The Plight of Mixed Race Adolescents*

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Abstract

Since 1970, the fraction of mixed race black-white births has increased nearly nine-fold. This paper describes basic facts about the behaviors and outcomes of black-white mixed race individuals. Unsurprisingly, on a host of background and achievement characteristics as well as adult outcomes, mixed race individuals fall in between whites and blacks. When it comes to engaging in risky and anti-social adolescent behavior, however, mixed race adolescents are stark outliers compared to both blacks and whites. We argue that these behavioral patterns are most consistent with a two-sector Roy model, in which mixed race adolescents – not having a predetermined peer group – engage in more risky behaviors to be accepted.

Throughout history racial mixing has been taboo, though not completely absent.[1] Fear of interracial mixing was a driving force behind the Jim Crow system in the South and the Black Codes in the North (Romano 2003). Mulattoes in the antebellum South occupied a distinct position between blacks and whites (Bodenhorn and Ruebeck 2003), yet Romano (2003) reports that children of mixed racial heritage were thought to be morally and physically inferior to "pure" blacks, and more prone to diseases such as tuberculosis.[2] Indeed, in *Perez v. Sharp* (1948) the State of California argued before the California Supreme Court that anti-miscegenation laws protected the larger social good because the children of racially mixed couples were biologically inferior.[3] Even supporters of the civil rights movement drew sharp distinctions between political and social equality (Moran 2003).[4]

Figure 1 plots the share of interracial marriages, by gender and race of spouse, from 1880 to 2000. Interracial marriage between blacks and whites has increased greatly over the second half of the 20th century. In 1920, marriages to whites comprised roughly 0.3% of black marriages (Fryer 2007a). By 2000, 5.9% of married black men chose a white bride and 2.7% of black women chose a white husband (Fryer 2007a).[5]

Accompanying the changes in interracial marriage were increases in the number of black-white mixed-race births. Figure 2 presents time series evidence from 1920-2000.[6] Before 1960, mixed-race black-white births were a negligible share of total births to blacks and whites, but by the 1980s they accounted for one in 200 births, and by the year 2000, one birth out of 70 was mixed race. Despite this recent increase, empirical evidence on the experiences of these children and adults is scarce. This is particularly surprising given the nexus of opposition to interracial mixing has been the negative implications for the children of such marriages (Romano 2003).[7]

Using a variety of data sources, including (but not limited to) the 2000 US Census, NCHS Vital Statistics, and the National Survey of Adolescent Health (Add Health), our empirical analysis of the life outcomes of black-white biracial individuals (whom we call "mixed race" hereafter in the paper, recognizing that there are other forms of biracialism not included in our analysis) unearths a rich set of new facts. Figure 3 presents a high-level summary of these findings. Using the wide range of variables available in these data sets we construct index measures of birth outcomes (e.g. birth weight, duration of pregnancy, etc.), home environment (e.g. household income, father in household, mother's education, etc.), physical characteristics (e.g. height, BMI, physical attractiveness), scholastic achievement (e.g. GPA, test scores, etc.), risky and anti-social behaviors (e.g. trouble with teacher, smoking, lying to parents, violent acts, etc.), psychological wellbeing (e.g. feel loved, not depressed, chances of living to 35, etc.), and adult outcomes (e.g. married, employed, household income, etc.). Figure 3 shows mean indices and their associated standard errors for blacks and whites relative to those for mixed race individuals. For all composite measures higher values are better.[8]

According to Figure 3, at birth mixed race children fall in between their black and white counterparts, but are closer to whites. They are reared in home environments that overall are more similar to those of black children. On the physical dimension mixed race adolescents score higher than both monoracial groups. School achievement results are between blacks and whites, but closer to blacks. Their adult outcomes are closer to blacks, too. Strikingly, however, mixed race adolescents engage in substantially more risky and anti-social behavior than either blacks or whites, especially outside of school. Of the twenty-one different "asocial behavior" variables that we analyze, mixed race adolescents are worse than both blacks and whites on fourteen of them;

they fall in between blacks and whites on the remaining seven measures. Mixed race children also fare somewhat worse on measures of psychological wellbeing.

We argue that the pattern in mixed race adolescents' behavior is largely consistent with a two sector Roy model (Roy 1951), in which all adolescents face pressure to conform to peer norms.[9] For mono-racial adolescents, this norm is determined by their race: black adolescents adhere to black norms and white adolescents adhere to white norms. Mixed race children have a choice, they can choose to associate with black children and adopt their norms, befriend white children and adopt their norms, or both. It is this outside option that gives mixed race adolescents a higher cost of group acceptance, resulting in them choosing riskier behaviors to gain such acceptance. While the Roy model we develop yields many predictions that are similar to a conformity model (Bernheim 1994), these two models diverge in one important dimension. The conformity model predicts that mixed race children who mostly interact with whites will adopt white behaviors, and mixed race children whose peer groups are mostly black will act black. In contrast, in the Roy model, when there are few blacks around, mixed race children can have a comparative advantage in black behaviors, inducing them to act particularly "black," And vice versa. Empirically, the evidence on this point tips the balance in favor of the Roy model.

Our analysis builds upon a relatively small prior literature on individuals of mixed race, especially Harris and Thomas (2002) and Ruebeck, Averett and Bodenhorn (2009), both of whom also use Add Health data.[10] Harris and Thomas (2002) focus on educational outcomes such as GPA, grade repetition, and test scores, generally finding that mixed race black-white children have outcomes between blacks and whites, but in some cases closer to and not statistically distinguishable from whites. Ruebeck et al. (2009) is the paper most similar to ours.[11] In independent research, they analyze many of the same outcomes that we consider

through the lens of a Bernheim-type conformity model. They find that mixed race children adopt behaviors that are characterized both as "white" and as "black" leading to a greater variance in mixed race behavior than is observed for either whites or blacks. They conclude that mixed-race identities are not as strongly codified as those for monoracials.

The remainder of the paper is structured as follows. Section II describes the data used in the analysis and the process of identifying mixed race individuals. Section III describes the empirical evidence on the behaviors and outcomes of mixed race individuals from birth to adulthood. Section IV interprets the empirical findings of Section III through the lens of economic theory (with the formal treatment of the theory presented in the appendix). Section V concludes.[12]

II. Data Description and Identification of Mixed Race Individuals

The absence of systematic empirical research on how mixed race children fare relative to their monoracial peers is due in part to data limitations. Few data sets record racial information in a way that mixed race children can be identified. Data sets that include a mixed race classification are either too small to be useful, or contain little information on childhood or adolescent experiences. The notable exception to this data shortcoming is the restricted-use version of the National Longitudinal Study of Adolescent Health (Add Health) – the primary data set used in this paper.[13]

Add Health began as a stratified random sample of all high schools in the US, resulting in a nationally representative sample of 90,118 students entering grades 7 through 12 in the 1994-95 school year. A sub sample (of the original in-school survey) of 20,745 students was given a series of in-home interviews.[14] The original data collection took place in 1995, with Wave II

done in 1996 and Wave III carried out in 2001.[15] In addition, Wave I included a parent questionnaire conducted at home, in which 17,700 out of roughly 20,000 of the children's parents participated. As in all longitudinal data, some respondents could not be located or contacted after repeated attempts, refused to participate, or were unable to do so. Sample weights supplied with each wave attempt to correct for observed patterns of non-response.

A wide range of data is gathered on the adolescents in the study.[16] We use an array of data on demographics, family background, psychological wellbeing, behavior and academic achievement. In all our analysis we use missing value indicators and sample weights.

In order to provide a more comprehensive analysis of the economic and social outcomes of mixed race people we supplement Add Health with the 2000 US Census and NCHS Natality data. The US Census allows us to expand the set of outcomes to include adult outcomes such as income, completed education, home ownership, marital status, and so on; while the NCHS Natality data allows us to analyze how mixed race individuals fare relative to their monoracial counterparts at birth.[17] The Web Appendix describes these two supplementary data sources in detail.

Classifying Individuals as Mixed Race

Identifying individuals of mixed race in survey data can be tricky, and there is little consensus about the best way to do so (Robbin 2000).[18] We conceptualize the tradeoffs in constructing such a measure using a 2×2 matrix. The first relevant dimension is whether one bases the classification on the race of the parents or the response of the individual himself. The second relevant dimension for classifying mixed race children is how "strict" or "inclusive" one is in defining who is mixed race. Our preferred definition is one that is individual-based and

strict. We use an individual-based definition both because data on fathers in Add Health are often missing, and even if a male guardian is present, it is impossible in our data to determine whether he is the biological father.[19] By "strict," we mean an individual is considered race *A* if and only if he consistently says he is race *A* whenever he is observed in the data. If there are any inconsistencies across waves, we code the race as missing.[20]

Using this definition we obtain 304 black-white mixed children in Add Health, which is likely to understate the true number of mixed race adolescents in the data.[21] Nonetheless, the resulting frequency of mixed race children is consistent with that observed in the 2000 Census among children of the appropriate age. In the 2000 Census children who check black and white as race constitute approximately 0.38% of the population between the ages of 12 and 18—the age range of the overwhelming majority of children in Add Health. The percentage of mixed race children in Add Health, employing our strict, child-based definition, is 0.34%. All of the results we report in the paper for adolescent and adult outcomes correspond to this definition of mixed race.

We cannot use our preferred child-based definition with the NCHS Natality data. In this data set we rely on parents' race in classifying babies as mixed race. That is, an infant is coded as mixed race if one of his parents is listed as white on the birth certificate and the other one is listed as black. Unfortunately, information on the race of the father is missing for 14.4% of observations. We omit these observations from our analysis, which likely leads us to understate the number of mixed race babies.[22]

Variables Used in the Analysis

The variables contained in Add Health are at the heart of our analysis. We broadly classify them into five categories: home environment, physical characteristics, school achievement, risky and anti-social behavior, and psychological wellbeing. For further details on these variables and their construction, see the Web Appendix.

Demographic variables include age, gender, whether born in the United States, and region of residence. Our set of home environment variables consists of 10 variables. These include household income, receipt of public assistance such as welfare, father in the household, the marital status of the parent filling out the questionnaire, mother's age, whether or not their mother is a college graduate or has ever been married, and years in current residence.

Our measures of physical attributes include birth weight, height, Body Mass Index (BMI), and interviewer rated attractiveness.[23] Achievement is proxied by score on the Add Health Picture Vocabulary Test (AHPVT), grade point average (GPA), whether or not a student has repeated a grade, and whether the student has a learning disability.[24] The AHPVT is an abridged and computerized version of the well-known Peabody Picture Vocabulary Test-Revised, conducted as part of the Wave I home interview for 19,713 children. GPA is based on student self reports; grade repetition and learning disabilities are drawn from the parent questionnaire.[25]

We analyze eight variables corresponding to a child's (broadly defined) psychological wellbeing. These variables include the child's responses to questions such as the degree to which his mother or father cares about him, how close he feels to other people, whether he feels accepted or loved, is depressed, likes himself, and expects to live to age 35.

