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THE SOCIAL AND STATISTICAL CONSTRUCTION OF RACE

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The Social and Statistical Construction of Race

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ABSTRACT

We examine the social construction of race in the United States, from Reconstruction to the modern day, and show how this affects statistical differences across and within racial categories. During the Reconstruction era, people with the same light brown skin tones, recorded by the Freedman's Bank (1865-1874), were more likely racialized as White or Mulatto in the 1870 Census if they were wealthier or literate. Racial assignment of descendants remained fluid through the 1940 Census. In modern data, self-reported race also varies with income and college completion among people with light brown skin tones. This endogenous racial assignment increases cross-race wealth gaps, which we show can be adjusted using sub-samples with data on skin tone or ancestry. Endogenous race also induces selection when controlling for race that, for example, attenuates the relationship between wealth and skin tone.

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Classification of individuals into racial categories is an enduring feature of society, as is statistical analysis of these categories. When racial groupings are influenced by socioeconomic characteristics, in addition to physical characteristics such as skin tone, statistical comparisons between or within racial groups are affected by the social process that defines the groups. In the United States, after emancipation removed the legal distinction between free and enslaved people, segregation relied on constructed racial groupings to determine who would be what race – and what race was. The Reconstruction Era (1865–1877) saw efforts to integrate formerly-enslaved people into broader social, economic, and political institutions, until White backlash gave rise to state-supported racial segregation in the Jim Crow Era (1877–1964). Into modern times, even as US society becomes more multi-racial, Black-White racial stratification is an enduring social and statistical construction.

We examine the social construction of race, and its statistical implications, drawing on data across three time periods in the US: Reconstruction-era data from the Freedman’s Bank and the 1870 Census, linked descendants through the 1940 Census, and modern data from the National Longitudinal Surveys of Youth (NLSY97) through 2008. We show that people with the same physical skin color, particularly those with light brown skin tones, were racialized differently in the 1870 Census according to their wealth, literacy, and other proxies for socioeconomic status (SES). Over the following decades, through the 1940 Census, racial assignment remained fluid and correlated with SES among the linked descendants of Black people in the 1870 Census. In modern data from the NLSY97, self-reported race continues to vary with socioeconomic status among people with light brown skin tones. Endogenous racialization of individuals is not era-specific, but instead is an enduring characteristic of racial categorization.

After documenting persistent endogenous racialization, we explore the statistical consequences. Most directly, the social construction of race affects estimated between-race differences, increasing the reported racial wealth gap. Within-race, it induces a selection effect that understates associations between income and other variables that affect racial assignment, such as skin color or even education. Building on the non-classical measurement error and sample selection bias literatures, we show statistical adjustments that draw on sub-samples of data with information on skin tone or ancestry.

Our analysis begins in 1870, using detailed skin tone data collected by the Freedman’s Savings Bank (1865-1874), in which Bank clerks recorded depositors’ “complexion” and other information to help identify depositors when they returned to the bank. This Reconstruction period is both an important stage in the social construction of race, and also provides a particular opportunity to explore the racial assignment of people with non-white complexions who were of African ancestry and recently enslaved or the descendants of enslaved people.

The recorded complexion data includes skin tone (e.g., dark, dark brown, brown, light brown, light) and occasionally other physical descriptors (e.g., distinctive scars or pox marks). We hand-link these Freedman’s Bank records to the 1870 Census, in which enumerators racially classified the depositors as “Black,” “Mulatto,” or “White,” along with recording depositors’ wealth and literacy. Although Census workers were instructed to classify race based on the presence of “any perceptible trace of African blood,” our results reveal a racial classification system constructed not only on physical appearance but also reflecting socioeconomic status.

Table 1 provides a motivating tabulation of the data, comparing depositors’ complexion from the Freedman’s Bank and their recorded race in the 1870 Census. Darker skin tones are associated with being racialized as Black (along the diagonal in Columns 2 – 4), but our main focus is on the heterogeneity across rows: for people in the same complexion group, the systematic variation in who was racialized as Black, Mulatto, or White.¹ We also examine the variation down columns, within Census race: the relationship between skin tone and SES, associated with “colorism,” which may reflect discrimination against people with darker skin tones.

We first present evidence for the social construction of race during Reconstruction: among people with the same skin tone, particularly light brown skin tones, those with higher wealth or literacy are substantially more likely to be racialized as White or Mulatto. We estimate selected racialization along each of three margins (White or Mulatto vs. Black; White vs. Mulatto or Black; and Mulatto vs. Black). Our interpretation is not that wealth and literacy alone directly cause someone to be considered White; rather, wealth, literacy, and other proxies for SES jointly affect how different people are racialized. We also show that higher status occupations are associated with being racially classified as White or Mulatto, whereas people with the same skin tones are more likely to be recorded as Black if they have a traditionally Black name or a greater share of Black neighbors.

Individuals’ 1870 racial classification is somewhat more sensitive to their wealth and literacy in counties with less residential segregation, where Census enumerators might expect to find Black or White people in an area. Indeed, among individuals with light brown skin tones, recorded race is insensitive to wealth and literacy if all nearby Census-enumerated individuals are White or if most are Black, but highly sensitive to wealth and literacy for intermediate values of neighbors’ racial composition. Along other dimensions of geographic

¹Note that “Yellow” was a descriptor at the time for a light-skinned African American person. The Freedman branch in New York City attracted immigrant depositors, but Freedman branches were generally located across the South which had less immigration. Almost all immigrants are White in the complexion data and in the Census (e.g., people born in Italy were 99.7% “White” in the full 1870 Census), such that our estimates are not sensitive to excluding the Freedman Branch in New York City or all foreign-born people in the Census.

heterogeneity, we find that the sensitivity of racial classification to wealth and literacy does not vary substantively with other county characteristics related to Black wealth, Black literacy, historical racial violence (Chyn, Haggag and Stuart, 2024), or modern intergenerational mobility by race (Chetty et al., 2026). We also estimate similar effects by gender and for adults and children.

Among descendants of the full population of 1870 Black and Mulatto people, whom we can link to in later Censuses, roughly 20% are White in the 1900 Census and roughly 50% are White in the 1940 Census.² Among Black and Mulatto people with higher SES in 1870, a larger share of their descendants are classified as White in 1940. Additionally, the White descendants of a given Black or Mulatto person in 1870 had higher average income in 1940 than the Black descendants. Note that causality can run in both directions without detailed skin tone data: people who appear White in 1940 have greater economic opportunities due to their perceived race, and people with light brown skin tones may be considered White if they are of higher SES. Black income is 58% lower than White income in the 1940 Census, as reported, and 41% lower when classifying based on linkage to a Black or Mulatto ancestor in 1870. When higher-SES descendants of Black people are less often recorded as Black, this decreases measured intergenerational Black economic mobility.

In recent decades, self-reported race among individuals with light brown skin tones continues to co-vary with income and education. Using NLSY97 data, for people born in 1980-84, we examine household-reported race and parents' net wealth from 1997, enumerator-reported race in 2007, and data collected in 2008 on the person's skin tone, education, and income. Reported race is very similar across data waves and, in both cases, reported race is sensitive to SES for people with light brown skin tones.³ Estimated income disparities by race are more similar to estimated income disparities by skin tone in the modern data, however, as White non-Hispanic people with darker skin tones are poorer than the average White non-Hispanic person and richer than the average Black person compared to in the historical data.

This social construction of race creates a divergence between comparisons based on endogenous racial classification and comparisons based on African ancestry. Although African ancestry is not recorded in the 1870 Census, reflecting people enslaved or the descendants of those enslaved, we develop an approach to evaluate this divergence using the sample of depositors in the Freedman's Bank. In doing so, we contribute to a literature on the use of

²We link descendants using the Census Tree dataset and, while some links will be false or omitted, we see similar numbers when restricting to user-supplied genealogical links (Price et al., 2021; Buckles et al., 2025).

³Non-white skin tones in the modern data may increasingly reflect non-African ancestry, but increasing multiracial marriage rates and immigration also create greater scope for racial fluidity among those with African ancestry.

sub-samples to correct statistical bias from non-classical measurement error (Chen, Hong and Tamer, 2005; Chen, Hong and Nekipelov, 2011; Carlson and Dell, 2025). Assuming that Freedman depositors with non-white skin tones are of African ancestry, and that people of African ancestry are considered White in the Census at the same rate as in the Freedman sample,⁴ Bayes’ rule implies that 1.4% of White people in the Census in Freedman branch counties have some African ancestry. The Freedman sample also provides data on wealth by Census race and skin tone. The resulting statistical adjustment has a substantial effect: while Black people have average household wealth that is 5.7% of White household wealth, all people with African ancestry have 9.3% of the wealth of those with European ancestry – an increase of roughly 60%. This upward adjustment to African ancestry wealth in 1870, along with adjusted higher incomes in 1940 and less adjustment in the modern data, implies slower convergence in economic disparities after 1940 than in the unadjusted data.

Endogenous racial assignment also has statistical implications when estimating within-race differences or “controlling for race.” Prior research on colorism, for example, generally examines associations between skin tone and outcomes, such as income and education, while controlling for race or limiting the sample to Black people. Building on literature that models sample selection bias, we show that these specifications attenuate the association with skin tone when race is socially constructed: among people classified as Black, those with light brown skin are more often poor because if they were wealthier then they would be more likely classified as White. Similarly, among White people, those with light brown skin are more often wealthy because if they were poorer then they would be more likely classified as Black. We see these patterns in both the 1870 Census and modern NLSY97 data. More broadly, when race is determined by physical characteristics and socioeconomic status, controlling for race is a form of over-controlling that attenuates estimated associations with the factors driving racial classification. Splitting the sample by skin tone preserves the substantial association between SES and skin color estimated in the full population.

We devote a great deal of attention to historical record linkage, which has the potential to generate spurious estimates. We hand-link all Freedman’s Bank records to the contemporary 1870 Census using biographical information for the depositor, along with details on other household members noted in bank records, which gives us greater confidence in linkage accuracy. We iterate on these hand-links with a machine-learning model. Our estimates are not sensitive to restricting the sample to links with increasingly supportive supplemental

⁴Consistent with this assumption, the Mulatto share of the Black and Mulatto population is similar in the Freedman sample (16.96%) and full Census within counties with a Freedman’s Bank branch (16.68%) excluding Freedman depositor households. We also estimate only modest differences in observables between Freedman depositors and the Census, within race, and can implement this statistical adjustment within cells defined by observable characteristics.

information or a higher machine-learning match probability. Further, the linkage rate is not differentially lower for high-SES Black people.

We also bound the potential bias from “reverse causality” and unmeasured physical characteristics in 1870, whereby unmeasured indicators of African ancestry are correlated with socioeconomic status. For example, if skin tone were unmeasured (as in 1940), then appearing White may allow a person to reach higher SES rather than higher SES causing that person to be classified as White. Our bounding exercise leverages the observed influence of our detailed skin tone data, compared to less-detailed skin tone categories. The estimated bounds suggest that reverse causality and unmeasured physical characteristics would not quantitatively account for our results, reinforcing the important role of wealth and other proxies for SES in how people were racialized. Conversely, if our observed proxies for SES are correlated with unmeasured *social* cues, such as attire, speech patterns, or neighbors’ characteristics, this remains consistent with the social construction of racial categories.

If skin tone is measured with error, racial categorization may capture some unobserved physical variation in skin tone. We examine this using a sub-sample of depositors with two separate measures of skin tone from opening an account twice. For these depositors, we find that bank clerks recorded similar measures of skin tone, and estimate little influence of classical measurement error in skin tone when instrumenting for one measure with the other. There could also be non-classical measurement error in skin tone, from the Freedman’s Bank clerk recording lighter skin tones when people appeared wealthier at the bank or skin tone itself becoming darker in response to lower SES. Both channels would create a *stronger* relationship between measured skin tone and Census wealth, rather than our estimated attenuation from endogenous racial assignment. Further, if the bank clerk recorded lighter skin tones for wealthier people, then it would bias downward our estimated effect of wealth on race among people with the same recorded skin tone.

Our takeaway is not just that race is a social construct, but that we can both (1) see the continued construction of race along socioeconomic status lines through US history, from Reconstruction through segregation to the modern day, and (2) draw out the statistical implications for analyses of cross-race and within-race differences.

I Implications and Connections to Related Literature

One implication of race being socially constructed, from Reconstruction through the modern day, is to highlight how economic inequality has been both a consequence *and* a source of racial stratification. After early political and economic successes during Reconstruction, backlash led to the abandonment of Reconstruction efforts (Logan, 2020; Chyn, Haggag and Stuart, 2024; Frieden, Grossman and Lowery, 2024) and racism adapted (Engerman, 2003). A

dichotomous Black-White racial categorization emerged not only through directed efforts to support White social, economic, and political control in the absence of enslavement (Harris, 1993; Washington, 2011), but was also reinforced through Black collectivism to counter the negative effects of racial segregation (Reece, 2021). Segregation increased from 1880 to 1940 (Logan and Parman, 2017), limiting economic mobility and convergence in racial wealth gaps even after the Jim Crow era ended (Chyn, Haggag and Stuart, 2022; Althoff and Reichardt, 2024; Derenoncourt et al., 2024). Although the Census itself was not used to assign access to schools or other public goods, someone’s assigned race substantially impacted how they were treated by the law and society more generally. The systemic nature of continued racial divisions and disparities is highlighted in stratification economics (Darity Jr., 2005; Darity Jr., Mason and Stewart, 2006; Darity Jr., Hamilton and Stewart, 2015; Chelwa, Hamilton and Stewart, 2022; Bayer, Charles and Derenoncourt, 2025).

This paper advances a large literature on the social construction of race, which crosses disciplines including Anthropology, Critical Race Theory, Economics, Health, History, Law, Political Science, Psychology, and Sociology.⁵ There is broad understanding that racial groupings vary by social context, along with individuals’ membership in those groups, but there is limited discussion of the statistical implications when analyzing differences across race or controlling for race (Sen and Wasow, 2016; Rose, 2023). For considering the racial wealth gap for people whom the Census reports as being Black or White, as in Derenoncourt et al. (2024), we show that selected racial assignment for even a small share of the population can have large quantitative implications. Similarly, for interpreting the estimated lower intergenerational economic mobility for children who report being Black (Chetty et al., 2020), these differences become inflated when some higher-SES descendants are not classified as Black or known to have Black ancestors.⁶ This racial fluidity causes analyses to miss some sources of economic progress for those of African ancestry. Some controversially attribute

⁵See, for example, Boas (1912); Montagu (1945); Rogers (1952); Hahn, Mulinare and Teutsch (1992); Haney López (1994); Witzig (1996); Bonilla-Silva (1997); Zuberi (2001); Darity Jr. (2005); Smedley and Smedley (2005); Goldsmith, Hamilton and Darity Jr. (2007); Penner and Saperstein (2008); Davis (2010); Charles and Guryan (2011); Freeman et al. (2011); Morning (2011); Saperstein and Penner (2012); Saperstein and Gullickson (2013); Penner and Saperstein (2013); Omi and Winant (2014); Darity Jr., Hamilton and Stewart (2015); Hersch (2018); Reece (2019); Dahis, Nix and Qian (2020); Davenport (2020); Ioannidis, Powe and Yancy (2021); Chelwa, Hamilton and Stewart (2022); Francis, Hardy and Jones (2022); Abramitzky et al. (2023); Rose (2023).

⁶For Native Americans and immigrants to the United States, there is more discussion of how selective ethnic identification can create biases (Alba and Chamlin, 1983; Lieberman and Waters, 1993; Waters, 1994; Alba and Islam, 2009; Duncan and Trejo, 2011, 2017; Duncan et al., 2020; Kosack and Ward, 2020; Eschbach, Supple and Snipp, 1998; Duncan and Trejo, 2023). There has generally not been data on skin tone, however, to implement our analysis. Selective exit from ethnic groups over generations can occur when more-educated people marry lighter-skinned people (as in Brazil, see Schwartzman, 2007), which changes skin tone over generations, whereas we focus on differential racialization for people with the same skin tone.

the lack of Black economic progress to innate differences (Herrnstein and Murray, 1994). Among the critiques, Heckman (1995) notes that supposed innate characteristics like IQ are endogenous to socioeconomic status; to this, we add that classified race itself is endogenous to socioeconomic status.

The fluidity of race has been emphasized in Latin America, where racial categories are thought to be flexible in contrast to more fixed racial categories in the United States (Lovell and Wood, 1998; Villarreal, 2010; Telles and Paschel, 2014; Rangel, 2015; Monk Jr., 2016; Davenport, 2020; Laudares and Valencia Caicedo, 2023; Woo-Mora, 2024). The literature on Latin America often highlights differences in socioeconomic status by skin tone, controlling for race, in contrast to a focus on racial disparities in the US. While racial fluidity in Latin America is often contrasted with rigid racial categories in the United States, with the long-presumed application of a “one-drop rule” in the United States, our results illustrate that racial categories were also historically flexible in the United States and have continued over time to be formed based on both socioeconomic status and physical characteristics.⁷

Discrimination based on skin tone is referred to as colorism, which typically manifests in people with lighter skin tone receiving preferential treatment. Lighter skin tones have long been associated with differing societal treatment in the United States, from enslavement (Keith and Herring, 1991; Bodenhorn, 2015; Reece, 2018) through the present day (Wade, Romano and Blue, 2004; Burch, 2015).⁸ Colorism has been studied in many settings, in which skin color predicts a wide range of life outcomes.⁹ This literature generally estimates differences by skin tone within race, or controlling for race, such as estimates that wages are higher among lighter-skinned African Americans (Goldsmith, Hamilton and Darity Jr., 2006, 2007; Kreisman and Rangel, 2015). We show that estimated within-race relationships can substantially *understate* the true association with skin tone, in both historical and modern US data, because of endogenous racial classification.¹⁰

⁷McGee (2025) develops a theoretical model for how elites use skin color in the construction of race to establish and maintain their socioeconomic position, which is compared against differences by Census race in the US and differences by skin tone in Brazil within race.

⁸Abramitzky et al. (2023) explore different outcomes for children classified as Mulatto or Black, within the same household, over the late-19th and early 20th centuries. Noghanibehambari and Fletcher (2025) find that children classified as Black, who appear in linked samples as White adults in the 1940 Census, live longer. We show that Census race is correlated with skin tone, but differs in ways associated with socioeconomic status.

⁹See, for example, Johnson (1934); Ransford (1970); Harburg et al. (1978); Hughes and Hertel (1990); Keith and Herring (1991); Seltzer and Smith (1991); Johnson, Bienenstock and Stoloff (1995); Krieger, Sidney and Coakley (1998); Klonoff and Landrine (2000); Bowman, Muhammad and Ifatunji (2004); Majumdar (2004); Goldsmith, Hamilton and Darity Jr. (2006); Hersch (2006); Gyimah-Brempong and Price (2006); Landor et al. (2013); Monk Jr. (2014); Burch (2015); Diette et al. (2015); Hunter (2016); Blake et al. (2017); Dixon and Telles (2017); Hersch (2018); Louie and Wilkes (2018); Uzogara (2019); Adukia et al. (2023).

¹⁰Racial reclassification in administrative data, particularly to avoid detection of discrimination, can also bias estimates of disparate treatment by race (Luh, 2023; Finlay, Luh and Mueller-Smith, 2024; Baron et al., 2024).

Our estimates highlight the fluidity of constructed racial classifications across people and over generations. A related historical literature explores how an individual’s race could vary over time with changing life circumstances. Some authors emphasize that race affects SES and others emphasize that SES affects race, using historical Census-to-Census links to examine changes in linked individuals’ race from Black to Mulatto (Saperstein and Gullickson, 2013), from Black to White (Dahis, Nix and Qian, 2020), and from Mulatto to White (Mill and Stein, 2016). However, without data on skin tone, it is difficult to separate these causal directions. Census-to-Census links are also highly susceptible to linkage error, particularly when race differs, which can generate spurious associations between race and socioeconomic status.¹¹ A related modern literature also analyzes whether SES changes individuals’ reported race or how others perceive their race (Penner and Saperstein, 2008; Saperstein and Penner, 2012, 2016). In response, some have emphasized the rarity of someone switching between Black and White racial categories (Alba, Insolera and Lindeman, 2016; Kramer, DeFina and Hannon, 2016; Foy, Ray and Hummel, 2017; Irizarry, Monk, Jr. and Cobb, 2023). Indeed, changing race is rare in our NLSY97 data, occurs for people with dark skin tones that is suggestive of data recording errors, and is not systematically associated with changes in socioeconomic status. We emphasize that a given person’s race can be persistent over time, but there can still be more substantial variation in racial identification across people and over generations that is influenced by socioeconomic status.

This view into the social construction of race over such a long time horizon has not been documented before. Further, while there is broadening exposure to the idea that race is socially constructed, the literature generally does not consider the statistical implications for estimated cross-race and within-race differences. We show adjusted estimates of cross-race and within-race differences, which adjust for the endogenous assignment of race by using supplemental data on skin tone or ancestry – which illustrates the value of collecting such data, even if only within sub-samples.

II Data Construction and Summary Statistics

II.A Skin Tone Data from the Freedman’s Savings Bank

We begin our analysis using the historical records of the Freedman’s Savings Bank (1865-1874). The Freedman’s Bank was chartered by Congress in 1865 and marketed to newly-emancipated people, though some others also used the Bank. The Bank collected deposits and paid

¹¹Incorrectly linking some Black people to future White people, who have higher SES on average, would generate a spurious positive relationship between SES and racial classification as White. We mitigate this concern by making contemporaneous hand-links with additional household information, and by using SES measures from the depositor data whose effects would instead be attenuated by false matches.

interest, rarely lending at the branch level.¹² Its Congressional charter allowed the Bank to open interstate branches, unusual for the time, and it was initially restricted to investments in US treasuries before successful lobbying by the White leadership of the Bank allowed them to invest in riskier assets. After many of these loans failed, in railroads and ventures of the leadership’s associates, the Bank collapsed in 1874 and depositors eventually received at most 62% of their final balance. W.E.B. Du Bois (1903) describes the Bank’s failure as setting back “the thrift of the freedmen” as much as “ten additional years of slavery could have” (Bois, 1903, p. 37). The Bank was described by Frederick Douglass as “the black man’s cow, but the white man’s milk” (July 3, 1874), and Congress declined to compensate depositors’ losses. A growing literature has explored the impacts of the Freedman’s Bank, both before and after its collapse (Stein and Yannelis, 2020; Arthi, Richardson and Orden, 2024; Célérier and Tak, 2025; Edwards, 2024; Traweek and Wardlaw, 2024; Bogan et al., 2026).

When someone opened an account with the Freedman’s Bank, the branch clerk filled out a depositor record (Appendix Figure 1). This included the depositor’s name, birth state, age, and names of household members along with other information. The form included a field for “complexion,” which Osthaus (1976, p. 82) discusses as helping to identify the person if they lost their deposit book. There are 368 unique string entries for complexion in our sample, reflecting spelling variations and less common physical descriptors, which we standardize into 27 detailed skin tone categories (reported in Table 1, and Appendix Table 1 provides a tabulation of detailed skin tone category by branch). Some skin tone categories coincide with more racial categories (e.g., black, colored, nearly black, mulatto, nearly white, white), which we exclude from some specifications.¹³ Skin tone was the main identifying physical characteristic recorded by the Bank, with only occasional references to other characteristics (e.g., distinctive scars or pox marks). The Bank’s choice of skin tone as a primary identifying characteristic is consistent with a large literature on the use of skin color to distinguish individuals (Kessen and Weiskopf, 1976; Katz and Kofkin, 1997; Hirschfeld, 2008; Kinzler and Spelke, 2011).

Our main specifications compare people within the 27 detailed skin tone categories listed in Table 1, which reflect more-detailed skin tone data than are typically available to researchers,

¹²The Freedman’s Bank was not formally connected to the Freedman’s Bureau and was not financially backed by the US government, though some promotional materials fostered confusion (Célérier and Tak, 2025).

¹³Freedman’s Bank branches with Black clerks, listed by Osthaus (1976), record more detailed descriptions of skin tone rather than broader or more racial categories. There is insufficient information on Census enumerators to find their recorded race in the 1870 Census, and explore related heterogeneity, though we expect the Census enumerators were mostly White (as US Marshals and Assistant Marshals in 1870). By comparison, Union Army records on “complexion” predominately refer to African American soldiers as “Black.” We thank John Clegg for providing tabulations from the African American Civil War Soldiers Project.

but we also use a “skin tone index” in some analysis. To create this index, where higher values indicate darker skin tones, we use our links to the 1870 Census. For each skin tone category, we define the index as the share of people with that skin tone that are Black in the Census (multiplied by one) plus the share of people with that skin tone that are Mulatto in the Census (multiplied by one-half). Any such index is an arbitrary scaling, but provides a continuous measure across categories that is useful for parts of our analysis and reported in Column 5 of Table 1.¹⁴ Our main analysis, however, focuses on the variation across rows: for people with a particular skin tone, we examine who is racialized as Black, Mulatto, or White based on their other characteristics.

We observe two separate entries for complexion data for 578 depositors in our sample, when the depositor opened multiple accounts at different times. For 62% of these depositors, the detailed skin tone category is the same from both records. For an additional 15% of these depositors, the skin tone index values are within 0.05 index units. Figure 2 plots the two skin tone index values against each other, where the size of the circle is proportional to the number of depositors. We use these multiple measurements as instruments for each other in assessing the impacts of measurement error in skin tone.

II.B Linkage to 1870 Census Records

We hand-link all Bank depositor records to the 1870 Census, iterating with a machine-learning model to reduce errors. We start with 44,077 linkable depositor records that have the depositor’s age and birth state.¹⁵

We first generate candidate links in the 1870 Census that have the same birth state and gender, age within ± 10 years, and a Jaro-Winkler string distance between first and last names ≤ 0.3 .¹⁶ These initial candidate links allow for fairly wide differences because of the high proportion of newly-emancipated people in our sample that have lower levels of numeracy and literacy. The additional supporting information can suggest promising links for records that are less close matches on age and depositor name. We keep at most the top 20 candidate links.¹⁷

¹⁴When race is endogenous to socioeconomic status, the ordering of skin tone categories will not be affected if darker skin tone is negatively correlated with socioeconomic status (which is consistent with what we find in the data).

