high school, some high school, high school degree, and any college. I then aggregate earnings by markets and race for men age 23-38 in the 1940 100% census, and WWII enlistment test z-scores based on the national score distribution for men ages 23-38. Figure XIV plots earnings gaps

[51] This mechanism differs from the "ethnic capital" concept in Borjas (1992, 1995); Leon (2005). Borjas suggests that a person's own human capital may depend on the human or financial capital of her ethnic community during childhood. I am suggesting that the compensation a person receives for her previously-accumulated human capital may depend on the human capital of her contemporary peers in the labor market.

against test score gaps across all labor markets along with the estimated regression line. Strikingly, the implied relationship predicts small black-white earnings gaps in hypothetical markets without black-white skill gaps, although this prediction is far out of sample. To my knowledge, even this cross-sectional correlation has not been documented previously due to data limitations.[52]

Table XII presents fixed effects regressions of log earnings on a black dummy variable and AGCT scores in a variety of specifications. In Columns (1)-(3), I estimate a simplified version of the regression in Table IX in the matched microdata. Column (1) documents a slightly larger black-white earnings gap without age controls. Column (2) controls for market fixed effects (state × broad education group), and shows that black-white earnings gaps fall slightly. Column (3) once again shows that in this simplified specification, AGCT scores account for a slightly smaller share of black-white earnings gaps: about 25% rather than the 40% reported above. Column (4) adds mean peer test scores to the specification. Consistent with intra-group spilloverse and social multipliers, the black dummy declines dramatically, and the coefficient on peer scores is large conditional on own scores. Columns (5)-(7) replicate columns (1)-(3) on data aggregated to the level of race and market. Again consistent with an important role for intra-group spillovers, the coefficient on AGCT score nearly triples in the aggregate specification, and now accounts for over 60% of black-white earnings gaps. However, these specifications are limited by the smaller size and potentially less representative nature of the matched subsample, which only contains a subset of all potential markets due to missing data. Therefore, in columns (8)-(10) I once again estimate specifications from columns (1)-(3), but now on the full samples of test score and earnings data without restricting to the matched sample. These columns strengthen the findings from the matched sample: the coefficient on group-level AGCT in column (10) is now well over three times its microdata analogue in column (3) and eliminates nearly 80% of the black-white earnings gap.[53]

[52] The NLSY is too small to estimate black-white test score gaps by state. NAEP data are large enough to estimate black-white test scores by state, but does not contain final educational attainment. Project Talent data contain educational attainment at ages 23 and 29 but only for subsets that responded to voluntary followup surveys.

[53] Taken literally, these results raise a puzzle in that they predict small racial earnings gaps around .2 log points in 1940 in hypothetical markets with zero racial test score gaps, in sharp contrast with the observed pattern for Asians in CA in 1940 who exhibit virtually no test score gaps and large earnings gaps of .4-.5 log points. However, this "prediction" requires extrapolating far out of sample in 1940, as blacks score at least .6 standard deviations below whites and earn at least 0.2 log points less than whites in virtually all labor markets included in the regression. Moreover, CA is just one state, and it may deviate from the regression line for many reasons. The key lesson from this exercise is that market-level group test score aggregates can account for a much larger share of black-white earnings gaps than individual test scores, which is consistent with social multipliers, as emphasized in the text.

Of course, the patterns documented in this section are descriptive and could be driven by unobserved variables rather than intra-group human capital spillovers. The findings could also be driven by measurement error in individual human capital, whereby market-level mean test scores simply proxy for individual skills (Borjas, 1992, 1995); this would be consistent with some recent work finding that individual skills can explain a much larger share of black-white conditional wage gaps in the South in 1940 than previously thought (Carruthers and Wanamaker, 2016). Unfortunately, my data do not allow me to distinguish these theories from human capital spillovers.

10 Other Explanations for Asian Economic Divergence

So far I have emphasized a key role for Asians' high initial human capital endowments, and the instability of prejudiced-based labor market discrimination relative to skill-based labor market discrimination, in explaining Asian economic ascendance in CA. The implication, if true, is that increasing human capital of other groups such as blacks, Hispanics and Native Americans could also close their earnings gap, even in the presence of continuing racial prejudice. However, I have only examined non-experimental variation in skills across racial groups, implying other factors correlated with skills could potentially explain Asians' high dynastic earnings growth. Other candidate explanations might involve differences in endowments of non-human capital, constraints, or preferences. In Section 3 I document that white prejudice and legal discrimination in labor, education and housing markets in CA were, if anything, harsher toward Asians than blacks in CA in many respects due to Asians' status as both non-whites and "aliens ineligible for citizenship." In Section, 7 I argue that factors increasing the propensity to invest in children's human capital, such as "ethnic capital" (Borjas, 1992), have played a significant but secondary role compared to factors affecting how Asians received compensation for their high initial stocks of human capital. English fluency is also unlikely to play any significant role given my focus on CA-born Asians, the vast majority of whom attended integrated schools with many other US-born children of other races starting early in childhood (Wollenberg, 1978). Here I discuss several other potential explanations for Asian economic success. I argue these other factors are less attractive both empirically and theoretically.

Table XIII displays many additional outcomes for black and Asian parents ages 25-55 with CA-born co-residing children in every year 1900 to 2000.[54] Some factors are roughly

[54] This sample becomes less comparable across races in more recent decades as rates of single parenthood have risen (e.g., Akerlof et al., 1996), implying greater exclusion of lower-SES fathers from my sample

similar for blacks and Asians in most years, including marital status and fertility, casting doubt on any central role for quantity-quality tradeoffs in children (e.g., Becker and Tomes, 1976; Chiswick, 1988). Asians have slightly greater labor supply, total family income in 1950, and likelihood of collecting non-labor income in 1940. However, these differences in non-human capital do not appear large enough to explain Asians' subsequent divergence. The largest differences are that Asian parents have been more likely to live outside cities, self-employ, and rent rather than buy their own homes. Therefore it is possible that something about rural, renting, self-employed lifestyles chosen by Asians in the early-mid 20th century set their children on a path to greater income growth, and that these adult economic choices were not simply manifestations of Asians' large cognitive skill advantage over blacks. For example, Asians could have made different choices due to different preferences, rather than different skill endowments, and it may be that these preferences themselves or the choices they enabled gave their children economic advantages.

This explanation is less attractive than the explanation based on human capital endowments. First, living outside cities in rented homes has not previously been considered a major advantage for children. Second, Bates (1997) provides evidence suggesting that self-employment among immigrants often reflects an absence of more-preferred labor market opportunities, rather than a preference for entrepreneurship or a desire to expose children to distinct skills associated with running one's own business. Recall that for much of the 19th and 20th centuries, Asians in CA were barred from nearly all government and corporate jobs, unionized workplaces, professional societies, and many other employers in CA, and only allowed to enter the lucrative US labor market legally as "merchants" or certain other skilled workers under the Exclusion Laws. In light of these circumstances, it would be surprising if high rates of Asian self-employment simply reflected unusual group preferences. Moreover, Asian self-employment rates fell dramatically as their labor market opportunities expanded, and no longer exceeded those of whites by 1980, again suggesting this was not a deep cultural preference but rather a response to constraints.

11 Robustness

Throughout the analysis I have excluded households with zero and missing total earnings (head + spouse) from the analysis. Many of these zeros represent self-employed families

in groups with higher rates of single parenthood. Unfortunately, the census only asks women about fertility, and therefore co-residence remains the only method for restricting the sample to parents.

with positive labor supply and business income, and many others likely represent measurement error or transitory earnings shocks. An alternative approach is therefore to impute positive household earnings for these households and include them in the analysis. I implement this by calculating average household earnings among all individuals with non-zero earnings in cells defined by year, race, age, sex, education, marital status, and state or country of birth. I assign cell means to individuals with zero and missing earnings based on this set of characteristics, roughly following Autor et al. (1998). In households with two earners I take the maximum of these two predictions. For households with zero earnings I follow Neal (2006) and adjust for selection by multiplying imputed household earnings by 0.6. While this method is somewhat *ad hoc*, it provides a rough check on whether households with zero and missing earnings are likely to be driving the main results. Using this new income variable I re-estimate the main results from pseudo-panels in Section 6 and counterfactual black-white earnings gaps in Section 7. Appendix Figures (A.5)-(A.6) document that the main results are virtually unchanged.

Focusing on household earnings may confound group variation in earnings with group variation in rates of single parenthood. To examine this I re-estimate group dynastic growth rates as in Section 6 using fathers' and sons' individual earnings rather than total household earnings. Appendix Figure A.7 documents that the results are virtually unchanged.

Duncan and Trejo (2016) document that 20% of second-generation Asian Americans in the 2000s report their race to census enumerators as "white," and that these Asians tend to have lower schooling than other Asians. However, I find that Asians exhibit unusually high dynastic growth rates in pseudo-panels for every cohort born in the CA after 1920, and that Asians experienced rapid declines in conditional earnings gaps by the late 1960s. While I cannot rule out a role for endogenous ethnic identification in these results, it seems likely that a much lower share of Asians would have identified themselves as white to census enumerators in these earlier decades. Note that intermarriage of Asians with whites increased dramatically in decades after 1970, suggesting widespread cultural assimilation occurred over the decades after the main results documented in this paper.

12 Conclusion

In this paper I address four main questions. By focusing on the CA-born, I obtain more meaningful comparisons between Asians, blacks and whites that control for broad institutional environment and selection of parents or grandparents into voluntary, long-distance migration in pursuit of economic gain.

Question 1: Does high Asian income reflect high dynastic income growth, or compositional effects of new immigration? I exploit pseudo-panels linking parental income to future income of their CA-born children to distinguish dynastic group income growth from compositional effects of new high-skilled migration. I find that Asian dynasties exhibit rapid intergenerational growth consistent with higher steady-state group income than both whites and blacks for every cohort born in CA since 1920. Asian dynasties since 1940 do possess some growth advantage over both white and black dynasties born in CA.

Question 2: Why did Asian dynastic income grow more rapidly than other groups? To explore potential mechanisms underlying Asians' high dynastic income growth, I estimate a simple intergenerational decomposition of group earnings into parental income distributions, final educational attainment conditional on parental income, and children's earnings conditional on education. I quantify the importance of these three components by permuting them across groups to construct counterfactual black-white earnings gaps in the next generation and in dynastic steady state. Contrary to public perception, Asian dynastic income has grown faster primarily due to large increases in earnings *conditional* on education, with a significant but secondary role for higher educational attainment conditional on parental income, and no significant role for higher parental income. The key feature of post-1940 Asian success is that Asians, unlike blacks, fully and rapidly eliminated their large conditional earnings gaps.

Question 3: Why were CA-born Asians but not blacks able to close their conditional earnings gap? Using a large sample of WWII enlistee test scores from 1943 both separately and matched to the 1940 census, I document that these test scores can account for a large share of conditional earnings gaps in 1940 for CA-born blacks but not Asians. This result suggests that Asians earnings gaps in 1940 stemmed primarily from contemporaneous taste-based discrimination or misperceptions, in sharp contrast with the black earnings gap which reflected discrimination based on skill gaps inherited from centuries of slavery and educational exclusion on top of labor market prejudice. The rapid divergence of conditional earnings between CA-born Asians and blacks after 1940—once institutional and monolithic forms of discrimination had subsided—provides novel empirical evidence in support of the hypothesis of Becker (1957); Arrow (1972) and others that competitive labor markets tend to eliminate large earnings gaps based purely on taste-based but not productivity-based discrimination.