Our final category of variables from Add Health is designed to capture a student's risky and anti-social behavior in and out of school. The in-school behavior variables include: trouble with teachers, trouble paying attention, trouble with homework, trouble with students, effort on

schoolwork, skipping school, and never suspended or expelled. The variables designed to measure behavior out of school include: watch TV, drink, smoke, dare, lie to parents, fight, property damage, steal, violent acts, sell drugs, encounter violence, ever had sex, ever had sexually transmitted disease (STD), and ever illegal drugs.

In the survey many of these questions take the form "Since school started this year, how often have you had trouble ….?" Answers to these questions range, for example, from 0 to 4, where 0 indicates "never," and 4 indicates "everyday." For all such questions with answers that are ordinal, but do not have clear cardinality, we normalize responses to be mean zero with standard deviation equal to one in our weighted sample. While this procedure complicates comparisons of results across variables, as the distance between points is unlikely to be constant, the advantage is that by reducing the "dimensionality" of the outcome within variable comparisons between racial groups become easier. We have also estimated ordered logistic regressions that do not impose cardinality, but yield the same qualitative results. We focus on the normalized regressions for ease of interpretation of the main coefficients.

In addition to the variables contained in Add Health we use natality data from the NCHS Vital Statistics to judge how well mixed race individuals fare at birth. Our set of birth outcomes includes: birth weight, duration of pregnancy, indicators for anemia, diabetes, fetal distress, and for whether the mother smoked or consumed alcohol during the pregnancy.

To complete the picture, we obtain information on adult outcomes from the 2000 US Census. Our set of adult outcomes includes being married, having children, having at least a bachelor's degree, an employment indicator, the number of weeks worked in previous year, occupational prestige score, household income, an indicator for being poor, not migrated within the last five years, owning one's own home, the value of the house, live outside city center, and

indicators for being disabled and being institutionalized. We view the latter as a proxy variable for involvement in criminal activity. As information in the Census on the institutionalized population is often based on administrative records, our results with respect to this outcome should be taken with a grain of salt.[26]

III. Empirical Evidence on Mixed Race Adolescents

In this section, we describe basic facts about the situation of mixed race individuals on the myriad dimensions we consider: birth outcomes, demographics, home environment, physical characteristics, academic achievement, psychological wellbeing, adult outcomes, and behaviors inside and outside of school. Summary statistics for the variables we use in our analysis are displayed in Tables 1-6. The left panels in these tables present means with standard deviations in parenthesis for whites, blacks, and mixed black-white students under our strict individual-centered definition, if possible. Individuals of all other races have been omitted from the analysis. As noted earlier, except where there are natural units for a variable (e.g. household income or weight), we have normalized the responses to be mean zero with a standard deviation of one in our sample.

Also of interest is the degree to which there are differences across groups after controlling for background characteristics. For instance, in the raw data it is unclear whether the outcomes of mixed-race kids differ from those of whites because those of mixed-race are less likely to come from two-parent households. Thus, in the right panel of Tables 1-6 we report the estimated racial gaps for each outcome measure after controlling for a range of background characteristics using the following linear model:

$$y_{i,s} = \alpha + \beta_w white_{i,s} + \beta_b black_{i,s} + X'_{i,s}\gamma + \mu_s + \varepsilon_{i,s} \quad (1)$$

where $y_{i,s}$ represents an outcome for individual i in geographic unit s, $white_{i,s}$ and $black_{i,s}$ are a mutually exclusive set of racial identifiers with mixed race as the omitted category; μ_s denotes a school fixed effect for variables from Add Health and a state fixed effect for those from the Census and Vital Statistics. The vector $X_{i,s}$ consists of controls for gender, several age categories, place of birth, region, the full set of home environment variables, and multiple birth weight intervals.[27] Although it is in general not obvious what the "right" set of control variable is, we believe that it is desirable to control for as many confounding factors as possible (such as the home environment and birth weight), especially when considering behavioral and psychological outcomes.[28] Naturally, the point estimates should be interpreted as the "residual" difference between mixed race individuals and their monoracial counterparts, as opposed to the "raw" difference reported in the left panel.

In each of the tables, we report all results relative to mixed race children. That is we report our estimates for β_w and β_b. For all outcome variables contained in Add Health we also estimate models without school fixed effects, and display the results in the Web Appendix. The results change very little when we include school fixed effects.[29]

Table 1 displays birth outcomes for mixed race babies relative to that of blacks and whites. On five out of seven dimensions mixed race infants fall in between their monoracial counterparts, but are often closer to whites.[30] The exception to this pattern is whether the mother smoked or consumed alcohol during the pregnancy. The mothers of mixed race children are much more likely to do so—or at least to admit to doing so—than the mothers of monoracial babies.

Racial differences in home environment variables are shown in the upper panel of Table 2A. Mixed race adolescents have family incomes more similar to black children. The likelihood of having a father in the home is virtually identical for these two groups. The parents of mixed race children are less likely to have been married than those of other races (although rates of ever married are higher for these mothers than for blacks). The mothers of mixed race children are younger on average, but slightly more likely to be a college graduate. Mixed race children are much more mobile than their single race counterparts.[31]

In Tables 2-4 and 6, we rely on the relatively small sample of mixed race children available in Add Health. For the home environment variables shown in Table 2A, unlike the other variables we use in the paper (e.g. anti-social behaviors, academic achievement, psychological wellbeing), it is possible to verify the patterns in Add Health using the 2000 Census. Census results for a set of home environment variables similar to those in Add Health are reported in Table 2B. The results are generally quite similar, but with some differences. Mixed race children fare slightly better with respect to household income, having a father in the home, and having married parents in the Census, but still lag far behind whites. The mothers of mixed race children are not as young in the Census as they are in Add Health.

The lower panel in Table 2A shows our set of physical variables. Mixed race birth weights look more like whites than blacks. Differences in adolescent height and BMI are relatively small. Mixed race adolescents are rated as .41 standard deviations more attractive than white children and .44 standard deviations more attractive than blacks.

Table 3 presents academic outcomes. Mixed race adolescents are less likely than blacks or whites to have a learning disability. Their AHPVT scores are between that of blacks and whites, but closer to whites. While blacks fare .71 standard deviations worse than whites, mixed race

children lag .24 standard deviations behind. On our other two achievement variables (grade point average and whether or not a student repeated a grade), mixed race adolescents are either between blacks and whites but more similar to blacks, or essentially tied with blacks.

The next set of variables we consider is related to psychological wellbeing. Table 4 displays the results. Although not always statistically significantly different, mixed race children fare worst on four out of seven psychological dimensions explored. The greatest observed difference is with respect to whether the child perceives his father as caring, which mixed race children do significantly less. In all other dimensions mixed race adolescents fall roughly between their monoracial peers, but often report outcomes closer the worse group. Interestingly, blacks tend to be more content on most dimensions relative to whites and mixed race children. The exception to this finding is when asked about their chances of surviving to age 35.[32] It is important to note that our analysis cannot answer questions of causality. We simply uncover racial differences in the data that cannot be explained by differences in observable characteristics.

Table 5 shows results for our set of adult outcomes. As there might be differences related to cohorts in who self-identifies as mixed race in the 2000 Census, we also report separate sets of results for four broadly defined age groups in the Web Appendix. With the exception of having children and having not migrated within the last five years, mixed race individuals have outcomes in between blacks and whites on every dimension we consider. While mixed race adults are closer to whites with regard to having children, they are more similar to blacks in terms of being married, and almost exactly in the middle between blacks and whites for household income, having obtained at least a bachelor's degree, and weeks worked last year. In the Web Appendix we show that mixed race people in all age groups roughly fall in between

blacks and whites on most outcomes. A clear exception is that mixed race adults in our oldest age group (61 and over) are much more mobile. Surprisingly, they are almost equally likely as whites to have a bachelor's degree, have similar occupational scores, and conditionally upon owning a home their houses are almost as valuable as those of whites. However, with respect to owning a home in the first place, and being married mixed race individuals of these cohorts are much more similar to blacks.

With the aforementioned caveat regarding the reliability of Census data on the institutionalized population in mind, Table 5 shows that mixed race adults are considerably less likely to be institutionalized than blacks. This is especially true for mixed race individuals below the age of 40. Mixed race peoples' rates of institutionalization in our older two age groups are closer to blacks than to whites (see Web Appendix). We have also explored differences in victimization rates using data from the National Crime and Victimization Survey (not shown here). For almost all types of crimes and age groups mixed race people are much more likely to report having been victimized than either monoracial group, although some of these differences are implausibly large.[33]

In addition to the variables considered so far, the richness of Add Health allows us to analyze one last set of variables: adolescent behaviors. Tables 6A and 6B display our results. Strikingly, on fourteen out of the twenty-one variables related to asocial behavior mixed race adolescents exhibit strictly worse behavior than both of their single race counterparts. Behavior at school by mixed race adolescents generally mirrors that of blacks, except with regard to exerting effort and skipping school—two dimensions on which mixed race children are significantly worse than blacks.[34] The asocial behavior of mixed race children stands out even more clearly outside of school. With the exception of watching television (which blacks do more

of), mixed race adolescents are the worst or essentially tied for worst on every other behavior considered. This is true whether the risky behaviors are those more common to whites (e.g. drinking and smoking) or to blacks (e.g. sex and violence). Broadly speaking mixed race adolescents occupy the lower envelope of good behaviors of blacks and whites.[35] Similarly, Choi et al (2006) find that multi-racial adolescents are at greater risk for substance abuse.

IV. Interpreting the Data through the Lens of Economic Theory

Broadly summarizing, the data presented above suggests that mixed race individuals grow up in home environments that are similar to blacks, have academic achievement and adult outcomes in between that of whites and blacks, but engage in much more risky behaviors than either racial group as adolescents.

In this section we explore a range of possible economic models with the goal of understanding the degree to which the various models are capable of matching the patterns in the data, particularly mixed race adolescents' especially asocial behavior. We discuss three broad categories of models: discrimination-based models, conformity models, and a Roy model. In the main text we restrict ourselves to a verbal discussion of different models. The intuition provided in the text is formalized in a technical appendix.

