A Constructivist Perspective on Empirical Discrimination Research

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Abstract

Contemporary scholars view race as a constructed social category, not a biological fact. Yet most empirical discrimination research treats race no differently than other individual characteristics typically observed in data. This article considers the implications of adopting a constructivist perspective instead. I develop a simple model where agents use observable characteristics to both interpret membership in racial social categories and make decisions. Discrimination is the result of acting based on perceived social identity. The model highlights the need to measure the racial "first stage"—the social identity contrast between individuals—instead of relying on race as coded in data, and draws a novel distinction between race-based and direct statistical discrimination. I illustrate some implications using data on wages, speech patterns, and skin color and conclude with strategies for future research that build on the constructivist model.

An enormous empirical literature studies the influence of race in labor markets, the criminal justice system, health care, and other settings. Virtually all of this work takes racial categories as facts about people—individuals are Black, white, Asian, and so on as much as they might be immigrants, have blue or brown eyes, or have completed high school. A parallel literature in sociology and anthropology questions this approach, asking, What is meant by a variable B_i that takes a value of one if individual i is "Black"? Does B_i measure melanin levels above a threshold or other phenotypic information? If not determined by physical traits, does B_i refer to i's own ethnoracial identity claims or the category assigned by another actor? Is B_i fixed, or might it change across contexts and as other individual traits evolve? And what, if at all, does it matter for quantitative research on racial discrimination?

For decades, scholars across the humanities and social sciences have regarded race as, to quote Paul Holland, "a socially determined construction with complex biological associations" (Holland, 2008). No surjective map associates individual ancestry or phenotypic and biological characteristics, such as skin tone or hair texture, with a consistent racial taxonomy. Who is considered white, Black, Native American, or Asian in one time or place may not be in another, or even in the same time and place but wearing different clothing. The constructivist argues that race exists not as a natural but a social category forged over hundreds of years of political and historical processes. As a result, while individuals may *observe* others' physical traits, they *interpret* race; race in data and economic models therefore reflects both physical facts about people and the potentially non-neutral mental models people use to digest those facts.

These ideas are not simply the abstract concerns of progressive scholars in the humanities. Substantial quantitative research demonstrates that interpretations of race are both fluid and contextually dependent. In a notable experiment, for example, Freeman et al. (2011) demonstrate that identical faces are more likely to be categorized as white when wearing a suit and tie instead of janitorial overalls. The boundaries of racial categories, as well as who belongs where, are constantly contested in public and political discourse. President Barack Obama is famously the frequent subject of diverging racial perceptions. A 2010 Pew Research poll found that more than half of respondents who identified as Black saw Obama as Black, but less than a quarter of white respondents did the same even though Obama himself has stated "I identify as African-American—that's how I'm treated and that's how I'm viewed. I'm proud of it" (Reynolds, 2007).[1]

Constructivism is also central to a rich literature in sociology and economics that explores the emergence and consequences of social identities (Akerlof and Kranton, 2000; Darity, Mason and Stewart, 2006; Akerlof and Kranton, 2010). A non-essentialist per-

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[1] During the 2012 presidential election, Fox News contributor Laura Ingraham pondered whether Herman Cain would be the "first Black president" because he does not "have a white mother, white father" (Somanader, 2011). Cain, for his part, claimed Obama was more of an "international" (Reeve, 2011).

spective on race is central to this strand of research. The core idea, in fact, is that racial differences emerge *endogenously* as an outcome of stereotypes that, in equilibrium, engender real disparities across groups and reinforce perceptions of racial difference (Coate and Loury, 1993). Acknowledging the plasticity of racial cues is a natural sequitur. When race reflects the social significance of potentially manipulable signals, individuals face incentives to "pass" or "assimilate" across groups if the reputational benefits exceed the costs (Austen-Smith and Fryer, 2005; Eguia, 2017; Kim and Loury, 2019). The fact that passing or partial passing is possible points to the fragility of an essentialist notion of racial identity in the first place.