¹⁵We also restrict the sample to depositors with complexion data, which was recorded for 92% of depositor accounts that were otherwise linkable (based on having the depositor’s age and birth state).

¹⁶We include exact matches on first initial, assigning a Jaro-Winkler distance of 0.3. For age, we adjust for when the depositor account was opened: if someone reports being 33 years old when they opened a bank account in 1873, we consider candidate people that are between ages 20 and 40 in the 1870 Census. We assign gender for the depositor records based on first name, and include an “ambiguous” category for rare intermediate cases that allows for links to men or women. For immigrants, predominately in the New York City branch, we use their birth country rather than birth state.

¹⁷We sort the candidate links as follows: by last-name string distance, then first-name string distance,

We then send these candidate links to our data team, where two people independently hand-link the records. They can link the depositor record to a unique Census record (1:1), link the depositor record to multiple potential Census records (1:m), or make no link to the Census. For cases where the two people make different links, we send these to a third person for reconciliation.

Our hand-linking process takes advantage of additional information beyond what is typically used in more algorithmic linkage across Censuses (Bailey et al., 2020; Abramitzky et al., 2021). Especially useful for our contemporaneous links are the names and ages of other household members recorded on the depositor form: for adults, their spouse and children; for children, their parents and siblings. We show our data team members the Census race, combining Black and Mulatto into a “Black/non-White” category, along with a coarse grouping of depositor complexion (black, ambiguous, white).¹⁸ We also show our data team the first and last name of the depositor and each potential Census match, along with the difference in age between the records.

We attempt to hand-link each depositor record, but we also train a machine-learning model on the hand-links (see Appendix A for details).¹⁹ We then ask a data team member to review hand-links in two categories: (1) hand-links that were made when the machine-learning model assigns a low probability (below 0.10), and (2) hand-links that were not made when the machine-learning model assigns a high probability (above 0.50). We then re-estimate the machine-learning model on the final hand-linked data, generating a match probability that we use for robustness analysis by varying the sample based on estimated link probability thresholds.

We link 14,138 depositor records to the Census uniquely (1:1), which reflects a 32% link rate that is fairly high relative to Census-to-Census links in this time period and particularly for a sample that is predominately recently-enslaved. We attribute this higher linkage rate to our making a more contemporaneous link between Freedman’s Bank records and the 1870 Census, rather than linking between Censuses, and the corresponding ability to take

spouse/parents’ string distance, child/siblings’ string distance, and the difference in depositor age between the depositor record and census record.

¹⁸The “ambiguous” category includes the complexion categories from “very light brown” to “fair” in Table 1, along with the ambiguously named “nearly black.” For depositors with “ambiguous” complexion, data team members would be more likely to consider potential links to Census records with “White” race, but their record linkage decisions would not be differential by socioeconomic status because our data team do not see this other information.

¹⁹We train two random forest models, separately for adult and child links, that include 41 and 49 variables respectively, describing the relationship between the depositor and each potential Census match. Some example variables reflect: string distance between first and last names, nicknames, and family member names; depositor complexion and Census race; age difference; the rarity of each first name; and the extent of missing matching fields in each record.

advantage of household member names that provide high confidence in links.

For example, the depositor record for Lafayette Spencer (Appendix Figure 1) corresponds closely to his Census record (Appendix Figure 2) with spouse Nancy and child Grant (who is 3 months old in the January Bank record and 10/12 months old in the August Census). The occupations also align (farming vs. farmer), along with the location (Hyde County, North Carolina), though we do not use occupation or location in the linkage process. Lafayette Spencer opened his account in 1870 with the New Bern branch (Craven County, North Carolina).

We restrict our analysis to the 14,138 unique links from the Freedman’s Bank data to the 1870 Census. Our main sample includes 10,286 census adults (7,268 men and 3,018 women) and 3,852 children (2,918 boys and 934 girls). Our main analysis uses the pooled sample, and we see similar estimates across adults and children and by gender. The gender imbalance reflects the composition of depositor accounts, rather than substantive differences in linkage rates.

A potential concern would be if we were systematically less likely to find high-SES Black people in the Census, or more likely to find low-SES Black people, among those with non-white skin tones. In this case, we could infer that higher-SES people are less likely to be classified as Black when they are less likely to be found in the Census. We do not observe Census race or wealth for unlinked depositors, but we can use occupation data from the depositor records to compare linkage rates by occupation. Appendix Table 2 shows that for our linkable depositors in the “black/non-white” skin tone category, we are 8.4 percentage points *more* likely to link the record 1:1 for people with a professional occupation in the depositor data and 0.6 percentage points less likely to link the record for people with a service/trade occupation in the depositor data, relative to farmers/laborers. Similarly, among linkable depositors in the “ambiguous” skin tone category, we are 6.7 percentage points and 1.1 percentage points more likely to link the record for people with a professional occupation and service/trade occupation, relative to farmers/laborers.²⁰ That it is somewhat easier to find higher-SES Black people, within skin tone group, is consistent with the 1870 Census under-enumerating the Southern population, particularly poorer Black people (Reid, 1995; Sutch, 2017; Derenoncourt et al., 2024).

Figure 1 shows the locations of Freedman’s Bank branches with surviving depositor records, where the size of the circle is proportional to the number of depositors we link to the

²⁰The differences in 1:1 linkage rates are driven by differences in non-linkage (1:0). We generate potential links for almost all linkable records and, of the 29,329 depositors that we fail to link uniquely, $\approx 10\%$ (2,925) are 1:m links. The differences in linkage rates by socioeconomic status are larger for depositors with white skin tone, but this does not affect our analysis which compares people within skin tone category and we often focus only on people with light brown skin tones (excluding white skin tone).

Census. These 27 branches cover the major Southern cities at the time. 54% of depositors are in their branch county and an additional 8% are in a neighboring county in the 1870 Census. Our estimates are robust to restricting the analysis to depositors in the branch county or neighboring county, as more-distant people may be linked incorrectly, though people may also have opened an account farther away (as in the case of Lafayette Spencer) or moved between the Census date and opening their account. Indeed, the share of depositors living in their branch county or neighboring counties falls from 71% for accounts opened in 1870 to 52% for accounts opened in 1874. As a comparison, Osthaus (1976) estimates that two-thirds of Freedman’s Bank depositors were living in the branch city when they opened their account with select branches.

II.C 1870 Census Data

Census enumerators visited households in 1870, categorizing people as “Black,” “Mulatto,” and “White.”²¹ Census instructions noted: “Be particularly careful in reporting the class Mulatto” to include “all persons having any perceptible trace of African blood” on which “important scientific results depend” (U.S. Census Office, 1870, p. 10). The 1870 Census reflects enumerators’ judgment along with self-reported information.²² The 1870 Census did not ask about African ancestry, noting only whether the person’s mother or father was foreign born, and focused instead on perceived race.²³

Despite Census efforts to track “any perceptible trace of African blood,” our estimates show that the classification of African Americans was in practice more similar to the Census’s handling of Native Americans, which incorporated social status by design. For Native Americans in 1870, enumerators were instructed to consider “the equilibrium produced by the equal division of blood, the habits, tastes, and associations of the half-breed ... to determine his gravitation to the one class [Indian] or the other [White]” (U.S. Census Office, 1872, p. 19). This is consistent with efforts to erase Native American presence, outside reservations, in contrast with efforts to segregate African Americans. However, if the “perceptible trace of African blood” depended on a person’s socioeconomic status (e.g., selectively categorizing wealthier people with light brown skin as White), then this holistic process would determine

²¹The two other racial categories in 1870 were “Chinese” and “Indian” (Native American), which are very rare among Freedman’s Bank depositors and we exclude from our analysis. The 1870 Census labels this column “Color,” but the Census classifications are racially focused in practice and changed over time with evolving racial structures (Hochschild and Powell, 2008; Humes and Hogan, 2009).

²²For example, in discussing the recording of occupation, the 1870 Census instructions note: “You are under no obligation to give any man’s occupation just as he expresses it. If he cannot tell intelligibly what he *is*, find out what he *does*, and characterize his profession accordingly [emphasis original]” (U.S. Census Office, 1870, p. 14).

²³It is rare in our sample for people to have a foreign-born parent and/or be foreign born (1,097 depositors, or roughly 7% of the linked sample), and the estimates are similar when excluding foreign-born depositors and those with a foreign-born parent.

the classification of Black Americans.

The 1870 Census is particularly useful in providing information on household wealth. Census enumerators could record a value of real estate owned and a value of personal estate owned for each person, but generally did so only for the household head, and we define a summed measure of household wealth. Bleakley and Ferrie (2016) show a strong linear relationship between tax-assessed wealth in Georgia and 1870 Census wealth (with a regression coefficient of 1.102 and standard error of 0.062).

We define an indicator variable for whether the depositor’s household has “measured wealth,” defined as $\geq \$100$ total household wealth, which is the case for 27% of our sample households. Census enumerators were instructed to not record personal wealth below \$100, and very rarely record real estate wealth below \$100.²⁴

We also analyze the continuous variation in wealth, adding \$45 for households with unmeasured wealth and taking the natural log. Our baseline adjustment assumes \$45 because some Census enumerators across the country did not follow the instructions and recorded positive values of personal wealth below \$100 (for 2% of households with less than \$100 wealth), with an average value of \$45. This value varies moderately by Census race (\$39, \$40, and \$48 for Black, Mulatto, and White household heads), and the estimated impact of log wealth is very similar when assuming these race-specific values. Unmeasured household-specific wealth below \$100 could attenuate the estimated effects of log wealth, though the estimates for log wealth are similar or only moderately larger when restricting the sample to those with \$100 or greater wealth.

The Census also reports whether people can read or write, for those aged 10 and older. Most depositors can do both or neither in the data (91%), so we define people as “literate” when they can read and write. We also report estimates for intermediate levels of literacy (e.g., read but not write), which fall between both and neither.²⁵

Table 2 reports summary statistics for our sample. 70% of the depositors are racialized as Black in the Census and 14% are racialized as Mulatto. Average household wealth is \$802, which reflects a skewed wealth distribution. Among those aged 10 and older, roughly one-third are literate. Freedman’s Bank depositors are moderately more likely to have measured household wealth and be literate than others of the same Census race in their county, controlling for gender and for being an adult (Table 2, Columns 2 – 4).

²⁴Census instructions were to record the approximate market value of real estate owned by the household, not including any mortgage (U.S. Census Office, 1870), though in this era people were less likely to have mortgages and had lower debt shares on real estate than in the modern US.

²⁵We mainly analyze whether the depositor is literate, but also consider the literacy of the household head.

II.D Data on Geographic Heterogeneity

We use data from several sources on county-level characteristics to explore the extent of geographic heterogeneity in our baseline estimates. We are grateful to the authors for making available their data and code. For county-level racial segregation, we use data from Logan and Parman (2017) that measures county racial segregation based on Black and White households' co-appearance on Census pages in 1880. We also construct reported racial gaps in wealth and literacy, at the county level, using the full-count 1870 Census (omitting Freedman depositors and their families). We use data on racial violence from Chyn, Haggag and Stuart (2024), which detail the location of crimes reported by the Freedmen's Bureau from 1865 to 1868 historically referred to as "outrages" and mostly perpetrated against African Americans. For each county in their covered region, we define the number of reported racial abuses per person racialized as Black or Mulatto in the Census. We also use data on modern intergenerational mobility from Chetty et al. (2026), which characterize county-level Black-White gaps in intergenerational mobility for children born from 1978 to 1992.

We also adapt the technique from Logan and Parman (2017) to measure the racial composition of individuals' neighbors and explore its direct effects on racial assignment and heterogeneity in the effects of wealth and literacy. For each depositor, we define the share of people recorded as Black or Mulatto that were enumerated in the Census within 50 people (plus-or-minus, omitting people within the same household).²⁶ We use this to define Black neighbor share, with values close to 0 or 100 along with intermediate values.

II.E Linkage to Descendants through 1940

To find the descendants of all Black and Mulatto people in 1870, we combine full-count census data from 1870 to 1940 with Census Tree crosswalks that link individuals across censuses (Price et al., 2021; Buckles et al., 2025). We first link all 1870 individuals to their children living in the same household. We then use the Census Tree to link these individuals and their children forward across censuses and, in each subsequent census, identify their own children using within-household parent-child links. This iterative process allows us to track descendants of 1870 individuals through 1940, along with their descendants' race and socioeconomic status. We begin with the full set of Census Tree links and also, for robustness, limit the links to user-supplied genealogical links.

²⁶We do not have Census page data in 1870, as used by Logan and Parman (2017) in 1880, but we sort the 1870 full-count Census in a manner that closely approximates the order of enumeration. We sort the data by the county of enumeration, then by microfilm reel, and then by the order in which each person appears in the 2019 version of the 1870 Census on the NBER server. From manually checking the order of various pages this appears to closely approximate the order in which people were enumerated.

II.F Race and Skin Tone in Modern NLSY Data

Bringing the analysis to modern times, we use data from the National Longitudinal Surveys of Youth (NLSY), conducted by the US Bureau of Labor Statistics, which include information on household-reported race and, in the 2008 wave, enumerated skin tone. Using NLSY97 data, for people born between 1980 and 1984, we focus on five main variables: race, skin tone, income, college completion, and parents' net wealth.

We use two measures of race: one self-reported by the household respondent in the initial interview round in 1997, and one reported by the enumerator in 2007. We restrict our sample to individuals recorded as Black or White (non-Hispanic) in both 1997 and 2007.

Skin tone data were collected for the NLSY97 cohort in the 2008 interview wave, based on interviewer observation using the National Immigration Survey (NIS) color scale. Interviewers compared the respondent's skin color to a color card (Appendix Figure 3), which shows the backs of hands with ten different skin colors from lighter to darker on a numeric scale initially developed for the NIS (Massey and Martin, 2003).

For a measure of socioeconomic status in 1997, we use reported parents' net wealth. For measures of socioeconomic status in 2008, we use reported income and whether the person had completed four years of college.²⁷

III Empirical Specifications

Our main empirical specifications examine race as the outcome. We define three outcomes to capture different margins: whether someone is racialized as White or Mulatto (instead of Black); whether someone is racialized as White (instead of Mulatto or Black); and whether someone is racialized as Mulatto (instead of Black, excluding White people).

We regress these outcomes on depositor characteristic D_i , depositor skin tone, and branch fixed effects:

$$(1) \quad Race_i = \beta D_i + \delta_S SkinToneIndex_i + \gamma_b + \epsilon_i,$$

$$(2) \quad Race_i = \beta D_i + \gamma_{SkinTone} + \gamma_b + \epsilon_i.$$

Equation 1 uses the continuous skin tone index as a control, standardized to have a mean of zero and a standard deviation of one. Equation 2 is our main specification, however, which uses fixed effects for each of the 27 detailed skin tone categories. We include branch fixed

²⁷For Log Income and Log Parental Wealth, we keep only positive reported values (0.7% and 6.3% of the sample, respectively). Our estimates are similar when replacing all non-positive values with \$500 before transforming the data, or analyzing income and wealth levels.

effects, as racial composition varied across branches and different branches often used different terms for skin tones, but our estimates are not sensitive to excluding branch fixed effects or including branch by detailed skin tone category fixed effects. Similarly, while depositors opened accounts between 1865 and 1874, the estimates are not sensitive to including fixed effects for the interaction of branch and account opening year. Most Freedman’s Bank branches had one clerk opening accounts and recording skin tone data (Osthaus, 1976).

To focus on effects for depositors with light brown skin tones, we also estimate equation 2 limiting the sample to depositors in a “light” skin tone group (between “very light brown” and “fair” in Table 1). We also report estimates for people within four other skin tone groups (black, dark, medium, white).²⁸

To explore how the effects of D_i vary across geographic areas, we extend equation 2 to interact D_i with county characteristic X_c :

$$(3) \quad Race_i = \phi(D_i \times X_c) + \beta D_i + \psi X_c + \gamma_{SkinTone} + \delta(D_i \times \gamma_{SkinTone}) + \gamma_{b, SkinTone} + \epsilon_i.$$

Here, our coefficient of interest is ϕ , which reflects the difference in β in counties with one standard deviation greater values of X_c (as we normalize X_c to have mean zero and standard deviation of one). We control for the main effects of X_c and D_i , along with interactions between the depositor characteristic and skin tone fixed effects ($D_i \times \gamma_{SkinTone}$) and branch-by-skin tone fixed effects ($\gamma_{b, SkinTone}$) so variation in geographic effects does not reflect variation in skin tone frequency.

We also consider empirical specifications with race as an independent variable, which reflects the more typical statistical analysis of race. For example, a typical analysis would regress wealth on an indicator for being classified as Black (or Mulatto) to estimate the racial wealth gap ($D_i = \beta_R Race_i + \epsilon_i$). In addition to these cross-race comparisons, we explore how the endogenous assignment of race affects within-race analyses that “control for race” ($D_i = \beta_Z Z_i + \beta_R Race_i + \epsilon_i$), where β_Z is affected by selective assignment of $Race_i$ based upon both D_i and Z_i . While skin tone is our leading example of Z_i , the effect of racial selection applies more broadly. For both cases, cross-race and within-race analyses, we show statistical adjustments for the endogenous assignment of race using sub-samples with data on skin tone and/or linked ancestry.

²⁸These skin tone groups are also defined from the detailed skin tone categories in Table 1: Black (black and colored); Dark (dark to medium dark brown); Medium (medium black to dark mulatto); and White (white).

IV Racial Assignment in the 1870 Census

IV.A Race as an Outcome

Table 3 reports that people are 11 percentage points more likely to be racialized as White or Mulatto if they have measured wealth in the Census (Panel A, Column 1). Having a one standard deviation darker skin tone index value substantially reduces the probability that someone is racialized as White or Mulatto by 29 percentage points, but conditional on this skin tone index there is also a substantial influence of wealth.²⁹

Column 2 is our preferred specification, replacing the skin tone index with detailed skin tone category fixed effects, which shows a very similar influence of wealth on racialization. Columns 3 and 4 report a 7 percentage point increase in whether people are racialized as White, compared to Mulatto or Black. Columns 5 and 6 show a 9 percentage point increase in being racialized as Mulatto compared to Black, excluding White people from the sample. Panels B and C report impacts of log wealth and literacy, in which these different proxies for socioeconomic status are also positively associated with being racialized as White or Mulatto.³⁰

Table 4 shows that this racial fluidity is greatest among people with light brown skin tones, reporting estimates separately by skin tone group. The effect of measured wealth on the probability that someone is racialized as White or Mulatto (Panel A) increases from 8.5% for those with “dark” skin tone to 21.0% for people with “light” skin tones (between “very light brown” and “fair”). The effect of wealth then decreases to 1% for people with “white” skin tone, as almost all people with white skin tone are classified as White in the Census. This shows that our main estimates are not driven by this group with white skin tone; rather, of specific interest are the people who are White in the Census with non-white skin tones. When estimating the probability that someone is racialized as White (Panel B), the effects are concentrated in the light skin tone group (24.0%). We report similar patterns for log wealth and literacy, estimated separately as in Table 3. These estimated magnitudes are substantial relative to the mean probabilities of racial assignment, by skin tone, reported in Table 1.

Figure 3 plots these estimated coefficients to visualize the pattern: intuitively, people with light skin tones are statistical “compliers” to the influence of socioeconomic status. By

²⁹A one standard deviation increase in the skin tone index corresponds to an increase of 0.3 (from Table 1), or roughly from “light” complexion to “brown” complexion.

³⁰The effects of log wealth are roughly linear through most of the sample, and not sensitive to omitting the largest values of wealth. Appendix Table 3 extends the literacy results, using four categories: can neither read nor write (the omitted group); can write but not read (very rare, less than 1% of the sample); can read but not write; and can read and write (our baseline definition of literacy). Partial literacy is somewhat predictive of race among people with the same skin tone, particularly along the Mulatto vs. Black dimension, and full literacy is more predictive of race.

contrast, when people have dark skin tones (or “white” complexion), their racialization is less sensitive to their wealth and literacy.³¹

Table 5 reports geographic heterogeneity in our baseline estimates. We report how the effects of wealth and literacy on race vary in counties with one standard deviation: higher racial segregation in 1880 (Column 1); greater gap in Black-White literacy in the Census (Column 2); greater gap in Black-White wealth in the Census (Column 3); greater reports of racial abuses against African Americans (Column 4); and greater Black-White gap in intergenerational economic mobility in the modern period (Column 5). Overall, the coefficients in Table 5 are small in magnitude relative to the main effects in Table 3, indicating that the estimated effects of wealth and literacy are substantively similar across counties.

Table 5 indicates a somewhat smaller effect of socioeconomic status on race in counties with higher racial segregation (Column 1), in which Census enumerators may be less likely to encounter Black or White people in the same locations, and we show further (below) how assigned race is more substantively influenced by neighborhood composition within county. In counties where there is a greater racial gap in literacy (Column 2), literacy has a somewhat greater effect on their assigned race. In counties with a larger racial wealth gap, however, racial boundaries were more fixed and wealth had a somewhat lower effect on being considered White (Column 3). In counties with more racial violence during the 1865–1868 period, there is a slightly greater effect of wealth on being considered White (Column 4). There is little variation in the effects associated with counties’ modern gap in measured Black-White intergenerational mobility (Column 5).

Within county, we can look further at how individuals’ racial identities are shaped by smaller, neighborhood-level environments. We estimate how the effect of wealth or literacy varies with the share of their closest neighbors who are Black (or Mulatto).³² Among individuals with light brown skin tones, recorded race is insensitive to their wealth and literacy if all nearby Census-enumerated individuals are White or if most are Black, but highly sensitive to wealth and literacy for intermediate values of neighbors’ racial composition (Figure 4). Black neighbor share also has a direct effect on racial assignment, both with and without controlling for wealth and literacy (Table 6), which suggests Census enumerators were inferring individuals’ race based on their social environment beyond their individual characteristics.

The interaction of wealth and literacy is also predictive of race. Table 6 shows that

³¹There continues to be some smaller effect of wealth and literacy on racialization for those with darker skin tones, including those recorded as having “black” skin tone, which can reflect more ambiguous or racialized skin tone measurements.

³²We use the ordering of households in the Census data and calculate the share of people who are recorded as Black or Mulatto within ± 50 observations of the depositor (omitting people within the same household).

having measured wealth and being literate are both predictive of Census race, when included together instead of individually as before, and the interaction of wealth and literacy further predicts Census race.³³ Socioeconomic status is naturally multi-dimensional, and these estimates suggest that racial assignment is particularly influenced by movement along multiple dimensions in concert.

To explore further this multi-dimensionality, we also estimate the effects of other depositor characteristics that are recorded on the Freedman’s Bank depositor form: the depositor’s name, occupation, and a proxy for literacy. Another reason to examine the effects of these Bank record characteristics is that these effects would be attenuated by record linkage error, in contrast to the effects of Census measures of wealth and literacy (and, below, we further examine the robustness to record linkage).

First, we define names as “Distinctively Black,” based on racially specific naming patterns that had emerged by this era (Cook, Logan and Parman, 2014, 2016, 2022).³⁴ Table 7 reports that people are less likely to be racialized as White or Mulatto when they have a more distinctively Black name in their depositor record (Panel A), which suggests additional channels through which race is socially constructed that need not be directly associated with socioeconomic status.

Second, the depositor record often lists an occupation, which is a proxy for socioeconomic status. There is potentially wide dispersion of incomes among “farmer” and “farming” (along with “farm laborer” and “laborer”), though opportunities for higher incomes within agriculture were limited among African Americans. We define occupational categories of “Professional” and “Service/Trades” occupations, which we compare to the omitted category of “Farmer/Laborer.”³⁵ If depositors have a professional or service/trade occupation, they are more likely to be racialized as White or Mulatto (Table 7, Panel B).

Third, the Bank account opening record also had a signature line, where it appears that

³³We find this interaction effect with or without including Black neighbor share in the regression specification.

³⁴For each first name, we calculate the share of people with that first name that are racialized as Black or Mulatto in the 1870 Census (by gender). We also estimate differential racialization based on the list of distinctively Black first names reported by Cook, Logan and Parman (2014), which limits the sample to men. We also find differential racialization associated with having a distinctively Black last name, which is not strongly correlated with having a distinctively Black first name.

³⁵For the “Professional” category, we looked to include occupations that involved higher-level education and/or office work (e.g., teachers, nurses, merchants, clerks), which corresponded closely to occupations with higher average education in 1950 (“edscore” ≥ 12) and so, in practice, we assign this cutoff. For the omitted “Farmer/Laborer” category, we looked to include occupations with more-intensive outdoor manual labor (e.g., farmer, farming, laborer, gardener, horse worker, woodcutter). For the middle-range “Service/Trades” category, we assigned the remaining occupations often associated with domestic labor and trades (e.g., laundress, cook, servant, housekeeper, driver, blacksmith, carpenter, bricklayer). We exclude those with missing occupations or children in school. The occupational composition of depositors is: 1,216 “Professional,” 5,547 “Service/Trades,” 3,696 “Farmer/Laborer,” and 3,679 uncategorized.

the depositor sometimes signed their own name and sometimes the bank clerk wrote the name with an X along with writing “his mark” or “her mark.” We use whether the depositor signed their own name as a proxy for literacy. Depositors are more likely to be racialized as White or Mulatto if they wrote their name on the signature line (Table 7, Panel C). There is no detectable effect of “his/her mark” on being racialized as White (rather than Mulatto or Black), but the estimates across Table 7 are consistent with Census enumerators racializing people differently based on characteristics from the depositor records after controlling for detailed skin tone fixed effects.