Question 4: Why might taste-based discrimination reduce earnings more persistently for some groups than others? Finally, I discuss several reasons why taste-based discrimination may persistently amplify skill-based group earnings gaps, and

point out that these theories tend to involve intra-group spillovers and hence predict larger impacts of market-level aggregate skills than individual skills on earnings. I test and confirm this prediction on test score and earnings data in microdata in the matched sample, and on market-level aggregate data. Controlling for market-level aggregate black skills, rather than individual skills as in the standard empirical models of discrimination (Neal and Johnson, 1996; Johnson and Neal, 1998), results in much larger predicted impacts of skills and much smaller residual black-white earnings gaps in 1940.

Overall, the results in this paper convey optimism that reducing skill deficits of racial minorities would reduce racial earnings deficits in modern labor markets, even if significant prejudice against minorities persists. The results also suggest that a combination of institutions and attitudes did prove strong enough to prevent even a highly skilled racial minority—Asian Americans—from achieving high earnings well into the mid-20th Century. On the other hand, the results have no clear implication for debates over the value of additional policies aimed at reducing labor market racial discrimination.

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	Percentile of White Prejudice (1 = Most Prejudice)							
Study	Black	Chinese	Japanese	Number Groups	Year	N	Sample	Method
Bogardus (1959)	0.87	0.93	0.77	30	1926	1,725	US college/adult students	Social Distance
Bogardus (1959)	0.97	0.70	1.00	30	1946	1,950	US college/adult students	Social Distance
Bogardus (1959)	0.90	0.83	0.87	30	1956	2,053	US college/adult students	Social Distance
Young (1927)	0.96	0.92	0.58	24	1927	221	U. Pennsylvania	Innate Ability
Young (1927)	1.00	0.83	0.67	24	1927	231	U. Pennsylvania	Innate Ability
Guilford (1931)	0.80	0.93	0.73	15	1931	198	U. Florida	Pairwise Comparisons
Guilford (1931)	0.87	0.93	0.80	15	1931	211	U. Kansas	Pairwise Comparisons
Guilford (1931)	0.73	0.93	0.60	15	1931	110	U. Nebraska	Pairwise Comparisons
Guilford (1931)	0.87	0.80	0.67	15	1931	100	New York U.	Pairwise Comparisons
Guilford (1931)	0.87	0.93	0.67	15	1931	208	Northwestern U.	Pairwise Comparisons
Guilford (1931)	0.73	0.87	0.80	15	1931	207	U. Washington	Pairwise Comparisons
Guilford (1931)	0.93	0.87	0.67	15	1931	62	Wells College	Pairwise Comparisons
Katz and Braly (1935)	0.87	0.93	0.67	15	1935	100	Princeton U.	Pairwise Comparisons
Chant & Freedman (1934)	1.00	0.86	0.77	22	1934	200	U. Toronto	Pairwise Comparisons
Thurstone (1928)	1.00	0.86	0.76	21	1928	239	U. Chicago	Pairwise Comparisons
Bogardus (1926)	0.75	0.83	0.92	12	1928	110	"Along West Coast"	Social Distance
Katz and Allport (1931)	1.00	0.77	0.77	31	1931	3,515	Syracuse U.	Social Distance[a]
Hartley (1946)	0.72	0.88	1.00	32	1938-39	132	Princeton U.	Social Distance[b]
Hartley (1946)	0.69	0.81	0.94	32	1938-39	86	Teachers College	Social Distance[b]
Hartley (1946)	0.38	0.94	1.00	32	1938-39	96	Normal School	Social Distance[b]
Hartley (1946)	0.81	0.94	1.00	32	1938-39	130	C.C.N.Y - Business	Social Distance[b]
Hartley (1946)	0.56	0.75	1.00	32	1938-39	144	Columbia U.	Social Distance[b]
Hartley (1946)	0.84	0.94	1.00	32	1938-39	39	Bennington College	Social Distance[b]
Hartley (1946)	0.03	0.81	0.94	32	1938-39	132	Howard U.	Social Distance[b]
Hartley (1946)	0.81	0.88	1.00	32	1938-39	35	C.C.N.Y - Arts	Social Distance[b]
Average[c]	0.83	0.87	0.83					
Weighted Average[c]	0.92	0.82	0.83					

Table I: Racial Prejudice Against Blacks and Asians, 1926-56

Notes: Table presents ranking of blacks, Chinese and Japanese in various published studies exploiting survey data on racial attitudes to construct measures of prejudice against groups. Ranking of 0 indicates minimum prejudice, and ranking of 1 indicates maximum prejudice. Where not otherwise noted, subjects in surveys are predominantly white Americans.

[a] Katz and Allport (1931) only include an abridged social distance survey reflecting willingness to accept various nationalities/ethnicities into one's fraternity/sorority at a college.

[b] Rankings for Hartley (1946) exclude fictional placebo nationalities (e.g. "Wallonian"), and groups that are not nationalities (e.g., "Nazis").

[c] Averages exclude New York University because sample is disproportionately Jewish American, and Howard University because sample is disproportionately Black.

	Racial Composition of School				School Inputs		Sample Size	
	% White	% Black	% Hispanic	% Asian	Class Size	Spending per Pupil	N Students	N Schools
Average White Student	88%	1%	8%	2%	27.7	$2,125	256,317	365
Average Black Student	29%	45%	22%	4%	27.1	$2,133	11,485	365
Average Hispanic Student	42%	5%	49%	4%	27.9	$2,014	48,658	365
Average Asian Student	62%	5%	19%	14%	27.8	$2,077	9,888	365

Table II: Average School Characteristics by Race in Los Angeles, 1938

Notes: Data on racial composition of schools obtained from 1938 survey described in text. Data on school inputs in 1938 obtained from Board of Education of the City of Los Angeles (1938). Spending per pupil converted into 2016 dollars using the Consumer Price Index - Urban.

	White		Black	
Year	Top Occupation	Share	Top Occupation	Share
1860	Farmers (owners and tenants)	0.395	Laborers (nec)	0.273
1870	Farmers (owners and tenants)	0.368	Farm laborers, wage workers	0.455
1880	Farmers (owners and tenants)	0.362	Farmers (owners and tenants)	0.335
1900	Farmers (owners and tenants)	0.270	Farmers (owners and tenants)	0.375
1910	Farmers (owners and tenants)	0.230	Farmers (owners and tenants)	0.357
1920	Farmers (owners and tenants)	0.205	Farmers (owners and tenants)	0.326
1930	Farmers (owners and tenants)	0.158	Laborers (nec)	0.257
1940	Laborers (nec)	0.118	Laborers (nec)	0.333
1950	Operative and kindred workers (nec)	0.100	Laborers (nec)	0.223
1960	Operative and kindred workers (nec)	0.108	Laborers (nec)	0.204
1970	Operative and kindred workers (nec)	0.095	Operative and kindred workers (nec)	0.155
1980	Managers, officials, and proprietors (nec)	0.126	Operative and kindred workers (nec)	0.139
1990	Managers, officials, and proprietors (nec)	0.149	Operative and kindred workers (nec)	0.108
2000	Managers, officials, and proprietors (nec)	0.172	Operative and kindred workers (nec)	0.096
	Asian		Native American	
Year	Top Occupation	Share	Top Occupation	Share
1860	Mine operatives and laborers	0.753	Other non-occupation	0.578
1870	Mine operatives and laborers	0.457	Farmers (owners and tenants)	0.322
1880	Mine operatives and laborers	0.294	Laborers (nec)	0.289
1900	Laborers (nec)	0.221	Farmers (owners and tenants)	0.263
1910	Laborers (nec)	0.212	Farmers (owners and tenants)	0.373
1920	Farm laborers, wage workers	0.154	Farmers (owners and tenants)	0.388
1930	Farm laborers, wage workers	0.197	Farmers (owners and tenants)	0.358
1940	Farm laborers, wage workers	0.249	Laborers (nec)	0.323
1950	Farm laborers, wage workers	0.175	Laborers (nec)	0.179
1960	Cooks, except private household	0.085	Laborers (nec)	0.195
1970	Cooks, except private household	0.075	Laborers (nec)	0.115
1980	Managers, officials, and proprietors (nec)	0.105	Operative and kindred workers (nec)	0.085
1990	Managers, officials, and proprietors (nec)	0.127	Laborers (nec)	0.081
2000	Managers, officials, and proprietors (nec)	0.147	Managers, officials, and proprietors (nec)	0.107

Table III: Top Occupation by Race, 1860-2000

Notes: Occupation shares calculated for men age 25-65, excluding residents of Alaska and Hawaii. Each race reweighted to match age distribution of whites in each year.

	U.S. Residents					
	AGCT Sample		Census Sample		AGCT-Census Match	
Variable	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
AGCT	97.681	22.707			99.058	22.228
Age	23.144	5.915	27.498	6.031	23.064	5.355
White	0.907	0.291	0.898	0.302	0.937	0.243
Black	0.068	0.251	0.096	0.294	0.062	0.241
Chinese	0.002	0.042	0.001	0.028	0.000	0.011
Japanese	0.000		0.001	0.033	0.000	
Less Than HS	0.254	0.435	0.436	0.496	0.243	0.429
Some HS	0.333	0.471	0.226	0.418	0.328	0.470
HS Graduate	0.308	0.462	0.217	0.412	0.318	0.466
Any College	0.106	0.308	0.121	0.326	0.111	0.314
N	525,792		19,975,888		211,103	

	California Residents					
	AGCT Sample		Census Sample		AGCT-Census Match	
Variable	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
AGCT	100.561	21.503			103.293	20.678
Age	24.142	6.988	28.011	5.966	24.547	5.960
White	0.896	0.305	0.943	0.232	0.957	0.204
Black	0.040	0.195	0.018	0.131	0.041	0.199
Chinese	0.009	0.095	0.007	0.086	0.001	0.031
Japanese	0.000		0.014	0.119	0.000	
Less Than HS	0.176	0.381	0.257	0.437	0.168	0.374
Some HS	0.324	0.468	0.245	0.430	0.318	0.466
HS Graduate	0.328	0.470	0.304	0.460	0.329	0.470
Any College	0.172	0.377	0.193	0.395	0.185	0.389
N	34,604		1,186,305		8,509	

Table IV: Summary Statistics

Notes: Table presents summary statistics for three samples for all U.S. residents and CA residents. All samples restrict to men. "AGCT Sample" is the sample of WWII enlistment records from 1943. "Census Sample" is 100% IPUMS census microdata for 1940. "AGCT-Census Match" is a match of these two prior datasets on first name, last name, state of birth, race and year of birth plus or minus one year.