This paper considers the import of constructivism for empirical research on racial discrimination. Rather than taking race as a fixed characteristic—one of potentially many essential X_i attributable to each individual—I present a simple model where agents use observed physical facts about people and contexts to make a judgment about racial social identities. These judgments reflect the myriad ways physical and contextual cues influence perceived membership in racial social categories that the decision maker inherits from long-standing political, social, and historical processes (Goffman, 1963; Tajfel, 1974; Loury, 2002; Emirbayer and Desmond, 2021). In line with recent research, judgments are not dichotomous; individuals with the same observables may present as "more white" or "more Black" depending on contextual factors. Ostensibly non-racial characteristics, such as incarceration history and attire, may influence how race is perceived as well. In this model, race is therefore neither a simple binary variable nor a composite of individual traits.[2] Instead, it is in the eye of the beholder.

The agent's utility may depend on perceived race directly due to prejudice or because the agent "statistically discriminates" about decision-relevant unobservables on the basis of racial social categories. I call either case discrimination. Utility may also depend on underlying individual characteristics directly or for what they signal about unobservable traits. Testing when differential decisions happen "because of" race thus faces an obvious and immediate identification problem. When the same X_i that determine perceived race enter utility directly, it is not possible to separate direct effects from discrimination. To do so, the empiricist requires either racial instruments—factors that influence perceived race but are excludable from utility—or strategies that compare individuals whose combinations of individual characteristics, absent differences in perceived race, ought to generate the same utility.

Some characteristics may be obviously excludable from utility on normative grounds. It would be unreasonable, for example, to argue that direct preferences over skin color reflect anything other than racial discrimination. Ceteris paribus comparisons of individuals with diverging skin tones is rarely physically possible, however, and the set of other potential racial cues that are obviously excludable quickly becomes controversial. While

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[2]That is, a "bundle of sticks" as suggested by Sen and Wasow (2016).

some scholars view the differential treatment of trained and matched Black and white testers sent to negotiate over automobile purchase as "decisive" evidence of discrimination, others argue that it is "unlikely that all characteristics that might affect [utility] will be perfectly matched" (Arrow, 1998; Heckman, 1998). Behind this critique lies an implicit definition of discrimination as the ceteris paribus "treatment effect" of race, subjecting discrimination to the same rigor as a pharmaceutical in a randomized controlled trial. In the constructivist perspective, however, there is no hypothetical experiment that could measure the treatment effect of race because race is not an isolable characteristic. Instead, manipulating race as a symbolic category requires varying at least one of the ceteris (Greiner and Rubin, 2011; Sen and Wasow, 2016; Kohler-Hausmann, 2018).

The difficulty of parsing racial from non-racial characteristics in the constructivist framework presents an important measurement error challenge. Consider the tradition of "kitchen-sink" benchmarking regressions and Oaxaca-Blinder decompositions, which attempt to compare outcomes across groups on an equal footing (Blinder, 1973; Corcoran and Duncan, 1979; Oaxaca and Ransom, 1994; Darity Jr, Guilkey and Winfrey, 1996). Race disparities that survive a large set of controls are thought to be more reliable evidence of discrimination. Without further restrictions, however, such controls may both eliminate potential confounders and attenuate the "first-stage" effect of coded race on perceived racial differences, leaving it unclear how to interpret gaps that diminish as more controls are added. Put simply, the social identity contrast between an Emily and Latisha who are both summa cum laude graduates of the Harvard mathematics department may be significantly weaker than the unconditional contrast. From the constructivist perspective, benchmarking thus runs the risk of overcontrol even in cases where the goal is to measure disparate treatment.[3]

This measurement problem is straightforward to demonstrate using data on wages, speech patterns, and skin color from the 1997 cohort of the National Longitudinal Survey of Youth (NSLY97). Consistent with the results in Neal and Johnson (1996), the large unconditional wage gap between Black and white respondents attenuates substantially after controlling for education, geography, and scores on aptitude tests. These same controls, however, also reduce between-group differences in other important racial cues, including skin shade and how likely one's speech is to be categorized as that of a Black speaker.[4] If the goal is to measure the possible extent of labor market discrimination based on social identity, augmented Mincer (1974)-style controls clearly adjust for wage-relevant skills and adjust the implicit social contrasts across workers. Indeed, if distinctive speech is taken as the relevant determinant of social identity, then the reduction in the Black-white wage gap measured in Neal and Johnson (1996) would be 40% smaller.