Appendix Table 4 reports jointly-estimated coefficients, including the depositor record variables from Table 7 and the Census variables from Table 6. Coefficients from such specifications can become more difficult to interpret due to the variables’ correlation, as in the case of literacy and “his/her mark,” but many of these variables are not so strongly correlated and their jointly-estimated coefficients have a similar interpretation as their individually-estimated coefficients. Most of these measures predict differential racialization, conditional on the other measures, and some effects are stronger (e.g., as in the case of distinctively Black names).

IV.B “Reverse Causality” and Unmeasured Characteristics

Our baseline findings indicate the social construction of race along economic lines in addition to physical differences between people. This interpretation would remain the same if racialization is influenced by other unmeasured socioeconomic characteristics that are correlated with wealth (e.g., attire or speech patterns). We do not claim these results isolate the causal effect of wealth on racialization; rather, we argue that wealth captures features of someone’s past and present socioeconomic environment that cause them to be racialized differently.

The interpretation would be different, however, if race was entirely determined by other unmeasured physical characteristics that are correlated with wealth. For instance, it is possible that the physical appearance of “whiteness” might directly affect socioeconomic status, either via reduced exposure to discrimination or because of wealth transfers from European ancestors (Myrdal, 1944; Frazier, 1957). If this “reverse causality” is only weakly captured by measured skin tone, and wealth is highly correlated with the unmeasured physical attributes determining racialization, then we might estimate a significant relationship between wealth and racialization where no causal link exists between SES and race. Indeed, without data to control for skin tone, wealthier people would clearly be more often White in the 1870 Census.

More broadly, to the extent that unmeasured physical features predict race (e.g., hair, facial features, subtleties of skin tone), and are correlated with wealth, one could try to

maintain the null hypothesis that race was entirely determined by physical features and not constructed along socioeconomic lines.³⁶

We have an opportunity to bound the influence of unmeasured physical characteristics, using the influence of detailed skin tone data that we do observe. This bounding exercise applies a method from Cinelli and Hazlett (2020), related to Altonji, Elder and Taber (2005); Oster (2019); Masten and Poirier (2026). If we only observed three coarse groupings of skin tone (darker, light, white), similar to what is more often observed when skin tone data are available, then we could still look to estimate the effect of wealth on racialization conditional on those coarse skin tone group fixed effects.³⁷ We would be concerned about unmeasured physical characteristics, however, because of potential remaining variation in skin tone (very light vs. light vs. light brown and brown vs. dark brown vs. dark). When we augment the analysis with more detailed skin tone data, we can quantify how including the skin tone index affects the estimates (due to its joint predictive power for race and its correlation with wealth beyond the three coarse skin tone group fixed effects). We can then consider how our estimated effects would change if we discovered yet another measure of physical characteristics, which was equally jointly predictive of race and wealth as the skin tone index.

Figures 5, 6, and 7 illustrate the potential attenuation of our baseline estimates from the inclusion of additional controls for physical appearance. The curved contour lines represent adjusted effects of wealth or literacy on race due to unmeasured characteristics having the indicated joint explanatory power for race (on the y-axis) and wealth or literacy (on the x-axis). For example, if unmeasured physical characteristics explained all residual variation in race (moving up the y-axis to one), then these characteristics would still need to be 4.5 times more correlated with wealth than the skin tone index to account for our baseline estimate.

Figure 5 shows the limited scope for unmeasured physical characteristics to explain our main estimated impacts of wealth on racialization. The lower left red diamond indicates that the estimated effect of wealth would drop from 0.108 to 0.099 with the addition of another variable that was as influential as adding the skin tone index (beyond three coarse groupings of skin tone).³⁸ With the addition of another summary measure of physical characteristics that is five times as influential as the skin tone index, the estimated effect of wealth would

³⁶Physical features can also be endogenous to wealth and other aspects of socioeconomic status, but here we consider the potential concern in which physical features are exogenous and predictive of race (while being correlated with wealth). We do not see substantial seasonality in recorded skin tone categories among depositors that opened accounts on two different dates, comparing accounts opened from May to September to those opened from November through March, both for all duplicate accounts and differentially for farmers relative to non-farmers.

³⁷For this specification, we group the Table 1 categories into: darker (from “black” to “dark Mulatto”), light (from “very light brown” to “fair”), and white.

³⁸The baseline effect is normalized to the origin, which corresponds to the specification from Table 3 (Panel A, Column 1) with the addition of the three coarse skin tone group fixed effects.

drop to 0.063 (the second red diamond). To entirely explain the effect of wealth, reaching zero at the dotted blue line, unmeasured physical characteristics would need to be 12 times as correlated with race and wealth as the detailed data on skin tone – which itself was the primary identifying information collected by the Bank.

Figure 6 shows similar robustness exercises for the effects of log wealth and literacy on whether people are racialized as White or Mulatto rather than Black. Figure 7 shows robustness for the effects of measured wealth on being racialized as White rather than Black or Mulatto, which requires unmeasured characteristics to be substantially more explanatory than our detailed skin tone data, and also shows a robust effect of measured wealth on whether people are racialized as Mulatto compared to Black.

Overall, these estimates indicate a substantial and robust relationship between proxies for socioeconomic status and racialization that would be difficult to quantitatively account for with unmeasured physical characteristics of depositors that cause people to have higher wealth (“reverse causality”) or are otherwise correlated with having higher wealth.

IV.C Robustness to Linkage Error and Alternative Specifications

Record linkage error is a main source of concern that we look to address. Because White and Mulatto people tend to have more wealth or higher literacy than Black people in the Census, inaccurate links to White or Mulatto people could cause us to observe people that both have higher wealth or literacy and are racialized as White or Mulatto. Linkage errors could then generate spurious average “effects,” though would not generate the differentially greater effect of wealth among those with light skin tones (from Table 4): our data team did not observe wealth or literacy when linking records, so mistaken links should be associated with the same average difference in wealth across skin tone groups.³⁹ Further, linkage error would attenuate estimates in our specifications that use depositors’ Bank record characteristics as explanatory variables.

Appendix Table 5 shows that our results are not sensitive to restricting the record links included in the analysis. Column 2 excludes links that the machine-learning model assigns a probability below 0.10, though human linkers were still comfortable with these links after re-hand-linking, and Column 3 excludes links that the machine-learning model assigns a probability below 0.50. Our preferred conservative approach more directly leverages the other household member names, restricting the sample to depositors with at least one other family member whose name aligns (Column 4) or at least two other family members whose names

³⁹The data team members may be more likely to link White people in the Census to depositors with “ambiguous” skin tones, on average, but this should not vary with a person’s wealth conditional on making a link. In practice, we are not more likely to link depositors with “ambiguous” skin tones to the 1870 Census. Also, the data team members did not observe whether someone was racialized as Black or Mulatto in the Census, which we combined into a “Black/non-White” category.

align (Column 5). Column 6 finds similar estimates when restricting our hand-linked sample to depositors whose name matches exactly to the Census name, and their age difference is within one year (due to variation in birthdays relative to the Census date and Bank account opening date). Appendix Table 6 shows similar effects of depositors’ Bank record characteristics when making the same sample restrictions.

Appendix Table 7 reports estimates when restricting the sample of depositors. We see similar effects among people living in their birth state (Column 2) and people living outside their birth state (Column 3), which suggests that migration did not substantively reset someone’s race to become more or less based on their socioeconomic characteristics. This is consistent with the geographically pervasive influence of socioeconomic characteristics on racialization from Table 5. Column 4 reports somewhat smaller effects among depositors living in the same branch county or neighboring counties as their Bank account. This may reflect a different set of depositors who traveled longer distances to open accounts, or potentially more reliable links to local depositors, though we find little effect of limiting the sample links (Appendix Tables 5 and 6). The estimates are similar to our baseline estimates when excluding the New York City branch that had more immigrant depositors (Column 5) and excluding all depositors who are foreign-born or have a foreign-born parent (Column 6).

Appendix Table 8, Column 2, reports larger estimates when omitting the more “racial” categories of skin tone (black, nearly black, colored, mulatto, white, nearly white). These “racial” skin tone labels may be subject to non-classical measurement error if some Freedman’s Bank clerks, similar to Census enumerators, were more likely to write down “black” or darker skin tones when people looked poorer. This bias in recorded skin tone would attenuate our baseline estimates: depositors would have lighter racial skin tone categories recorded when they are richer, even though their true skin tone is darker, so wealthier people would be *less* likely to be racialized as White or Mulatto by the Census within recorded skin tone categories (because they actually have darker skin tones).

Column 3 of Appendix Table 8 limits the sample to household heads only. It is not indicated who was present with the Census enumerator, but household heads are perhaps more likely to have interacted directly with the Census enumerator.

Appendix Table 8 also shows similar effects across gender and age, restricting the sample to women (Column 4) and children (Column 5). Column 6 restricts the sample to households with measured wealth (\$100 or greater), which shows similar effects of log wealth and somewhat larger variation with literacy.

Appendix Table 9 shows that the literacy of the household head is similar to or more influential than the literacy of the depositor themselves, consistent with broader social influences on how the depositor is racialized beyond their individual characteristics.

Appendix Tables 10 and 11 separate the influence of real estate wealth and personal property wealth, in which both matter individually and jointly, but having real estate wealth is somewhat more influential.

Appendix Table 12 reports similar estimates when varying the included control variables. Column 2 omits the branch fixed effects. Columns 3 – 7 include additional controls for: fixed effects for branch interacted with detailed skin tone category; fixed effects for branch by year of account opening; being emancipated prior to 1860; gender along with age and age-squared; and county fixed effects.⁴⁰ These specifications adjust for other potential sources of variation in differential racialization across people and places.

V Statistical Implications for Cross-Race Differences, Past and Present

The endogenous assignment of race has implications for measured racial disparities. We first consider the Black-White wealth gap in 1870: when “Black” includes only the Census-assigned Black and Mulatto population, this selectively omits some wealthier people with non-white skin tones who are classified as White in the Census but were enslaved or the descendants of enslaved people and would have been classified as Black or Mulatto if they were poorer. An alternative to the endogenous reported Black-White wealth gap is a fixed ancestral wealth gap: the wealth of people with any African ancestry, relative to people with only European ancestry.⁴¹ The difference in these measures reflects endogenous racial classification, yet a key empirical challenge is that African ancestry is unobserved in the full Census. We show how to use a sub-sample with supplemental data, from the Freedman’s Bank, to infer the share of White people with African ancestry in the general population and quantify the impact of endogenous racial assignment on the measured wealth gap.

We then estimate selected racial assignment of descendants through the 1940 Census, along with selected assignment of household-reported and enumerator-reported race in modern NLSY97 data. We compare differences by reported race to adjusted differences using data on linked ancestry and/or skin tone.

⁴⁰As an imperfect proxy for whether people were free in 1860, we use a machine-learning model to link Black and Mulatto people from 1870 back to 1860 when free people were enumerated by name in the Census (and enslaved people were counted without names).

⁴¹In 1870, this reflects the wealth gap between those who were and were not enslaved or the descendants of enslaved people. Colonial laws – such as the Virginia Slave Codes of 1705 – distinctly separated indentured servants of European ancestry from enslaved people of African descent, making slavery an inheritable condition for the latter group.

V.A Unadjusted and Adjusted Racial Wealth Gaps in 1870

In the 1870 Census, average Black household wealth ($\omega_B^C = \$266$) was 5.7% of average White household wealth ($\omega_W^C = \$4,633$) in Freedman’s Bank branch counties.⁴² Black economic outcomes are lowered, however, when higher-SES people are more likely classified as White. An alternative measure, which avoids this endogenous classification, is an ancestral wealth gap: the wealth of those with any African ancestry relative to those with exclusively European ancestry: ω_A/ω_E .

The difference between these wealth ratios is due to people of African ancestry who are classified in the Census as White. An unknown share of people with African ancestry are classified in the Census as White ($P_{W|A}^C$) and an unknown share of White people in the Census have African ancestry ($P_{A|W}^C$), where the C superscript denotes measures in the full Census. Using this notation, we can reconstruct the average wealth of all individuals of African ancestry as the probability-weighted wealth of Black people (ω_B^C) plus the wealth of White people of African ancestry ($\omega_{W,A}^C$):

$$(4) \quad \omega_A^C = \left(P_{B|A}^C \times \omega_B^C \right) + \left(P_{W|A}^C \times \omega_{W,A}^C \right),$$

where we assume that all reported Black people in the Census are of African ancestry. Similarly, we reconstruct the average wealth of people of exclusively European ancestry as the wealth of White people minus the wealth of White people of African ancestry (with probability weights):

$$(5) \quad \omega_E^C = \left(\frac{1}{P_{E|W}^C} \times \omega_W^C \right) - \left(\frac{P_{A|W}^C}{P_{E|W}^C} \times \omega_{W,A}^C \right).$$

Our goal is to use the Freedman subsample, in which we observe skin tone and wealth, to adjust the full Census data in Freedman branch counties in which we do not observe the frequency or average wealth of Census-assigned White people with African ancestry. We assume that Freedman’s Bank depositors with recorded non-white skin tones are of some African ancestry in 1870, i.e., formerly enslaved or recent descendants of enslaved people.⁴³

A first important unknown, in the Census, is the probability that someone is reported as White if they are of African ancestry: $P_{W|A}^C$. We start by assuming this probability in the full Census is the same as in the Freedman data where it can be estimated directly: $P_{W|A}^C =$

⁴²These data reflect household wealth for each individual, continuing to impute \$45 for households with zero reported wealth, so this reflects household wealth for an average individual reported to be of that race.

⁴³In our Freedman data, 99.8% of the people who are Black in the Census have non-white skin tone, and we assume the few exceptions are linkage error or the Bank recording white skin tone for someone with African ancestry.

$P_{W|A}^F = 0.047$. We later relax this assumption to hold conditional on observables, which does not substantially affect the results, consistent with the similarity between Freedman’s Bank depositors and other Black people in the same counties (Table 2).

We cannot make the same assumption about the share of White people in the Census with African ancestry ($P_{A|W}^C$), equating this with the share of White people in the Freedman data with African ancestry ($P_{A|W}^F$), because the Freedman’s Bank targeted people of African ancestry and so people of African ancestry are highly over-represented among White Freedman depositors. This would violate the assumption of equal conditional distributions (“missing at random”) in the literature on using sub-samples to adjust for non-classical measurement error (Chen, Hong and Tamer, 2005; Chen, Hong and Nekipelov, 2011; Carlson and Dell, 2025), as White people are more likely to have African ancestry in the Freedman sub-sample even conditional on observables. Indeed, if we omitted the relatively small share of Freedman depositors with white skin tone, then every White person in the Freedman sample would be of African ancestry.

In this sample, however, we can still estimate the probability of someone with African ancestry being reported as White in the Census. From our above assumption, that $P_{W|A}^C = P_{W|A}^F$, we can then apply Bayes’ Rule to infer the probability of African ancestry among White people in the Census:

$$(6) \quad P_{A|W}^C = \frac{P_{W|A}^C \times P_A^C}{P_W^C} = \frac{P_{W|A}^F \times \frac{P_B^C \times P_{A|B}^F}{P_{B|A}^F}}{P_W^C} = \frac{0.047 \times \frac{0.220 \times 1}{0.953}}{0.780} = 0.014.$$

This calculation includes a second application of Bayes’ Rule, $P_A^C = \frac{P_B^C \times P_{A|B}^F}{P_{B|A}^F}$, and our assumptions that $P_{W|A}^C = P_{W|A}^F$ and that all Black people in the Census have African ancestry (such that $P_{A|B}^C = P_{A|B}^F = 1$).

The second important unknown, in the Census, is average household wealth for people recorded as White with African ancestry ($\omega_{W,A}^C$). In the Freedman data, we measure $\omega_{W,A}^F = \$3,295$. We assume a constant scaling in average household wealth between the Census and Freedman data ($\frac{\omega_{W,A}^C}{\omega_{W,A}^F} = \frac{\omega_B^C}{\omega_B^F}$), such that:

$$(7) \quad \omega_{W,A}^C = \omega_{W,A}^F \times \frac{\omega_B^C}{\omega_B^F} = 3,295 \times \frac{266}{230} = 3,811.$$

This average wealth of White households with African ancestry is somewhat lower than the average wealth of reported White households, but substantially higher than the average wealth of reported Black households.

With these parameters, we calculate that household wealth in 1870 for people of African

ancestry is 9.3% of household wealth for people of European ancestry:

$$\begin{aligned}
 (8) \quad \frac{\omega_A^C}{\omega_E^C} &= \frac{(P_{B|A}^C \times \omega_B^C) + (P_{W|A}^C \times \omega_{W,A}^C)}{(\omega_W^C - P_{A|W}^C \times \omega_{W,A}^C) / P_{E|W}^C} \\
 &= \frac{(0.953 \times 266) + (0.047 \times 3,811)}{(4,633 - 0.014 \times 3,811) / 0.986} = \frac{433}{4,645} = 0.093.
 \end{aligned}$$

The bootstrapped 95% confidence interval is between 0.078 and 0.113, resampling both the Freedman sample and Census population 1,000 times.⁴⁴

This adjustment substantially increases (by 63%) average Black household wealth in 1870 as a share of average White household wealth, from shifting people with African ancestry from the group reported as White to the group reported as Black (or Mulatto). Reclassifying 1.4% of reported White households into the set of people with African ancestry increases the size of this group’s population by 5% and raises average wealth substantially above that of people classified as Black, while leaving average White-European wealth largely unchanged.⁴⁵ One implication of higher adjusted wealth in 1870, among people of African ancestry, is to imply slower subsequent convergence in wealth disparities.

This adjustment need not reduce measured wealth disparities, in all contexts in which race is socially constructed, and depends on the extent of racial reclassification and the relative wealth of reclassified people. For example, if the average wealth of White people with African ancestry were sufficiently low in our setting ($\omega_{W,A}^C < \$340$), then reclassifying this group would raise average White wealth more than average Black wealth and ω_A^C / ω_E^C would be less than ω_B^C / ω_W^C .

Our starting assumption was that estimated racial fluidity in the Freedman sample, where skin tone is observed, is equal to the degree of racial fluidity in the full Census ($P_{W|A}^C = P_{W|A}^F$). Racial fluidity was highest among people with light brown skin tones and, while there are no skin tone data for the full Census, the Mulatto share of Black or Mulatto households in the Freedman sample (16.96%) is similar to the Mulatto share of Black or Mulatto households in the Census in Freedman branch counties (16.68%). Also, Freedman depositors were only moderately wealthier than the average person in the Census of the same race (Table 2), despite in both datasets those classified as Mulatto being four times wealthier than those classified as Black. These moderate differences may increase the share of people with African ancestry

⁴⁴The confidence interval is very similar (0.079, 0.116) when resampling only the Freedman sample 1,000 times.

⁴⁵This adjustment has similar effect when setting household wealth to zero for all bottom-coded observations in the 1870 Census, as in Derenoncourt et al. (2024). Under this assumption $\omega_B^C / \omega_W^C = 0.050$ and $\omega_A^C / \omega_E^C = 0.086$, with an implied increase of 72%.

reported as White, though Freedman depositors also selected into an organization marketed specifically to formerly-enslaved people and may have been less integrated into White society. To see the sensitivity of the statistical adjustment to this assumption ($P_{W|A}^C = P_{W|A}^F$), we calculate an adjusted ratio of 7.5% when setting $P_{W|A}^C = 0.5 \times P_{W|A}^F$ and an adjusted wealth ratio of 12.9% when setting $P_{W|A}^C = 2 \times P_{W|A}^F$.

To relax this assumption, $P_{W|A}^C = P_{W|A}^F$, we return to the literature on using sub-samples to address non-classical measurement error (Chen, Hong and Tamer, 2005; Chen, Hong and Nekipelov, 2011; Carlson and Dell, 2025). If we observed African ancestry in a random sub-sample, conditional on observable characteristics (X), we could follow the existing literature and assume $P_{A|W,X}^C = P_{A|W,X}^F$ and re-weight wealth differences by ancestry in the Freedman data to match the distribution of observable characteristics in the Census. However, because the Freedman’s Bank targeted people of African ancestry (e.g., $P_{A|W}^F = 30\%$), we would also expect this share of White people with African ancestry to be higher within observable group cells in the Freedman data relative to the Census. Instead, we adapt our application of Bayes’ Rule to assume $P_{W|A,X}^C = P_{W|A,X}^F$ and relax our starting assumption by conditioning on observable characteristics.

Splitting the data by literacy, for example, $P_{W|A}^F$ for a literate person is 0.118 and for a non-literate person is 0.021. This reflects literate people of African ancestry being more likely classified as White, yet this does not imply that a literate White person is more likely to be of African ancestry than a non-literate White person. In the Census, the Black share of the literate population is substantially smaller than the Black share of the non-literate population (0.077 vs. 0.412). Applying Bayes’ Rule separately by literacy group implies that $P_{A|W}^C$ is 0.011 for a literate person and 0.015 for a non-literate person. That is, while a literate person of African ancestry is more likely to be classified as White, the literacy rates of people with European ancestry are substantially higher than the literacy rates of people with African ancestry, and so the probability of a White literate person being of African ancestry is somewhat less than the probability of a White non-literate person being of African ancestry. Combining this with the relative wealth of literate and non-literate people, by Census race and skin tone, implies $\omega_A/\omega_E = 9.2\%$.

More generally, we can split the data into finer bins in a fully saturated model defined by the interaction of multiple observable characteristics (see Appendix B). We calculated $\omega_A/\omega_E = 9.2\%$ assuming $P_{W|A,X}^C = P_{W|A,X}^F$, where X is an indicator for literacy.⁴⁶ Extending X to 4 bins, based on the interaction of literacy and household head, we estimate an adjusted wealth ratio $\omega_A/\omega_E = 9.4\%$. Extending X to 16 bins, based on the interaction of

⁴⁶For children under 10, who do not have reported literacy, we set literacy equal to zero for this exercise to maintain the same sample households as in the unconditional estimates.

literate, measured wealth, gender, and household head, we estimate an adjusted wealth ratio $\omega_A/\omega_E = 9.1\%$.

V.B Racial Classification of Descendants through 1940

While racial assignment was endogenous to socioeconomic status during Reconstruction, this influence might have faded through the Jim Crow segregation era. For example, as the “one drop rule” became socially and legally established across the US South, the share of people of African origin classified as White might have been driven lower. We now explore the fluidity of racial classification in later periods, following individuals’ descendants through the 1940 Census, and the implications for wealth gaps by reported race and latent ancestry. The Census categories changed over time, removing Mulatto as a category by 1940, so for later periods we combine Black and Mulatto categories into one Black category. We assume that endogenous classification happens in one direction: people with African ancestry may be classified as White, but people with non-African ancestry are not classified as Black.

We trace all descendants of Black and Mulatto people in the 1870 Census, following successive generations across censuses using the Census Tree links. Figure 8 shows that, for all Black or Mulatto people in the 1870 Census, a substantial share of their linked descendants are classified as White in later Censuses (Panel A). In 1900, roughly 20% of linked descendants are classified as White. In 1940, this number rises to approximately 50%. These numbers may be overstated by false links from Black people to White descendants, but the magnitudes are similar in the full Census Tree and restricting links to more genealogical hand-links provided by users.⁴⁷ Panel B reports estimates separately for Black and Mulatto people in 1870, where a greater share of Mulatto people’s linked descendants are White in later Censuses but a still substantial share of Black people’s linked descendants are White in later Censuses. For White people in 1870, 1% or fewer of their linked descendants are classified as Black in each subsequent Census.

Selected racialization, associated with SES, is evident across generations, similar to the SES-based racialization process we estimated in 1870. Descendants in 1940 are more likely classified as White when their linked Black or Mulatto ancestor in 1870 had higher socioeconomic status. Table 8, Column 1, shows that having measured wealth in 1870 is associated with a 7.2 percentage point increase in the probability that a linked descendant is classified as White in 1940, while being literate is associated with an increase of 14.9 percentage points.

⁴⁷These numbers also reflect the share of *linked* descendants who are White, and the Census Tree links White people across Censuses at higher rates than Black people. Linked White descendants of Black or Mulatto people in 1870 are 11% of the total Black population in 1940, which understates the share of descendants classified as White because it omits unlinked White descendants of Black and Mulatto people.

Further, comparing linked descendants of the same 1870 ancestor, those classified as White in 1940 have 74% higher wage income than those classified as Black (Table 8, Column 2; 0.553 log points).⁴⁸ This could reflect the impact of socioeconomic status on the probability of a descendant being classified as White; but, without skin tone data, this might also reflect that descendants who appear White have fewer obstacles to increasing socioeconomic status. Under either mechanism, an implication is that statistical disparities in 1940 for the reported Black population will overstate statistical disparities in 1940 for the population with a Black or Mulatto ancestor in 1870 and, in that sense, African ancestry.⁴⁹ As wealthier people of African ancestry become recorded as White, measured racial disparities in later periods understate upward economic mobility among people of African ancestry.

In the full 1940 Census, average wage income for Black people was 42% of average wage income for White people (\$498 vs. \$1,188).⁵⁰ Using all Census Tree links, roughly 370 thousand of these White people in the labor force in 1940 are linked to a Black ancestor in 1870, and these people have average wage income of \$1,011. Recombining this group with the reported Black population in 1940, instead of the reported White population, average wage income for all people linked to African ancestry was 46% of average income for the remaining White population. This adjustment is a lower bound on the African/European wealth ratio, however, because of the large number of missing links. Only 16% of Black people in 1940 are linked to a Black ancestor in 1870, which suggests that many White people in 1940 are also missing links to a Black ancestor. Assuming that White people in 1940 are missing links to a Black ancestor at the same rate as Black people in 1940, this implies 2.3 million White people in 1940 with African ancestry,⁵¹ in addition to the 3.4 million reported Black people in the labor force in 1940. Assuming that linked and unlinked White people with African ancestry have the same average income (\$1,011), the ancestry-based income ratio increases from 46% to 58%. This adjustment implies faster income convergence for all descendants of formerly enslaved people, compared to income convergence among people classified as Black in each period.