	θ = Education Mobility Intercept			γ = Education Mobility Slope			α = Earnings Intercept			β = Earnings Slope		
	White	Black	Asian	White	Black	Asian	White	Black	Asian	White	Black	Asian
Year	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1940	10.653	10.263	10.901	0.691	1.015	0.732	9.059	8.397	8.824	0.066	0.077	0.048
	(0.321)	(0.445)	(0.312)	(0.186)	(0.272)	(0.186)	(0.038)	(0.03)	(0.028)	(0.004)	(0.003)	(0.003)
1960	11.856	11.435	13.352	0.386	0.004	0.286	9.898	9.481	9.938	0.061	0.068	0.034
	(0.243)	(0.71)	(0.4)	(0.138)	(0.577)	(0.203)	(0.028)	(0.115)	(0.148)	(0.004)	(0.015)	(0.019)
1970	12.116	11.701	14.428	0.434	0.436	-0.167	10.272	9.756	9.787	0.050	0.064	0.104
	(0.343)	(0.137)	(1.043)	(0.209)	(0.081)	(0.65)	(0.05)	(0.124)	(0.315)	(0.008)	(0.019)	(0.048)
1980	12.344	12.379	14.542	0.427	0.350	-0.006	10.187	9.644	10.219	0.058	0.133	0.067
	(0.238)	(0.257)	(0.525)	(0.146)	(0.171)	(0.373)	(0.044)	(0.057)	(0.052)	(0.011)	(0.014)	(0.012)
1990	12.367	12.356	14.119	0.328	0.313	-0.129	10.210	9.711	10.291	0.130	0.209	0.131
	(0.22)	(0.273)	(0.473)	(0.126)	(0.165)	(0.249)	(0.051)	(0.081)	(0.056)	(0.014)	(0.023)	(0.016)
2000	12.174	12.182	13.853	0.554	0.462	0.101	10.195	9.617	10.157	0.152	0.245	0.187
	(0.174)	(0.121)	(0.4)	(0.109)	(0.07)	(0.241)	(0.089)	(0.155)	(0.135)	(0.025)	(0.044)	(0.038)

Table V: Linear Decomposition Estimates, Born in CA

Notes: "Education Mobility" intercepts and slopes estimated from linear regressions of children's highest grade attained by ages 22-29 on parental log income, using data grouped at the year by race by parental log income decile level. No adjustment is made for independent children. "Earnings" intercepts and slopes estimated from linear regressions of log household earnings for heads age 25-65 on highest grade of schooling attained in cells defined by year, race, and highest grade attained. Restricts to children born in CA. Probability weights are used to construct cell means, but no weights are used in the regressions. All races reweighted to age and sex distribution of CA-born blacks in each year. Earnings deflated to 2011 dollars using CPI-Urban before taking logs. "Earnings" regressions drop bottom 2% of education distribution by race and year. Intercepts reflect estimated values at minimum observed value of independent variable in collapsed, restricted sample, as opposed to estimated values at zero.

	Next Gen - Actual			w/ Asian Education		w/ Asian Earnings		w/ Asian Parental Income	
	White	Black	Asian	White	Black	White	Black	White	Black
Year	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1940	9.78	9.21	9.35	9.80	9.23	9.35	9.33	9.76	9.22
1960	10.42	9.98	10.27	10.50	10.13	10.23	10.19	10.42	9.98
1970	10.61	10.16	10.64	10.67	10.28	10.50	10.44	10.61	10.17
1980	10.37	10.02	10.52	10.45	10.25	10.42	10.41	10.36	10.03
1990	10.47	10.08	10.66	10.59	10.32	10.55	10.53	10.48	10.14
2000	10.52	10.06	10.72	10.66	10.35	10.55	10.50	10.52	10.11

Table VI: Implications of Intergenerational Decomposition for Next Generation, Born in CA

Notes: Presents estimated log household earnings in steady state using parameter estimates in Table (V) and equation (2). "Asian Education" assigns blacks the estimated intercept and slope of Asians' conditional expectation of children's education with respect to parental income. "Asian Earnings" assigns blacks the estimated intercept and slope of Asians' conditional expectation of children's earnings with respect to their education. "Asian Parental Income" refers to Asian mean parental income. Estimates based on sample restricted to children born in CA.

	Steady State - Actual			w/ Asian Education		w/ Asian Earnings	
	White	Black	Asian	White	Black	White	Black
Year	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1940	9.78	9.22	9.35	9.80	9.24	9.34	9.34
1960	10.42	9.98	10.28	10.50	10.13	10.23	10.19
1970	10.61	10.16	10.64	10.68	10.28	10.50	10.45
1980	10.36	10.01	10.52	10.45	10.25	10.42	10.41
1990	10.46	10.07	10.67	10.59	10.32	10.54	10.53
2000	10.49	10.03	10.72	10.65	10.35	10.52	10.51

Table VII: Implications of Intergenerational Decomposition in Steady State, Born in CA

Notes: Presents estimated log household earnings in steady state using parameter estimates in Table (V) and equation (3). "Asian Education" assigns blacks the estimated intercept and slope of Asians' conditional expectation of children's education with respect to parental income. "Asian Earnings" assigns blacks the estimated intercept and slope of Asians' conditional expectation of children's earnings with respect to their education. Estimates based on sample restricted to children born in CA.

Education Level	White	Black	Asian
No High School	81.6	67.7	79.5
	(0.256)	(0.798)	(1.61)
	[4,942]	[353]	[88]
Some High School	96.4	80.3	91.8
	(0.191)	(0.713)	(1.73)
	[9,956]	[570]	[92]
High School Graduate	109	90.8	104
	(0.158)	(0.941)	(2.55)
	[10,576]	[322]	[86]
Any College	117	97.2	116
	(0.216)	(1.8)	(2.5)
	[5,540]	[126]	[48]

Table VIII: Mean WWII Enlistee Test Scores by Race and Schooling in 1943, CA

Notes: Table presents raw means of WWII enlistment test scores by race and broad education category, restricting to enlistees reporting CA residence. Standard errors of means in parantheses, sample sizes in brackets.

Variables	(1) Pooled	(2) Pooled	(3) Pooled	(4) White	(5) White	(6) Black	(7) Black
Black	-0.633**	-0.392**	-0.360**				
	(0.0382)	(0.0281)	(0.0291)				
Age	0.0736**	0.0742**	0.0755**	0.0750**	0.0763**	0.0600**	0.0616**
	(0.00195)	(0.00177)	(0.00200)	(0.00163)	(0.00186)	(0.00498)	(0.00503)
AGCT		0.173**	0.0926**	0.175**	0.0938**	0.133**	0.0658**
		(0.00621)	(0.00695)	(0.00621)	(0.00747)	(0.0177)	(0.0228)
Education			0.0516**		0.0523**		0.0428**
			(0.00429)		(0.00499)		(0.00529)
Constant	6.962**	6.905**	6.357**	6.880**	6.324**	6.882**	6.438**
	(0.0365)	(0.0363)	(0.0423)	(0.0328)	(0.0469)	(0.154)	(0.148)
Observations	43,183	43,183	42,656	40,783	40,275	2,400	2,381
R-squared	0.166	0.202	0.228	0.181	0.208	0.110	0.137

Robust standard errors in parentheses
** p<0.01, * p<0.05

Table IX: Log Earnings Regressions on AGCT Scores in 1940

Notes: Dependent variable is log of annual earnings in all regressions. Sample matches AGCT data from 1943 WWII enlistment records to earnings data from 1940 census 100% sample. Restricts to men over age 22 in 1940; almost all men in sample between ages 22 and 35. Standard errors clustered at the state level.

	Average Years of Education											
	Chinese			Japanese			Black			White		
Year	In China	In U.S.	% Diff	In Japan	In U.S.	% Diff	In U.S.	In CA	% Diff	In U.S.	In CA	% Diff
1940	1.1	6.6	513%	5.7	8.7	53%	5.9	8.3	40%	9.1	10.2	12%
1950	1.5	7.0	378%	6.9	8.5	24%	6.7	8.5	27%	9.9	10.7	9%
1960	1.8	9.5	440%	8.4	9.7	15%	7.7	9.4	22%	10.3	11.0	7%
1970	3.1	11.4	273%	9.4	11.4	22%	9.0	10.5	17%	11.1	11.8	6%
1980	5.0	12.4	149%	10.1	12.6	26%	10.4	11.6	11%	12.0	12.6	6%
1990	6.5	13.1	100%	10.6	13.5	28%	11.6	12.4	7%	12.6	13.3	5%
2000	8.3	13.7	66%	10.5	14.1	34%	12.3	12.8	5%	13.1	13.7	5%

Table X: Educational Selection into Migration by Nationality/Race, 1940-2000

Notes: Numbers in table represent years of schooling rather than highest grade attained for both Chinese in China and Japanese in Japan. Education of Chinese in China taken from Table 3 of Gao (2016). Education of Japanese in Japan taken from Table A.7.1 of Leeuwen (2007). Education of all groups in U.S. reflect highest grade attained. Chinese and Japanese "In U.S." restrict to foreign-born to identify migrants who likely received education in country of origin. Blacks and whites "In CA" exclude residents of CA, while blacks and whites "In CA" include residents of CA who were born outside of CA in order to identify "migrants" to CA.

	OCCSCORE - Men in CA			OCCSCORE - Men in CA with Kids			Percent Difference			Percent of Men in CA with Kids		
Year	White	Black	Asian	White	Black	Asian	White	Black	Asian	White	Black	Asian
1900	20.4	15.7	12.7	21.6	16.1	25.8	5.9%	2.4%	103.5%	46.8%	39.2%	1.6%
1910	21.1	15.4	10.8	22.8	17.9	13.2	8.0%	16.7%	22.2%	41.9%	24.6%	5.1%
1920	21.8	14.9	12.2	23.0	15.0	14.4	5.6%	1.2%	18.3%	44.8%	30.6%	22.6%
1930	22.8	15.8	11.2	23.8	16.7	16.0	4.5%	5.6%	43.4%	47.7%	30.4%	29.0%
1940	22.9	15.2	10.7	23.5	16.4	17.7	2.7%	8.3%	64.9%	49.4%	26.4%	25.8%
1950	24.5	18.0	13.8	25.2	18.9	18.4	3.0%	5.2%	33.0%	55.6%	34.9%	34.4%
1960	25.5	19.1	20.0	26.4	20.0	22.1	3.2%	4.9%	10.5%	64.0%	47.4%	52.3%
1970	25.9	21.0	24.2	26.5	21.5	25.3	2.3%	2.5%	4.8%	63.3%	53.0%	53.3%
1980	26.4	23.0	26.2	26.9	23.5	27.3	1.8%	2.5%	4.3%	52.4%	48.1%	42.0%
1990	27.0	23.1	27.0	27.8	24.2	28.0	2.7%	4.9%	4.0%	46.0%	40.5%	40.8%
2000	28.1	24.5	28.8	29.0	25.8	29.7	3.3%	5.6%	3.3%	44.6%	36.9%	42.1%

Table XI: Occupational Selection into Fatherhood by Race, 1900-2000

Notes: Presents OCCSCORE for men living in CA, and men living in CA co-residing with their own children. "Percent Difference" indicates the percent difference in average OCCSCORE between these two groups of men within race and year. "Percent of Men in CA with Kids" indicates the share of men living in CA who are co-residing with own children.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
					Ln(Earnings)					
Black	-0.590**	-0.524**	-0.399**	-0.204*	-0.590**	-0.524**	-0.201	-0.686**	-0.487**	-0.105
	(0.0443)	(0.0300)	(0.0249)	(0.0915)	(0.0444)	(0.0436)	(0.133)	(0.0581)	(0.0281)	(0.109)
AGCT			0.137**	0.136**			0.359*			0.444**
			(0.0123)	(0.0125)			(0.133)			(0.115)
AGCT_Market				0.218*						
				(0.0904)						
Constant	9.153**	9.327**	9.427**	9.572**	9.153**	9.327**	9.566**	9.461**	9.380**	9.602**
	(0.0462)	(0.00931)	(0.0146)	(0.0598)	(0.0463)	(0.0135)	(0.0871)	(0.0475)	(0.000929)	(0.0572)
Observations	35,311	35,311	35,311	35,311	209	209	209	354	354	354
R-squared	0.022	0.064	0.078	0.078	0.329	0.951	0.956	0.284	0.986	0.990
Market FE	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Data Level	Micro	Micro	Micro	Micro	Market	Market	Market	Market	Market	Market
Dataset	Matched	Matched	Matched	Matched	Matched	Matched	Matched	Separate	Separate	Separate

Robust standard errors in parentheses
** p<0.01, * p<0.05

Table XII: Earnings Regressions on AGCT Scores for State-Education Aggregates in 1940

Notes: Dependent variable is log of annual earnings in all regressions. "Market FE" indicates whether market fixed effects are included in the regression, where "market" is defined by state of residence and broad educational category (no high school, some high school, high school graduate, any college). "Data Level" indicates whether regression is run on individual microdata or data that has been collapsed to the level of market × race. "Dataset" indicates whether earnings and AGCT scores taken from subsample of WWII enlistment records matched to 1940 100% census microdata, or whether earnings and AGCT scores taken from complete unmatched datasets separately. All regressions restricts to men over age 22 in 1940; almost all men in sample between ages 22 and 35. Standard errors clustered at the state level.