Discrimination-Based Models

In almost all models with human capital investment and discrimination, lower levels of discrimination lead to more investment in human capital (e.g. Becker 1957, Arrow 1973, Fryer and Jackson 2008). If mixed race individuals face weakly lower discrimination than blacks, for instance because they have lighter skin, one would expect weakly more human capital

investment on their part. If one interprets asocial behavior as interfering with human capital investment, which seems sensible, traditional discrimination models cannot explain our findings that mixed race adolescents behave worse than blacks.

Arcidiacono, Bayer and Hizmo (forthcoming) and Lang and Manove (forthcoming) present models in which discrimination can actually increase educational investment. In these models, discrimination decreases with educational attainment. Thus, it can be beneficial to "overinvest" in education to face lower levels of discrimination. These models predict that, at least for certain parts of the ability distribution, blacks invest more in education than mixed race individuals, and mixed race adolescents invest more than whites. However, neither model is consistent with mixed race children investing less than both blacks and whites.

Models of Conformity

In the classic conformity model, due to Bernheim (1994), each individual has preferences over behaviors, but also cares about popularity and social esteem in school. Social esteem is determined by the peer group's perceptions of a student's type. Types are unobservable, but others can infer an individual's type from her behavior. This may include patterns of speech, style of clothing, time engaged in certain activities, music on their iPod, and so on. Absent popularity considerations a student would choose behaviors solely based on her preferences. Given that her utility also depends on social esteem, she will adopt behaviors leading to favorable perceptions of her by others if she values popularity sufficiently much.

In our context, it is logical to think of peer groups as being determined by race, with white students automatically assigned to the white peer group and blacks put into the black peer group. If black and white peer groups draw different inferences about a student's type from the same

observed behaviors, Ceteris paribus, this will lead to "typically black" and "typically white" behaviors. For instance, it has been argued that strong academic achievement, wearing clothes from GAP, or whistling Vivaldi might have a positive impact on how white peers perceive a person, but a negative impact among black peers. Tables 6A and 6B document the existence of such patterns in our data. Differences between blacks and whites are statistically significant at the 5%-level for 18 out of the 21 behaviors we consider.

Mixed race adolescents in this model may differ from blacks and whites in that they do not have a predetermined peer group. They may care about popularity among both blacks and whites, possibly putting more weight on the assessment of one particular peer group. The ability of mixed race children to conform to either racial peer group can impose a cost on them in this model. Berman (2000) argues that groups provide public goods and charge their members for group membership by requiring them to make costly, but unproductive, investments. When it is easy to leave the group after receiving the public good, groups do better by holding their members to tougher standards. Because mixed race adolescents have an outside option, they must go to greater lengths to demonstrate their affiliation with the group. One way of demonstrating solidarity is to go to extremes in carrying out group-sanctioned misbehavior (see Austen-Smith and Fryer (2005) or Fryer (2007b) for a micro model of group dynamics which justifies this assumption). Peer groups holding mixed race adolescents to tougher standards can therefore rationalize why the inference function would be "flatter" than for monoracials. If the weight on group acceptance is large enough and the type-inference functions for mixed race adolescents are "flatter" than those for the monoracial groups, then the conformity model can explain why mixed race adolescents overinvest in asocial behaviors.[36, 37]

A reasonable assumption is that a mixed race student puts more weight on the black peer group as the fraction of blacks in the student's school rises. Under this assumption the conformity model would predict mixed race adolescents who attend schools with more blacks to "act more black" and those that attend schools with more whites to "act more white". This pattern, however, is not observed in the data. As Table 7 demonstrates, mixed race children exhibit *less* typical black behavior as the fraction of blacks at their school increases. We characterize typical black behaviors as those behaviors of which blacks do significantly more than whites.[38] Our index of typical black behaviors reported in Table 7 is constructed from factor analyzing the residuals from regressing typical black behaviors on our set of covariates and school fixed effects.[39]

A Two-Sector Roy Model

As in the conformity model, in our conceptualization of the Roy model each individual has preferences over behaviors and cares about popularity. The latter depends solely on whether or not an individual is an accepted member of the peer group. Blacks and whites seek acceptance by the members of their own race, i.e. they have a predetermined peer group. Mixed race adolescents, however, are able to choose whether to identify with whites *or* blacks—the two sectors in this model.[40] There are fixed costs associated with choosing each peer group, and the probability of being accepted by the group depends on observed behaviors.[41] Mixed race individuals choose the group yielding the highest expected utility.

The two-sector Roy model is consistent with the facts described in the empirical section. As in the conformity model, the fact that mixed race adolescents engage in more risky behavior than any of their single race peers can be rationalized through them being held to tougher

standards by both peer groups. That is they need to engage more in risky and anti-social behaviors to gain acceptance.

Unlike the standard conformity model, however, the two-sector Roy model can also be made consistent with the observation that when there are very few blacks in a school, mixed race adolescents "act more black". It is important to note that when there are few blacks present, the costs of choosing blacks as a peer group, i.e. of "acting black", may be lower. For example, fighting is one aspect of behavior more associated with blacks than whites. If blacks are more experienced fighters than whites, then it is less costly for a mixed race child to prove he can fight when the only opponents are whites.[42] This force works in the opposite direction of conformity.

In many Roy models, the individuals with the most choice have higher utility. In our model, there is tradeoff between having the benefit of more choice and incurring the cost of not having a predetermined peer group, so we are unable to sign the change in utility.

The Roy model is not the only model that can explain the data. For instance, the payoff to acting black may also depend on the racial composition in one's school thereby increasing or decreasing conformist tendencies.[43] It is important to note, however, that two of the most prominent theories, i.e. discrimination and a simple Bernheim-type conformity model, are incompatible with the data.

V. Conclusion

The number of mixed-race children has increased dramatically. While sociologists have theorized about the challenges facing these individuals since early in the 20th century, little systematic empirical research has explored their outcomes. Using a variety of data sources we show that mixed race individuals fall roughly in between their monoracial counterparts on most

outcome categories: birth outcomes, demographics, home environments, scholastic achievement, and adult outcomes.

A stark exception to this pattern, however, is that on virtually every dimension we are able to measure, mixed race adolescents engage in higher rates of risky and anti-social behavior than either whites or blacks. A Roy model in which mixed race individuals get to choose their peer group, but monoracials are restricted to have the peer group of their own race, is consistent with the observed patterns in the data.

Interestingly, however, mixed race individuals do not have particularly bad adult outcomes, despite the negative behaviors that are observed in adolescence. This raises an important question as to how detrimental negative adolescent behaviors are to long-term human capital formation.

Technical Appendix

In this appendix we formalize the two-sector Roy model and the conformity model discussed verbally in the main text.

A Formal Roy Model

Consider a population of many agents, each of whom selects some publicly observable behavior x from the set X. Each agent has intrinsic preferences over the set X, which we summarize by a utility function $g(x-t)$. The parameter t represents an agent's intrinsic bliss point: the $\arg\max_{x \in X} g(x-t)$. Following Bernheim (1994), we assume that $g(.)$ is twice continuously differentiable, strictly concave, symmetric, and achieves its maximum at $g(0)$.

Let $p_b(x)$ (respectively $p_w(x)$) denote the probability that the black (white) peer group accepts and individual with observable behavior x. Individuals who are accepted by the group garner a payoff $\beta > 0$. We denote the cost of choosing sector j by c_j.

Each agent chooses x to solve:

$$\max\left\{\max_{x \in X} g(x-t) + p_b(x)\beta - c_b, \max_{x \in X} g(x-t) + p_w(x)\beta - c_w\right\}.$$

To keep the model simple, we assume that $c_j = 0$ and $p_j(x) = 1$ for all monoracials. Thus, their decision problem can be represented as: $\max_{x \in X} g(x-t) + \beta$. The solution of which is $x = t$. This simplification abstracts away from peer dynamics that are surely going on within racial groups. All of the results of this simple model are consistent with a more general model in which all agents can choose their peer group if the cost of switching sectors is significantly lower for multiracial adolescents.

The fact that mixed race adolescents engage in more risky behavior than any of their single race peers can be rationalized through $p_j(x)$. As argued in the main text, because mixed race adolescents have an outside option, they must go to greater lengths to demonstrate their affiliation with the group, i.e. $p_j(x)$ is "flatter" for mixed race individuals than for monoracials.

To make the Roy model consistent with the observation that when there are very few blacks in a school, mixed race adolescents "act more black", c_b must rise with the respective racial group's share in a student's school. Under this assumption, choosing blacks as a peer group is less costly when there are fewer blacks.

A Formal Conformity Model

The Roy model described above is similar in spirit to a conformity model along the lines of Bernheim (1994), generalized to allow different groups to have different social norms. In the classic conformity model, an individual's type is unobservable to her peers. Thus, popularity is determined by other students' perceptions of a student's type. We assume that all agents within a racial group will, in equilibrium, form the same inferences about an individual's type. This lets us summarize a student's perceived type by a real number, q. Let $s(q)$ denote the social esteem of an individual thought to be type q. Types are unobservable, but others can infer an individual's type from her observable choices. Let $\varphi(q, x)$ be the inference function that links observable behaviors to perceived types and $\lambda_j, j \in \{b, w\}$ the weight that an individual puts on acceptance by group j.

Using the same notation as above, the utility maximization of an individual in the classic conformity model can be expressed as follows:

$$\max_{x_b, x_w \in X} \left\{ g(x_w - t_w, x_b - t_b) + \lambda_w \int_T s_w(q) \varphi(q, x_b, x_w) dq + \lambda_b \int_T s_b(q) \varphi(q, x_b, x_w) dq \right\},$$

where x_w and x_b represent "white" and "black" behaviors, respectively, and other racially dependent parameters are defined similarly.

If the weight on group acceptance is large enough and the inference functions for mixed race adolescents are "flatter" than those for the monoracial groups, then the model explains why mixed race adolescents overinvest in asocial behaviors. As in the Roy model, for mixed race adolescents it takes more black behaviors to be accepted by the black peer group and more white behaviors to be accepted by the white peer group.

If one interprets λ_b and λ_w as the fraction of blacks and whites in an individual's school, then under the conformity model we would expect mixed race adolescents who attend more black schools to "act more black" and those that attend more white schools to "act more white". As discussed in the main text, this pattern is not observed in the data.

References

Anderson, Margaret L., and Fienberg, Stephen E., *Who Counts? The Politics of Census-Taking in Contemporary America?* (New York: Russell Sage, 1999).

Antonovsky, Aaron, "Toward a Refinement of the 'Marginal Man' Concept," *Social Forces* 35 (1956), 57-62.

Arcidiacono, Peter, Patrick J. Bayer, and Aurel Hizmo, "Beyond Signaling and Human Capital: Education and the Revelation of Ability," *AEJ: Applied Economics* (forthcoming) (2010).