⁴⁸This specification includes 1870 ancestor fixed effects and controls for individual characteristics in 1940 (age, age-squared, gender), limiting the sample to people ages 18 – 64 who were working at least 26 weeks with positive wage income in 1940.

⁴⁹This analysis omits the linked descendants of people who were categorized as White in the 1870 Census with African ancestry, who were relatively wealthier in 1870.

⁵⁰For these calculations, we continue to limit the sample to people ages 18 – 64 and working at least 26 weeks with positive wage income.

⁵¹The implied 1940 share of White people with African ancestry, 1.9%, is consistent with our corresponding estimate of 1.4% for Freedman’s Bank counties in 1870, and with Bryc et al. (2015) who find that 3.5% of White-identifying 23andme.com users in 2013 have some African genetic ancestry. This estimate is an upper bound on the number of White people with African ancestry if White people in 1940 who had Black ancestors are at least as likely to be linked backwards to their Black ancestors as Black people.

V.C Racial Classification in Modern NLSY Data

We next explore the degree of racial fluidity in modern NLSY data (National Longitudinal Surveys of Youth), where race is household-reported for children in 1997 (ages 13-17) and enumerator-reported for those children in 2007 (ages 23-27). The NLSY97 sample combines detailed SES data with reported physical skin tone measured by enumerators in 2008. We limit the sample to 4,342 people reported as Black or White (Non-Hispanic) in 1997 and 2007, for whom we have skin tone data.

Table 9 reports estimated racial fluidity across people, controlling for skin tone fixed effects, for the whole sample (Column 1) and splitting the analysis by the ten reported skin tone groups (Columns 2 – 11). Among people with light brown skin tones (Columns 8 – 9), for whom there is substantial variation in racial identification, the probability that someone is White is substantively and statistically associated with higher income in 2008, parents' net wealth in 1997, and college completion by 2008. This table uses household-reported race in 1997 as the outcome variable; Appendix Table 13 reports very similar estimates using enumerator-reported race from 2007 (which rarely differs).⁵² For people with darker skin tones (Columns 2 – 7) and lighter skin tones (Columns 10 and 11), almost all people are reported as Black or White and so there is little racial fluidity within these groups.

While these results suggest that endogenous assignment of race continues into modern data, quantifying the statistical implications for racial disparities is more complicated. While lower-SES people are more likely to be classified as Black, in Columns 8 and 9, it would seem an over-adjustment to classify everyone with light brown skin tone in Columns 8 and 9 as having African ancestry. The modern NLSY97 is likely to include people of non-African ancestry with light brown skin tones, who are reported as White non-Hispanic, in contrast to the Freedman's Bank that collected detailed non-white skin tones for a newly-emancipated population of African ancestry. Multi-racial parentage and immigration create greater variation between skin tone and ancestry, though also create greater scope for racial fluidity.

The empirical distributions of socioeconomic status, racial identification, and skin tones in the NLSY97 imply that adjusting racial disparities in modern data has less effect than in the historical data. White people with light brown skin tones have lower average SES than the overall White population in the modern NLSY, and are not as substantially higher SES than the reported Black population as they were in 1870. Therefore, combining this group with the Black population raises average White SES more than in 1870 and raises average Black SES by less than in 1870.

⁵²Note that when SES measures in 2008 predict household-reported race in 1997, the timing is consistent with general SES differences across families being associated with racial identity. Later, we consider whether 2008 income is associated with changes in racial assignment conditional on 1997 household net wealth.

To illustrate this point, if we combine the reported White people in Columns 2 – 8 from Table 9 with the reported Black population, we estimate only small changes in the ratio of Black to White SES outcomes: from 75% to 77% for 2008 income; from 26% to 29% for parents’ net wealth in 1997; and from 44% to 43% for college completion.⁵³ Omitting all people in Columns 8 and 9, and taking the ratio of outcomes for people in columns 2 – 7 and people in columns 10 and 11 (from Table 9), the ratios are also similar to reported racial disparities: 74% for 2008 income, 25% for parents’ net wealth in 1997; and 43% for college completion.⁵⁴

In contrast to the estimated racial fluidity across people, which is our focus throughout, there is comparatively little variation in reported race within person in the NLSY97 data. Reported race differs across 1997 and 2007 rounds for only 0.8% of the sample, changing from Black to White for 18 people and from White to Black for 16 people. Among these “switchers,” 47% have dark skin tones (Columns 2 – 7 in Table 9) and 21% have white skin tones (Columns 10 and 11 in Table 9), which suggests recording errors in one period. Analyzing these changes in racial classification, we do not see that higher income in 2008, controlling for household net wealth in 1997, is associated with changes in racial classification.⁵⁵

Overall, we estimate selected assignment of race in the modern NLSY97 data, for both household-reported race and enumerator-reported race. The effect on measured cross-race differences is smaller than in 1870 and 1940 because, as discussed above, it depends on the relative average wealth of reported White people with light brown skin tones. Indeed, these data illustrate how the social construction of race can have different quantitative implications across contexts that will benefit from further analysis of sub-samples with data on skin tone and/or ancestry.

VI Statistical Implications for Within-Race Differences, Past and Present

We now explore the statistical implications of “controlling for race,” or splitting the sample by race, when race is endogenous to socioeconomic status. We start with the 1870 data, using

⁵³These numbers correspond to household-reported race in 1997, but are very similar for enumerator-reported race in 2007 because these align in 99.2% of cases.

⁵⁴The NLSY97 over-samples Black people, but up-weighting the White population in the NLSY97 (to match the 2010 Census shares for Black and White non-Hispanic people) only slightly affects the ratios when re-classifying the White population with darker skin tones (with calculated ratios of 79%, 32%, and 42%, respectively). Reweighting has no influence on the adjustment that omits people with light brown skin tones.

⁵⁵For this, we define an indicator variable equal to 1 if White, and regress the change in race on household income in 2008 controlling for household net wealth in 1997. A doubling of income in 2008 is estimated to have a statistically insignificant 0.01 percentage point increase in the probability of being classified as White, with a standard error of 0.19 percentage points, which is substantively and statistically smaller than the cross-sectional racial fluidity reported in Table 9. Among people with light brown skin tones, there is also no increase in the probability of being classified as White: the coefficients (and standard errors) associated with a doubling of income are -0.027 (0.023) and 0.009 (0.012) for the skin tones in Columns 8 and 9 of Table 9.

skin tone data from the Freedman’s Bank, and show similar data patterns in the modern NLSY97.

VI.A Empirical Specifications with Race as an Explanatory Variable

The endogeneity of racial classification has statistical implications for within-race comparisons. To illustrate the issue, we start by considering an analysis of potential colorism that regresses depositor characteristic D_i on the skin tone index:

$$(9) \quad D_i = \beta_0 + \beta_1 \text{SkinToneIndex}_i + \gamma_b + \epsilon_i,$$

where β_1 can be interpreted as the average difference for depositors with one standard deviation darker skin tone. We continue to control for Freedman branch fixed effects, so this coefficient is the average difference among depositors associated with the same Bank branch.

In Table 10, Column 1, we see that depositors in 1870 with one standard deviation darker skin tone are 12 percentage points less likely to have measured wealth, have 41% lower household wealth, and are 17 percentage points less likely to be literate.

A common empirical specification would “control for race,” examining the influence of skin tone within race, by including indicator variables for being Black (B_i) and Mulatto (M_i) in the Census:

$$(10) \quad D_i = \tilde{\beta}_0 + \tilde{\beta}_1 \text{SkinToneIndex}_i + \tilde{\beta}_2 B_i + \tilde{\beta}_3 M_i + \gamma_b + \epsilon_i.$$

Table 10, Column 2, reports substantially smaller estimated differences for depositors with one standard deviation darker skin tone: 1 percentage point less likely to have measured wealth, 10% lower household wealth, and 6 percentage points less likely to be literate. Columns 3 – 5 report smaller differences by skin tone within each racial group, which is also a typical comparison that is similar to “controlling for race.” For example, within the Black population, people with one standard deviation darker skin tone are 3.6 percentage points less likely to have measured wealth. Column 6 limits the sample to people that are Black or Mulatto in the Census.

The estimates in Columns 2 – 6 of Table 10 are attenuated by the endogenous assignment of race. In Sections VI.B and VI.C, we show why controlling for race understates the relationship between wealth and skin tone when race is endogenous to SES. The intuition is that people who are “Black” with lighter skin will be relatively poorer because otherwise some would not be classified as Black, so lighter skin becomes less associated with higher wealth among “Black” people. Relatedly, people who are “White” with darker skin will be relatively richer because otherwise some would not be classified as White, so darker skin

becomes less associated with lower wealth among “White” people.

In contrast, when restricting the sample to people with non-white skin tones, there remain substantial associations between socioeconomic status and skin tone (Table 10, Column 7) that are similar to the estimates in Column 1. There is no attenuation from restricting the sample based on skin tone, when skin tone is a fixed characteristic, and below we discuss further the implications of true or measured skin tone being endogenous to socioeconomic status.

Table 11 replicates these data patterns in the modern NLSY97 data. We construct a “skin tone index” in the same manner as with the Freedman’s Bank data, classifying skin tones based on the share of people with that skin tone recorded as Black. In the NLSY97 data, as in the 1870 data, we estimate substantial correlations between socioeconomic status and skin tone that are heavily attenuated when controlling for being recorded as Black (Column 2). Similarly, within race, we see an attenuated relationship between SES measures and the skin tone index (Columns 3 and 4). Excluding people with white skin tones, however, the association between SES and skin tone is not attenuated and similar to the unconditional estimate. This is consistent with endogenous assignment of race in the modern data, which we illustrate in the below model of sample selection.

VI.B Modeling Sample Selection from Endogenous Race

Let ω_i be the wealth of person i , as before, and now assumed to be decreasing linearly in darker skin tone s_i :

$$(11) \quad \omega_i = \alpha_0 + \alpha_1 s_i + e_i.$$

If s_i is measured accurately, then an OLS regression of ω_i on s_i yields the true α_1 . We later consider measurement error in s_i .

Suppose we estimate the same regression among respondents classified as Black.⁵⁶

$$(12) \quad \omega_i = \tilde{\alpha}_0 + \tilde{\alpha}_1 s_i + e_i, \text{ if } B_i = 1.$$

If racial classification is only a function of skin tone, then $\tilde{\alpha}_1 = \alpha_1$. However, if the probability of classification as Black increases with other characteristics u_i , such as poverty or illiteracy, with $\text{Cov}(u_i, e_i) < 0$, then $\tilde{\alpha}_1$ is biased upwards ($\tilde{\alpha}_1 > \alpha_1$ and $\alpha_1 < 0$).

⁵⁶The model focuses on “Black” and “White” racial categories, omitting a third “Mulatto” racial category, for conciseness and for its representation of the dichotomous racial grouping that underlay historical racial segregation and continues to define racial boundaries in the United States.

When people are classified as Black based on skin tone and these other factors u_i :

$$(13) \quad B_i = \mathbb{I}[\theta_0 + \theta_1 s_i + u_i > 0], \text{ with } \theta_1 > 0.$$

Wealth within the group classified as Black is:

$$(14) \quad \mathbb{E}[\omega_i | B_i = 1, s_i] = \tilde{\alpha}_0 + \tilde{\alpha}_1 s_i + \mathbb{E}[e_i | u_i > -(\theta_0 + \theta_1 s_i)],$$

and the error term is no longer orthogonal to skin tone. To illustrate this in a tractable case, we assume the errors are distributed normally ($e_i \sim N(0, \sigma_e^2)$, $u_i \sim N(\mu_u, \sigma_u^2)$) and negatively correlated ($\text{Corr}(u_i, e_i) = \rho < 0$). Then, expected wealth conditional on being classified as Black is:

$$(15) \quad \mathbb{E}[\omega_i | B_i = 1, s_i] = \tilde{\alpha}_0 + \tilde{\alpha}_1 s_i + \rho \sigma_e \lambda(\theta_0 + \theta_1 s_i),$$

where $\lambda(\cdot) = \phi(\cdot) / \Phi(\cdot)$ is the inverse Mills ratio as developed in the Heckman model of sample selection bias (Heckman, 1976, 1979). This final term is unobserved, creating an additional term in α :

$$(16) \quad \tilde{\alpha}_1 = \alpha_1 + \rho \sigma_e \frac{\text{Cov}(s_i, \lambda_i)}{\text{Var}(s_i)}.$$

Compared to the assumed true α_1 , which is less than zero, the estimated $\tilde{\alpha}_1$ is biased upwards because signals of poverty or illiteracy are negatively correlated with wealth ($\rho < 0$) and selected racial assignment makes the inverse Mills ratio lower with darker skin tones ($\partial \lambda_i / \partial s_i < 0$ hence $\text{Cov}(s_i, \lambda_i) < 0$), so the second term is positive. Thus, the effect of skin tone controlling for race ($\tilde{\alpha}_1$) is less negative than the unconditional effect (α_1) and may even be positive.

This issue occurs for any regression in which the explanatory variable is correlated with racial selection, if the residual variation in the outcome is correlated with residual variation in racialization. For example, we estimate effects of literacy and college completion on racial classification. Thus, in the standard Mincer regression where s_i is instead years of schooling, factors that affect both racial identification and log income (conditional on education) would bias the coefficient on education when controlling for race. For someone whose racial classification is ambiguous, who has high education, and is classified as Black, there is an expected negative error term in income that attenuates what would otherwise be the increase in income associated with high education. This is a form of “over-controlling bias,” when race is itself an outcome.

By contrast, there would not be attenuation if the sample were split into two groups by skin tone – or split into two groups by some fixed characteristic like African ancestry, if measurement error in African ancestry is uncorrelated with wealth. This aligns with our earlier assumption that non-white skin tone in the Freedman data reflected African ancestry, and the absence of attenuation in Table 10 when limiting the sample to people with non-white skin tone.

VI.C Simulated and Empirical Correlations between Wealth and Skin Tone, Unconditional and Conditional on Census Race

Figure 9, Panel A, provides a graphical illustration of the selection model from Section VI.B, showing simulated correlations between wealth and skin tone based on assumed illustrative parameters.⁵⁷ The black circles represent people racialized as Black, whereas the hollow circles represent people racialized as White.

Unconditional on Census race, the solid red line shows the assumed decreasing relationship between wealth and darker skin tone. Conditional on race, however, the two dashed lines show substantially attenuated relationships. Among those with darker skin, only richer people are racialized as White, which flattens the top dashed line. Among those with lighter skin, only poorer people are racialized as Black, which flattens the bottom dashed line.

Empirically, in our 1870 data, we see a similar pattern in Panel B of Figure 9. We plot log household wealth on the y-axis against the depositor’s skin tone index on the x-axis.⁵⁸ The solid red line shows a clear unconditional decline in wealth associated with darker skin tones. Conditional on race, however, the two dashed red lines show substantially flatter relationships. This is because among those with light skin tones, people racialized as Black are relatively poorer on average. Similarly, among those with darker skin tones, people racialized as White are relatively richer on average. This selected racialization attenuates the relationship within both racial groups.

In the modern NLSY97 data, we see similar patterns (Figure 9, Panel C). Household net wealth is lower for people with darker skin tones. This relationship is attenuated within household-reported race, however, because people with light brown skin reported as Black are relatively poorer and people with somewhat darker skin reported as White are relatively richer.

⁵⁷We select parameters to illustrate the model’s qualitative implications: $\omega_i = -0.5 \times s_i + e_i$, with s_i randomly drawn from a standard normal distribution, and let $B_i = 1$ if $0.75 \times s_i + u_i > -0.5$. We draw 500 error terms, e_i and u_i , from a standard normal distribution with a -0.75 correlation. We then fit population regression lines to the full sample and within the White and Black racial groups (continuing to omit a third Mulatto racial group for ease of presentation).

⁵⁸We restrict the sample to people with measured household wealth to aid in visualizing this relationship, as the bottom-coded households are grouped together.

VI.D Measurement Error in Skin Tone

We also consider implications if skin tone is recorded based partly upon signals of socioeconomic status. This might occur if wealthier people are less exposed to sunlight, or if Freedman’s Bank clerks and NLSY97 enumerators simply perceive them as lighter-skinned (Dixon and Telles, 2017). Suppose people record skin tone, $\hat{s}_i$, as a function of some measure of socioeconomic status, v_i :

$$(17) \quad \hat{s}_i = s_i + v_i.$$

Let $\delta_{e\hat{s}}$ be the coefficient from a regression of the wealth residual e from Equation 11 on $\hat{s}$, which is negative ($\text{Corr}(v, e) < 0$), and let $\delta_{v\hat{s}}$ be the coefficient from a regression of v on $\hat{s}$ (positive). The OLS regression of wealth on skin tone from Equation 11 becomes:

$$(18) \quad \omega_i = \hat{\alpha}_0 + \hat{\alpha}_1 (s_i + v_i) + \eta_i$$

and the estimated coefficient $\hat{\alpha}_1 = \delta_{e\hat{s}} + (1 - \delta_{v\hat{s}}) \alpha_1$.

The first term, $\delta_{e\hat{s}}$, creates a downward bias in the relationship between wealth and skin tone (more negative) when the measurement of skin tone is affected by signals of wealth. The same type of bias would also arise when someone’s measured skin tone actually becomes darker due to lower wealth, such as working as an outdoors laborer in a lower-income job, which would create a more negative relationship between measured skin tone and wealth.

The second term represents attenuation bias, as with classical measurement error. This attenuation bias could be exacerbated when controlling for Census race, also reducing the coefficients in Column 2 relative to Column 1 in Tables 10 and 11.

To assess the attenuation from classical measurement error, the Freedman’s Bank data provide an opportunity to use two measures of skin tone from when some depositors opened two accounts at different times. Table 12 restricts our analysis to this subsample and finds 2SLS estimates that are similar to the OLS estimates, instrumenting one measurement of skin tone with the other. The first-stages are very strong, unconditional or conditional on Census race, with F-statistics of 1,541 and 373 due to high correlation in the multiple measures of skin tone. These estimates indicate little attenuation from classical measurement error, but instead attenuation from sample selection due to the endogenous assignment of race based on wealth.

VII Conclusion

We estimate fluid racial classification in the United States, historically and in the modern period. We find that people with the same physical skin tone, particularly those with light

brown skin tones, are racialized differently based on their wealth and other proxies for socioeconomic status. This historical and continuing social construction of racial groups underlies persistent social stratification, and affects statistical analyses of both cross-group and within-group differences.

Our analysis starts in the Reconstruction Era, using detailed data on skin tone from depositor records of the Freedman’s Savings Bank (1865-1874). Emancipation had put the United States’ social structure into a period of potential transformation. The Reconstruction Era saw efforts to integrate formerly-enslaved people, which gave way to competing efforts to reimpose antebellum social structures. Without the *de jure* distinction between “free” and “enslaved,” racial construction was an important tool for social control that set the stage for continued racial stratification during and after the Jim Crow segregation era through the modern day.

Over generations, from 1870 through 1940, we estimate selected exit from the reported Black population. This has statistical implications for interpreting estimates of lower economic mobility among Black people: across generations, when higher-SES Black people have more White descendants and when White descendants have higher SES than Black descendants of the same ancestor, the observed lower SES of reported Black people partly reflects upward economic mobility among people of African ancestry who are no longer recorded as Black. In NLSY97 data through 2008, we continue to see selected racial assignment among people with light brown skin tones, which echoes our estimates from 1870. We estimate similar patterns for household-reported race and enumerator-reported race, which rarely differ for people in the NLSY97.

We report adjusted economic disparities by African ancestry, in contrast to the typical statistical analysis that reflects selection into reported racial groups. This analysis highlights novel ways to use sub-samples with supplemental data on skin tone and/or ancestry. Indeed, an increasing number of datasets survey skin tone (e.g., NLSY97, General Social Survey, Add Health, National Immigrant Survey, ANES Time Series) or collect skin tone data from images using machine-learning algorithms (see, for example, Adukia et al. (2023); Kamel and Woo-Mora (2026)), and there is increasing ancestry data from an expanding Census Tree (Price et al., 2021; Buckles et al., 2025). In the absence of such data, researchers can also consider how the endogenous assignment of race might qualitatively affect the interpretation of their estimates and/or bound the quantitative implications using assumed parameter values regarding the degree of racial fluidity and its association with outcomes.

While reported race varies rarely for a given person, over time, reported race is substantively associated with SES across people. Thus, in both modern data and in 1870, the selected assignment of race attenuates within-race differences by skin tone. More generally, common

statistical practice that “controls for race” does not account for selection into race based on other explanatory variables, despite growing recognition that “race is a social construct.” We show that splitting the sample by skin tone does not introduce this attenuation, which highlights the value of collecting and analyzing data on skin tone that is only selectively reflected in data on race.

Socially constructed racial identities exist in society as categories through which people form community, organize politically, and experience discrimination. Comparisons across or within these racial groups can deliver important insights, but those comparisons will reflect the social process that assigned people to those groups. Our analysis helps understand how those racial identities formed within particular social contexts – both reflecting and supporting economic stratification along these constructed racial boundaries. Alternative statistical constructions, using data on ancestry or skin tone, avoid relying on endogenously formed racial categories, but this does not mean society itself should define racial boundaries based on ancestry or skin tone.

Research on discrimination often focuses on race, as socially constructed, as a cause of historical and contemporaneous differences in socioeconomic outcomes. Our analysis shows that racial stratification is also an outcome of historical and contemporaneous differences in socioeconomic environments. This can understate the impact of policies and economic environments that ameliorate outcomes for people of African ancestry, as some become selectively classified as White over generations.

We advance the literature beginning with uniquely-detailed historical data, allowing us to document the influence of socioeconomic status on racial classification across people with similar skin tone. The historical setting then allows us to follow individuals’ descendants forward in time, through the 1940 Census, showing selected racialization in the Census across generations. These patterns continue into the modern period, in which both self-reported race and enumerator-reported race in the NLSY97 are associated with socioeconomic status for people with light brown skin tones. The continued construction of race along socioeconomic status lines, from Reconstruction through segregation to the modern day, has enduring social and statistical implications for cross-race and within-race disparities.

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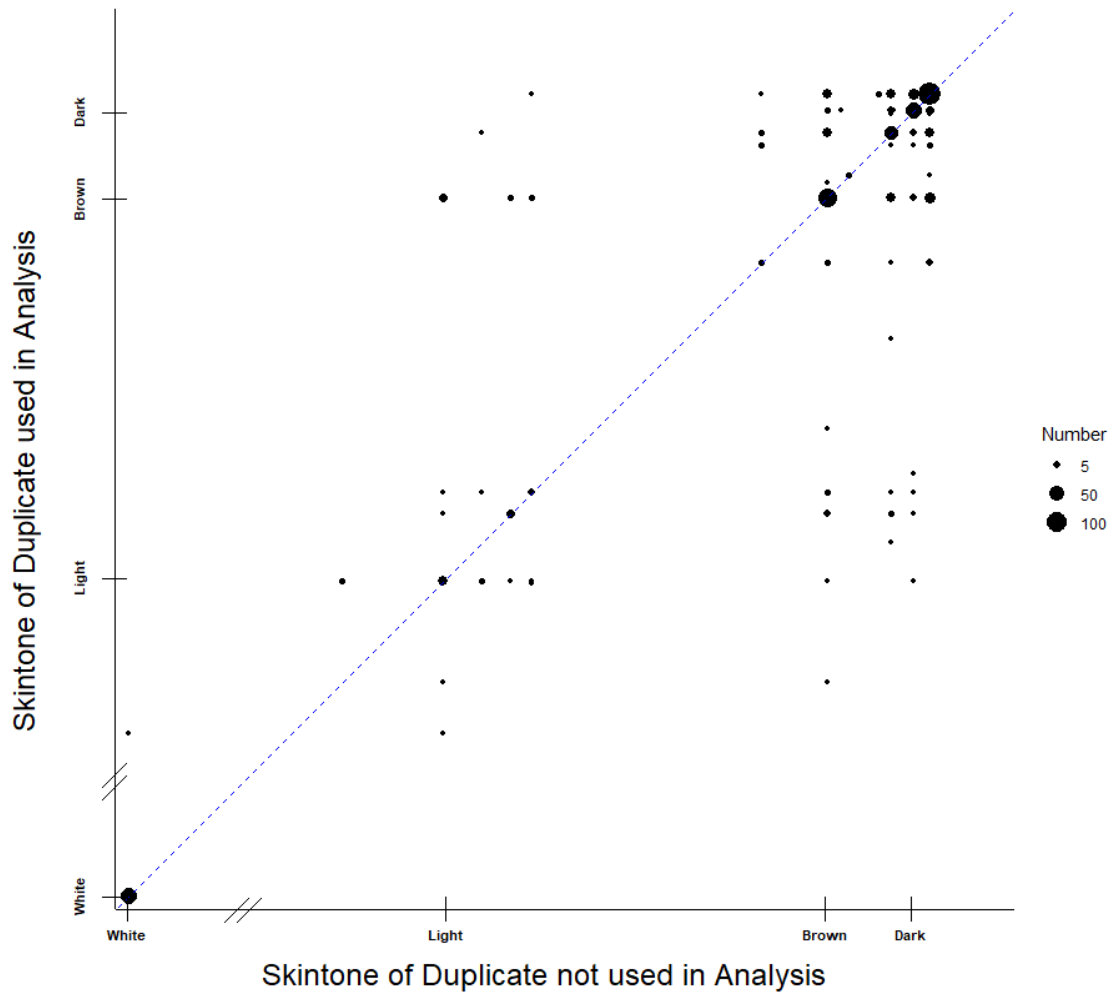
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Figure 1. Freedman Bank Depositor Accounts Linked to 1870 Census, by Branch



Notes: This figure shows the locations of Freedman Bank branches in our sample, where the size of the circle is proportional to the number of depositors we link to the Census.