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[3]Ayres (2010) argues that "included-variable" bias is a concern for statistical tests of disparate impact but not disparate treatment.

[4]The speech data were created and studied originally in Grogger (2019).

One way out of the benchmarking morass is to take an explicit stand on what *is* decision relevant, thereby reducing the dimension of the problem. In Becker (1957)'s original analysis of labor market discrimination, for example, workers' marginal product fully characterizes their value to firms. Discrimination occurs when an employer acts as if the equally productive Black worker commands a higher wage. The researcher can therefore test for discrimination by finding sets of characteristics that yield diverging perceptions of race but hold utility fixed. Defining the set of decision-relevant factors, however, typically requires normative claims on what *ought* to matter to decision makers absent discrimination. Making these claims can be controversial. Moreover, decision makers do not typically directly observe latent traits such as productivity. They must instead make guesses about them using the characteristics they do see. Comparing two individuals with equal *expected* productivity to the agent poses further challenges, as I discuss below.

Finally, the constructivist model highlights an inherent tension in the classic distinction between "taste-based" and statistical motivations for discrimination. Statistical reasoning about decision-relevant unobservables based on perceived race necessarily reflects a coarsening of underlying characteristics—many people are inferentially grouped together as "Black" or "white" despite their underlying differences (Mullainathan, 2002; Fryer and Jackson, 2008; Bordalo et al., 2016). Yet these groupings are not necessarily neutrally or exogenously constructed. To the extent that who is seen as Black or white reinforces in part the social meaning of race, group-based reasoning at the expense of within-group heterogeneity is difficult to cast as a purely statistical exercise and may no longer be the efficient solution to a decision problem under uncertainty.

Studying discrimination empirically therefore requires institutional or normative restrictions on what information affects preferences and racial perceptions and how. Many disagreements about whether and when discrimination has been reliably identified empirically, the nature of its motivations, and what to do about it stem from disagreements about what such restrictions are reasonable. Since many battles over discrimination occur in courtrooms, one might expect the law to offer sharper guidance on how to define and measure race and discrimination. As I detail below, however, the same difficulties that challenge empirical discrimination research reappear in legal contexts. Though decades of legal contests have produced multiple theories of discrimination and evidentiary standards, in many cases what it means to say legally that an action was illegally taken "because of" race remains unclear.

These arguments should not be construed as claims that race and racial discrimination are not pressing and real social problems. The fact that social identity is constructed does not make its impacts on society any less sharply felt. Nor is the objective here to argue that individuals' internal notions of identity are unimportant or wrong in any sense. Rather, my objective here is to encourage empirical researchers to think critically

about what their data tell us about how members of different racial groups are treated and also how membership in these groups is constructed and perceived.

In what follows, I begin with a review of theoretical and empirical research on racial identity. The goal here is not to be comprehensive. Instead, I focus on a subset of key ideas and results that underscore the quantitative importance of constructivist ideas. I then discuss how legal notions of discrimination, from which recent empirical research draws much inspiration, grapple with the meaning of race. Finally, I sketch the model of discrimination introduced above and discuss its implications for applied research. I conclude with some suggested solutions and directions for future work.

1   What is race?

Two broad theories have dominated scholarship on race, each with its own important implications for empirical discrimination research.[5] The first, often dubbed "essentialism," views race as a primarily biological taxonomy of people: one's race is a fixed set of natural characteristics determined primarily by ancestry. These views have strong ties to the history of slavery and colonialism, underlie many arguments for racial supremacy, and were of central interest to eugenicists. One can see clear traces of essentialism in American racial classifications, such as a Louisiana law passed in 1970 that decreed anyone with at least one thirty-second or more "Negro blood" was legally "Black."