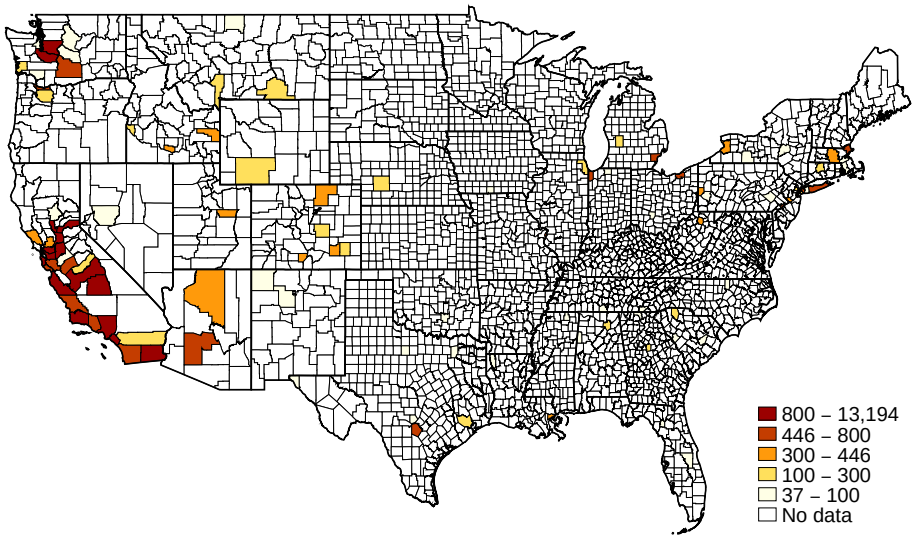
	Married			Num Kids Ever Born to Females			Urban		
Year	White	Black	Asian	White	Black	Asian	White	Black	Asian
1900	86.8%	92.9%	91.3%	4.9	6.7	2.4	54.7%	69.2%	78.5%
1910	87.5%	91.0%	97.1%	4.4	3.9	5.8	63.5%	73.5%	58.8%
1920	88.8%	85.0%	95.9%	.	.	.	65.7%	90.5%	68.7%
1930	91.3%	88.4%	94.2%	.	.	.	69.9%	89.1%	61.3%
1940	90.2%	86.6%	87.7%	3.8	5.5	5.3	68.1%	86.5%	67.7%
1950	93.9%	91.4%	85.8%	2.6	4.2	3.3	.	.	.
1960	94.5%	85.6%	91.2%	2.8	3.8	3.3	.	.	.
1970	91.5%	77.5%	93.0%	3.3	4.3	3.2	.	.	.
1980	86.0%	67.0%	91.2%	3.5	4.2	3.0	.	.	.
1990	81.6%	59.2%	88.5%	2.7	3.1	2.7	87.5%	97.8%	97.7%
2000	81.8%	59.8%	87.5%	.	.	.	.	.	.

	Owning Home			Self-Employed			Weeks Worked in Prior Year		
Year	White	Black	Asian	White	Black	Asian	White	Black	Asian
1900	0.476	0.392	0	.	.	.	.	.	.
1910	0.543	0.639	0.146	0.367	0.296	0.501	.	.	.
1920	0.503	0.401	0.119	.	.	.	.	.	.
1930	0.529	0.474	0.145	0.205	0.144	0.307	.	.	.
1940	0.507	0.381	0.219	0.174	0.103	0.331	40.733	38.951	43.663
1950	.	.	.	0.156	0.035	0.333	40.249	38.107	43.621
1960	0.733	0.492	0.651	0.1	0.041	0.211	41.028	39.183	43.21
1970	0.72	0.536	0.726	0.089	0.04	0.14	42.164	42.66	43.755
1980	0.747	0.57	0.779	0.109	0.033	0.111	43.088	43.429	44.683
1990	0.705	0.463	0.707	0.127	0.045	0.123	44.516	44.069	45.494
2000	0.705	0.457	0.704	0.125	0.053	0.121	45.516	44.665	45.934

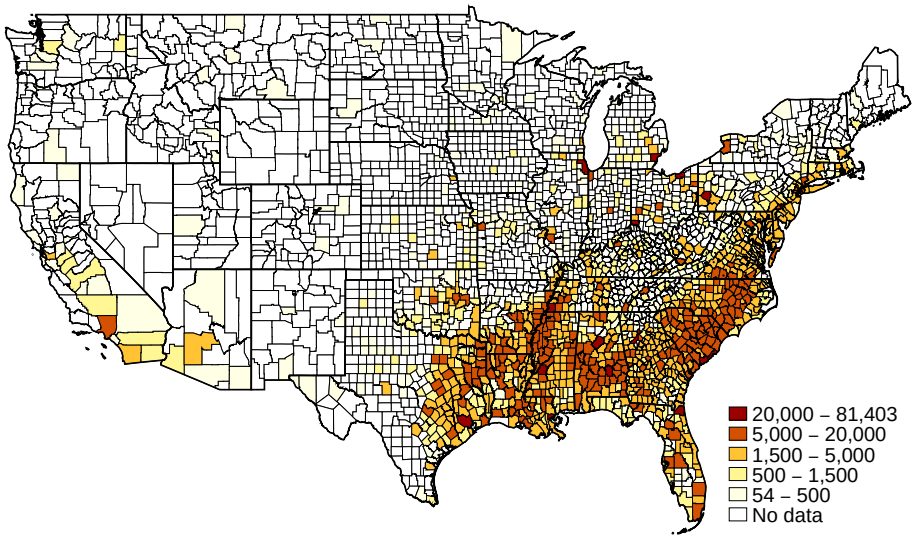
	Hours Worked per Week			Total Family Income			Non-Labor Income > $50		
Year	White	Black	Asian	White	Black	Asian	White	Black	Asian
1900	.	.	.	.	.	.	.	.	.
1910	.	.	.	.	.	.	.	.	.
1920	.	.	.	.	.	.	.	.	.
1930	.	.	.	.	.	.	.	.	.
1940	41.0	39.4	45.1	.	.	.	22.0%	24.7%	28.8%
1950	40.4	38.0	45.3	$29,593	$19,352	$21,003	.	.	.
1960	38.7	37.3	39.9	$47,683	$30,888	$46,121	.	.	.
1970	38.2	38.4	38.4	$59,202	$42,468	$58,589	.	.	.
1980	38.5	39.1	39.2	$56,385	$43,810	$61,162	.	.	.
1990	39.5	40.1	40.2	$72,873	$53,908	$74,242	.	.	.
2000	.	.	.	$80,912	$57,263	$84,928	.	.	.

Table XIII: Various Outcomes for Parents of CA-Born Children by Race, 1900-2000

Notes: Sample restricts to parents ages 25-55 co-residing with CA-born children. All cells reweighted within year to match age and sex distribution of black parents of CA-born children. Total family income deflated with CPI-Urban for 2000. Missing values indicate unavailability of variable in IPUMS census year.



(a) Asian



(b) Black

Figure I: Population of Native-Born Children Across U.S. Counties, 1940

Notes: Children age 0-18, excluding Alaska and Hawaii.

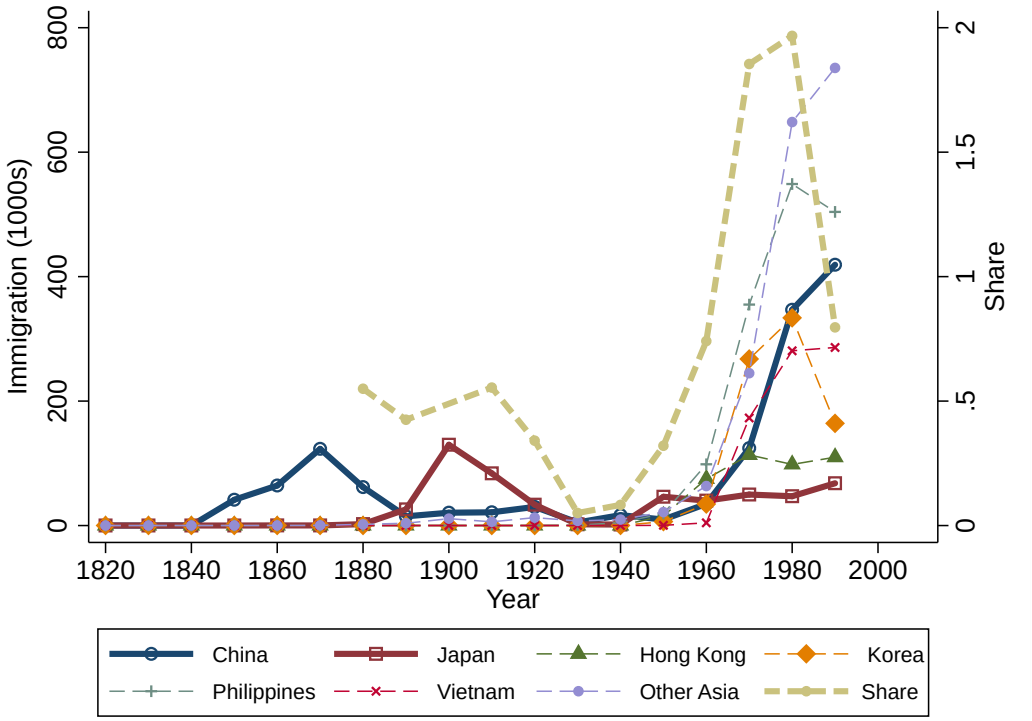
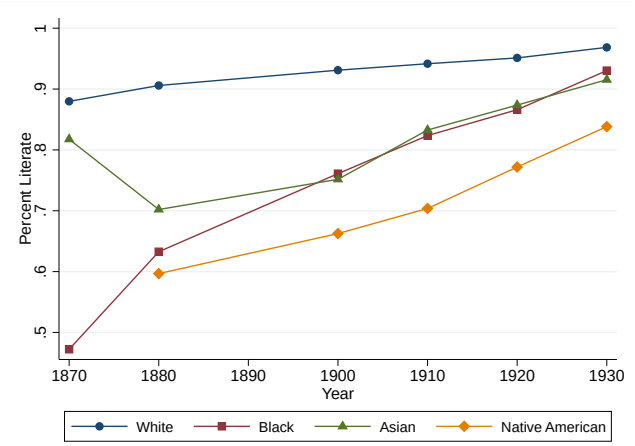
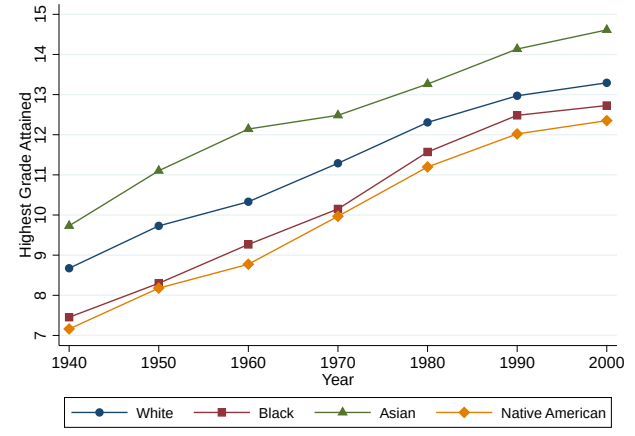