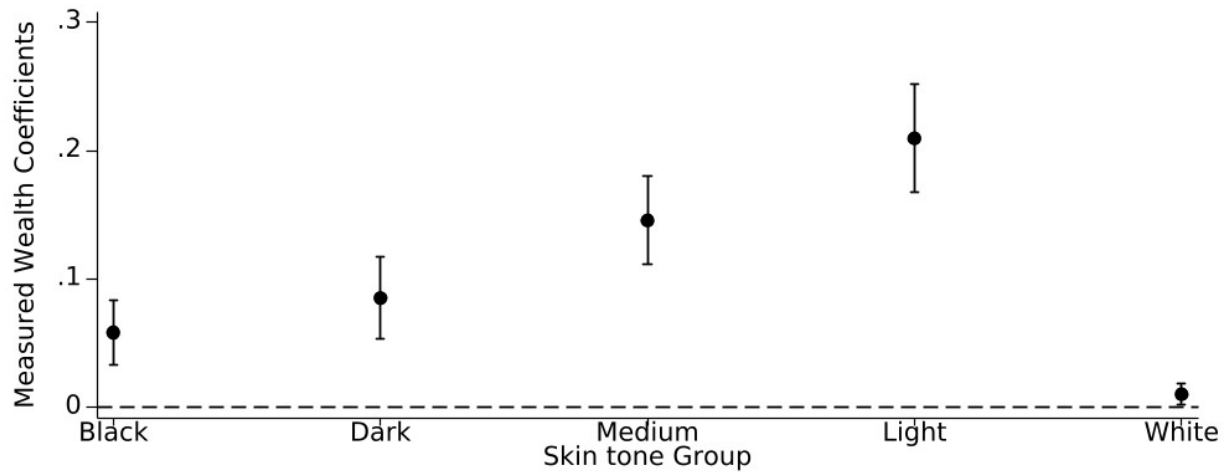
Figure 2. Comparing Repeated Bank Records on Depositor Skin Tone



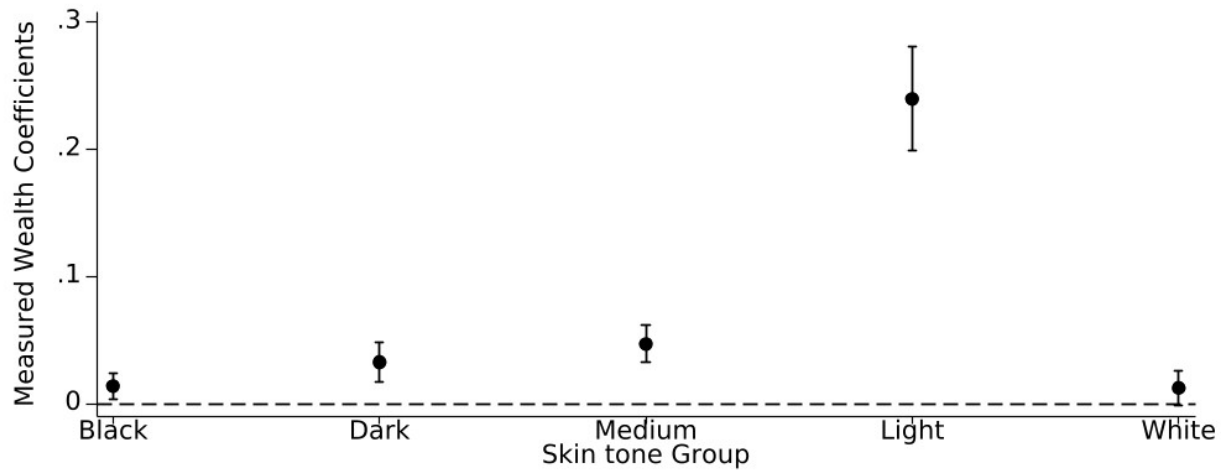
Notes: For 578 Freedman Bank depositors that opened an account twice on different dates and thereby have two measures of skin tone, this figure plots the two skin tone index values against each other: the y-axis has the value used in the main analysis (from the depositor record with more biographical information) and the x-axis has the value not used in the main analysis (which we use as an instrument in some specifications). Each axis is labeled with reference values for the skin tone index (corresponding to white, light, brown, and dark in Table 1). Note the condensed axis between white and light. The size of the circle is proportional to the number of observations, and these circles are plotted against a dashed 45-degree line.

Figure 3. Graphed Effects of Measured Wealth on Racialization, by Skin Tone Group

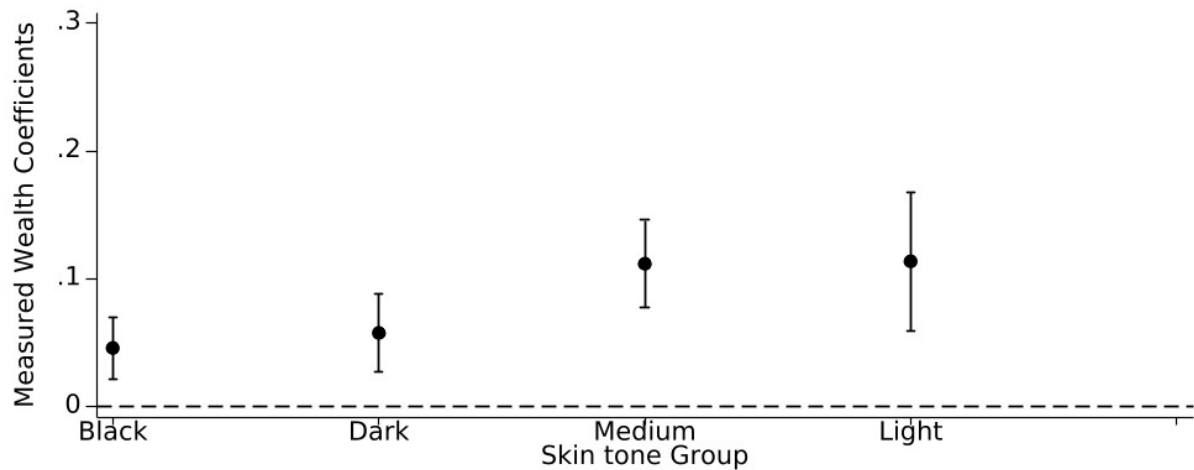
Panel A: White or Mulatto (vs. Black)



Panel B: White (vs. Mulatto or Black)



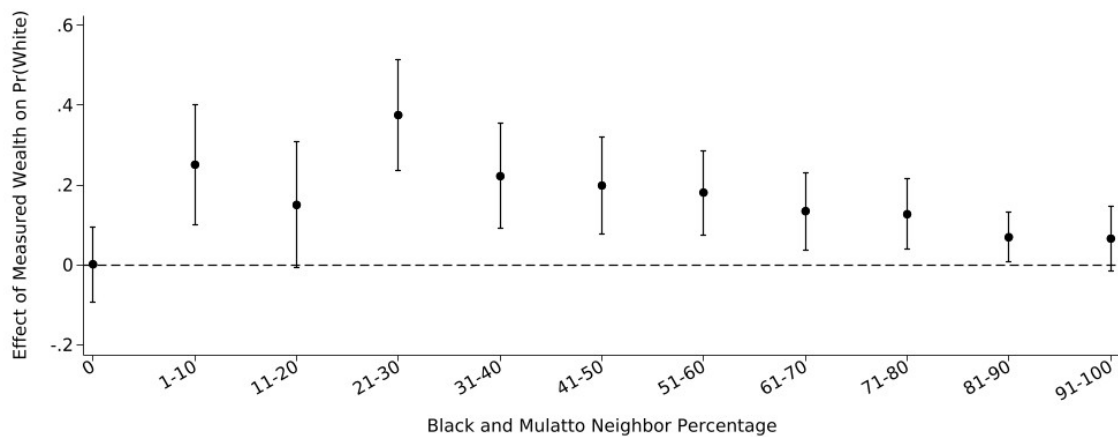
Panel C: Mulatto (vs. Black)



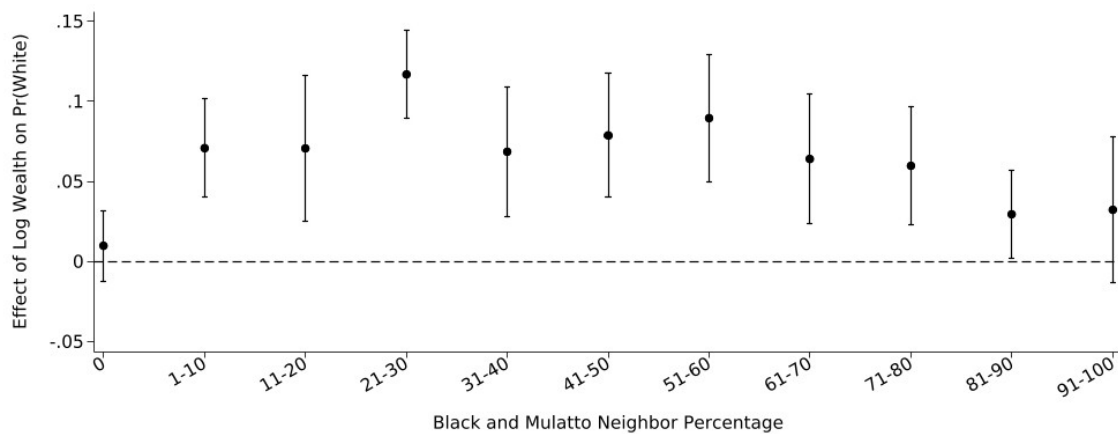
Notes: This figure plots the coefficients from the first row of Panels A, B, and C in Table 4, which show how the effect of measured wealth on Census race varies across the reported skin tone groups. The vertical bars correspond to 95% confidence intervals.

**Figure 4. Effects of SES on Racialization as White, by Black Neighbor Share
(Light Skin Tone Group)**

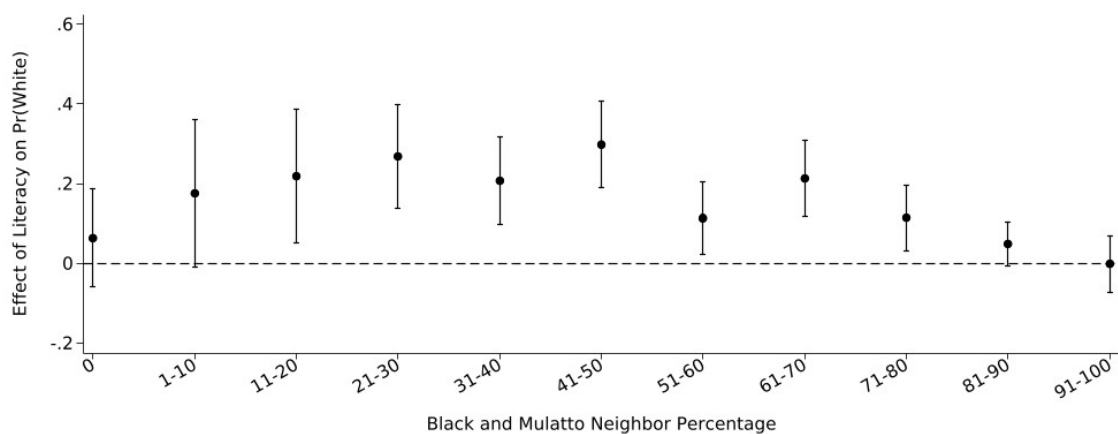
Panel A: Measured Wealth



Panel B: Log Household Wealth

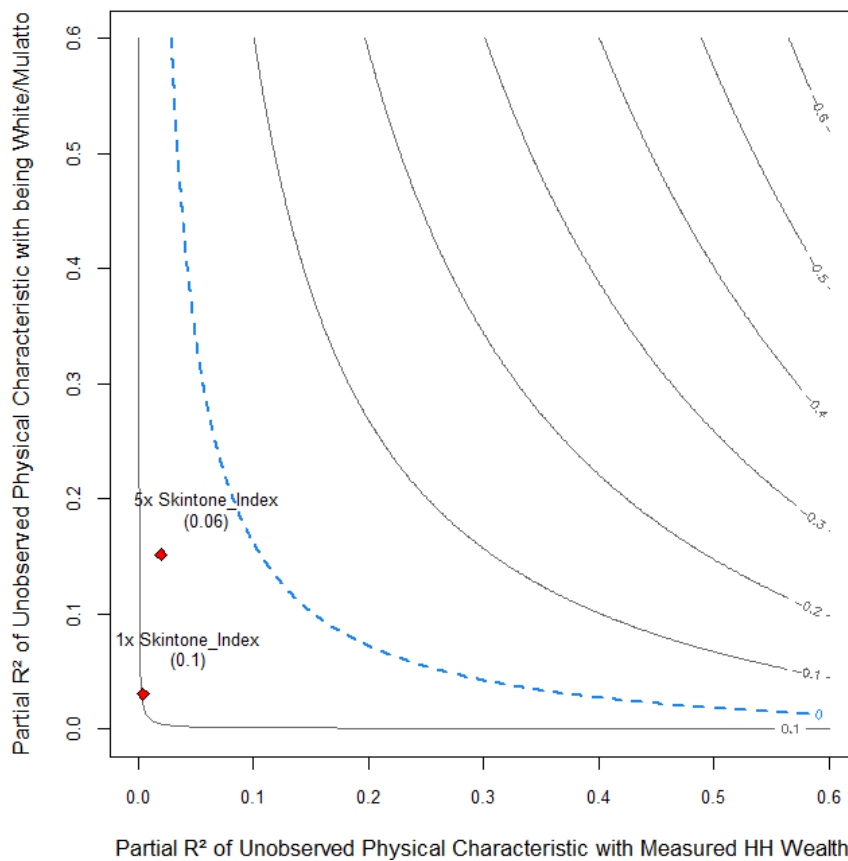


Panel C: Literacy



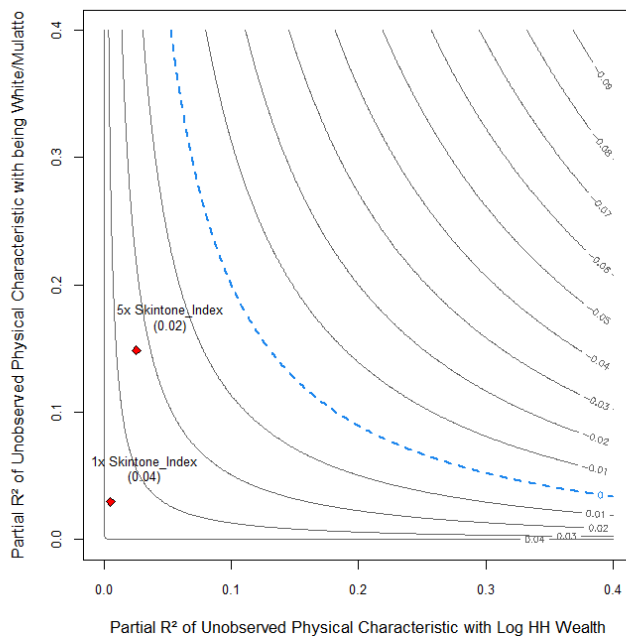
Notes: This figure shows how the effect on the probability of being racialized as White from measured wealth (Panel A), log wealth (Panel B), and literacy (Panel C) varies with the racial composition of a person's neighbors. Each point corresponds to Table 4, Column 4, Panel B, but interacting the SES measure with the indicated share of a person's 1870 Census neighbors that are Black or Mulatto (ranging from no Black or Mulatto neighbors to between 90% and 100%). Vertical bars correspond to 95% confidence intervals.

**Figure 5. Bounding the Influence of Unmeasured Physical Characteristics:
Effect of Measured Wealth on Racialization as White or Mulatto (vs. Black)**



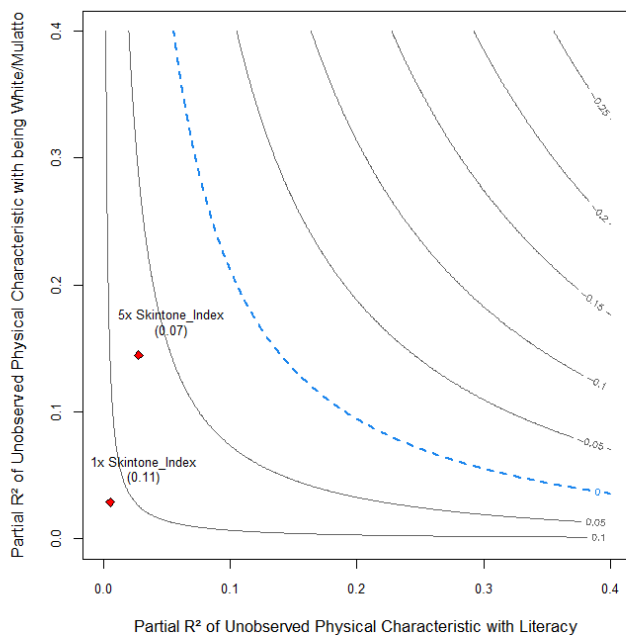
Notes: This figure shows the potential influence of unmeasured physical characteristics on the estimated effect of measured wealth on people being racialized in the 1870 Census as White or Mulatto (as opposed to Black). The first red diamond, closest to the origin, indicates the estimated effect of wealth if there were unmeasured physical characteristics that were as jointly predictive of measured wealth and racialization as the detailed skin tone index (beyond three coarse skin tone groups). The second red diamond corresponds to unmeasured physical characteristics that are 5 times as influential. To fully explain the effect, reaching the dashed blue line, unmeasured physical characteristics would need to be 12 times as jointly predictive of measured wealth and racialization as the detailed skin tone index. If unmeasured physical characteristics explained all residual variation in race, moving up the y-axis to one, then these unmeasured characteristics would need to be 4.5 times more correlated with having measured wealth than the detailed skin tone index.

Figure 6. Bounding the Influence of Unmeasured Physical Characteristics:
Panel A. Effect of Log Wealth on Racialization as White or Mulatto (vs. Black)



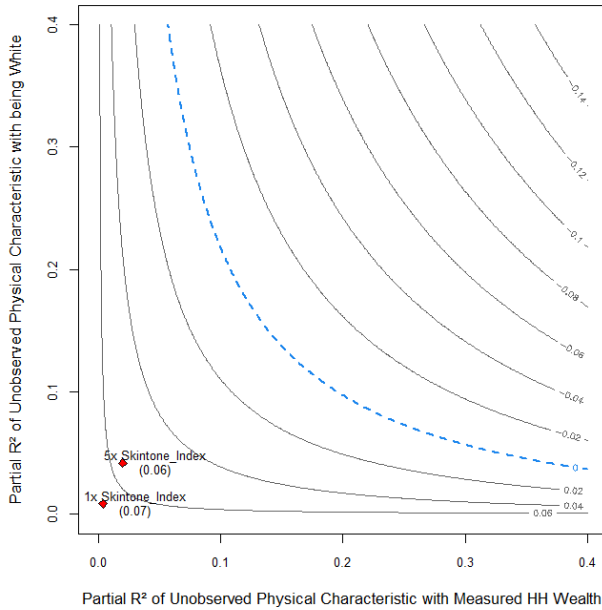
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Panel B. Effect of Literacy on Racialization as White or Mulatto (vs. Black)

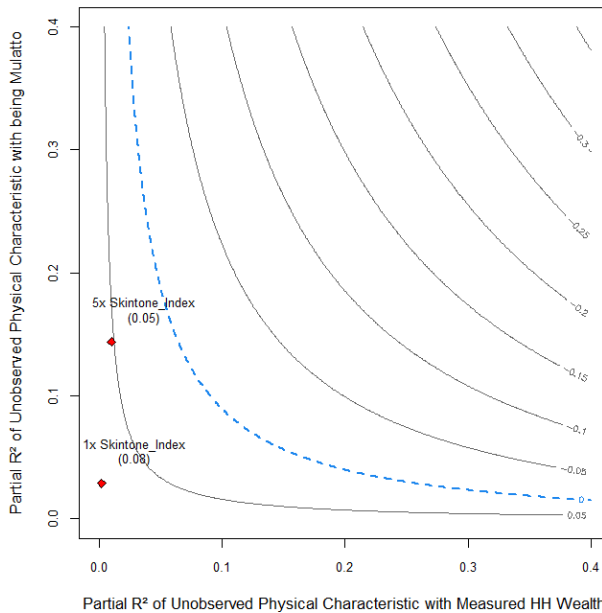


Notes: Similar to Figure 5, this figure shows the potential influence of unmeasured physical characteristics on the estimated effect of log wealth (Panel A) and literacy (Panel B) on people being racialized in the 1870 Census as White or Mulatto (as opposed to Black). For Panel A, to fully explain the effect of log wealth, unmeasured physical characteristics would need to be 12 times as jointly predictive of log wealth and racialization as the detailed skin tone index. If unmeasured physical characteristics explained all residual variation in race, moving up the y-axis to one, then these unmeasured physical characteristics would need to be 4.4 times more correlated with log wealth than the detailed skin tone index. For Panel B, to fully explain the effect of literacy, unmeasured physical characteristics would need to be 12 times as jointly predictive of literacy and racialization as the detailed skin tone index. If these characteristics fully explained all residual variation in race, they would need to be 3.8 times more correlated with literacy than the detailed skin tone index.

Figure 7. Bounding the Influence of Unmeasured Physical Characteristics:
Panel A. Effect of Measured Wealth on Racialization as White (vs. Mulatto or Black)

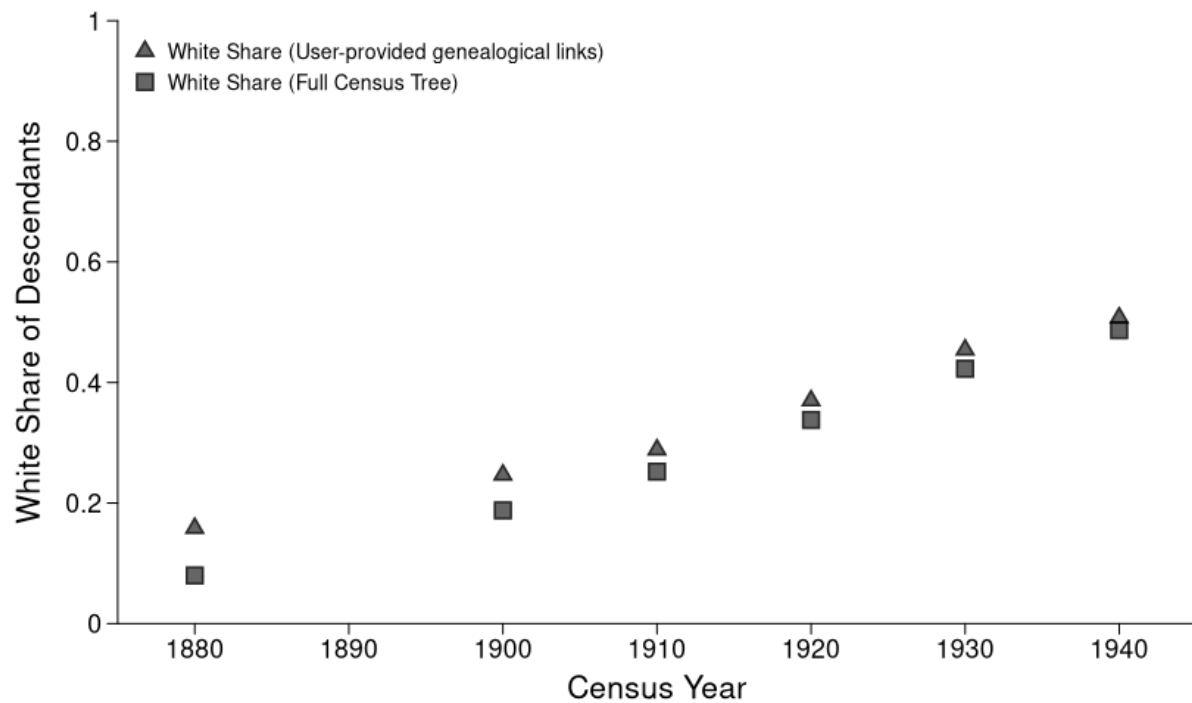


Panel B. Effect of Measured Wealth on Racialization as Mulatto (vs. Black)

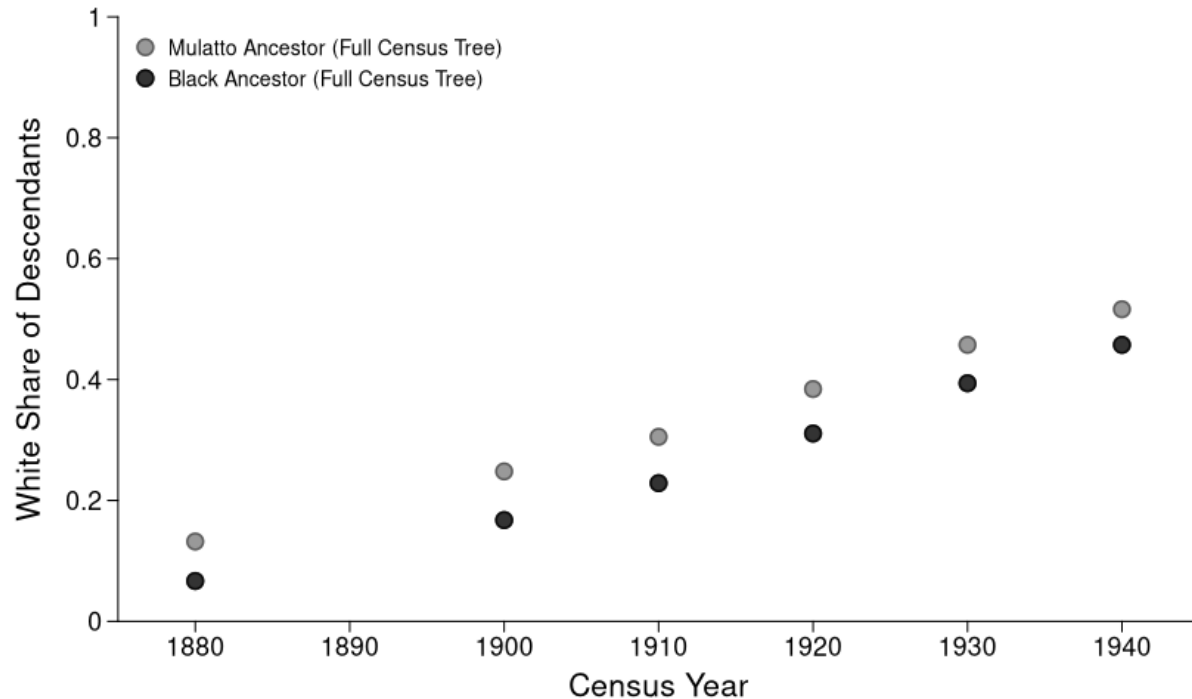


Notes: Similar to Figure 5, this figure shows the potential influence of unmeasured physical characteristics on the estimated effect of having measured wealth on people being racialized in the 1870 Census as White as opposed to Mulatto or Black (in Panel A) and being racialized as Mulatto as opposed to Black (in Panel B). For Panel A, to fully explain the effect of having measured wealth, unmeasured physical characteristics would need to be 26 times as jointly predictive of measured wealth and racialization as the detailed skin tone index. If unmeasured physical characteristics explained all residual variation in race, moving up the y-axis to one, then these unmeasured physical characteristics would need to be 6.0 times more correlated with having measured wealth than the detailed skin tone index. For Panel B, to fully explain the effect of having measured wealth, unmeasured physical characteristics would need to be 13 times as jointly predictive of having measured wealth and racialization as the detailed skin tone index. If these characteristics fully explained all residual variation in race, they would need to be 5.0 times more correlated with having measured wealth than the detailed skin tone index.