Yet Louisiana's law also highlights an important challenge to essentialist ideas: borders between seemingly "natural" categories are fundamentally arbitrary. Why draw the line at one-thirty second? Constructivism argues that such confusion arises because no essential racial taxonomy exists. Classifications such as "Black" and "white" represent social categories forged by social and political processes intimately tied to chattel slavery, the legacy of Jim Crow, the War on Drugs, the rise of mass incarceration, and persistent socio-economic divides. Through these processes, physical and contextual markers—particularly skin color—became markers of social difference and identity. Race, in the constructivist view, refers to these social categories and their meaning, not to one's genetics or ancestry directly.

While constructivist views are the product of relatively modern qualitative scholarship, growing quantitative empirical evidence calls for more nuance than allowed by treating race as an unambiguous demographic category. For one, simply assigning basic racial labels to people is non-trivial. For example, Liebler et al. (2017) find that 6% of people changed race and Hispanic-origin responses between the 2000 and 2010 Decennial censuses, including 6% of people reported as non-Hispanic Black in 2000. Innumerable

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[5]I provide a brief overview of these complex topics here. For more thorough introductions see Zuberi (2001), Bonilla-Silva (1999), Sen and Wasow (2016), Emirbayer and Desmond (2021), and Kohler-Hausmann (2018).

other examples illuminate how cleanly defining the boundaries of racial categories is not a simple exercise (Kennedy, 2012; Davenport, 2016).

Some may object that much purported racial fluidity is concentrated among people from multi-racial families or with Hispanic origins. Yet racial labels are not only flexible generally but also respond to simple social and contextual factors, pointing to a deeper fluidity in how race is interpreted and perceived. Studying the 1979 National Longitudinal Survey of Youth cohort, Saperstein and Penner (2012) report that changes in both self-reported and interviewer-assigned race are associated with major life events.[6] Charles and Guryan (2011) report similar sensitivity to earnings and education in the Current Population Survey, while Cornwell, Rivera and Schmutte (2017) show that changes in racial classifications in Brazil are associated with wage changes.

Thus even in cases where demographic racial labels remained unchanged, social cues likely affect perceptions of how *cleanly* an individual belongs to particular social categories. Gaddis (2017) makes this point clearly when studying perceptions of names. Children named Bria and Tamika are equally likely to be recorded as Black on birth records (roughly 80%), yet mothers of Bria are nearly four times more likely to have some college education. Less than 30% of Gaddis' survey respondents associated being Black with the name Bria, however, while close to 90% did so for Tamika.[7] "Blackness" for many is thus more closely associated with class than straightforward demographics, a pattern noted in many analyses of the roles race and class play in inter-group relations (Jaynes, 2004).[8]

The phenomenon of "passing" provides yet another window into the construction of racial categories. Passing is the act of signaling with physical and contextual cues—by, for example, whistling Vivaldi while walking the streets at night—that an observer should not apply the naive social classification they might otherwise. Passing recognizes that race is, in part, a performance: "You are not Black because you are (in essence) Black; you are Black... because of how you juggle and combine many differently racialized and class(ed) actions" (Jackson Jr, 2010). Naturally, when social categorization is manipulable, members of stigmatized groups face incentives to present otherwise when the benefits outweigh the costs (Kim and Loury, 2019). Doing so is only possible because racial social categorization is not strictly tied to innate physical characteristics.

Of course, individuals also have their own notions of racial identity. When census surveys ask respondents to declare their race, they drawn on facts about themselves and their experiences to do so. One's own racial identity is not typically directly observed,

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[6]Alba, Insolera and Lindeman (2016) argue that much of this racial fluidity is concentrated among respondents with mixed racial family backgrounds. Regardless, shifting racial identify seems to be a real feature of the NSLY data.