Arrow, Kenneth, "The Theory of Discrimination" in Orley Ashenfelter and Albert Rees, (Eds.), *Discrimination in Labor Markets*, (Princeton: Princeton University Press, 1973), 3-33.

Aspinall, Peter, J., "The Conceptual Bias of Ethnic Group Terminology and Classifications," *Social Science & Medicine* 45 (1997), 689-698.

Aspinall, Peter J., "The Conceptualisation of and Categorisation of Mixed Race/Ethnicity in Britain and North America: Identity Options and the Role of the State," *International Journal of Intercultural Relations* 27 (2003), 269-296.

Austen-Smith, David, and Roland G. Fryer, "An Economic Analysis of 'Acting White'," *Quarterly Journal of Economics* 120 (2005), 551-583.

Becker, Gary S., *The Economics of Discrimination*, (Chicago:University of Chicago Press, 1957).

Berman, Eli, "Sect, Subsidy, and Sacrifice: An Economist's View of Ultra-Orthodox Jews," *Quarterly Journal of Economics* 115 (2000), 905-953.

Bernheim, Douglas B., "A Theory of Conformity," *Journal of Political Economy* 102 (1994), 841-877.

Bodenhorn, Howard, "The Complexion Gap: The Economic Consequences of Color Among Free African Americans in the Rural Antebellum South," in K. D. Kauffman, (Ed.), *Advances in agricultural economic history*, vol. 2, (Amsterdam: Elsevier, 2003).

Bodenhorn, Howard, and Christopher S. Ruebeck, "The Economics of Identity and the Endogeneity of Race," NBER Working Paper 9962 (2003).

Bodenhorn, Howard, and Christopher S. Ruebeck, "Colourism and African–American Wealth: Evidence from the Nineteenth-Century South," *Journal of Population Economics* 20 (2007), 599-620.

Brunsma, David L. "Interracial Families and the Racial Identification of Mixed-Race Children: Evidence from the Early Childhood Longitudinal Survey," *Social Forces* 84 (2005), 1131-1157.

Choi, Y., T.W. Harachi, M.R. Gillmore, and R. Catalano, “Are Multiracial Adolescents at Greater Risk? Comparison of Rates, Patterns, and Correlates of Substance Use and Violence between Monoracial and Multiracial Adolescents,” *American Journal of Orthopsychiatry* 76:1 (2006), 86-97.

Cicala, Steve, Roland G. Fryer, and Jörg L. Spenkuch. “The Market for Peers.” Unpublished Manuscript. University of Chicago (2011).

Conley, Dalton, *Honky*. (New York: Vintage, 2001).

Cohn, David, “How the South Feels,” *Atlantic Monthly* (January 1944), 47-51.

Davis, F. James, *Who is Black? Ones Nation's Definition*, (University Park, PA: Pennsylvania State University Press, 1991).

Fryer, Roland G., “Guess Who's Been Coming to Dinner? Trends in Interracial Marriage over the 20th Century,” *Journal of Economic Perspectives* 21 (2007a), 71-90.

Fryer, Roland G., “A Model of Social Interactions and Endogenous Poverty Traps,” *Rationality and Society* 19 (2007b), 335-366.

Fryer, Roland G., and Matthew O. Jackson, “A Categorical Model of Cognition and Biased

Decision Making," *B.E. Journal of Theoretical Economics* 8 (2008), Article 6.

Fryer, Roland G., Lisa Kahn, Steven D. Levitt, and Jörg L. Spenkuch, "The Plight of Mixed Race Adolescents," NBER Working Paper No. 14192 (2008).

Goldberg, Milton M., "A Qualification of the Marginal Man Theory," *American Sociological Review* 6 (1941), 52-58.

Golovensky, David I., "The Marginal Man Concept: An Analysis and Critique," *Social Forces* 30 (1952), 333-339.

Green, Arnold W., "A Re-Examination of the Marginal Man Concept," *Social Forces* 26 (1947), 167-171.

Hahn, Robert A., Benedict I. Truman, and Nancy D. Barker, "Identifying Ancestry: The Reliability of Ancestral Identification in the United States by Self, Proxy, Interviewer, and Funeral Director," *Epidemiology* 7 (1996), 75-80.

Harris, David R., "Does It Matter How We Measure? Racial Classification and the Characteristics of Multiracial Youth," in J. Perlmann and M. C. Waters, (Eds.), *The New Race Question*, (New York: Russell Sage, 2002).

Harris, David R., and Joseph J. Sim, "Who Is Multiracial? Assessing the Complexity of Lived

Race," *American Sociological Review* 67 (2002), 614-627.

Harris, David R., and Justin L. Thomas, "The Educational Costs of Being Multiracial: Evidence from a National Survey of Adolescents," PSC Research Report No. 02-0521 (2002).

Hill, Mark E., "Color Differences in the Socioeconomic Status of African American Men: Results of a Longitudinal Study," *Social Forces* 78 (2000), 1437-1460.

Hoffman, Frederick, *Race, Traits and Tendencies of the American Negro*, (New York: Macmillan, 1896).

Jonas, Kimball, *Group Quarters Enumeration.* Census 2000 Evaluation E.5, US Census Bureau (2003).

Kao, Grace, "Racial Identity and Academic Performance: An Examination of Biracial Asian and African Youth," *Journal of Asian American Studies* 2 (1999), 223-249.

Keith, Verna M. and Cedric Herring, "Skin Tone and Stratification in the Black Community," *American Journal of Sociology* 97 (1991), 760-778.

Lang, Kevin and Michael Manove, "Education and Labor-Market Discrimination" *American Economic Review* (forthcoming) (2010).

Lee, Sharon M., "Racial Classifications in the U.S. Census: 1890-1990," *Ethnic and Racial Studies* 16 (1993), 75-94.

Moran, Rachel, *The Regulation of Race and Romance*, (Chicago: University of Chicago Press, 2003).

Park, Robert E., "Human Migration and the Marginal Man," *American Journal of Sociology* 33 (1928), 881-893.

Park, Robert E., "Mentality of Racial Hybrids," *American Journal of Sociology* 36 (1931), 534-551.

Romano, Reene, *Race Mixing: Black-White Marriage in Postwar America*, (Cambridge, MA: Harvard University Press, 2003).

Roy, Andrew D., "Some Thoughts on the Distribution of Earnings," *Oxford Economic Papers* 3 (1951), 135-46.

Ruebeck, Christopher S., Susan Averett, and Howard Bodenhorn, "Acting White or Acting Black: Mixed-Race Adolescents' Identity and Behavior," *The B.E. Journal of Economic Analysis and Policy* 9 (2009).

Stonequist, Everett V., “The Problem of the Marginal Man,” *American Journal of Sociology* 41 (1935), 1-12.

Stonequist, Everett V., *The Marginal Man: A Study in Personality and Culture Conflict*, (New York: Charles Scribener's Sons, 1937).

Suskind, Ron, *A Hope in the Unseen: An American Odyssey from the Inner City to the Ivy League*, (New York: Broadway, 1999).

Telles, Edward E., and Nelson Lim, “Does it Matter Who Answers the Race Question? Racial Classification and Income Inequality in Brazil,” *Demography* 35 (1998), 465-474.

Wilson, Anne, “'Mixed Race' Children in British Society: Some Theoretical Considerations,” *The British Journal of Sociology* 35 (1984), 42-61.

Xie, Yu, and Kimberly Goyette, “The Racial Identification Biracial Children with One Asian Parent: Evidence from the 1990 Census,” *Social Forces* 76 (1997), 547-570.

Footnotes

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[1] Laws governing the integration of schools, neighborhoods, and intimate relationships were among the last civil rights to be granted. Between 1913 and 1948, 30 out of 48 states banned interracial marriage. In 1948 California was the first state since 1887 to repeal its antimiscegenation law. This was done in response to *Perez v. Sharp*. On June 12, 1967, the landmark Supreme Court decision in *Loving v. Virginia* ruled, unanimously, that preventing

marriages between individuals solely on the basis of racial classification violated the Equal Protection and Due Process Clauses of the Fourteenth Amendment. This ruling struck down anti-miscegenation laws in 16 remaining states. See Moran (2003) for a thoughtful review.

[2] Interestingly, light skinned blacks were much more likely to operate farms and accumulated more wealth than their dark skinned counterparts (Bodenhorn 2003, Bodenhorn and Ruebeck 2007).

[3] Some whites even went as far as to claim that mixed-race children would be sterile like mules (Romano 2003). Hoffman (1896) argues that miscegenation is responsible for the increasing black mortality rate, as well as blacks' "consequent inferior social efficiency and diminishing power as a force in American national life."

[4] Cohn (1944) argued that blacks should be given justice in the courts, protection of their property, a fair distribution of tax money, and equal wages. But, he insisted, white southerners would not forgo the segregation that kept blacks and whites separate for fear that any breach in the walls of social segregation would lead to racial mixture.

[5] We are well aware that black-white individuals comprise only a fraction of all people of mixed race in the US today. However, given the historical opposition to the mixing of blacks and whites, and blacks' special position in American society, it seems warranted to focus our attention in this group of mixed race individuals.

[6] The solid line has been computed using age-specific responses given on the 2000 Census, which allowed individuals to check multiple race categories for the first time. It is possible that individuals in earlier cohorts are more reluctant to identify themselves as mixed race, exaggerating the growth in this category over time. Also, to the extent that survival rates differ between racial groups, our estimates will be biased.

The dashed line is based on NCHS Natality data, which contain information on the race of parents. Unfortunately, information on the race of the father is often missing. Mothers of mixed race babies might be more reluctant to provide information on the father of their child, and this reluctance might have decreased over time. Therefore, these estimates might be biased, too. Despite the fact that we can't rule out that both time series overstate the increase in mixed race births, it seems implausible to attribute all or even most of the sharp increase to bias.

[7] Romano (2003) reports that whites considering interracial marriage are nearly always asked the question "What about the children?"

[8] In constructing our index measures we have regressed each variable belonging to a particular outcome category on a set of covariates including gender, several age categories, place of birth, region, home environment variables, multiple birth weight intervals, and school fixed effects. For each category we then averaged the standardized residuals from these regressions for each individual, and normalized the resulting individual-level means on each variable to have a mean of zero and a standard deviation of one. The estimates reported in Figure 3 correspond the racial differences in means, with mixed race individuals serving as the omitted category. The Web Appendix provides further details on the construction of these indices.