Figure II: Gross Immigration into U.S. from Various Asian Countries, 1821-1991

Notes: Data on immigration flows taken from Department of Homeland Security, Yearbook of Immigration Statistics 2003. Data on stock of Asians from census data, adjusted to include Japanese in Hawaii as reported in Table I in Nordyke and Matsumoto (1977). Immigration totals include "foreign nationals who, during a fiscal year, were granted lawful permanent residence (i.e., admitted as immigrants or became legal permanent residents), were admitted into the United States on a temporary basis (e.g., tourists, students, or workers), applied for asylum or refugee status, or were naturalized." No adjustment made for undocumented immigration.



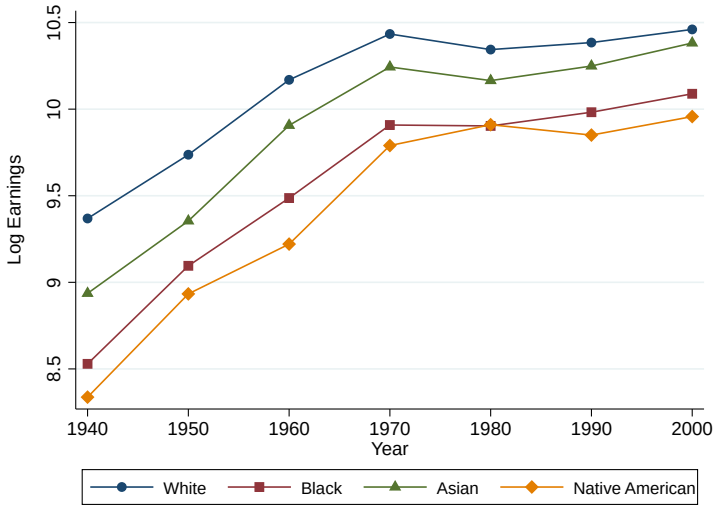
(a) Percent Literate, 1880-1930



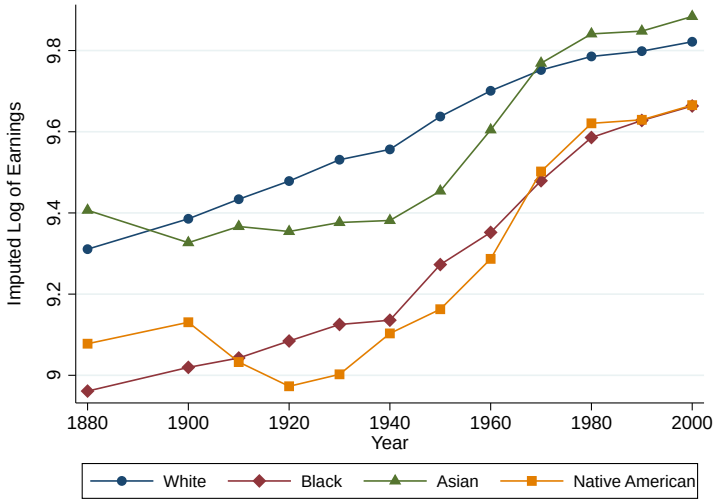
(b) Highest Grade Attained, 1940-2000

Figure III: Human Capital by Race, 1880-2000

Notes: Literacy defined as ability to read and write in any language. Figure restricts to ages 25-65 and excludes residents of Alaska and Hawaii. All races reweighted to match age and sex distribution of whites in every year.



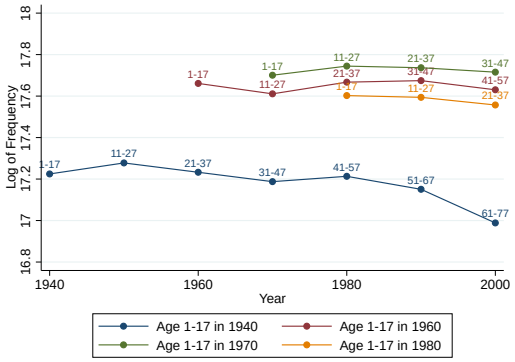
(a) Log Earnings, 1940-2000



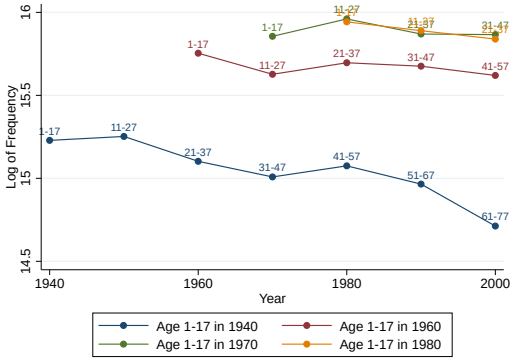
(b) Imputed Log Earnings, 1880-2000

Figure IV: Log Earnings of Men, 1880-2000

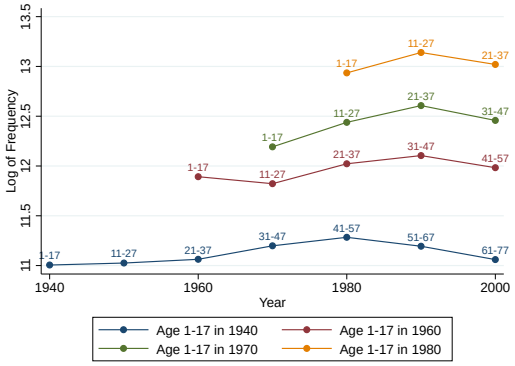
Notes: Panel (a) plots average log male earnings age 25-65 by race and year. Panel (b) plots average imputed log male earnings age 25-65 by race and year, with imputation based on earnings in 1940 averaged by cells defined by OCC1950 and native-born status, excluding observations with zero earnings or missing occupation, and restricting to household heads. Residents of Hawaii and Alaska excluded and races reweighted to match age distribution of whites in every year.



(a) White



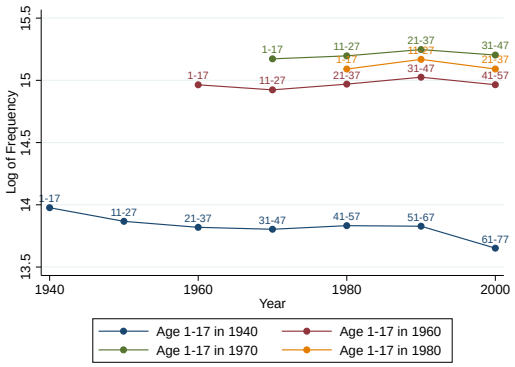
(b) Black



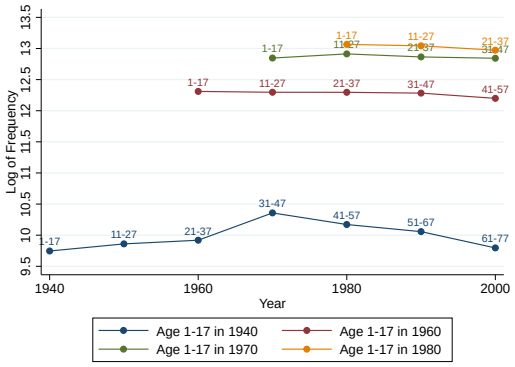
(c) Asian

Figure V: Log Frequencies of Pseudo-Cohorts: Born in U.S.

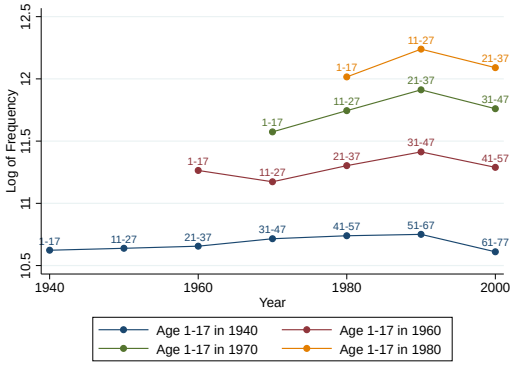
Notes: Figure plots log of frequencies by race for cohorts of native-born individuals age 1-17 in in 1940, 1960, 1970, 1980.



(a) White



(b) Black



(c) Asian

Figure VI: Log Frequencies of Pseudo-Cohorts: Born in CA

Notes: Figure plots log of frequencies by race for cohorts of individuals born in CA ages 1-17 in 1940, 1960, 1970, 1980.