[7]Similar comparisons are possible with other distinctively Black names and for men.

[8]Related work shows that physical markers such as skin tone play an important role in determining social identity among those widely viewed as members of the same race (Monk Jr, 2021).

however. And even if it were, what matters for discrimination is not how a person views themselves but how they are viewed by others. Despite this, many quantitative and physical scientists continue to view race primarily in biological terms (Morning, 2007). Much research in economics implicitly adopts this view, treating race as a fixed demographic characteristic readily measured by categorical variables.

Putting aside philosophical issues of causality, the constructivist challenge to empirical research is this: Do we intend to ask whether an agent treats an individual differently because of his skin color, as if manipulation of that single trait alone would lead to different outcomes? Or do we intend to ask whether an agent treats an individual differently because a constellation of physical and contextual features strongly suggest they belong in a social category that has particular meaning to the decision maker? This article explores the import of taking this idea seriously.

2 What is race and discrimination under the law?

Since many battles over discrimination are fought in courtrooms, the law might offer more clear-cut guidance for empiricists. This section argues that, unfortunately, it does not. The Fourteenth Amendment, the basis for cornerstone racial civil rights cases including *Brown* v. *Board of Education* and *Loving* v. *Virginia*, makes no mention of race, color, or ancestry and their meaning. The nation's most comprehensive civil rights legislation, the 1964 Civil Rights Act, prohibits discrimination in public facilities and programs, public education, and employment by restricting differential treatment "on the basis of," "because of," "on the ground of," "on account of," or "by reason of" race, color, religion, sex, or national origin. No definition is given of race, aside from an implicit differentiation from color.

In light of this ambiguity, substantial case law has developed interpreting when exactly behavior falls afoul of the legal protections against discrimination. Two distinct doctrines have emerged. The first—disparate treatment—covers *intentional* discrimination and is intimately tied to the Fourteenth Amendment's promise of "equal protection." The most obvious cases occur when documentary evidence makes race's role as a motivating factor explicit. In the infamous case of *Foster* v. *Chatman*, for example, the Supreme Court ruled that Georgia prosecutors had unconstitutionally struck all prospective Black jurors in Timothy Foster's murder trial. Key to the case were prosecutors' notes highlighting which jurors were Black with "B" annotations.

There is little to debate in such cases. Race, however conceptualized, clearly played an illegal role. Yet the law also recognizes that discrimination can be proved without "smoking gun" evidence of the relevant party's state of mind. Circumstantial evidence is frequently used to establish disparate treatment (*Teamsters* v. *United States*, 431 U.S. 324, 1977), typically using frameworks that leave discrimination as the residual

explanation after eliminating plausible alternatives (*McDonnell Douglas Corp.* v. *Green*, 411 U.S. 792, 1973). In fact, statistical disparities alone can establish evidence of disparate treatment (*Hazelwood School Dist.* v. *United States*, 433 U.S. 299, 1977). The heart of these cases lies in determining which characteristics are job-relevant and hence plausible explanations for observed treatment disparities. Naturally, there is no bright line rule that can be universally applied, and as such, legal definitions of discrimination face many of the same empirical challenges I highlight below.

The second core legal doctrine—disparate impact—covers cases of "unintentional" discrimination, or situations when polices and behaviors that are "fair in form, but discriminatory in operation" (*Griggs* v. *Duke Power Co.*, 401 U.S. 424, 1971). Title VII's disparate impact law prohibits facially race-neutral policies if they have a "disproportionate" impact on a protected group and are shown not to be job related. However, the disparate impact doctrine typically sidesteps complicated issues of the meaning of race as well. In fact, because differences in treatment need not happen "because of" race at all, a claim simply requires pointing to a specific policy that causes disparate impacts across identifiable groups.