[9] As we note in an earlier version of this paper, Fryer et al (2008), the two-sector Roy model can be interpreted as formalizing some of the ideas in the "marginal man" hypothesis (Park 1928, 1931, Stonequist 1935, 1937), a highly influential, yet rarely tested description of the experiences of mixed race individuals. The "marginal man" is depicted as someone who lives in a bi-cultural environment and who is caught between the two conflicting cultures. The "marginal man" concept has been criticized by various authors, largely based on counterexamples and subtle theoretical grounds (Goldberg 1941, Golovensky 1952, Green 1947, Antonovsky 1956).

Most importantly these authors have argued that living in a bicultural environment does not automatically result in inner conflict. In his qualitative analysis Antonovsky (1956), for instance, finds multiple coping strategies among American Jews. Inner conflict is not a critical component of the Roy model.

[10] Less closely related is a more recent literature that relates skin tone to economic outcomes (Keith and Herring 1991, and Hill 2000).

[11] We did not become aware of Ruebeck et al's (2009) parallel research agenda until shortly before the completion of Fryer et al (2008).

[12] A Web Appendix with the precise definitions and sources of all variables used in the analysis is available on the authors' websites.

[13] We use the restricted-use data set that contains the full sample and more detailed information. The number of observations in restrictive-use version of Add Health is 90,118, while only roughly 6,500 observations are available in the public-use version. Furthermore, the restricted-use version contains more detailed information related to friend and sibling identification, respondents' romantic relationships, and spatial distances.

[14] This sample was selected in part to be representative of the full sample (a core of 12,105) as well as selection on several criteria for oversamples: disabled, blacks from well-educated families, Chinese, Cuban, Puerto Rican, and adolescents with siblings. The response rate on the first wave of the home interview was 78.9%.

[15] The response rates on the second and third waves of the survey were 88.2% and 77.4%, respectively.

[16] For a detailed description, see the Add Health website http://www.cpc.unc.edu/projects/addhealth.

[17] We also have some very limited data on outcomes of young adults from the third wave of Add Health. Unfortunately, the sample sizes for mixed race children on these adult outcomes are extremely small and most likely subject to selective attrition, leading to estimates that are quite imprecise and sometimes deviate from our estimates using the 2000 Census. Therefore, we rely on the Census in our analysis of adult outcomes, though it is important to note that mixed race adolescents are weakly above blacks in nearly all outcomes in *both* datasets.

[18] There is a small literature in sociology and population studies on racial identification (Goldstein and Morning 2000, Lee 1993, Aspinall 1997, 2003, Harris 2002, Harris and Sim 2002, Anderson and Fienberg 1999, Davis 1991, for the UK Wilson 1984). Kao (1999), using the National Education Longitudinal Study, defines an adolescent as mixed race if their race differs from the race of their guardian who completes the parent survey. Harris and Thomas (2002) identify adolescents as mixed race if they self identify as mixed race or they provide inconsistent monoracial categories on different waves of the survey. Brunsma (2005) looks at children who select into the "More than one race" category on the Early Childhood Longitudinal Study. Xie and Goyette (1997) use the 1990 Public Use 5% Micro Sample of the US Census and classify children as multi-racial if they are living with two parents who check different single race categories. A few empirical studies allow an observer / interviewer to identify who is mixed race (Harris and Sim 2002, Hahn, Benedict and Barker 1996, Telles and Lim 1998 for the case of Brazil).

[19] Ruebeck, Averett, and Bodenhorn (2008) make use of the racial classification of an adolescent's parents in Add Health and code an individual as mixed race if one of his parents is mixed or black and the other one is white or mixed. To increase their sample size and lessen the

degree of selection associated with children living in intact families, they also employ a definition based on children's self-selection into black and white on the home survey.

[20] Because our definition is based on self-reporting, we cannot rule out that endogeneity in who declares themselves to be race *A* biases our results. We have explored the sensitivity of our findings to a variety of different categorizations of race. While results for particular variables do, of course, vary across these definitions, the same basic patterns are present under each of these definitions. Full results for other definitions are reported the Web Appendix available on the authors' websites.

[21] As a robustness check, we looked at the consistency of racial identification for whites and blacks in the Add Health and the Early Childhood Longitudinal Survey (ECLS). In the Add Health 16.3% of blacks would be dropped from the data for inconsistent racial identification and 10.7% of whites. In ECLS, these numbers are 1.1% for blacks and 0.2% for whites. We have also explored a more "inclusive" child-level definition, under which there are three additional ways in which a student can be classified as mixed race. First, if he is consistently non-Hispanic and marked both black and white, and no other race, in all waves in which he participated. This corresponds to our strict definition. Second, a student is coded as mixed if he qualified as mixed under the above definition on any single survey, even if he failed to do so in other instances. Third, a student is coded as mixed if he marks a combination of black and white and no other race across surveys. For example if the student marks only black at school and only white at home then he is coded mixed. This is the same procedure used in Harris and Thomas (2002) and is done so to obtain as many potentially mixed race students as possible.

[22] We have tried to bound the results by assigning different races to observations with missing information. While the actual values of individual point estimates do of course change,

the results remain qualitatively unchanged, and are even quantitatively surprisingly robust to different assumptions.

[23] At the end of the in-home interview in Wave I the interviewer was asked to rate the physical attractiveness of the respondent on a scale from 1 to 5, where 0 indicates "very unattractive", and 5 indicates "very attractive." Whenever we use this variable in our analysis, we include interviewer fixed effects to account for interviewer specific tastes.

[24] Harris and Thomas (2002) analyze three of these outcomes: grade point average, grade retention, and AHPVT.

[25] To get a sense of how much exaggerating there might be in the data among different racial groups, we compared the survey data with data collected from official transcripts, for the first year of high school of 12,115 Wave III respondents who signed a transcript release form. Blacks reported that their GPAs were 10.9% higher than the actual GPA compared to 4.5% for whites and 8.7% for mixed race students. Due to a lack of objective measures we are forced to rely on self-reports for other outcomes we report. Of course differential self-reporting is a possible source of bias in our analysis.

[26] Jonas (2003) shows that only 19.7% of individuals in correctional institutions filled out the Census form themselves or were interviewed by a Census enumerator, while 56.3% of answers are based on administrative data, and 24.0% result in non-response.

[27] When considering physical attributes we do not control for birth weight. Similarly, the results for our set of home environment variables have not been adjusted for the effect of the other variables in this category.

[28] In an earlier working paper version we report results without controlling for birth weight and home environment variables. The results are qualitatively robust to varying the set of controls.

[29] Under the assumption that reference points vary on the school level we can therefore dismiss the hypothesis that differences in self-reported outcomes are due to different reference points.

[30] Given the small sample means the racial differences in birth outcomes portrayed in Table 2 are not only statistically significant, but are often substantial in a real world sense.

[31] One possible explanation for the greater mobility of mixed race children might be that their parents are more likely to be members of the military. Yet, we are able to dismiss this explanation as the same pattern emerges in the 2000 Census after we exclude all children whose parents currently or formerly served in the armed forces.

[32] Under the parent-strict definition of mixed race adolescents, these differences become quite stark.

[33] A detailed set of results is available from the authors upon request.

[34] One, admittedly unsatisfactory, explanation for blacks reporting more effort on schoolwork than whites would be racially different conceptions of what it means to invest “a lot of” effort.

[35] One possible explanation for why mixed race adolescents fight more often is that they might get picked on more than blacks or whites. However, if mixed race children got picked on a lot, we would expect them to say that they don’t feel accepted. Yet, on that measure they are very close to whites (see Table 5).

[36] If extreme levels of asocial behavior are detrimental to group acceptance, then, compared to monoracial children, mixed race adolescents will still overinvest in asocial behaviors; unless, of course, *any* asocial behavior decreases their chances of acceptance.

[37] One would expect the variance of asocial behaviors to be larger among mixed race adolescents. This is hypothesis, indeed, confirmed by Reubeck et al (2009).

[38] These are: getting into trouble with one's teacher, trouble paying attention, trouble with homework, trouble getting along with other students, watching TV, fighting, committing violent acts, having sex, and contracting an STD.

[39] More specifically we regress all behavior variables from the school survey, which contains more observations than the home survey, for which blacks scored significantly higher in Tables 8A and 8B on a vector of controls for gender, several age categories, place of birth, region, home environment variables, and multiple birth weight intervals, as well as school fixed effects. We then factor analyze the residuals from these regressions. The first factor, which explains, approximately 36% of the variance of the residuals, corresponds to our index of black behavior. Alternative ways of constructing on index, such as averaging the residuals (also including variables from the home survey), yield very similar results.

[40] Patterns in extracurricular sports roughly follow the distribution one might expect in the Roy model. Whites tend to participate more in baseball, field hockey, ice hockey, soccer, swimming, tennis, volleyball, and wrestling; whereas blacks are more likely to do track or play football and basketball. Mixed race adolescents do more of all sports than blacks, and only slightly less of the typically white sports than whites.

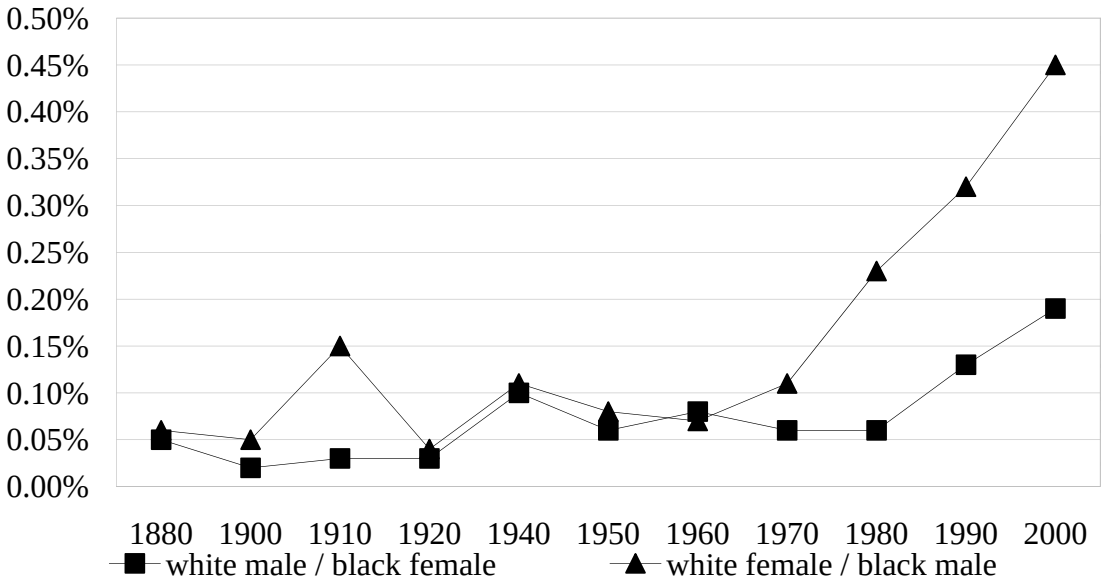
[41] The assumption that blacks and whites have a predetermined peer group is equivalent to a prohibitively high cost of switching sectors.