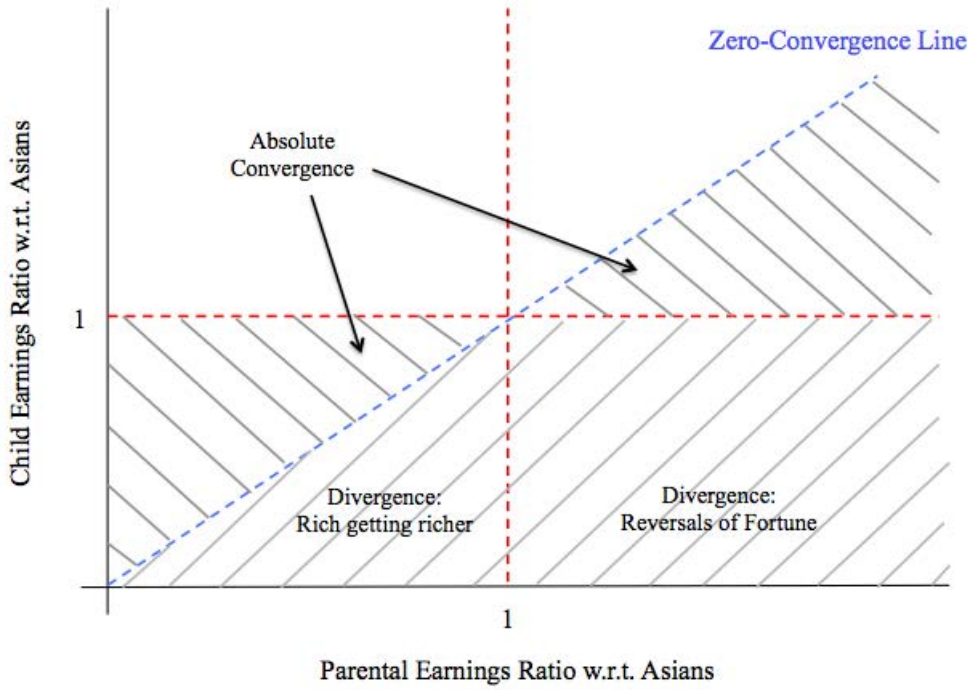
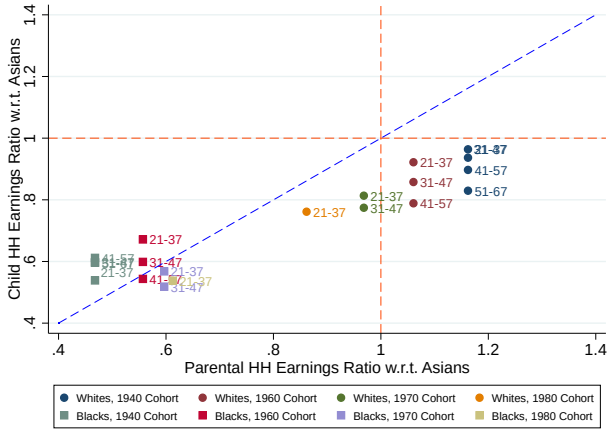
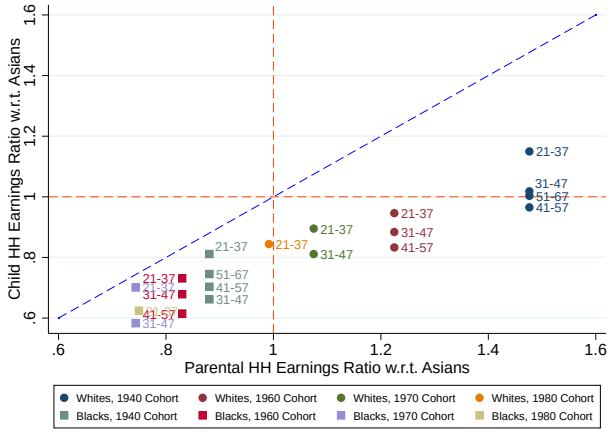


Figure VII: Earnings Ratio Convergence Figures: Illustration

Notes: Diagram illustrates interpretation of earnings ratios of parents and children for various groups with respect to Asians. Points above 1 on the x-axis imply parents in a group are richer than Asian parents, and points above 1 on the y-axis imply children in a group are richer than Asian children.



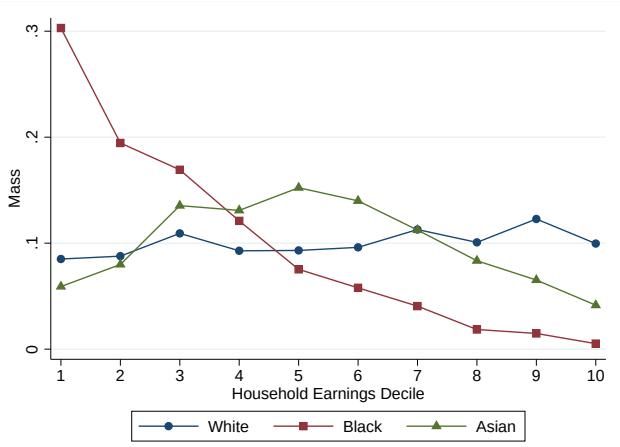
(a) Born in US



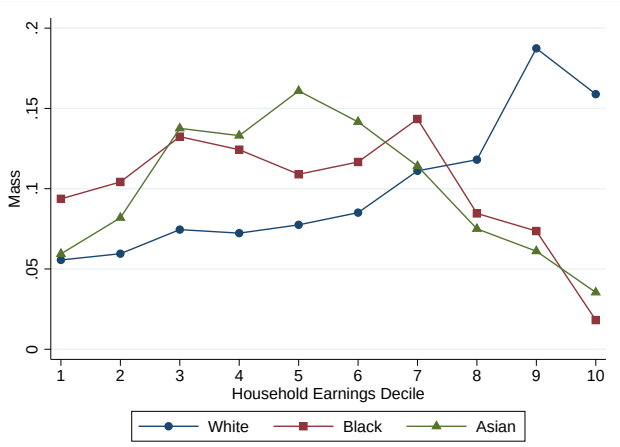
(b) Born in CA

Figure VIII: Intergenerational Change in Earnings Ratios

Notes: Figure plots earnings ratios for parents of children age 1-17 in 1940 and 1960 on the x-axes, and earnings ratios for children in these cohorts at later ages in subsequent censuses. All earnings ratios are plotted with respect to Asians of the same ages in the same parent and child groups. Household earnings plots earnings of head and spouse, counting absence of spouse as zero spousal earnings. Households with zero total earnings excluded from all calculations.



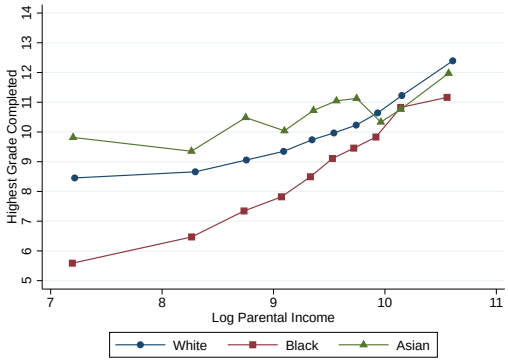
(a) Born in U.S.



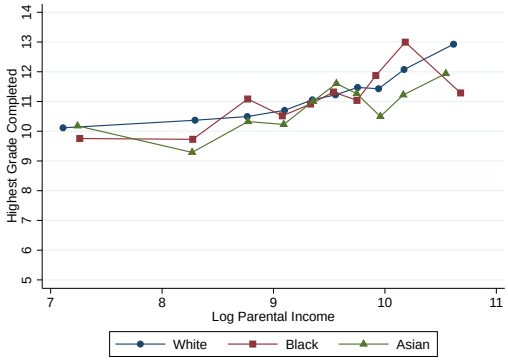
(b) Born in CA

Figure IX: Parental Income Distribution for Native-Born by Race, 1940

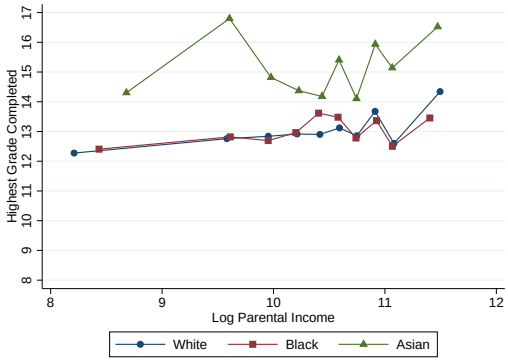
Notes: Figures plot the probability mass functions for total parental income deciles of native-born children under age 18 in 1940. Deciles calculated over full US population, and therefore held fixed across races and locations.



(a) Born in U.S., 1940



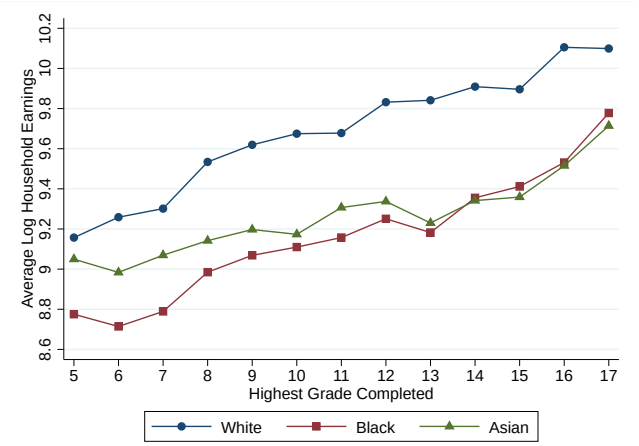
(b) Born in CA, 1940



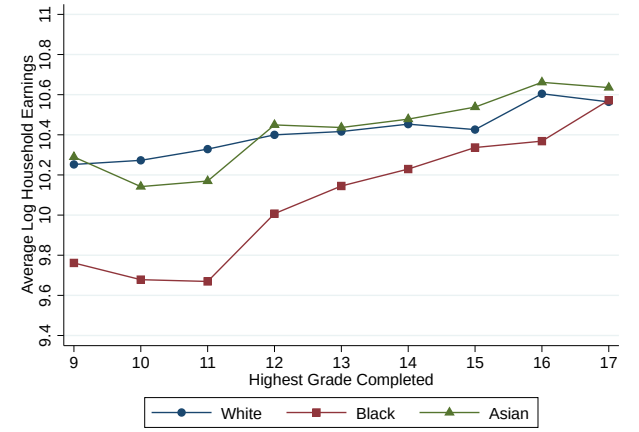
(c) Born in CA, 1980

Figure X: Educational Attainment by Log Parental Income

Notes: Hawaii and Alaska excluded. Figure adjusts for independent children and pools ages 22-29. Log parental income calculated as sum of head and spouse earnings over full population age 25-65.



(a) 1940



(b) 1980

Figure XI: Log Household Earnings by Highest Grade Attained: Born in CA

Notes: Restricts to CA-born ages 25-65. Reweights all groups to age and sex distribution of CA-born blacks in each year. Earnings deflated using CPI-Urban to 2011 dollars.