Figure 8. White Descendant Share, from 1880 to 1940, of Black and Mulatto People in 1870
Panel A: White Share of Linked Descendants, by Genealogical Link Type

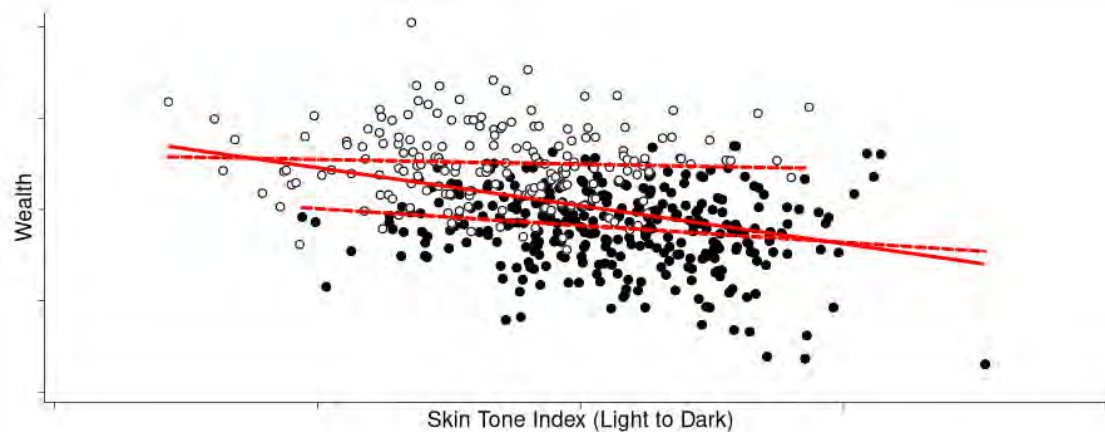


Panel B: White Share of Linked Descendants, by Ancestor's 1870 Race (Mulatto or Black)

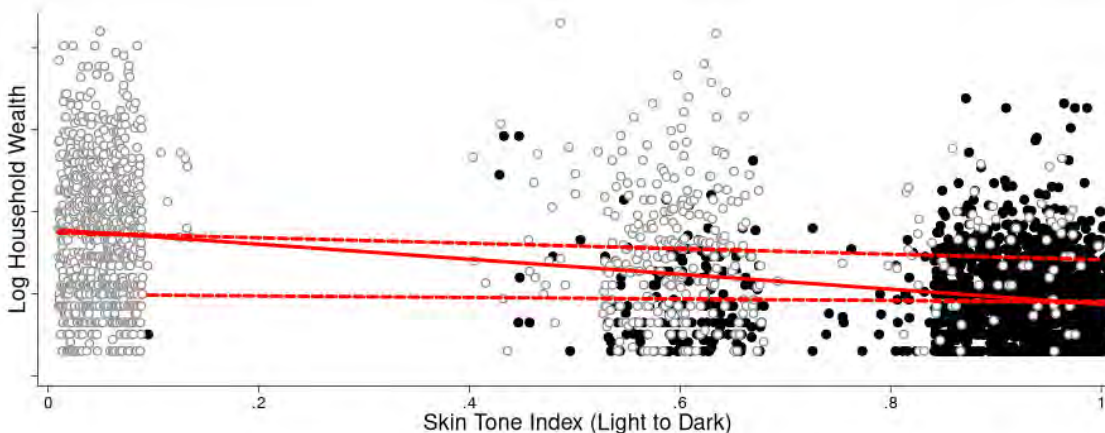


Notes: These figures show the share of people racialized as White, from 1880 to 1940, who are linked to a Black or Mulatto ancestor in the 1870 Census. Panel A shows this using all links in the Census Tree, and restricted to only user-provided genealogical links. Panel B shows this separately for descendants of people classified as Mulatto and descendants of people classified as Black in the 1870 Census.

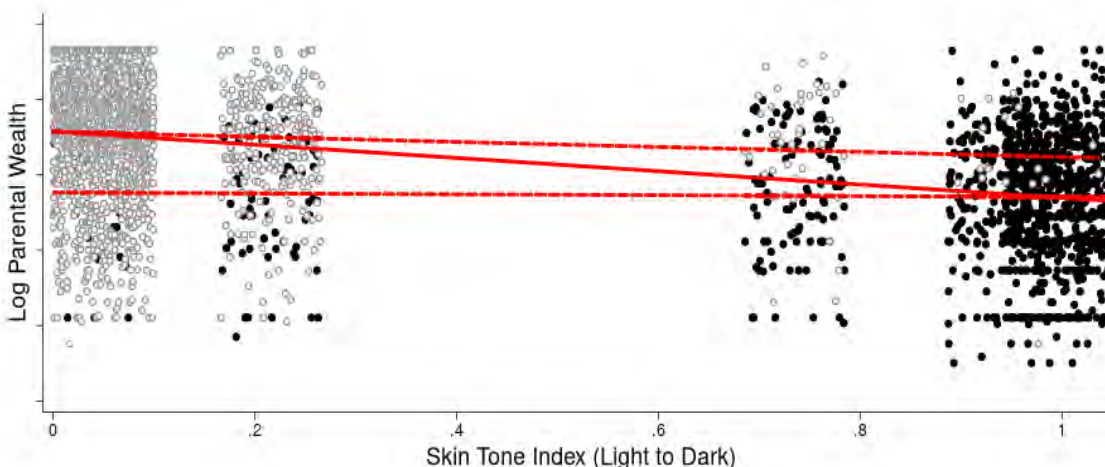
Figure 9: Simulated and Empirical Correlations Between Wealth and Skin Tone
Panel A: Simulated Correlations, Unconditional and Conditional on Race



Panel B: Empirical Correlations, Unconditional and Conditional on 1870 Census Race



Panel C: Empirical Correlations, Unconditional and Conditional on NLSY97 Race



Notes: Panel A shows simulated correlations between wealth and skin tone across all people (solid red line) and the attenuated relationships within each selected racial group (two dashed lines). Panel B shows empirical correlations between wealth and skin tone, across all people with measured wealth (solid red line) and within groups racialized as Black or White in the 1870 Census (two dashed lines). Panel C shows empirical correlations between parental wealth and skin tone, across all people with positive parental wealth (solid red line) and within groups self-reported as Black or White non-Hispanic in the NLSY. In each panel, black circles represent values for people racialized as Black and hollow circles represent values for people racialized as White.

Table 1. Freedman Bank Depositor Complexion and 1870 Census Race

Depositor Complexion:	Number of Depositors	Share By 1870 Census Race:			Skin Tone Index
		Black	Mulatto	White	
(1)	(2)	(3)	(4)	(5)	
Black	3,606	0.94	0.05	0.01	0.97
Colored	95	0.91	0.09	0.00	0.95
Dark	1,633	0.91	0.08	0.01	0.95
Very Dark	49	0.90	0.10	0.00	0.95
Dark Black	31	0.87	0.13	0.00	0.94
Dark Brown	1,555	0.88	0.11	0.01	0.93
Very Dark Brown	72	0.85	0.15	0.00	0.92
Medium Dark Brown	19	0.89	0.05	0.05	0.92
Medium Black	89	0.81	0.18	0.01	0.90
Medium Brown	98	0.82	0.15	0.03	0.89
Brown	2,967	0.77	0.22	0.01	0.88
Nearly Black	183	0.79	0.07	0.14	0.83
Light Black	32	0.56	0.41	0.03	0.77
Dark Mulatto	20	0.50	0.45	0.05	0.73
Very Light Brown	13	0.46	0.46	0.08	0.69
Light Colored	6	0.33	0.67	0.00	0.67
Griff	45	0.60	0.11	0.29	0.66
Yellow	441	0.44	0.41	0.15	0.64
Light Brown	532	0.47	0.31	0.22	0.62
Mulatto	135	0.41	0.37	0.21	0.60
Light	715	0.38	0.37	0.25	0.57
Bright	83	0.36	0.41	0.23	0.57
Very Light	67	0.27	0.43	0.30	0.49
Nearly White	53	0.21	0.47	0.32	0.44
Olive	8	0.38	0.13	0.50	0.44
Fair	15	0.07	0.07	0.87	0.10
White	1,576	0.01	0.01	0.98	0.01
Total	14,138	0.70	0.14	0.15	0.78

Notes: Column 1 reports the total number of Freedman Bank depositors with the indicated complexion in the Bank's depositor record. We use these 27 detailed skin tone categories, which we standardize from 368 unique strings that include spelling variations and occasional other physical descriptives. Columns 2, 3, and 4 report the share of depositors racialized as Black, Mulatto, or White in the 1870 Census. Column 5 reports a continuous "Skin Tone Index" that is defined for each skin tone category as: the share of depositors racialized as Black plus one-half times the share of depositors racialized as Mulatto.

Table 2. Depositor Summary Statistics in 1870 Census

	Sample	Differences from Full Census:		
	Mean	Black	Mulatto	White
	(1)	(2)	(3)	(4)
Adult	0.73 [0.45]	-	-	-
Male	0.72 [0.45]	-	-	-
Black	0.70 [0.46]	-	-	-
Mulatto	0.14 [0.35]	-	-	-
Measured Household Wealth	0.27 [0.44]	0.041 (0.004)	0.091 (0.010)	-0.006 (0.009)
Household Wealth	\$802 [6586]	\$1.5 (37.0)	\$82.4 (134.4)	-\$39.4 (473.5)
Literate	0.35 [0.48]	0.021 (0.003)	0.079 (0.010)	0.011 (0.008)
Number of Depositors	14,138	9,964	2,035	2,139

Notes: Column 1 reports average characteristics for our sample of Freedman Bank depositors linked to the 1870 Census. Columns 2, 3, and 4 report differences for depositors by Census race, relative to non-depositors in the full Census, controlling for: county fixed effects and indicator variables for adult (18+) and male. We exclude all non-depositors in households with depositors. Literate is defined only for people aged 10 and older. Standard deviations are reported in brackets, and robust standard errors are reported in parentheses.

Table 3. Estimated Differences in 1870 Census Racial Assignment by Socioeconomic Status

	White or Mulatto		White		Mulatto	
	vs. Black		vs. Mulatto or Black		vs. Black	
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Measured Wealth						
Wealth $\geq$ \$100	0.109 (0.008)	0.108 (0.007)	0.068 (0.005)	0.068 (0.005)	0.087 (0.009)	0.085 (0.009)
Skin Tone Index	-0.289 (0.003)		-0.275 (0.003)		-0.307 (0.010)	
Skin Tone Fixed Effects		Yes		Yes		Yes
Number of Depositors	14,138	14,138	14,138	14,138	11,999	11,999
Panel B: Log Wealth						
Log Wealth	0.040 (0.002)	0.041 (0.002)	0.031 (0.002)	0.030 (0.002)	0.044 (0.004)	0.043 (0.004)
Skin Tone Index	-0.281 (0.003)		-0.267 (0.003)		-0.302 (0.010)	
Skin Tone Fixed Effects		Yes		Yes		Yes
Number of Depositors	14,138	14,138	14,138	14,138	11,999	11,999
Panel C: Literacy						
Literate	0.124 (0.008)	0.122 (0.008)	0.065 (0.005)	0.067 (0.005)	0.094 (0.008)	0.092 (0.008)
Skin Tone Index	-0.283 (0.004)		-0.271 (0.003)		-0.301 (0.011)	
Skin Tone Fixed Effects		Yes		Yes		Yes
Number of Depositors	13,029	13,029	13,029	13,029	11,277	11,277

Notes: Panel A, Columns 1 and 2, report effects of the household having measured wealth ($\geq$ \$100) on whether depositors are racialized in the 1870 Census as White or Mulatto (as opposed to Black). Columns 3 and 4 report effects on whether depositors are racialized as White (as opposed to Mulatto or Black), and Columns 5 and 6 report effects on whether depositors are racialized as Mulatto (as opposed to Black, excluding White depositors from the sample). Panel B reports effects of the household's log wealth, adding \$45.25 to all households with zero measured wealth. Panel C reports effects of the depositor being literate, which is limited to people ages 10 and older in the Census. Columns 1, 3, and 5 control for the skin tone index (from Column 5 of Table 1), which we standardize to have a mean of zero and a standard deviation of one. Columns 2, 4, and 6 control for fixed effects for each of the 27 detailed skin tone categories (listed in Table 1). All specifications include Freedman Bank branch fixed effects, and robust standard errors are reported in parentheses.

Table 4. Effects of Socioeconomic Status on 1870 Census Racial Assignment, by Skin Tone Group

	Skin Tone Group:				
	Black (1)	Dark (2)	Medium (3)	Light (4)	White (5)
Panel A. Dependent Variable: White or Mulatto vs. Black					
Wealth $\geq$ \$100	0.058 (0.013)	0.085 (0.016)	0.146 (0.018)	0.210 (0.022)	0.010 (0.004)
Log Wealth	0.032 (0.007)	0.041 (0.007)	0.067 (0.007)	0.079 (0.005)	0.002 (0.001)
Literate	0.034 (0.011)	0.068 (0.014)	0.144 (0.018)	0.296 (0.023)	0.035 (0.019)
Number of Depositors	3,701	3,359	3,389	2,113	1,576
Panel B. Dependent Variable: White vs. Mulatto or Black					
Wealth $\geq$ \$100	0.014 (0.005)	0.033 (0.008)	0.047 (0.007)	0.240 (0.021)	0.012 (0.007)
Log Wealth	0.012 (0.004)	0.017 (0.004)	0.025 (0.004)	0.090 (0.006)	0.003 (0.002)
Literate	0.014 (0.005)	0.021 (0.005)	0.030 (0.007)	0.245 (0.020)	0.067 (0.026)
Number of Depositors	3,701	3,359	3,389	2,113	1,576
Panel C. Dependent Variable: Mulatto vs. Black					
Wealth $\geq$ \$100	0.046 (0.012)	0.058 (0.015)	0.112 (0.017)	0.114 (0.028)	
Log Wealth	0.022 (0.006)	0.027 (0.007)	0.051 (0.007)	0.060 (0.009)	
Literate	0.022 (0.010)	0.050 (0.013)	0.123 (0.018)	0.222 (0.027)	
Number of Depositors	3,676	3,329	3,331	1,635	

Notes: Each reported coefficient is from a separate regression, as in Table 3 (Columns 2, 4, and 6 of Panels A, B, and C). Each column splits the analysis from Table 3 into separate skin tone groups. These skin tone groups are defined from the detailed skin tone categories in Table 1: Black (black and colored); Dark (dark to medium dark brown); Medium (medium black to dark mulatto); Light (very light brown to fair); and White (white). The samples are moderately smaller for the Literate row, as this question is limited to people ages 10 and older in the Census. All specifications include Freedman Bank branch fixed effects, and robust standard errors are reported in parentheses.

Table 5. Geographic Heterogeneity in 1870 Census Racial Assignment by Socioeconomic Status

	One Standard Deviation Difference in County Characteristics:				
	Higher 1880 Segregation (1)	Larger Racial Literacy Gap (2)	Larger Racial Wealth Gap (3)	More Racial Violence (4)	Larger Racial Gap in Generational Mobility (5)
Panel A. Dependent Variable: White or Mulatto vs. Black					
Wealth $\geq$ \$100	-0.022 (0.007)	-0.010 (0.007)	-0.004 (0.006)	0.019 (0.010)	0.008 (0.006)
Log Wealth	-0.005 (0.002)	-0.005 (0.002)	-0.001 (0.002)	0.012 (0.005)	0.000 (0.002)
Literate	-0.003 (0.007)	-0.022 (0.007)	0.044 (0.007)	0.001 (0.009)	-0.014 (0.007)
# of Depositors	14,138	14,124	14,124	8,055	14,119
Panel B. Dependent Variable: White vs. Mulatto or Black					
Wealth $\geq$ \$100	-0.012 (0.005)	-0.030 (0.005)	-0.011 (0.005)	0.021 (0.007)	0.001 (0.004)
Log Wealth	-0.004 (0.002)	-0.009 (0.002)	-0.003 (0.002)	0.014 (0.003)	0.000 (0.002)
Literate	-0.016 (0.005)	-0.014 (0.005)	0.013 (0.004)	0.018 (0.008)	-0.005 (0.005)
# of Depositors	14,138	14,124	14,124	8,055	14,119
Panel C. Dependent Variable: Mulatto vs. Black					
Wealth $\geq$ \$100	-0.023 (0.009)	0.010 (0.008)	0.004 (0.007)	0.005 (0.010)	0.013 (0.007)
Log Wealth	-0.008 (0.004)	0.001 (0.003)	0.001 (0.004)	0.006 (0.006)	0.004 (0.004)
Literate	0.009 (0.008)	-0.017 (0.009)	0.036 (0.006)	-0.011 (0.008)	-0.011 (0.009)
# of Depositors	11,999	11,999	11,999	7,563	11,983

Notes: Each column reports how the effect of wealth or literacy varies in counties with one standard deviation: higher racial segregation in 1880 (Column 1), larger Black-White gap in literacy (Column 2), larger Black-White wealth gap (Column 3), greater racial violence (Column 4), and larger Black-White gap in intergenerational mobility (Column 5). We include the main effects and report the interaction with the indicated county characteristic. For Column 1, we use data on county racial segregation from Logan and Parman (2017) based on racial composition of Census manuscript pages. For Column 2, we use the county's literacy rate (for people ages 10 and older) among people racialized as Black in the 1870 Census. We exclude depositors and their family members in calculating county averages, and the sample declines slightly because of 14 depositors in counties with zero Black people in the Census. For Column 4, we use data from Chyn, Haggag, and Stuart (2024) on the frequency of crimes reported by the Freedmen's Bureau for racial violence perpetrated against African Americans. For each county, we calculate the number of crimes reported per person racialized as Black or Mulatto, conditional on the county having at least one report of violence. The sample declines because of non-reported data for some states. For Column 5, we use data from Chetty, Dobbie, Goldman, Porter, and Yang (2026) on intergenerational mobility, comparing parents' and childrens' earnings. To define Black mobility, we take the difference in incomes of a Black child born to parents in the 75th percentile of the Black income distribution within a county to a Black child born in the 25th distribution of the income distribution (averaging over the 1978-1992 birth cohorts). A larger difference corresponds to a less mobile county. The Black-White mobility gap is defined as the difference between the previously defined Black mobility and a similarly-defined White mobility measure. All specifications include Freedman Bank branch fixed effects, and robust standard errors are reported in parentheses.

Table 6. Effect of Black Neighbor Share on 1870 Census Race, along with Wealth and Literacy

	White or Mulatto			White vs. Mulatto			Mulatto		
	vs. Black			or Black			vs. Black		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Black Neighbor Share	-0.173 (0.013)	-0.158 (0.012)	-0.156 (0.012)	-0.166 (0.008)	-0.159 (0.008)	-0.156 (0.008)	-0.084 (0.013)	-0.082 (0.013)	-0.081 (0.013)
Measured Wealth		0.100 (0.008)	0.076 (0.010)		0.064 (0.005)	0.030 (0.005)		0.081 (0.009)	0.058 (0.010)
Literate		0.104 (0.008)	0.089 (0.008)		0.052 (0.004)	0.031 (0.004)		0.083 (0.008)	0.066 (0.009)
Measured Wealth $\times$ Literate			0.056 (0.014)			0.080 (0.010)			0.072 (0.020)
Number of Depositors	13,029	13,029	13,029	13,029	13,029	13,029	11,277	11,277	11,277

Notes: Columns 1, 4, and 7 report estimated differences in Census racial assignment by the share of someone's neighbors who are Black or Mulatto in the Census. Columns 2, 5, and 8 also include whether someone has measured household wealth ($\geq \$100$) and whether the person is literate (able to read and write). Columns 3, 6, and 9 also include an interaction between measured household wealth and literacy. Each column includes fixed effects for each of the 27 detailed skin tone categories (listed in Table 1), and in each column we limit the sample to people with reported literacy (ages 10 and older). All specifications include Freedman Bank branch fixed effects, and robust standard errors are reported in parentheses.

Table 7. Differences in 1870 Census Racial Assignment by Bank Record Characteristics

	White or Mulatto		White		Mulatto	
	vs. Black		vs. Mulatto or Black		vs. Black	
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: "Distinctively Black" Name						
"Distinctively Black" Name	-0.021 (0.003)	-0.019 (0.003)	-0.007 (0.001)	-0.009 (0.001)	-0.014 (0.003)	-0.013 (0.003)
Skin Tone Index	-0.299 (0.003)		-0.283 (0.003)		-0.310 (0.010)	
Skin Tone Fixed Effects		Yes		Yes		Yes
Number of Depositors	14,057	14,057	14,057	14,057	11,926	11,926
Panel B: Occupation in Bank Record						
Professional Occupation	0.069 (0.012)	0.065 (0.012)	0.008 (0.007)	0.015 (0.007)	0.075 (0.015)	0.069 (0.014)
Service/Trades Occupation	0.050 (0.008)	0.035 (0.008)	-0.017 (0.004)	-0.001 (0.004)	0.043 (0.008)	0.037 (0.008)
Skin Tone Index	-0.304 (0.004)		-0.282 (0.003)		-0.300 (0.012)	
Skin Tone Fixed Effects		Yes		Yes		Yes
Number of Depositors	10,459	10,459	10,459	10,459	9,276	9,276
Panel C: Writes Own Signature in Bank Record						
Depositor Signature	0.055 (0.008)	0.051 (0.008)	0.000 (0.004)	0.004 (0.004)	0.059 (0.008)	0.054 (0.008)
Skin Tone Index	-0.295 (0.004)		-0.284 (0.003)		-0.318 (0.011)	
Skin Tone Fixed Effects		Yes		Yes		Yes
Number of Depositors	12,110	12,110	12,110	12,110	10,334	10,334

Notes: This table reports estimates similar to those in Table 3, but for depositor characteristics defined using the Bank's depositor record. Panel A reports effects of having a one standard deviation more "distinctively Black" name, based on the frequency of that name in the 1870 Census among people racialized as Black or Mulatto compared to those racialized as White. Panel B reports effects of having a professional occupation or service/trades occupation, relative to the omitted category of having a farmer/laborer occupation. Panel C reports effects associated with the depositor having signed their name in the Bank record (as opposed to the Bank cashier signing the name and indicating "his/her mark.") All specifications include Freedman Bank branch fixed effects, and robust standard errors are reported in parentheses.

Table 8. Racial Assignment in 1940 among Descendants of 1870 Black or Mulatto People

	White in 1940 (1)	Log Income in 1940 (2)
Panel A: Differences in 1940 Census Race by 1870 Black or Mulatto Ancestor Characteristics		
1870 Measured Wealth	0.072 (0.001)	
1870 Literate	0.149 (0.001)	
Panel B: Differences in 1940 Income by 1940 Census Race, within 1870 Black or Mulatto Ancestor		
White in 1940		0.553 (0.005)
1870 Ancestor Fixed Effects		Yes
Sample Size	4,393,386	763,482

Notes: The sample is people in the 1940 Census who are linked to a Black or Mulatto ancestor in the 1870 Census (using the full Census Tree). The outcome in Column 1 is whether someone is White in the 1940 Census, which is regressed on characteristics of their Black or Mulatto ancestor in 1870: whether the ancestor had measured household wealth in 1870, and whether the ancestor was literate in 1870. The outcome in Column 2 is log wage income in 1940, which is regressed on whether the person is classified as White in 1940 (and controlling for age, age-squared, and gender, limiting the sample to people ages 18-64 who were working at least 26 weeks with positive wage income). Column 2 also includes fixed effects for 1870 ancestor, so the comparison is between people in 1940 with the same linked ancestor. The sample size in Column 2 reflects people who share a linked ancestor. Robust standard errors are in parentheses.