[42] Anecdotally, this phenomenon has been observed among some programs for gifted minority youth held at M.I.T. each summer. These programs attract a subset of black and mixed race children who are among the "whitest" acting in their schools. At M.I.T., however, they have a comparative advantage in acting "black," and engage in a wide range of behaviors to signal how "black" they are (Suskind 1999). Similarly, Canada (1995) speculates that even the most violent youth in Boston "would not have lasted more than a couple of weeks in the South Bronx." (p. 25).

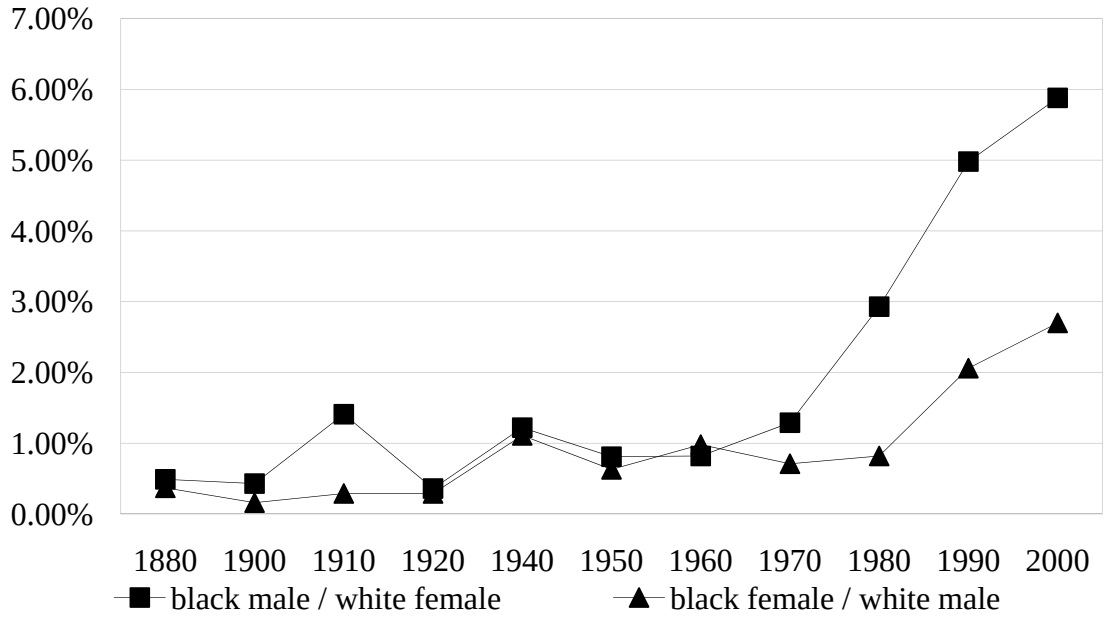
[43] See Cicala et al. (2011) for a model of social interactions in which the payoff to group membership depends on group composition and individuals endogenously sort into peer groups.

Figure 1: Percent of Whites (A) and Blacks (B) Marrying out of Race, by Gender and Race of Spouse (as a Percentage of all Marriages)

(A)

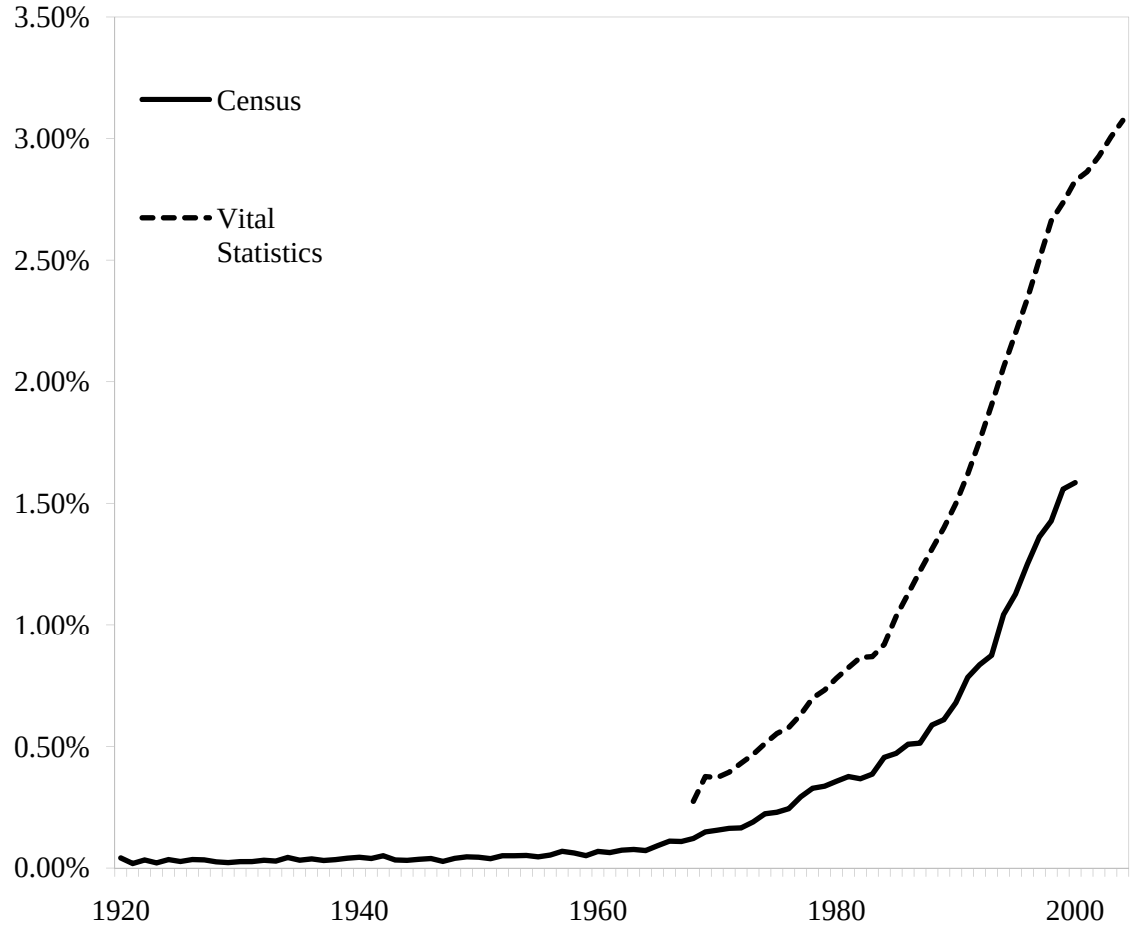


(B)



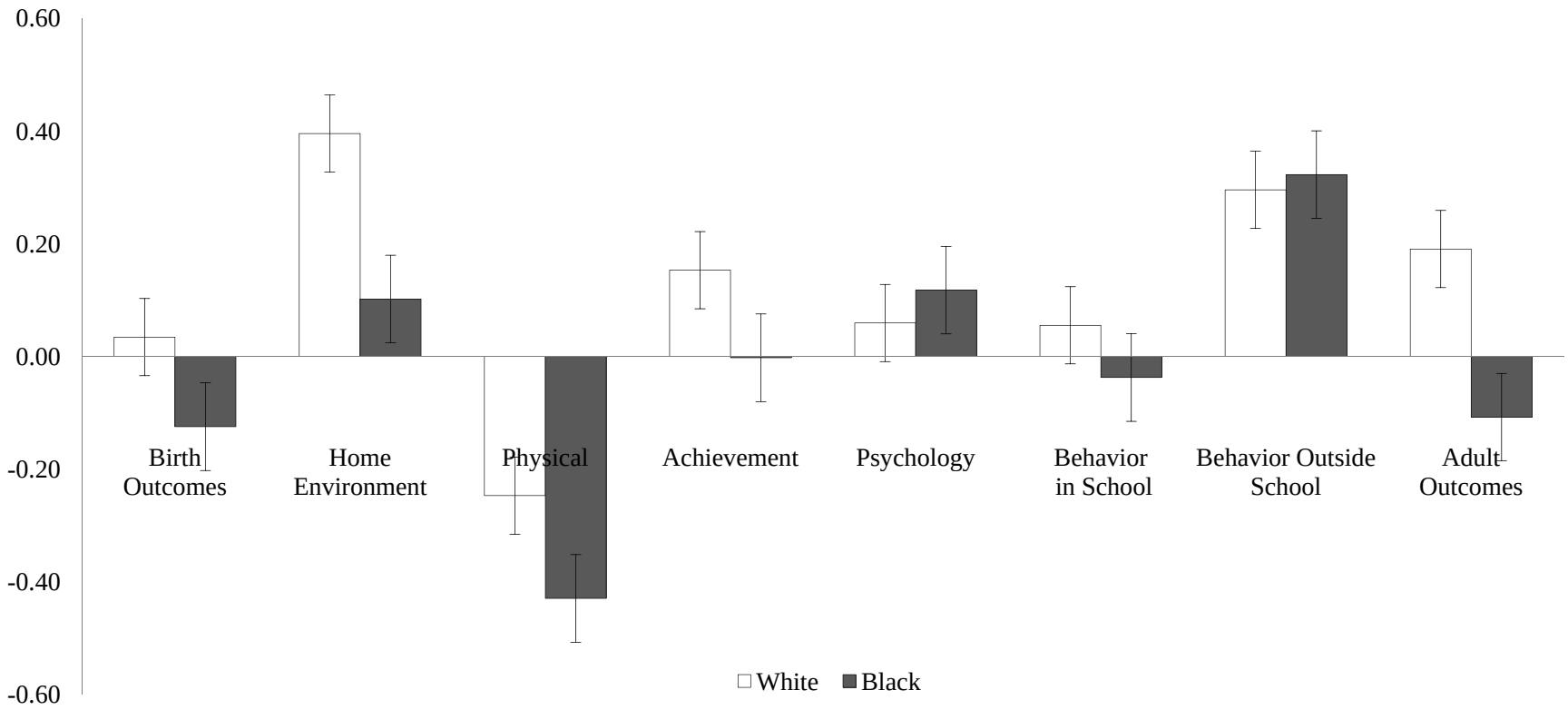
Notes: Both figures are from Fryer (2007a).