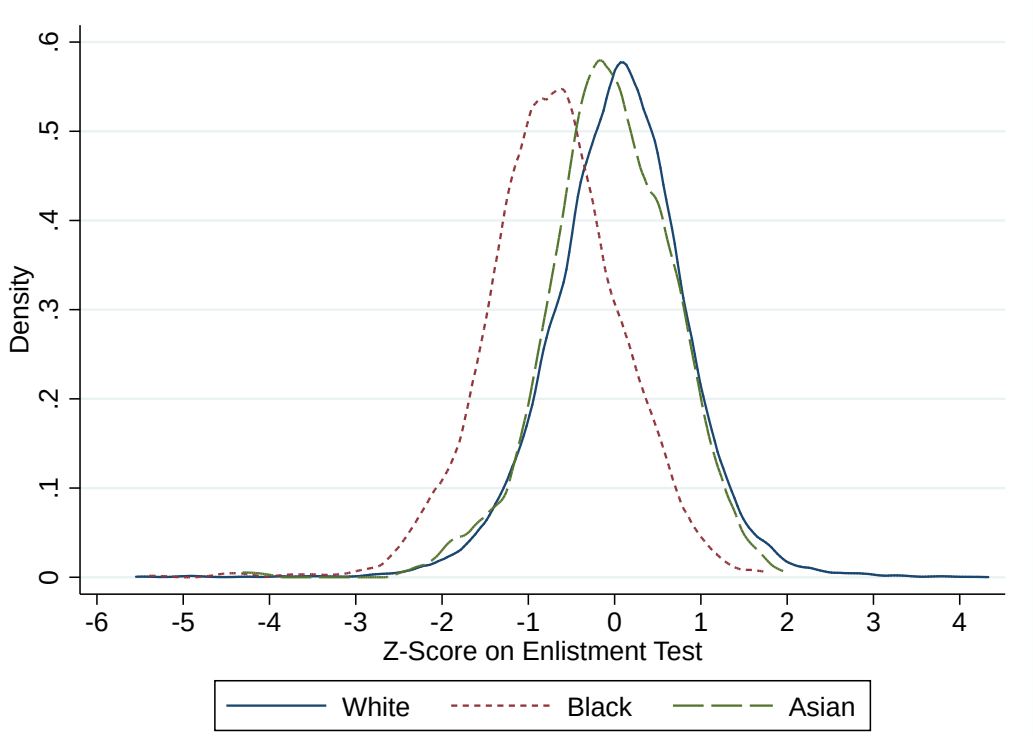
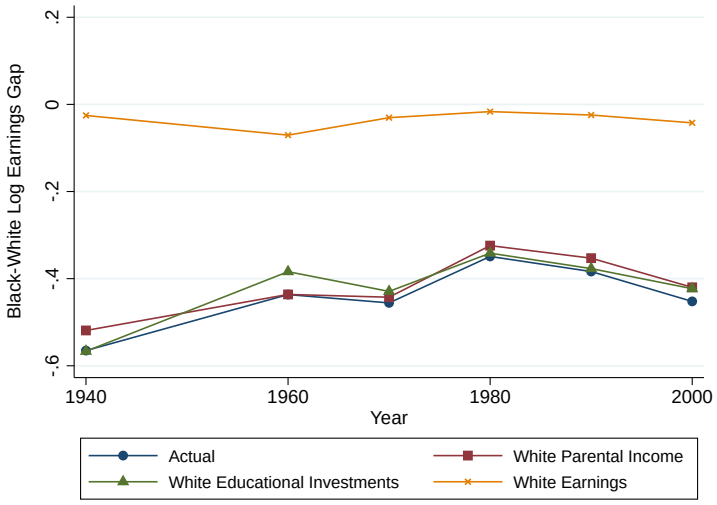
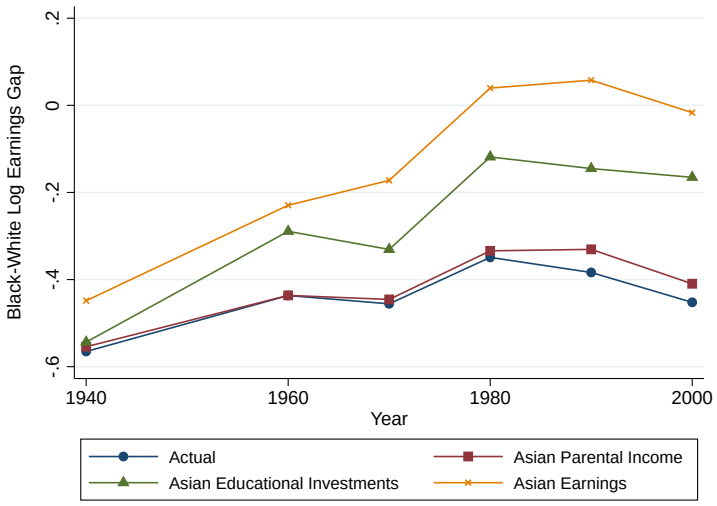


Figure XII: WWII Enlistment Test Score Distributions by Race in 1943, CA

Notes: Figure plots distributions of residuals from regression of normalized test scores on complete sets of education and age dummies. Restricts to native-born men ages 25-38 living in CA.



(a) Imputing White Earnings Components to Blacks



(b) Imputing Asian Earnings Components to Blacks

Figure XIII: Counterfactual Black-White Log Earnings Gaps in CA, 1940-2000

Notes: Figure presents simulated black-white log earnings gaps using estimates of the four parameters in Equation (2) for each race r and each generation t, $\alpha_{r,t}, \beta_{r,t}, \gamma_{r,t}, \theta_{r,t}$ as shown in Table VI, as well as mean parental income $E\left[y_{r,t-1}\right]$. "Earnings" refers to log of household earnings (head + spouse). "Actual" predicts black-white earnings gaps using estimated parameters for each racial group. "White Parental Income" assigns to blacks the white parental income distribution. "White Educational Investments" assigns to blacks the white conditional expectation of children's education with respect to parental income. "White Earnings" assigns to blacks the white expectation of household earnings condional on education. Panel (b) repeats this but assigns these respective components from Asians to blacks. All estimates restrict to "children" born in CA.

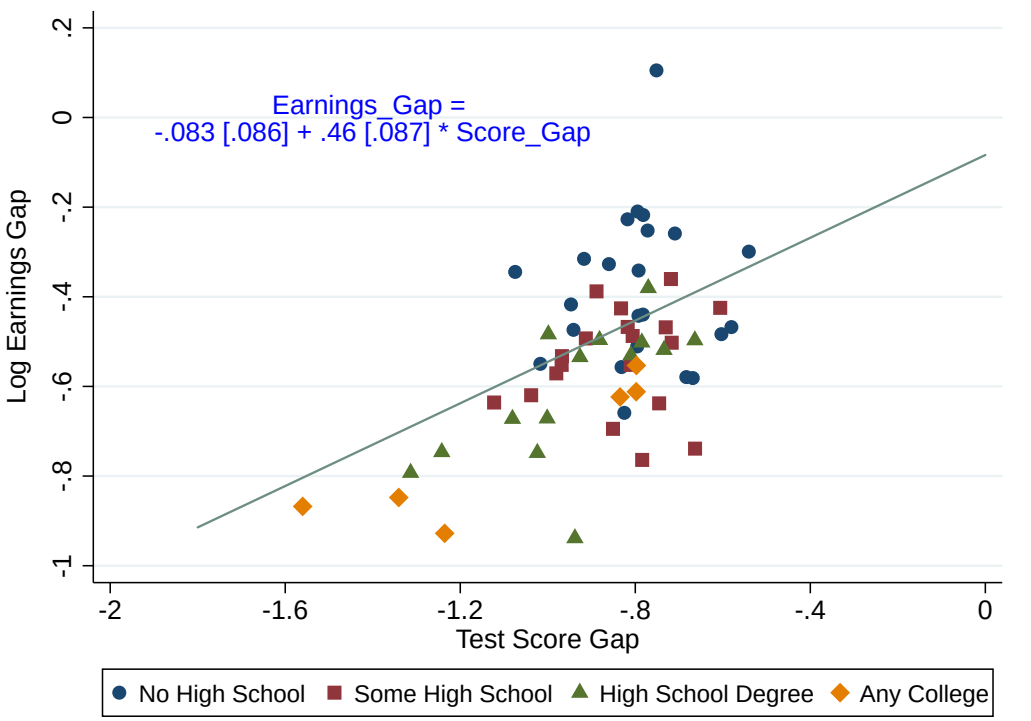
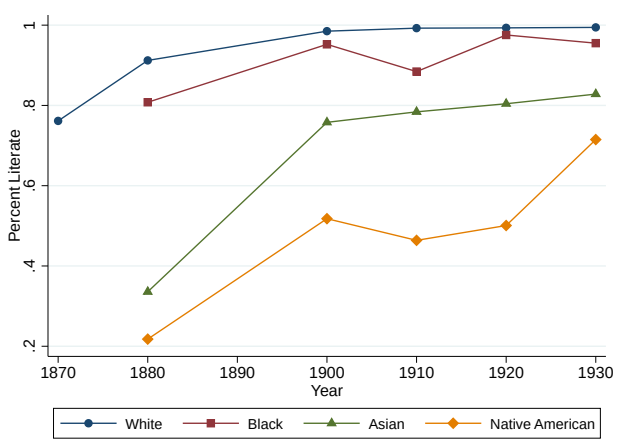
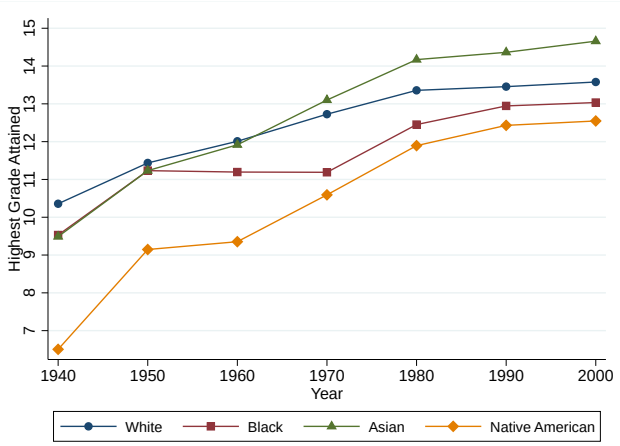


Figure XIV: Black-White Earnings and Skill Gaps by State and Education Level in 1940

Notes: Figure plots log earnings gaps by skill gaps at the level of broad educational group and state of residence for men ages 23-45. Earnings gaps defined as log earnings of whites minus log earnings of blacks. Cells with fewer than 30 individual blacks omitted from figure. Education groups are no high school, some high school, high school degree, and any college. Test scores normalized into z-score in microdata before construction of score gaps at the state-education level.



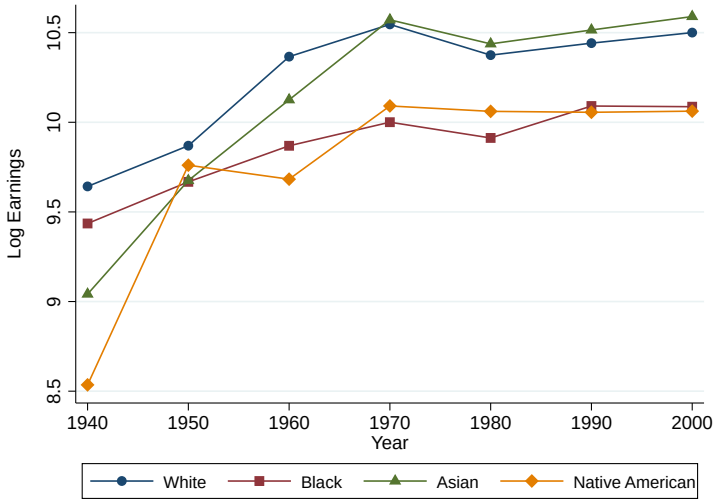
(a) Percent Literate, 1880-1930



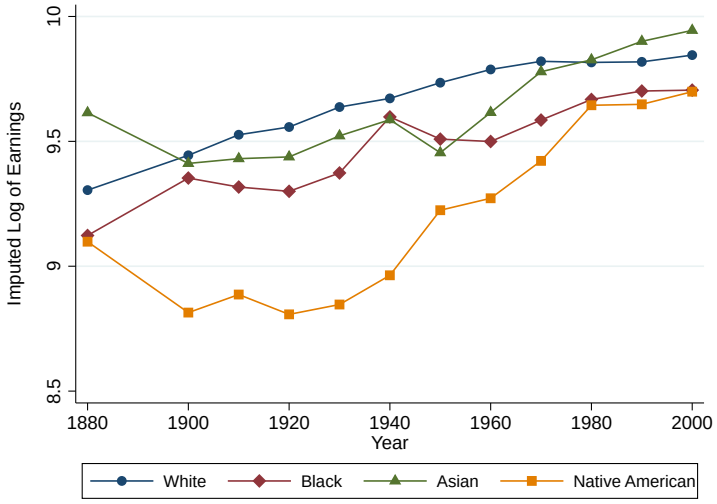
(b) Highest Grade Attained, 1940-2000

Figure A.1: Human Capital by Race, CA-Born 1880-2000

Notes: Restricting to individuals born in California. Literacy defined as ability to read and write in any language. Figure restricts to ages 25-65 and excludes residents of Alaska and Hawaii. All races reweighted to match age and sex distribution of whites in every year.