Table 9. Selected Racial Assignment in Modern NLSY Data, by Skin Tone Group

Dependent Variable: White	Full Sample	By Skin Tone Group (Darkest to Lightest):									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Panel A: Income											
Log Income	0.019 (0.004)	0.000	0.008 (0.008)	0.018 (0.015)	0.003 (0.003)	0.004 (0.004)	0.004 (0.004)	0.082 (0.037)	0.093 (0.027)	0.009 (0.006)	0.002 (0.002)
Share Classified as Black	0.31	1	0.99	0.92	1.00	0.99	0.99	0.70	0.18	0.03	0.00
Sample Size	3,195	20	81	191	201	171	148	148	380	833	1,022
Panel B: Wealth											
Log Parental Wealth	0.022 (0.003)	0.000	-0.014 (0.014)	0.028 (0.009)	0.002 (0.002)	0.000	0.001 (0.001)	0.082 (0.021)	0.092 (0.013)	0.024 (0.006)	0.002 (0.002)
Share Classified as Black	0.35	1	0.99	0.94	1.00	1	0.99	0.72	0.20	0.03	0.00
Sample Size	3,094	21	103	223	216	182	157	143	357	771	921
Panel C: Education											
College Completion	0.016 (0.006)	0.000	-0.008 (0.008)	-0.037 (0.033)	-0.007 (0.005)	-0.004 (0.004)	-0.010 (0.007)	0.006 (0.088)	0.127 (0.039)	0.022 (0.011)	-0.004 (0.004)
Share Classified as Black	0.37	1	0.99	0.94	0.99	1.00	0.99	0.74	0.22	0.04	0.00
Sample Size	4,316	30	141	318	323	265	242	210	470	1,046	1,271

Notes: The sample is people in the NLSY97 (National Longitudinal Surveys of Youth), born between 1980 and 1984, who are classified as Black or White (non-Hispanic) in both 1997 (household-reported) and 2007 (enumerator-reported). In each column, the outcome is whether an individual is classified as White in 1997 (and Appendix Table 13 reports similar estimates for whether an individual is classified as White in 2007, as these classifications rarely vary). Column 1 is a pooled sample, and Columns 2-11 split the sample by skin tone group ordered from darkest to lightest (enumerator-reported in 2008, see Appendix Figure 3). In each Panel, whether someone is classified as White is regressed on: the person's log income (Panel A, reported in 2008); the person's parents' net wealth (Panel B, reported in 1997); and whether the person has completed four years of college (Panel C, reported 2008). Robust standard errors are in parentheses.

Table 10. Differences in Wealth and Literacy by Skin Tone, Attenuated Within Census Race

	Full Sample		Within Census Race:			Excluding White:	
	(1)	(2)	Black (3)	Mulatto (4)	White (5)	Race (6)	Skin Tone (7)
Panel A. Dependent Variable: Wealth $\geq$ \$100							
Skin Tone Index	-0.122 (0.005)	-0.011 (0.008)	-0.036 (0.012)	-0.034 (0.018)	0.009 (0.011)	-0.071 (0.009)	-0.129 (0.009)
Black		-0.383 (0.021)					
Mulatto		-0.258 (0.021)					
Number of Depositors	14,138	14,138	9,964	2,035	2,139	11,999	12,562
Panel B. Dependent Variable: Log Wealth							
Skin Tone Index	-0.532 (0.019)	-0.107 (0.027)	-0.085 (0.028)	-0.226 (0.058)	-0.080 (0.044)	-0.247 (0.028)	-0.492 (0.030)
Black		-1.476 (0.077)					
Mulatto		-1.119 (0.076)					
Number of Depositors	14,138	14,138	9,964	2,035	2,139	11,999	12,562
Panel C. Dependent Variable: Literate							
Skin Tone Index	-0.171 (0.005)	-0.055 (0.008)	-0.061 (0.014)	-0.131 (0.020)	-0.076 (0.010)	-0.133 (0.011)	-0.202 (0.010)
Black		-0.399 (0.021)					
Mulatto		-0.246 (0.021)					
Number of Depositors	13,029	13,029	9,448	1,829	1,752	11,277	11,790

Notes: Column 1 reports the unconditional relationship between the indicated outcome (in each Panel) and the skin tone index. Column 2 also includes whether the person is racialized as Black or racialized as Mulatto. Columns 3, 4, and 5 report separate estimates within the subsamples of depositors who are racialized as Black, Mulatto, or White. Column 6 excludes depositors with White race in the 1870 Census. Column 7 excludes depositors with white skin tone in the Freedman Bank records. All specifications include Freedman Bank branch fixed effects, and robust standard errors are reported in parentheses.

Table 11. Differences in Income and Education by Skin Tone, Attenuated Within NLSY Race

	Full Sample		Within NLSY Race:		Excluding White:	
	(1)	(2)	Black	White	Race	Skin Tone
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. Dependent Variable: Log Income						
Skintone Index	-0.163	-0.010	0.005	-0.029	0.005	-0.156
	(0.018)	(0.037)	(0.055)	(0.048)	(0.055)	(0.032)
Black		-0.353				
		(0.077)				
Sample Size	3,195	3,195	995	2,200	995	1,340
Panel B. Dependent Variable: Log Parental Wealth						
Skintone Index	-0.749	-0.152	-0.048	-0.309	-0.048	-0.704
	(0.030)	(0.068)	(0.089)	(0.104)	(0.089)	(0.057)
Black		-1.367				
		(0.140)				
Sample Size	3,094	3,094	1,088	2,006	1,088	1,402
Panel C. Dependent Variable: College Completion						
Skintone Index	-0.086	-0.058	-0.012	-0.130	-0.012	-0.055
	(0.006)	(0.013)	(0.017)	(0.019)	(0.017)	(0.012)
Black		-0.066				
		(0.027)				
Sample Size	4,316	4,316	1,595	2,721	1,595	1,999

Notes: As in Table 10, but now using the NLSY data, Column 1 reports the unconditional relationship between the indicated SES measure (in each Panel) and the skin tone index. Column 2 also includes whether the person is racialized as Black (household-reported in 1997). Columns 3 and 4 report separate estimates within NLSY race. Column 5 excludes people of White race, and Column 6 excludes people of White skin tone (corresponding to those in columns 10 and 11 in Table 9). Robust standard errors are reported in parentheses.

Table 12. Differences in Wealth and Literacy by Skin Tone, 2SLS with Multiple Measures

	OLS		2SLS	
	(1)	(2)	(3)	(4)
Panel A. Dependent Variable: Wealth $\geq$ \$100				
Skin Tone Index	-0.130 (0.026)	-0.064 (0.048)	-0.124 (0.028)	-0.037 (0.058)
Black		-0.221 (0.146)		-0.283 (0.163)
Mulatto		-0.111 (0.142)		-0.162 (0.153)
Number of Depositors	578	578	578	578
Panel B. Dependent Variable: Log Wealth				
Skin Tone Index	-0.510 (0.090)	-0.318 (0.139)	-0.539 (0.101)	-0.342 (0.163)
Black		-0.705 (0.402)		-0.650 (0.417)
Mulatto		-0.481 (0.387)		-0.435 (0.397)
Number of Depositors	578	578	578	578
Panel C. Dependent Variable: Literate				
Skin Tone Index	-0.170 (0.030)	-0.135 (0.049)	-0.180 (0.033)	-0.153 (0.061)
Black		-0.108 (0.140)		-0.069 (0.163)
Mulatto		0.042 (0.135)		0.076 (0.151)
Number of Depositors	542	542	542	542
First Stage, Dependent Variable: Skin Tone Index				
Duplicate Skin Tone Index			0.924 (0.024)	0.751 (0.039)
F-Statistic on Instrument			1541	373

Notes: Columns 1 and 2 replicate Table 3, but restricting the sample to depositors whose skin tone is recorded twice from opening multiple accounts with the Bank at different dates. Columns 3 and 4 are two-stage least squares estimates corresponding to Columns 1 and 2, but instrumenting for the primary value of the skin tone index (from the record with more biographical information) using the secondary value of the skin tone index. The first-stage coefficients are reported below, along with the F-statistic of the excluded instrument. All specifications include Freedman Bank branch fixed effects, and robust standard errors are reported in parentheses.

Appendix for:

The Social and Statistical Construction of Race

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A Linking Freedman Bank Depositor Records to the 1870 Census: Iterative Hand-Linking and Machine Learning Model Details

This section provides further details on our process for linking the Freedman Bank depositor records to the 1870 Census. In particular, we include details on the variables used in estimating the random forest linking model. We use the model to iterate on the hand-links, but we ultimately hand-link all records.

To begin the process, in a “blocking” stage, we generate up to 20 candidate matches in the 1870 Census for each of the 44,077 linkable depositors in the Freedman Bank depositor records. A linkable record has the depositor name, age, and birth place (state or country).

We separate the 44,077 linkable depositors into two groups: 35,958 adults and 8,119 children. We define a depositor as a child when their age in the depositor record is younger than 18 and they have no spouse or children in their depositor record. This distinction between adults and children determines the family information shown when hand-linking the records: for children, we display the names of their parents and siblings; for adults, we display the names of their spouse and children.

The blocking code provides 861,813 “potential matches” for the 44,077 depositors, for an average of 19.55 potential matches per linkable depositor.

We send these potential matches to our data-linking team, who use their judgment to determine the appropriate links given the provided information (depositor name, age, complexion/race, and family member names). Each depositor was hand-linked by two members of our data-linking team, with a third person resolving any differences in linking decisions.

The data-linking team determines for each “potential match” one of three categories of link:

- **Type 0:** If there is no likely match, then the team member enters “0” in all the rows corresponding to this depositor.
- **Type 1:** If there is one likely match, then the team member enters “1” in the row for that matched person in the 1870 Census and enters “0” for each other potential match.
- **Type 3:** If there are multiple candidates that could be a possible match, then our team member enters “3” in those rows and enters “0” elsewhere. For this paper, we exclude these one-to-many matches and focus only on the unique matches, though it is relevant that they had the option of indicating multiple matches.

After hand-linking all 44,077 depositor records, we construct two random forest models (one for adults and one for children) to help assess the potential quality of links made. We use

these assessments to revisit potentially bad matches (e.g., a Type 1 that should be Type 0) and revisit potentially missed matches (e.g., a Type 0 that should be a Type 1), as described in the main text. As a consequence, we re-handchecked 4,357 adult links and 815 child links (out of 35,958 total adult links and 8,119 total child links). We can also then report robustness to excluding hand-links below particular predicted thresholds, after re-estimating the model with the updated hand-links.

A.1 Defining Machine Learning Model Variables

For each random forest model, the dependent variable (“true match probability”) is defined as: 0 for potential matches that are assigned a “0”; 1 for potential matches that are assigned a “1”; and $1/K$ for each potential match assigned a “3,” where the depositor had $K \geq 2$ type 3 matches with the 1870 Census IDs.

We then create predictors for the random forest models, based flexibly on the characteristics of the people in the depositor records and the 1870 Census. The random forest model for adults contains 41 predictors and the model for children has 49 predictors, where the model can iteratively determine which predictors to emphasize. Note that predictors containing the word “spouse” and “kid” only correspond to adult depositors, while those containing “parents” or “siblings” correspond to child depositors. For each pair of people (one from the depositor records and the other from the 1870 Census), the predictors are as follows:

Depositor String Similarity Variables

Variable(s)	Description
jw_first, jw_last	One minus the Jaro-Winkler distances between the first/last names of the depositor and potential Census match.
L1_first, L1_last	An indicator equal to one if the first letter of the first/last names are the same
inits12_first	An indicator equal to one if either of two first names only has one letter.
inits2_first	An indicator equal to one if both of two first names only have one letter.
namefirst_nickname_jw	One minus the smallest Jaro-Winkler distance between a first name and the other first name’s corresponding nickname.
first_common, last_common	A commonness score of the depositor’s first/last name.
nys_first, nys_last	Indicators equal to one if the phonetic spelling between the first/last names is the same.

Depositor Age and Complexion/Race

Variable(s)	Description
birthyear_diff	Difference in birth year.
race_1_blk, race_1_wht	Indicators equal to one if the person in the depositor records has darker than “very light brown” complexion in the depositor records or whether the person has “white” complexion, where the omitted category is what we define as ambiguous complexion (between “very light brown” and “fair”).
race_wht_blk	A dummy variable equal to 1 if one person has complexion darker than “very light brown” in the depositor records (from Table 1) and is White in the Census, or if one person has “white” complexion in the depositor records and is Black or Mulatto in the Census.

Spouse/Parents String Similarity Variables

Variable(s)	Description
L1_spouse, L1_mother, L1_father	An indicator equal to one if the initial letters of the first/last names or the initial letters of the spouse or parents' names are the same.
jw_spouse, jw_mother, jw_father	One minus the Jaro-Winkler distances between the spouses'/parents' names.
jw_parents_mean	The average of jw_mother and jw_father.
spouse_common, mother_common, father_common	A commonness score of the depositor's spouse's/parents' first names.
nys_spouse, nys_mother, nys_father	Indicators equal to one if the phonetic spelling between the spouses'/parents' names is the same.
spouse_nickname_jw, mother_nickname_jw, father_nickname_jw	One minus the Jaro-Winkler distance between a spouse's/parent's name and the other spouse's/parent's corresponding nickname.

Spouse/Parents String Similarity Missing Variables

Variable(s)	Description
missing12_spouse, missing12_mother, missing12_father	An indicator equal to one if spouse/parent names are missing in either the depositor record or census record.
missing2_spouse, missing2_mother, missing2_father	An indicator equal to one if spouse/parent names are missing in both the depositor record and census record.

Children/Siblings String Similarity Variables

Variable(s)	Description
kid_nickname_jw_max, sibling_nickname_jw_max	One minus the minimum Jaro-Winkler distance between a child/sibling's name and another child/sibling's corresponding nickname.
jw_kids_max, jw_kids_mean, jw_siblings_max, jw_siblings_mean	One minus the minimum/mean of the Jaro-Winkler distances between the children/siblings' names.
jw_rsc_kids_max, jw_rsc_kids_mean, jw_rsc_siblings_max, jw_rsc_siblings_mean	One minus the minimum/mean of the Jaro-Winkler distances between the children/siblings' names, re-scaled by the kids' names' commonness.
nys_kids_any, nys_kids_mean, nys_siblings_any, nys_siblings_mean	Minimum/mean of the phonetic distances between the children/siblings' names.
nys_rsc_kids_any, nys_rsc_kids_mean, nys_rsc_siblings_any, nys_rsc_siblings_mean	Minimum/mean of the phonetic distances between the children/siblings' names, re-scaled by the children/siblings' names' commonness.

Children/Siblings String Similarity Missing Variables

Variable(s)	Description
missing12_kids, missing12_siblings	An indicator equal to one if children/siblings names are missing in either the depositor record or census record.
missing2_kids, missing2_siblings	An indicator equal to one if children/siblings names are missing in both the depositor record and census record.
nys_kids_any_missing, nys_kids_mean_missing, nys_siblings_any_missing, nys_siblings_mean_missing	Indicator equal to one if the corresponding variable is missing.
nys_rsc_kids_any_missing, nys_rsc_kids_mean_missing, nys_rsc_siblings_any_missing, nys_rsc_siblings_mean_missing	Indicator equal to one if the corresponding variable is missing.
jw_kids_max_missing, jw_kids_mean_missing, jw_siblings_max_missing, jw_rsc_kids_max_missing, jw_rsc_kids_mean_missing, jw_rsc_siblings_max_missing	Indicator equal to one if the corresponding variable is missing.

B Adjusted Racial Wealth Gaps in 1870, Conditional on Observables

This section briefly describes how we estimate the adjusted wealth gap when relaxing our main assumptions, $P_{W|A}^C = P_{W|A}^F$ and $\omega_{W,A}^C = \omega_{W,A}^F \times \frac{\omega_B^C}{\omega_B^F}$, to instead vary within groups defined by a set of observables X . For example, if X contains indicator variables for literacy, gender, and adult, then we assume $P_{W|A,X}^C = P_{W|A,X}^F$ within each of the eight bins defined by the interaction of the three indicator variables.

To construct the estimator, we partition the Freedman and Census data into bins defined by X , and compute estimates of $\omega_{A,X}^C$ and $\omega_{E,X}^C$ for all bins as described in the paper for the pooled data. The next step is to estimate the total number of people in the Census with African ancestry ($N_{A,X}^C$) or European ancestry ($N_{E,X}^C$) within each bin. We use the Law of Total Probability and our assumption that $P_{A|B}^C = 1$ to note that for people of African ancestry: $N_{A,X}^C = N_X^C \times P_{A|X}^C = N_X^C \times (P_{A|W,X}^C \times P_{W,X} + 1 \times P_{B,X})$. Similarly, for people of European ancestry: $N_{E,X}^C = N_X^C \times ((1 - P_{A|W,X}^C) \times P_{W,X} + 0 \times P_{B,X})$. We then estimate ω_A^C and ω_E^C by summing across all bins X the product of the estimated number of people within an ancestral group and their average wealth, then dividing by the total population within ancestry. We then divide to recover an adjusted wealth gap:

$$(19) \quad \frac{\omega_A^C}{\omega_E^C} = \frac{\sum_X N_{A,X}^C \times \omega_{A,X}^C / \sum_X N_{A,X}^C}{\sum_X N_{E,X}^C \times \omega_{E,X}^C / \sum_X N_{E,X}^C}.$$

This now assumes $P_{W|A,X}^C = P_{W|A,X}^F$, rather than $P_{W|A}^C = P_{W|A}^F$. In the unconditional case, without conditioning on bins defined by X , the N cancel and we are left with the pooled unconditional ratio.

Appendix Figure 1. Freedman Bank Depositor Record for Lafayette Spencer

No. 1445 Record for Lafayette Spencer

Date of Application, January 17, 1870
 Where born, Hyde Co. Middle Creek
 Where brought up, do.
 Residence, do.
 Age, 26 -
 Complexion, dark brown - stout -
 Occupation, Farming -
 Works for Mr. Clayton -
 Wife, Nancy (Gilliard) m. - 5 yrs.
 Children, Grant - 3 mos. dead Elsie - Julia Ann
 Francis - 1 not named -
 Father, Jack S. lives with me -
 Mother, Elsie S.
 Brothers, Jack ¹² - Samuel ²⁸ in Charleston S.C.
 dead - Milton - Henry -
 Sisters, Matilda (m. Robt. Gibbs) - Jane ^{d.} - Sarah ¹⁸
 Martha ⁷ - Edith ¹⁶ -
 Signature, Lafayette Spencer

No. 1445 Record for	Lafayette Spencer
Date of Application	January 17, 1870
Where born	Hyde County, Middle Creek
Where brought up	"
Residence	"
Age	26 years old
Complexion	Dark brown, stout
Occupation	Farming
Works for	William Clayton
Wife	Nancy (Gilliard), married 5 yrs
Children	Grant 3 months; dead: Elsie, Julia Ann, Francis, 1 not named
Father	Jack S. lives with me
Mother	Elsie S.
Brothers	Jack 12, Samuel 28 in Charleston, S.C. dead: Milton, Henry
Sisters	Matilda (m. Robert Gibbs), Jane (d.), Sarah (18) Martha (17), Edith (16)

Notes: The image on the left is the depositor record for Lafayette Spencer, from an account opened on January 17, 1870 with the New Bern branch of the Freedman Bank. On the right is a typed transcription. Note that Hyde County is near New Bern (Craven County), but is not a neighboring county.

Appendix Figure 2. 1870 Census Record for Lafayette Spencer

SCHEDULE 1.—Inhabitants in Lake Landing Township, in the County of Wayne, State of N. Carolina, enumerated by me on the 8th day of August, 1870. 497

Post Office: Lake Landing W. J. Smith, Ass't Marshal.

1	2	3	4			7	8		10	11		13	14	15	16		18	19	
			Age	Sex	Color		Value of Real Estate Owned	Value of Personal Estate		Place of Birth	Mother of Foreign Birth				Whether deaf and dumb, blind, insane, or idiotic	Male		Female	
193	193	Spencer Lafayette	30	M	B	Farmer	0	0	N. Carolina							✓	✓		✓
		Nancy	24	F	B	Keeping House	0	0	"							✓	✓		
		Grant	0	M	B		0	0	"			Oct							
		Anna	20	F	B		0	0	"							✓	✓		
		Mary L	18	F	B		0	0	"							✓	✓		
		Cinda	38	F	B		0	0	"							✓	✓		

Spencer Lafayette	30	M	B	Farmer	0	0	N. Carolina							✓	✓		✓
" Nancy	24	F	B	Keeping House	0	0	"							✓	✓		
" Grant	0	M	B		0	0	"				Oct						
" Anna	20	F	B		0	0	"							✓	✓		
" Mary L	18	F	B		0	0	"							✓	✓		
" Cinda	38	F	B		0	0	"							✓	✓		

Notes: The image above is the 1870 Census record for Lafayette Spencer, with a typed transcription below.

Appendix Figure 3. NLSY Enumerator's Color Card



Notes: This color card was distributed to NLSY enumerators to classify respondents' skin color in the 2008 survey round. The images show the backs of hands with ten different skin colors, from lighter to darker on a numeric scale initially developed for the National Immigration Survey (NIS).

Appendix Table 1. Tabulation of Bank Depositor Complexion Categories by Branch

Complexion:	Freedman Bank Branch:																										
	ATL	AUG	BAL	BEA	CHA	CMS	HUN	LEX	LIT	LOU	LYN	MEM	MOB	NAS	NAT	NOR	NWB	NWL	NYC	RIC	SAV	SHR	STL	TAL	VIC	WDC	WIL
Black	312	372	55	137	379	2	110	94	13	14	0	175	39	6	43	189	180	185	58	309	384	48	2	41	430	4	25
Colored	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	90	2	0
Dark	5	0	27	2	22	38	18	3	1	11	1	77	69	82	4	78	33	10	1	97	554	67	3	105	5	253	67
Very Dark	7	0	0	0	1	3	0	1	2	0	0	1	0	4	0	0	1	0	0	16	0	0	1	0	0	0	12
Dark Black	0	1	0	0	1	0	0	26	0	0	0	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
Dark Brown	88	105	14	88	393	20	10	30	38	34	0	95	23	117	3	0	52	9	80	232	68	7	0	22	3	9	15
Very Dark Brown	51	0	0	0	0	0	1	1	1	0	0	1	0	2	0	0	0	0	0	13	0	0	0	0	0	0	2
Med. Dark Brown	0	0	0	0	0	4	2	2	0	0	0	4	0	3	0	1	1	0	0	2	0	0	0	0	0	0	0
Medium Black	0	0	0	0	0	0	1	87	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Medium Brown	1	0	0	0	0	23	26	15	1	0	0	2	0	8	0	0	16	2	0	1	0	0	0	0	0	1	2
Brown	183	75	62	152	286	10	134	14	60	198	3	180	73	117	9	3	78	18	128	199	324	43	0	56	304	210	48
Nearly Black	55	108	0	0	0	0	0	4	0	0	0	4	0	0	0	0	2	0	0	8	2	0	0	0	0	0	0
Light Black	1	0	0	0	3	0	0	26	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dark Mulatto	0	0	0	0	0	0	0	0	0	19	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Very Light Brown	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	9	0	0	0	0	0	1	1
Light Colored	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Griff	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	38	0	0	0	0	6	0	0	1	0
Yellow	4	53	23	1	1	9	71	1	4	2	0	28	1	18	13	16	0	73	1	2	9	1	0	1	62	45	2
Light Brown	30	12	2	9	47	19	18	8	20	55	0	39	3	42	7	1	4	2	77	70	12	11	0	16	6	12	10
Mulatto	0	51	1	0	0	5	0	0	0	43	0	1	1	0	1	0	1	5	0	3	6	0	1	6	2	8	0
Light	4	22	1	6	139	18	2	12	2	2	0	52	8	5	2	11	36	14	35	4	247	30	0	8	13	28	14
Bright	4	7	5	0	0	3	1	3	0	6	0	11	0	15	0	3	3	1	0	1	0	0	0	17	0	3	0
Very Light	1	0	0	0	10	0	0	0	5	0	0	1	0	2	0	2	2	1	12	7	21	0	0	1	0	1	1
Nearly White	11	9	0	1	6	0	3	1	2	0	0	2	0	0	0	4	2	0	5	4	2	0	0	0	0	1	0
Olive	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	1	0	0	0	0	0	1	0
Fair	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	0
White	53	26	59	5	55	0	14	19	47	16	0	6	0	10	10	14	41	65	944	11	76	5	0	6	51	26	17

Notes: For each Freedman Bank branch, the columns list their number of depositors by detailed skin tone category. The branches are ordered as follows: Atlanta (GA), Augusta (GA), Baltimore (MD), Beaufort (SC), Charleston (SC), Columbus (MS), Hunstville (AL), Lexington (KY), Little Rock (AR), Louisville (KY), Lynchburg (VA), Memphis (TN), Mobile (AL), Nashville (TN), Natchez (MS), Norfolk (VA), New Bern (NC), New Orleans (LA), New York (NY), Richmond (VA), Savannah (GA), Shreveport (LA), St. Louis (MO), Tallahassee (FL), Vicksburg (MS), Washington (DC), Wilmington (NC). The skin tone categories are sorted in descending order of the value of the "skin tone index" defined in Table 1.

Appendix Table 2. Comparing Linkage Rates for 1:1 Matches by Complexion and Occupation

	All Occupation Groups	Occupation Group:		
		Professional	Services and Manufacturing	Farmers and Laborers
Complexion:	(1)	(2)	(3)	(4)
All skin tones	0.321 (0.002)	0.385 (0.009)	0.307 (0.003)	0.308 (0.004)
Black / non-white skin tones	0.315 (0.003)	0.396 (0.012)	0.306 (0.004)	0.312 (0.004)
Ambiguous skin tones	0.325 (0.006)	0.371 (0.020)	0.315 (0.008)	0.304 (0.015)
White skin tone	0.353 (0.007)	0.373 (0.016)	0.303 (0.013)	0.212 (0.024)

Notes: Each cell reports the linkage rate from the Freedman depositor data to the 1870 Census (unique links, 1:1), by the indicated complexion group and occupation group in the depositor record. The sample includes all depositor records with a reported complexion corresponding to those in Table 1. The "Ambiguous skin tones" category includes the complexion categories from "very light brown" to "fair" in Table 1, along with the ambiguously named "nearly black." Standard errors are reported in parentheses.