Figure 2: Black-White Births as a Percentage of all Black and White Births



Notes: Data are from the 2000 Census 5% Public Use Micro Sample (solid line) and from NCHS Vital Statistics (dotted line). See Data Web Appendix for details.

Figure 3: Overview of Results



Notes: Figure shows coefficients and associated standard errors from regressing our composite outcome measures on indicator variables for race. Black-white mixed race individuals are the omitted category. The construction of our composite measures is outlined in the text; the Web Appendix provides additional detail, and the source and precise definition of every variable used in construction.

Table 1: Birth Outcomes (Vital Statistics)

	Raw Data			Adjusted			
Dependent Variable	White	Black	Mixed	White	Black	Observations	R-squared
Birth Weight	3.376	3.144	3.299	0.043***	-0.153***	3,220,900	0.037
	(0.587)	(0 .657)	(0.618)	(0.002)	(0.002)		
Infant Mortality	0.005	0.011	0.008	-0.003***	0.003***	3,222,671	0.001
	(0.071)	(0.106)	(0.089)	(0.000)	(0.000)		
Duration of Pregnancy (weeks)	38.886	38.364	38.794	0.126***	-0.374***	3,191,247	0.011
	(2.403)	(3.078)	(2.697)	(0.009)	(0.010)		
Anemia	0.020	0.035	0.029	-0.006***	0.008***	3,176,459	0.008
	(0.140)	(0.185)	(0.167)	(0.001)	(0.001)		
Diabetes	0.029	0.032	0.028	-0.004***	0.002***	3,176,459	0.009
	(0.168)	(0.175)	(0.166)	(0.001)	(0.001)		
Fetal Distress	0.037	0.049	0.042	-0.004***	0.008***	2,887,514	0.007
	(0.188)	(0.217)	(0.202)	(0.001)	(0.001)		
Mother Smoked During Pregnancy	0.113	0.065	0.173	-0.006***	-0.100***	2,769,370	0.089
	(0.316)	(0.246)	(0.378)	(0.001)	(0.001)		
Mother Drank During Pregnancy	0.008	0.007	0.010	-0.001**	-0.002***	2,764,040	0.005
	(0.088)	(0.083)	(0.098)	(0.000)	(0.000)		

Notes: Entries in the left panel are means and standard deviations by race in the weighted raw data. Entries in the right panel are coefficients for whites and blacks as well as heteroskedasticity robust standard errors from estimating the empirical model, i.e. equation (1), by population weighted least squares. Mixed race is the omitted category. The respective dependent variables are listed on the left of each row. Covariates include gender as well sets of indicator variables for mothers' age, mothers' years of schooling, mother never married. Missing values indicators for each covariate and region fixed effects are also included in the regressions. See the Data Web Appendix for the precise definition and source of each variable. * denotes significance at the 10%-level, ** significance at the 5%-level, and *** significance at the 1%-level. Variables marked with ° are normalized to have mean 0 and standard deviation 1 in our weighted sample including individuals of all ages.

Table 2A: Demographics (Add Health)

I. Home Environment

	Raw Data			Adjusted			
Dependent Variable	White	Black	Mixed	White	Black	Observations	R-squared
Household Income (log)	10.613	9.913	10.106	0.385**	-0.141	8,294	0.303
	(0.734)	(0.912)	(0.664)	(0.155)	(0.133)		
Not on Welfare	0.940	0.794	0.844	0.064	-0.051	9,406	0.131
	(0.237)	(0.404)	(0.366)	(0.060)	(0.048)		
Father in Household	0.833	0.534	0.544	0.263***	0.002	48,197	0.108
	(0.373)	(0.499)	(0.499)	(0.036)	(0.038)		
Parents Married	0.787	0.426	0.245	0.491***	0.176*	9,433	0.149
	(0.409)	(0.495)	(0.434)	(0.090)	(0.098)		
Mother's Age	41.596	41.600	39.660	1.828**	0.984	8,537	0.105
	(5.964)	(8.273)	(3.737)	(0.785)	(0.713)		
Mother is College Graduate	0.321	0.308	0.370	-0.028	-0.068	41,016	0.102
	(0.467)	(0.462)	(0.484)	(0.041)	(0.042)		
Mother Ever Married	0.987	0.800	0.916	0.042	-0.132**	8,564	0.15
	(0.115)	(0.400)	(0.281)	(0.051)	(0.056)		
Years in Current Residence	8.065	6.719	4.654	3.159***	1.439*	10,716	0.103
	(5.743)	(5.782)	(4.151)	(0.802)	(0.859)		

II. Phsyical Variables

	Raw Data			Adjusted			
Dependent Variable	White	Black	Mixed	White	Black	Observations	R-squared
Birth Weight (in kg)	3.415	3.222	3.362	-0.022	-0.165**	8,672	0.074
	(0.539)	(0.547)	(0.443)	(0.079)	(0.079)		
Height (in meters)	1.692	1.692	1.707	-0.025**	-0.018	10,711	0.305
	(0.106)	(0.108)	(0.096)	(0.012)	(0.012)		
BMI	22.136	23.239	22.601	-0.557	0.511	10,549	0.085
	(4.244)	(4.744)	(4.618)	(0.759)	(0.731)		
Attractiveness	0.007	(0.041)	0.414	-0.413**	-0.441***	10,787	0.040
	(0.998)	(1.008)	(0.904)	(0.169)	(0.160)		

Notes: Entries in the left panel are means and standard deviations by race in the weighted raw data. Entries in the right panel are coefficients for whites and blacks as well as heteroskedasticity robust standard errors clustered by school from estimating the empirical model, i.e. equation (1), by population weighted least squares. Mixed race is the omitted category. The respective dependent variables are listed on the left of each row. In addition to the covariates listed in the text, indicator variables for missing values on each covariate, and school fixed effects are also included in the regressions. See the Data Web Appendix for the precise definition and source of each variable. * denotes significance at the 10%-level, ** significance at the 5%-level, and *** significance at the 1%-level.

Table 2B: Home Environment (Census)

	Raw Data			Adjusted			
Dependent Variable	White	Black	Mixed	White	Black	Observations	R-squared
Household Income (log)	1.916	1.253	1.597	0.347***	-0.315***	1,537,676	0.103
	(0.842)	(1.073)	(0.912)	(0.011)	(0.012)		
Not on Welfare	0.994	0.977	0.984	0.009***	-0.009***	794,028	0.008
	(0.077)	(0.150)	(0.125)	(0.002)	(0.002)		
Father in Household	0.749	0.399	0.507	0.255***	-0.098***	1,615,234	0.136
	(0.433)	(0.490)	(0.500)	(0.006)	(0.006)		
Parents Married	0.776	0.408	0.506	0.268***	-0.103***	1,438,503	0.099
	(0.417)	(0.492)	(0.500)	(0.007)	(0.007)		
Mother's Age	41.366	39.528	4.068	1.111***	-0.674***	1,352,706	0.146
	(5.863)	(6.837)	(6.857)	(0.090)	(0.091)		
Mother is College Graduate	0.253	0.121	0.211	0.051***	-0.085***	1,352,706	0.024
	(0.435)	(0.326)	(0.408)	(0.006)	(0.006)		
Mother Ever Married	0.984	0.758	0.853	0.130***	-0.099***	1,352,706	0.146
	(0.124)	(0.428)	(0.355)	(0.005)	(0.005)		
Not Migrated in Last 5 Years	0.586	0.504	0.465	0.114***	0.035***	1,615,234	0.033
	(0.493)	(0.500)	(0.499)	(0.006)	(0.006)		

Notes: Entries in the left panel are means and standard deviations by race in the weighted raw data. Entries in the right panel are coefficients for whites and blacks as well as heteroskedasticity robust standard errors from estimating the empirical model, i.e. equation (1), by population weighted least squares. Mixed race is the omitted category. The respective dependent variables are listed on the left of each row. Covariates include gender, an extensive set of age indicators, a nativity indicator, and indicator variables for missing values on each covariate. State fixed effects are also included in the regressions. See the Data Web Appendix for the precise definition and source of each variable. * denotes significance at the 10%-level, ** significance at the 5%-level, and *** significance at the 1%-level. Variables marked with ° are normalized to have mean 0 and standard deviation 1 in our weighted sample including individuals of all ages.

Table 3: Achievment variables (Add Health)

	Raw Data			Adjusted			
Dependent Variable	White	Black	Mixed	White	Black	Observations	R-squared
No Learning Disability	0.863	0.850	0.961	-0.116***	-0.094**	9,407	0.159
	(0.344)	(0.357)	(0.197)	(0.036)	(0.038)		
AHPVT Score°	0.164	-0.756	-0.161	0.183	-0.393**	10,296	0.385
	(0.913)	(1.037)	(1.011)	(0.165)	(0.173)		
GPA	2.934	2.592	2.720	0.157***	-0.075	43,930	0.168
	(0.788)	(0.755)	(0.783)	(0.056)	(0.057)		
Never Repeated a Grade	0.824	0.673	0.653	0.135	0.07	10,791	0.180
	(0.381)	(0.469)	(0.480)	(0.086)	(0.085)		

Notes: Entries in the left panel are means and standard deviations by race in the weighted raw data. Entries in the right panel are coefficients for whites and blacks as well as heteroskedasticity robust standard errors clustered by school from estimating the empirical model, i.e. equation (1), by population weighted least squares. Mixed race is the omitted category. The respective dependent variables are listed on the left of each row. In addition to the covariates listed in the text indicator variables for missing values on each covariate, and school fixed effects are also included in the regressions. See the Data Web Appendix for the precise definition and source of each variable. * denotes significance at the 10%-level, ** significance at the 5%-level, and *** significance at the 1%-level. Variables marked with ° are normalized to have mean 0 and standard deviation 1 in our weighted sample.