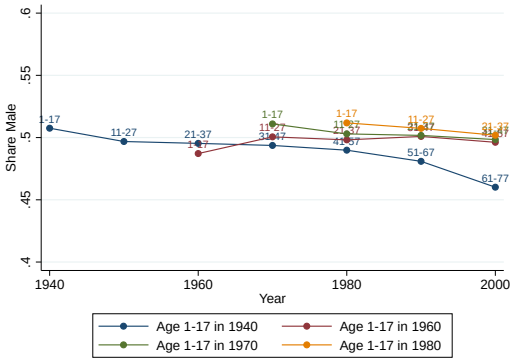
(a) Log Earnings, 1940-2000



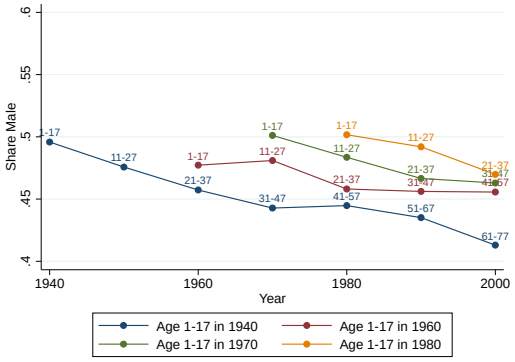
(b) Imputed Log Earnings, 1880-2000

Figure A.2: Log Earnings of Men, CA-Born 1880-2000

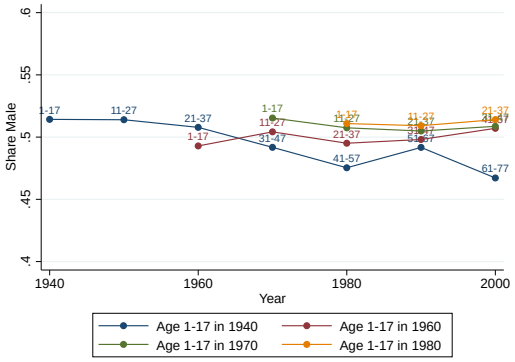
Notes: Restricting to individuals born in California. Panel (a) plots average log male earnings age 25-65 by race and year. Panel (b) plots average imputed log male earnings age 25-65 by race and year, with imputation based on earnings in 1940 averaged by cells defined by OCC1950 and native-born status, excluding observations with zero earnings or missing occupation, and restricting to household heads. Residents of Hawaii and Alaska excluded and races reweighted to match age distribution of whites in every year.



(a) White



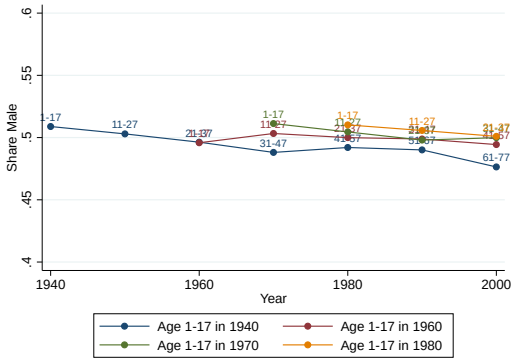
(b) Black



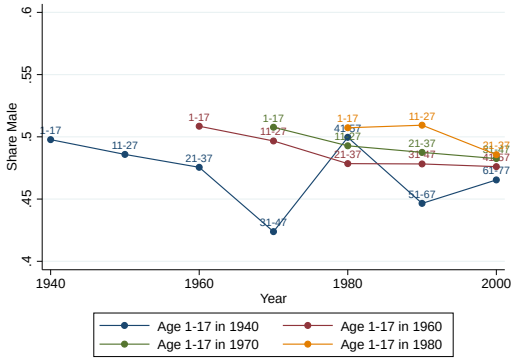
(c) Asian

Figure A.3: Male Share in Pseudo-Cohorts: Born in U.S.

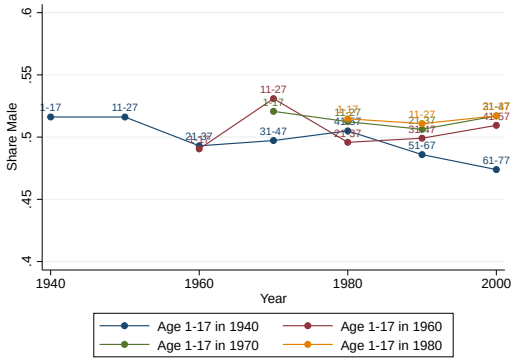
Notes: Figure plots male share by race for cohorts of native-born individuals age 1-17 in 1940, 1960, 1970, 1980.



(a) White



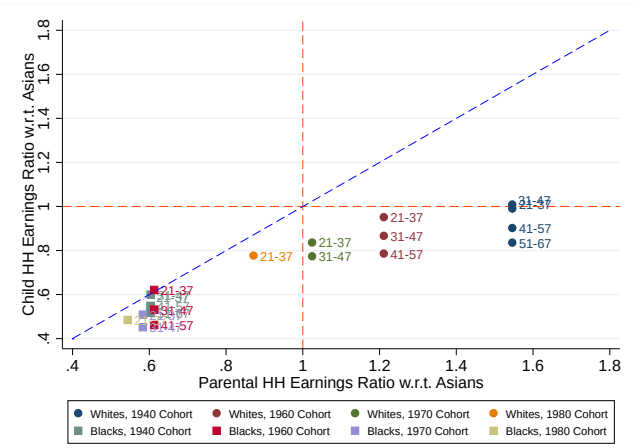
(b) Black



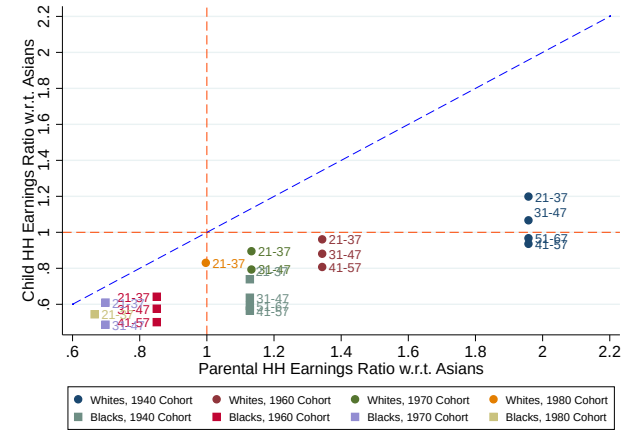
(c) Asian

Figure A.4: Male Share in Pseudo-Cohorts: Born in CA

Notes: Figure plots male share by race for cohorts of individuals born in CA ages 1-17 in 1940, 1960, 1970, 1980.



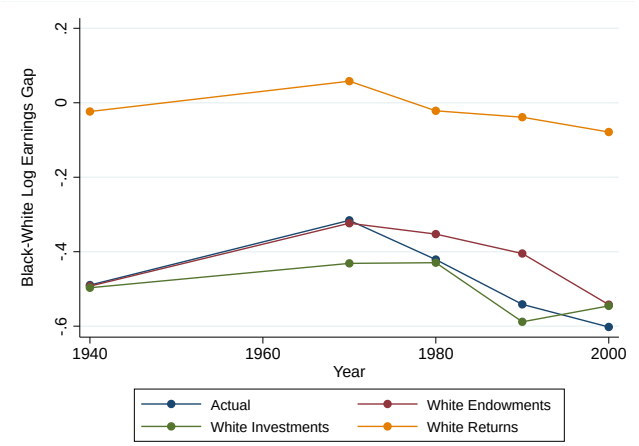
(a) Born in US



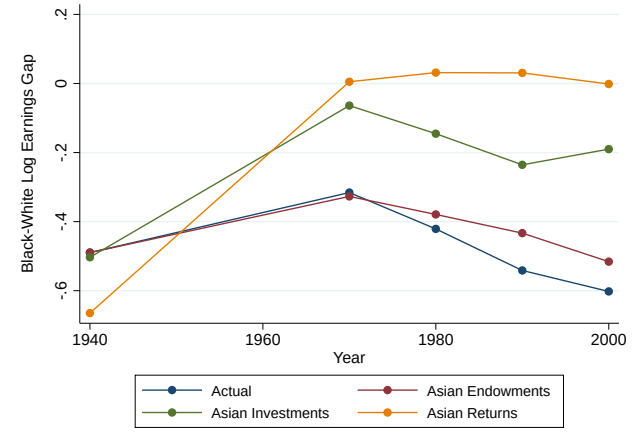
(b) Born in CA

Figure A.5: Intergenerational Change in Earnings Ratios, with Imputations

Notes: Replicates Figure VIII using household earnings with imputations for zero and missing values as described in text.



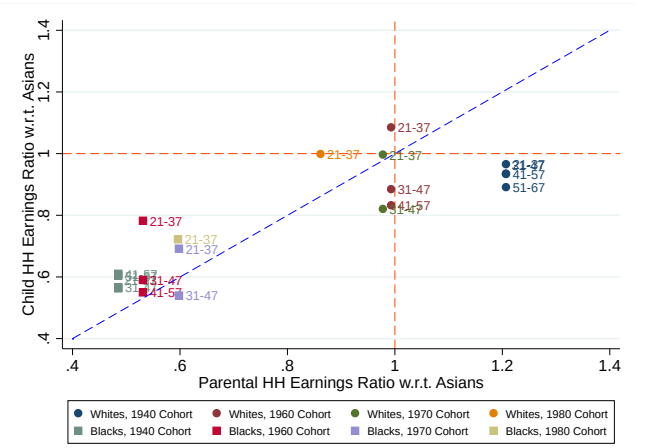
(a) Assign White Components to Blacks



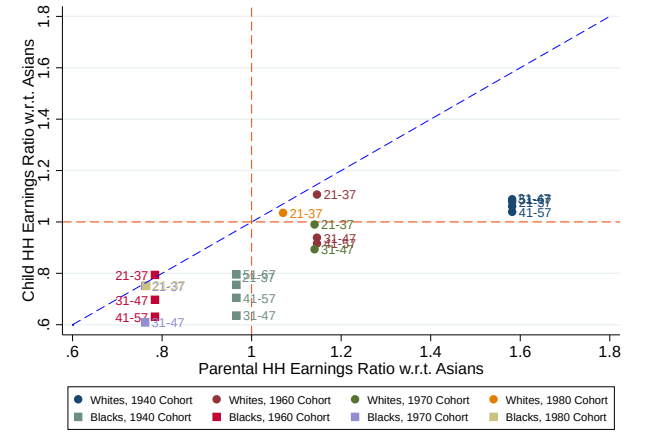
(b) Assign Asian Components to Blacks

Figure A.6: Counterfactual Black-White Log Earnings Gaps in CA, 1940-2000

Notes: Replicates Figure XIII using household earnings with imputations for zero and missing values as described in text.



(a) Born in US



(b) Born in CA

Figure A.7: Intergenerational Change in Individual Earnings Ratios

Notes: Replicates Figure VIII using fathers' and sons' earnings rather than total household earnings.