Appendix Table 3. Differences in 1870 Census Racial Assignment by Literacy Category

	White or Mulatto	White	Mulatto
	vs. Black	vs. Mulatto or Black	vs. Black
	(1)	(2)	(3)
Can Write, Cannot Read	0.029 (0.031)	0.014 (0.016)	0.026 (0.032)
Can Read, Cannot Write	0.078 (0.012)	0.001 (0.005)	0.078 (0.013)
Can Read, Can Write	0.133 (0.008)	0.067 (0.005)	0.103 (0.008)
Number of Depositors	13,029	13,029	11,277

Notes: This table extends the estimates in Table 3, Panel C, Columns 2, 4, and 6, where someone is defined as literate if they can read and write. Here, the omitted category is being recorded as cannot read and cannot write, and we now report estimated differences for people who: can write and cannot read; can read and cannot write; can read and write. Each specification includes skin tone fixed effects and Freedman branch fixed effects, and the sample is restricted to people ages 10 and older with reported literacy data. Robust standard errors in parentheses.

Appendix Table 4. Differences in 1870 Racial Assignment by SES Measure, Jointly Estimated

	White or Mulatto	White	Mulatto
	vs. Black	vs. Mulatto or Black	vs. Black
SES Measures:	(1)	(2)	(3)
Measured Wealth	0.097 (0.009)	0.066 (0.006)	0.073 (0.010)
Literacy	0.089 (0.009)	0.058 (0.006)	0.061 (0.010)
Professional Occupation	0.035 (0.012)	-0.001 (0.007)	0.044 (0.015)
Service/ Manufacturing Occupation	0.026 (0.008)	-0.012 (0.004)	0.035 (0.008)
His Mark	0.010 (0.009)	-0.019 (0.005)	0.021 (0.009)
Distinctively Black Name	-0.043 (0.016)	-0.019 (0.006)	-0.028 (0.016)
Black Neighbor Share	-0.132 (0.015)	-0.149 (0.009)	-0.059 (0.015)
Number of Depositors	8,996	8,996	7,954

Notes: This table combines estimates from Tables 3, 6, and 7, jointly estimating the differences in 1870 Census racial assignment by SES measure. The sample is limited to depositors with data for each measure, and each specification includes skin tone fixed effects and Freedman Bank branch fixed effects. Column 1 reports effects on whether depositors are racialized in the 1870 Census as White or Mulatto (as opposed to Black); Column 2 reports effects on whether depositors are racialized as White (as opposed to Mulatto or Black); and Column 3 reports effects on whether depositors are racialized as Mulatto (as opposed to Black, excluding White depositors from the sample). Robust standard errors are reported in parentheses.

Appendix Table 5. Effects of SES on Census Racial Assignment, Robustness to Link Restrictions

	Baseline Handlinks (1)	Exclude ML Prob < 0.10 (2)	Exclude ML Prob < 0.50 (3)	≥ 1 Family Match (4)	≥ 2 Family Match (5)	Exact Name & Birth Year ±1 (6)
Panel A. Dependent Variable: White or Mulatto vs. Black						
Wealth ≥ \$100	0.108 (0.007)	0.099 (0.008)	0.077 (0.009)	0.101 (0.009)	0.093 (0.012)	0.100 (0.014)
Log Wealth	0.041 (0.002)	0.037 (0.002)	0.029 (0.003)	0.038 (0.003)	0.033 (0.004)	0.032 (0.004)
Literate	0.122 (0.008)	0.110 (0.008)	0.094 (0.010)	0.121 (0.011)	0.118 (0.014)	0.093 (0.015)
Number of Depositors	14,138	12,459	8,598	8,335	4,974	3,568
Panel B. Dependent Variable: White vs. Mulatto or Black						
Wealth ≥ \$100	0.068 (0.005)	0.056 (0.005)	0.028 (0.005)	0.062 (0.006)	0.047 (0.007)	0.047 (0.009)
Log Wealth	0.030 (0.002)	0.025 (0.002)	0.013 (0.002)	0.026 (0.002)	0.021 (0.003)	0.018 (0.003)
Literate	0.067 (0.005)	0.051 (0.004)	0.028 (0.004)	0.060 (0.007)	0.052 (0.008)	0.042 (0.008)
Number of Depositors	14,138	12,459	8,598	8,335	4,974	3,568
Panel C. Dependent Variable: Mulatto vs. Black						
Wealth ≥ \$100	0.085 (0.009)	0.081 (0.009)	0.074 (0.011)	0.079 (0.011)	0.083 (0.014)	0.099 (0.018)
Log Wealth	0.043 (0.004)	0.041 (0.004)	0.036 (0.004)	0.041 (0.005)	0.039 (0.006)	0.048 (0.008)
Literate	0.092 (0.008)	0.090 (0.009)	0.085 (0.010)	0.095 (0.011)	0.097 (0.014)	0.082 (0.016)
Number of Depositors	11,999	10,769	7,561	6,957	4,025	2,888

Notes: Column 1 reports our baseline estimates from Table 3 (in Columns 2, 4, and 6 of Panels A, B, and C). Each coefficient is from a separate regression and, as before, the sample size is smaller for Literate. In Column 2 and 3, we exclude links that the machine-learning model assigns a probability below 0.10 or 0.50. In Column 4, we restrict the sample to depositors with at least one other household member whose name also matches between the depositor record and 1870 Census (e.g., a spouse or child for adult depositors, and a parent or sibling for child depositors). In Column 5, we restrict the sample to depositors with at least two other household members whose name matches. Within our hand-linked households, for this sample restriction we define a household member name "match" as having Jaro-Winkler string distance below 0.30 (searching within family members only). In Column 6, we limit the hand-linked records to those with an exact name match and an age difference that is one year or less. All specifications include Freedman Bank branch fixed effects, and robust standard errors are reported in parentheses.

Appendix Table 6. Census Racial Assignment by Depositor Characteristics in Bank Records, Robustness to Link Restrictions

	Baseline Handlinks (1)	Exclude ML Prob < 0.10 (2)	Exclude ML Prob < 0.50 (3)	≥ 1 Family Match (4)	≥ 2 Family Match (5)	Exact Name & Birth Year ±1 (6)
Panel A. Dependent Variable: White or Mulatto vs. Black						
"Distinctively Black" Name	-0.019 (0.003)	-0.017 (0.003)	-0.015 (0.003)	-0.018 (0.003)	-0.019 (0.005)	-0.035 (0.006)
Professional Occupation	0.065 (0.012)	0.060 (0.013)	0.064 (0.015)	0.067 (0.017)	0.077 (0.022)	0.098 (0.024)
Service/Trade Occupation	0.035 (0.008)	0.041 (0.008)	0.051 (0.009)	0.049 (0.011)	0.061 (0.015)	0.056 (0.016)
Own Signature	0.051 (0.008)	0.056 (0.008)	0.058 (0.009)	0.052 (0.010)	0.066 (0.013)	0.066 (0.015)
Number of Depositors	14,138	12,459	8,598	8,335	4,974	3,568
Panel B. Dependent Variable: White vs. Mulatto or Black						
"Distinctively Black" Name	-0.009 (0.001)	-0.006 (0.001)	-0.002 (0.001)	-0.008 (0.002)	-0.009 (0.002)	-0.009 (0.003)
Professional Occupation	0.015 (0.007)	0.017 (0.007)	0.018 (0.008)	0.015 (0.010)	0.021 (0.014)	0.030 (0.014)
Service/Trade Occupation	-0.001 (0.004)	0.004 (0.003)	0.003 (0.003)	-0.002 (0.005)	-0.001 (0.007)	-0.002 (0.008)
Own Signature	0.004 (0.004)	0.002 (0.004)	0.000 (0.004)	-0.001 (0.005)	0.004 (0.007)	0.013 (0.008)
Number of Depositors	14,138	12,459	8,598	8,335	4,974	3,568
Panel C. Dependent Variable: Mulatto vs. Black						
"Distinctively Black" Name	-0.013 (0.003)	-0.013 (0.003)	-0.014 (0.003)	-0.013 (0.003)	-0.013 (0.005)	-0.030 (0.005)
Professional Occupation	0.069 (0.014)	0.057 (0.015)	0.061 (0.018)	0.067 (0.020)	0.072 (0.027)	0.103 (0.030)
Service/Trade Occupation	0.037 (0.008)	0.040 (0.008)	0.051 (0.010)	0.053 (0.011)	0.068 (0.015)	0.057 (0.017)
Own Signature	0.054 (0.008)	0.059 (0.008)	0.062 (0.010)	0.061 (0.011)	0.076 (0.014)	0.067 (0.016)
Number of Depositors	11,999	10,769	7,561	6,957	4,025	2,888

Notes: Column 1 reports our estimates from Table 7 (in Columns 2, 4, and 6 of Panels A, B, and C). Columns 2 to 6 report estimates for restricted samples, as described in Appendix Table 4 (that correspond to our baseline estimates from Table 3). In Columns 2 and 3, we exclude links that the machine-learning model assigns a probability below 0.10 or 0.50. In Column 4, we restrict the sample to depositors with at least one other household member whose name also matches between the depositor record and 1870 Census (e.g., a spouse or child for adult depositors, and a parent or sibling for child depositors). In Column 5, we restrict the sample to depositors with at least two other household members whose name matches. Within our hand-linked households, for this sample restriction we define a household member name "match" as having Jaro-Winkler string distance below 0.30 (searching within family members only). In Column 6, we limit the hand-linked records to those with an exact name match and an age difference that is one year or less. All specifications include Freedman Bank branch fixed effects, and robust standard errors are reported in parentheses.

Appendix Table 7. Effects of SES on Census Racial Assignment, Restricted Samples by Location

	Baseline Handlinks (1)	In Birth State (2)	Outside Birth State (3)	In Branch or Border County (4)	Exclude NYC Branch (5)	Exclude Foreign-born (6)
Panel A. Dependent Variable: White or Mulatto vs. Black						
Wealth $\geq$ \$100	0.108 (0.007)	0.112 (0.009)	0.101 (0.012)	0.063 (0.009)	0.117 (0.008)	0.119 (0.008)
Log Wealth	0.041 (0.002)	0.043 (0.003)	0.036 (0.004)	0.025 (0.003)	0.051 (0.003)	0.049 (0.003)
Literate	0.122 (0.008)	0.115 (0.009)	0.142 (0.015)	0.093 (0.009)	0.120 (0.008)	0.124 (0.008)
Number of Depositors	14,138	10,254	3,884	8,827	12,797	13,041
Panel B. Dependent Variable: White vs. Mulatto or Black						
Wealth $\geq$ \$100	0.068 (0.005)	0.071 (0.006)	0.060 (0.008)	0.015 (0.004)	0.074 (0.005)	0.074 (0.005)
Log Wealth	0.030 (0.002)	0.033 (0.003)	0.025 (0.003)	0.009 (0.002)	0.037 (0.002)	0.036 (0.002)
Literate	0.067 (0.005)	0.058 (0.005)	0.091 (0.010)	0.023 (0.004)	0.065 (0.005)	0.067 (0.005)
Number of Depositors	14,138	10,254	3,884	8,827	12,797	13,041
Panel C. Dependent Variable: Mulatto vs. Black						
Wealth $\geq$ \$100	0.085 (0.009)	0.084 (0.010)	0.088 (0.016)	0.067 (0.010)	0.084 (0.009)	0.084 (0.009)
Log Wealth	0.043 (0.004)	0.042 (0.004)	0.046 (0.008)	0.034 (0.004)	0.043 (0.004)	0.043 (0.004)
Literate	0.092 (0.008)	0.088 (0.009)	0.104 (0.017)	0.089 (0.010)	0.089 (0.008)	0.091 (0.008)
Number of Depositors	11,999	9,031	2,968	7,782	11,649	11,860

Notes: Column 1 reports our baseline estimates from Table 3 (in Columns 2, 4, and 6 of Panels A, B, and C). Column 2 limits the sample to depositors that are reported in the 1870 Census as living in their birth state, and Column 3 limits the sample to depositors that are reported in the 1870 Census as living outside their birth state. Column 4 limits the sample to depositors that are in the same county or neighboring county in the 1870 Census as the Freedman Bank branch where they opened their account (between 1866 and 1874). Column 5 excludes all depositors associated with the Freedman Bank branch in New York City, which had the largest share of white depositors (and foreign-born depositors). Column 6 excludes all foreign-born depositors or depositors with at least one foreign-born parent. All specifications include Freedman Bank branch fixed effects, and robust standard errors are reported in parentheses.

Appendix Table 8. Effects of SES on Census Racial Assignment, Alternative Samples

	Baseline Handlinks (1)	No "Racial" Categories (2)	Household Head Only (3)	Only Women (4)	Only Children (5)	Only Wealth $\geq$ \$100 (6)
Panel A. Dependent Variable: White or Mulatto vs. Black						
Wealth $\geq$ \$100	0.108 (0.007)	0.147 (0.011)	0.089 (0.010)	0.123 (0.016)	0.121 (0.013)	-
Log Wealth	0.041 (0.002)	0.066 (0.004)	0.036 (0.003)	0.044 (0.005)	0.042 (0.004)	0.041 (0.004)
Literate	0.122 (0.008)	0.157 (0.010)	0.118 (0.010)	0.135 (0.016)	0.114 (0.016)	0.166 (0.016)
Number of Depositors	14,138	8,726	7,699	3,952	3,852	3,843
Panel B. Dependent Variable: White vs. Mulatto or Black						
Wealth $\geq$ \$100	0.068 (0.005)	0.099 (0.007)	0.048 (0.006)	0.090 (0.011)	0.086 (0.009)	-
Log Wealth	0.030 (0.002)	0.050 (0.003)	0.023 (0.003)	0.037 (0.004)	0.036 (0.003)	0.037 (0.004)
Literate	0.067 (0.005)	0.084 (0.006)	0.067 (0.006)	0.093 (0.011)	0.060 (0.010)	0.115 (0.012)
Number of Depositors	14,138	8,726	7,699	3,952	3,852	3,843
Panel C. Dependent Variable: Mulatto vs. Black						
Wealth $\geq$ \$100	0.085 (0.009)	0.095 (0.011)	0.070 (0.011)	0.089 (0.019)	0.100 (0.018)	-
Log Wealth	0.043 (0.004)	0.047 (0.005)	0.036 (0.005)	0.040 (0.007)	0.053 (0.008)	0.049 (0.008)
Literate	0.092 (0.008)	0.116 (0.011)	0.086 (0.010)	0.095 (0.017)	0.091 (0.017)	0.127 (0.019)
Number of Depositors	11,999	8,189	6,899	3,387	2,806	2,574

Notes: Column 1 reports our baseline estimates from Table 3 (in Columns 2, 3, and 4 of Panels A, B, and C). Each coefficient is from a separate regression and, as before, the sample size is smaller for Literate. Column 2 omits the more "racial" categories of skin tone: (black, nearly black, colored, mulatto, white, nearly white). Column 3 restricts the sample to Household Heads only, Column 4 restricts the sample to women only, and Column 5 restricts the sample to children only (ages 17 and younger). Column 6 restricts the sample to households with measured wealth ($\geq$ \$100). All specifications include Freedman Bank branch fixed effects, and robust standard errors are reported in parentheses.

Appendix Table 9. Census Racial Assignment by Literacy of Household Head and Depositor

	White or Mulatto		White		Mulatto	
	vs. Black		vs. Mulatto or Black		vs. Black	
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Household Head Literacy						
Household Head Literacy	0.131 (0.008)	0.131 (0.008)	0.086 (0.005)	0.087 (0.005)	0.096 (0.008)	0.092 (0.008)
Skin Tone Index	-0.279 (0.003)		-0.269 (0.003)		-0.303 (0.010)	
Skin Tone Fixed Effects		Yes		Yes		Yes
Number of Depositors	14,138	14,138	14,138	14,138	11,999	11,999
Panel B: Depositor Literacy						
Depositor Literacy	0.124 (0.008)	0.122 (0.008)	0.065 (0.005)	0.067 (0.005)	0.094 (0.008)	0.092 (0.008)
Skin Tone Index	-0.283 (0.004)		-0.271 (0.003)		-0.301 (0.011)	
Skin Tone Fixed Effects		Yes		Yes		Yes
Number of Depositors	13,029	13,029	13,029	13,029	11,277	11,277
Panel C: Household Head and Depositor Literacy						
Household Head Literacy	0.085 (0.013)	0.087 (0.013)	0.079 (0.007)	0.077 (0.007)	0.055 (0.014)	0.050 (0.014)
Depositor Literacy	0.062 (0.012)	0.058 (0.012)	0.007 (0.006)	0.010 (0.006)	0.055 (0.013)	0.056 (0.013)
Skin Tone Index	-0.279 (0.004)		-0.267 (0.003)		-0.300 (0.011)	
Skin Tone Fixed Effects		Yes		Yes		Yes
Number of Depositors	13,029	13,029	13,029	13,029	11,277	11,277

Notes: This table reports estimates that correspond to depositor literacy in Table 3, but for the literacy of the Household Head (in Panel A) and for the jointly estimated effects of Household Head literacy and depositor literacy (in Panel C).

Appendix Table 10. Census Racial Assignment by Measured Personal Property and Real Estate

	White or Mulatto vs. Black		White vs. Mulatto or Black		Mulatto vs. Black	
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Measured Real Estate Property						
Real Estate Value	0.140 (0.010)	0.136 (0.009)	0.089 (0.007)	0.094 (0.007)	0.121 (0.013)	0.117 (0.012)
Skin Tone Index	-0.289 (0.003)		-0.276 (0.003)		-0.306 (0.010)	
Skin Tone Fixed Effects						
Number of Depositors	14,138	14,138	14,138	14,138	11,999	11,999
Panel B: Measured Personal Property						
Personal Property	0.103 (0.008)	0.105 (0.008)	0.084 (0.006)	0.083 (0.006)	0.077 (0.010)	0.074 (0.010)
Skin Tone Index	-0.290 (0.003)		-0.274 (0.003)		-0.309 (0.010)	
Skin Tone Fixed Effects						
Number of Depositors	14,138	14,138	14,138	14,138	11,999	11,999
Panel C: Measured Real Estate and Personal Property						
Real Estate Value	0.113 (0.010)	0.107 (0.010)	0.063 (0.007)	0.068 (0.007)	0.103 (0.013)	0.100 (0.013)
Personal Property	0.068 (0.009)	0.072 (0.008)	0.065 (0.005)	0.062 (0.005)	0.052 (0.010)	0.050 (0.010)
Skin Tone Index	-0.284 (0.003)		-0.271 (0.003)		-0.304 (0.010)	
Skin Tone Fixed Effects						
Number of Depositors	14,138	14,138	14,138	14,138	11,999	11,999

Notes: This table reports estimates that correspond to measured wealth in Table 3, but separating total household wealth into real estate wealth (in Panel A), personal property wealth (in Panel B), and the jointly estimated effects (in Panel C).

Appendix Table 11. Census Racial Assignment by Log Personal Property and Real Estate

	White or Mulatto vs. Black		White vs. Mulatto or Black		Mulatto vs. Black	
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Log Real Estate Wealth						
Log Real Estate Wealth	0.038 (0.003)	0.038 (0.002)	0.028 (0.002)	0.028 (0.002)	0.048 (0.005)	0.046 (0.005)
Skin Tone Index	-0.287 (0.003)		-0.272 (0.003)		-0.303 (0.010)	
Skin Tone Fixed Effects		Yes		Yes		Yes
Number of Depositors	14,138	14,138	14,138	14,138	11,999	11,999
Panel B: Log Personal Property						
Log Personal Wealth	0.042 (0.003)	0.046 (0.003)	0.047 (0.003)	0.044 (0.003)	0.047 (0.006)	0.046 (0.006)
Skin Tone Index	-0.287 (0.003)		-0.267 (0.003)		-0.308 (0.010)	
Skin Tone Fixed Effects		Yes		Yes		Yes
Number of Depositors	14,138	14,138	14,138	14,138	11,999	11,999
Panel C: Log Real Estate and Personal Property						
Log Real Estate Wealth	0.029 (0.003)	0.027 (0.003)	0.014 (0.002)	0.015 (0.002)	0.040 (0.005)	0.039 (0.005)
Log Personal Wealth	0.024 (0.004)	0.028 (0.004)	0.038 (0.003)	0.034 (0.003)	0.028 (0.006)	0.028 (0.006)
Skin Tone Index	-0.282 (0.003)		-0.264 (0.003)		-0.302 (0.010)	
Skin Tone Fixed Effects		Yes		Yes		Yes
Number of Depositors	14,138	14,138	14,138	14,138	11,999	11,999

Notes: This table reports estimates that correspond to log wealth in Table 3, but separating total household wealth into real estate wealth (in Panel A), personal property wealth (in Panel B), and the jointly estimated effects (in Panel C). For households with less than \$100 in measured wealth, we continue to assign a value of \$45.25 before taking the natural log (based on the average among the 2% of households nationwide for which Census enumerators did report wealth between \$0 and \$100).

Appendix Table 12. Effects of SES on Census Racial Assignment, Alternative Specifications

	Additional controls for:					
	Baseline	No Branch	Branch by Acc.	Emancipated	Age and	County
	Handlinks	FE	Open Year FE	by 1860	Gender	FE
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. Dependent Variable: White or Mulatto vs. Black						
Wealth $\geq$ \$100	0.108	0.102	0.108	0.105	0.111	0.102
	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.008)
Log Wealth	0.041	0.040	0.041	0.040	0.042	0.037
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Literate	0.122	0.124	0.121	0.119	0.123	0.118
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
Number of Depositors	14,138	14,138	14,138	14,138	14,138	14,138
Panel B. Dependent Variable: White vs. Mulatto or Black						
Wealth $\geq$ \$100	0.068	0.066	0.069	0.071	0.069	0.045
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.004)
Log Wealth	0.030	0.030	0.030	0.031	0.031	0.022
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Literate	0.067	0.069	0.067	0.069	0.068	0.055
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.004)
Number of Depositors	14,138	14,138	14,138	14,138	14,138	14,138
Panel C. Dependent Variable: Mulatto vs. Black						
Wealth $\geq$ \$100	0.085	0.078	0.084	0.079	0.088	0.091
	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
Log Wealth	0.043	0.041	0.043	0.040	0.044	0.043
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Literate	0.092	0.092	0.091	0.087	0.092	0.097
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.009)
Number of Depositors	11,999	11,999	11,999	11,999	11,999	11,999

Notes: Column 1 reports our estimates from Table 3 (in Columns 2, 4, and 6 of Panels A, B, and C). Columns 2 to 6 report estimates for alternative specifications with different controls. Column 2 omits the branch fixed effects. Column 3 includes fixed effects for each branch interacted with the bank account opening year. Columns 4 to 6 are the same as our baseline specification, except for the addition of: an indicator variable for whether the depositor was free in 1860 (restricted to those racialized as Black or Mulatto in the 1870 Census); an indicator for gender and controls for age and age-squared; and fixed effects for the depositor's county in the 1870 Census. All specifications include Freedman Bank branch fixed effects (except Column 2), and robust standard errors are reported in parentheses.

Appendix Table 13. Selected Racial Assignment in Modern NLSY Data (Enumerator-Reported Race), by Skin Tone Group

Dependent Variable: White	Full Sample	By Skin Tone Group (Darkest to Lightest):									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Panel A: Income											
Log Income	0.021 (0.004)	0.018 (0.019)	0.008 (0.008)	0.030 (0.017)	0.015 (0.008)	0.008 (0.008)	0.012 (0.009)	0.063 (0.039)	0.101 (0.027)	0.006 (0.006)	0.003 (0.002)
Share Classified as Black	0.31	0.95	0.99	0.91	0.98	0.99	0.99	0.70	0.18	0.03	0.01
Sample Size	3,195	20	81	191	201	171	148	148	380	833	1,022
Panel B: Wealth											
Log Parental Wealth	0.021 (0.003)	0.000	-0.014 (0.014)	0.027 (0.009)	-0.005 (0.006)	0.000	0.001 (0.001)	0.078 (0.022)	0.089 (0.014)	0.022 (0.006)	0.002 (0.002)
Share Classified as Black	0.35	1.00	0.99	0.94	0.98	1.00	0.99	0.72	0.21	0.03	0.00
Sample Size	3,094	21	103	223	216	182	157	143	357	771	921
Panel C: Education											
College Completion	0.019 (0.007)	-0.038 (0.039)	-0.008 (0.008)	-0.041 (0.033)	0.008 (0.024)	-0.004 (0.004)	0.016 (0.026)	0.011 (0.087)	0.133 (0.039)	0.022 (0.011)	-0.003 (0.004)
Share Classified as Black	0.37	0.97	0.99	0.93	0.98	1.00	0.99	0.74	0.22	0.04	0.00
Sample Size	4,316	30	141	318	323	265	242	210	470	1,046	1,271

Notes: The sample is people in the NLSY97 (National Longitudinal Surveys of Youth), born between 1980 and 1984, who are classified as Black or White (non-Hispanic) in both 1997 (household-reported) and 2007 (enumerator-reported). In each column, the outcome is whether an individual is classified as White in 2007 (and Table 9 reports similar estimates for whether an individual is classified as White in 1997, as these classifications rarely vary). Column 1 is a pooled sample, and Columns 2-11 split the sample by skin tone group ordered from darkest to lightest (enumerator-reported in 2008, see Appendix Figure 3). In each Panel, whether someone is classified as White is regressed on: the person's log income (Panel A, reported in 2008); the person's parents' net wealth (Panel B, reported in 1997); and whether the person has completed four years of college (Panel C, reported 2008). Robust standard errors are in parentheses.