Table 4: Psychological variables (Add Health)

	Raw Data			Adjusted			
Dependent Variable	White	Black	Mixed	White	Black	Observations	R-squared
Mother Cares°	-0.016	0.062	-0.017	0.012	0.068	44,583	0.028
	(1.012)	(0.947)	(1.069)	(0.082)	(0.084)		
Father Cares°	0.009	-0.044	-0.298	0.311***	0.261**	37,105	0.037
	(0.978)	(1.111)	(1.352)	(0.109)	(0.112)		
Close to People°	0.042	-0.170	-0.095	0.082	-0.033	45,463	0.054
	(0.985)	(1.042)	(0.961)	(0.068)	(0.072)		
Feel Accepted°	-0.024	0.098	-0.002	-0.041	0.127	44,751	0.034
	(0.997)	(1.007)	(0.926)	(0.082)	(0.082)		
Feel Loved°	-0.030	0.124	-0.068	0.015	0.135*	44,818	0.034
	(0.992)	(1.022)	(1.023)	(0.073)	(0.078)		
Not Depressed°	-0.035	0.145	-0.185	0.109	0.312***	46,350	0.099
	(0.995)	(1.006)	(1.103)	(0.098)	(0.095)		
Like Oneself°	-0.071	0.292	0.021	-0.076	0.261**	44,879	0.079
	(0.999)	(0.950)	(1.061)	(0.112)	(0.114)		
Chances Live to 35°	0.054	-0.216	-0.013	0.05	-0.121*	46,769	0.050
	(0.947)	(1.163)	(1.065)	(0.072)	(0.070)		

Notes: Entries in the left panel are means and standard deviations by race in the weighted raw data. Entries in the right panel are coefficients for whites and blacks as well as heteroskedasticity robust standard errors clustered by school from estimating the empirical model, i.e. equation (1), by population weighted least squares. Mixed race is the omitted category. The respective dependent variables are listed on the left of each row. In addition to the covariates listed in the text indicator variables for missing values on each covariate, and school fixed effects are also included in the regressions. See the Data Web Appendix for the precise definition and source of each variable. * denotes significance at the 10%-level, ** significance at the 5%-level, and *** significance at the 1%-level. Variables marked with ° are normalized to have mean 0 and standard deviation 1 in our weighted sample.

Table 5: Adult Outcomes, Ages: 18 and older (Census)

	Raw Data			Adjusted			
Dependent Variable	White	Black	Mixed	White	Black	Observations	R-squared
Married	0.615	0.384	0.319	0.140***	-0.067***	8,746,444	0.151
	(0.487)	(0.486)	(0.466)	(0.005)	(0.005)		
Have Children	0.376	0.415	0.327	0.001	0.016***	8,746,444	0.194
	(0.484)	(0.493)	(0.469)	(0.005)	(0.005)		
Bachelor's Degree	0.234	0.121	0.177	0.051***	-0.079***	8,746,444	0.061
	(0.424)	(0.326)	(0.382)	(0.004)	(0.004)		
Employed	0.621	0.539	0.634	0.045***	-0.078***	8,746,444	0.294
	(0.485)	(0.498)	(0.482)	(0.006)	(0.006)		
Weeks Worked Last Year	45.373	43.212	41.186	1.189***	-0.846***	6,074,996	0.116
	(12.542)	(14.228)	(15.118)	(0.198)	(0.199)		
Occupational Score°	28.318	25.055	25.742	0.119***	-0.199***	6,739,443	0.093
	(10.451)	(8.936)	(9.876)	(0.012)	(0.012)		
Household Income (log)	10.759	10.351	10.575	0.232***	-0.209***	8,344,888	0.114
	(0.881)	(1.032)	(0.965)	(0.011)	(0.011)		
Poor	0.079	0.213	0.169	-0.059***	0.065***	8,472,415	0.046
	(0.269)	(0.41)	(0.375)	(0.005)	(0.005)		
Not Migrated in Last 5 Years	0.586	0.545	0.389	0.044***	0.044***	8,746,444	0.157
	(0.492)	(0.498)	(0.488)	(0.006)	(0.006)		
Own Home	0.779	0.555	0.500	0.166***	-0.047***	8,421,485	0.116
	(0.415)	(0.497)	(0.500)	(0.006)	(0.006)		
Value House (log)	11.606	11.186	11.598	0.166***	-0.223***	6,338,830	0.182
	(0.872)	(0.848)	(0.893)	(0.014)	(0.014)		
Live Outside City Center	0.466	0.314	0.459	0.099***	-0.112***	5,562,574	0.206
	(0.499)	(0.464)	(0.498)	(0.007)	(0.007)		
Institutionalized	0.016	0.045	0.022	-0.009***	0.024***	8,746,444	0.057
	(0.125)	(0.206)	(0.147)	(0.002)	(0.002)		
Disabled	0.230	0.317	0.219	-0.068***	0.046***	8,746,444	0.117
	(0.421)	(0.465)	(0.414)	(0.005)	(0.005)		

Notes: Entries in the left panel are means and standard deviations by race in the weighted raw data. Entries in the right panel are coefficients for whites and blacks as well as heteroskedasticity robust standard errors from estimating the empirical model, i.e. equation (1), by population weighted least squares. Mixed race is the omitted category. The respective dependent variables are listed on the left of each row. Covariates include gender, an extensive set of age indicators, a nativity indicator, and indicator variables for missing values on each covariate. State fixed effects are also included in the regressions. See the Data Web Appendix for the precise definition and source of each variable. * denotes significance at the 10%-level, ** significance at the 5%-level, and *** significance at the 1%-level. Variables marked with ° are normalized to have mean 0 and standard deviation 1 in our weighted sample including individuals of all ages.

Table 6A: Behavior in School (Add Health)

	Raw Data			Adjusted			
Dependent Variable	White	Black	Mixed	White	Black	Observations	R-squared
Trouble with Teacher°	-0.051	0.198	-0.003	0.018	0.189**	47,305	0.058
	(0.967)	(1.098)	(0.980)	(0.080)	(0.084)		
Trouble Paying Attention°	-0.031	0.119	0.127	-0.107	0.003	47,141	0.035
	(0.972)	(1.095)	(0.990)	(0.088)	(0.092)		
Trouble with Homework°	-0.044	0.170	0.132	-0.093	0.038	47,193	.041
	(0.976)	(1.071)	(0.955)	(0.070)	(0.070)		
Trouble with Students°	-0.065	0.247	0.214	-0.209**	0.011	47,235	0.073
	(0.966)	(1.086)	(1.053)	(0.088)	(0.088)		
Effort Schoolwork°	0.058	-0.224	0.095	0.065	0.259***	47,495	0.098
	(1.002)	(0.956)	(1.089)	(0.086)	(0.085)		
Skipping School°	0.013	-0.054	0.207	-0.107	-0.282***	46,852	0.119
	(1.002)	(0.982)	(1.319)	(0.094)	(0.088)		
Never Suspended or Expelled	0.774	0.519	0.484	0.145	0.031	10,793	0.209
	(0.418)	(0.500)	(0.504)	(0.103)	(0.103)		

Notes: Entries in the left panel are means and standard deviations by race in the weighted raw data. Entries in the right panel are coefficients for whites and blacks as well as heteroskedasticity robust standard errors clustered by school from estimating the empirical model, i.e. equation (1), by population weighted least squares. Mixed race is the omitted category. The respective dependent variables are listed on the left of each row. In addition to the covariates listed in the text indicator variables for missing values on each covariate, and school fixed effects are also included in the regressions. See the Data Web Appendix for the precise definition and source of each variable. * denotes significance at the 10%-level, ** significance at the 5%-level, and *** significance at the 1%-level. Variables marked with ° are normalized to have mean 0 and standard deviation 1 in our weighted sample.

Table 6B: Behavior Outside School (Add Health)

	Raw Data			Adjusted			
Dependent Variable	White	Black	Mixed	White	Black	Observations	R-squared
Watch TV°	-0.140	0.527	0.255	-0.340***	0.185**	47,477	0.152
	(0.947)	(1.021)	(0.987)	(0.064)	(0.072)		
Drinking°	0.026	-0.103	0.145	-0.118*	-0.299***	46,767	0.134
	(1.004)	(0.975)	(1.055)	(0.071)	(0.068)		
Smoking°	0.078	-0.303	0.060	0.075	-0.424***	46,881	0.105
	(1.055)	(0.667)	(1.073)	(0.092)	(0.087)		
Daring°	0.057	-0.227	0.191	-0.123	-0.376***	46,695	0.086
	(1.025)	(0.856)	(1.154)	(0.090)	(0.088)		
Lie to Parents°	-0.005	0.015	0.203	-0.205**	-0.203**	46,622	0.031
	(0.985)	(1.054)	(1.125)	(0.085)	(0.084)		
Fight°	-0.019	0.071	0.241	-0.221**	-0.169*	45,338	0.089
	(0.997)	(1.007)	(1.130)	(0.086)	(0.088)		
Property Damage°	0.032	-0.152	0.192	-0.087	-0.205	10,722	0.067
	(1.032)	(0.819)	(1.016)	(0.176)	(0.185)		
Steal°	0.011	-0.063	0.572	-0.508*	-0.498*	10,715	0.053
	(1.013)	(0.920)	(1.398)	(0.290)	(0.295)		
Violent Acts°	-0.058	0.252	0.629	-0.437	-0.254	10,736	0.114
	(0.947)	(1.166)	(1.601)	(0.323)	(0.322)		
Sell Drugs°	-0.004	0.020	0.019	0.095	0.109	10,720	0.060
	(0.989)	(1.048)	(1.041)	(0.145)	(0.140)		
See Violence°	-0.065	0.294	0.302	-0.177	-0.004	10,738	0.106
	(0.934)	(1.213)	(1.289)	(0.282)	(0.276)		
Ever Sex	0.358	0.576	0.584	-0.143**	-0.005	10,684	0.233
	(0.480)	(0.494)	(0.497)	(0.058)	(0.059)		
Ever STD	0.018	0.079	0.082	-0.069	-0.006	10,784	0.067
	(0.134)	(0.270)	(0.277)	(0.045)	(0.043)		
Ever Illegal Drugs	0.321	0.266	0.556	-0.109	-0.184*	10,638	0.120
	(0.467)	(0.442)	(0.501)	(0.098)	(0.098)		

Notes: Entries in the left panel are means and standard deviations by race in the weighted raw data. Entries in the right panel are coefficients for whites and blacks as well as heteroskedasticity robust standard errors clustered by school from estimating the empirical model, i.e. equation (1), by population weighted least squares. Mixed race is the omitted category. The respective dependent variables are listed on the left of each row. In addition to the covariates listed in the text indicator variables for missing values on each covariate, and school fixed effects are also included in the regressions. See the Data Web Appendix for the precise definition and source of each variable. * denotes significance at the 10%-level, ** significance at the 5%-level, and *** significance at the 1%-level. Variables marked with ° are normalized to have mean 0 and standard deviation 1 in our weighted sample.

Table 7: Mixed Race Adolescents' "Typical Black" Behavior

	Index Value	Percent Black at School
1st Quartile	0.303	less than 4.1%
	(0.128)	
2nd Quartile	0.134	4.1% to 17.2%
	(0.104)	
3rd Quartile	-0.017	17.2% to 48.4%
	(0.124)	
4th Quartile	-0.110	above 48.4%
	(0.116)	

Notes: Entries are means and standard errors for our index measure of typical black behaviors by racial composition of school. The construction of the index is described in the text; the Web Appendix provides additional detail, and the source and precise definition of every variable used in construction.