Though I have discussed "the law" generally in this section, the legal system does not treat discrimination in all domains equally. Employment discrimination law is especially developed due to Title VII and the Civil Rights Act's creation of the Equal Employment Opportunity Commission. Title VI, the part of the Civil Rights Act that prohibits discrimination in federally funded programs, has no disparate impact provisions, which were only added to Title VII in 1991. In all contexts, however, it seems that the law offers relatively little guidance to empirical researchers about how to operationalize modern views of race.

3 A constructivist model of discrimination

This section formalizes the constructivist perspective on race in an explicit but simple model. The model recognizes that race is not an independent characteristic but rather is a function of how those characteristics are perceived in particular contexts and by particular people. I then discuss the model's implications for identifying discrimination in common empirical settings.

3.1 The race function

To model the process of racial social categorization, I first introduce a *race function* that maps individual characteristics into perceived membership in racial social identities. Specifically, a decision maker observes a set of characteristics X. For example, a bail judge deciding whether to grant pretrial release may observe a defendant's skin color, criminal

history, defense attorney's arguments, attire, hair texture, etc. Not all characteristics are necessarily observed by the researcher: X can be partitioned into $[X_1 \ X_2]'$ to reflect observed and unobserved factors.

The race function $r(X) : \mathbb{R}^p \to [0, 1]$ captures how these characteristics affect perceived membership in racial social categories. For simplicity, social categories are modeled as binary continuum—i.e., from the most "white" to the most "Black"—but in principle could instead be represented as a simplex of arbitrary dimension. As discussed above, r reflects social classification, not demographic classification or individuals' internal identities. Classification need not be stable over time, consistent across individuals, or intentionally constructed by agent. And while classification may serve as a useful heuristic for making decisions under uncertainty, even under full information the agent still perceives social identity.

After observing individual characteristics and perceiving race, the agent takes an action $a \in A$. The bail judge, for example, can decide to release the defendant on their own recognizance, set monetary bail, or deny pretrial release all together. Their utility from action a depends on the action, perceived race, and individual characteristics: $U(a, r(X), X)$. The agent maximizes utility by selecting the best action given r and X.

Allowing utility to depend on X captures the direct effects of individual characteristics on the decision. The judge, for example, may be swayed by the defense attorney's attestations that the defendant presents no risk to the community or observe a recommendation produced by an algorithm. The judge may also value individual factors for their signal value about an ultimate, latent objective, Utility from detaining individuals with a prior history of pretrial misconduct, for example, may be higher because the judge believes these individuals are more likely to misbehave again.

Utility also depends directly on perceived race. It may do so first because of prejudice, however motivated. For example, if the judge views themselves as white, they may consciously or subconsciously seek to treat members of the racial "outgroup" more harshly. Responding to someone's race directly captures a "taste" for discrimination—utility from a given action is simply higher or lower *because of* perceived race Becker (1957). Allowing for this effect captures the most uncontroversial form of discrimination.

Perceived race may also affect utility because the agent uses racial categories to make inferences about relevant unobservables. The judge may believe, for example, that white defendants are more likely to be involved in drug than violent crime and thus feel more comfortable releasing them on their own recognizance. These beliefs may be correct, on average, or reflect distorted views of between-group differences (Bordalo et al., 2016). When reasoning based on social categories, what matters is whether the agent views an individual as Black or white and their beliefs about the behaviors and traits of both groups; the specific characteristics that produced the racial inference are glossed over.

The goal in discrimination research is to determine how decisions depend on perceived

race. Using potential outcomes, one might let $Y \in A$ reflect the action taken and potential actions $Y(r, X)$ depend on individual characteristics and perceived race. The goal is to test whether $Y(r, X) \neq Y(r', X)$ *for some* $r \neq r'$. At this level, the identification problem is clear. Without additional restrictions, it will not be possible to differentiate effects of characteristics from effects of perceived race because r is an arbitrary function of X. Not only are potentially decision-relevant elements of X potentially *correlated* with race due (e.g., if the distribution of crime types is not evenly distributed across groups), but decision-relevant elements of X may also *directly* affect perceived race.

The fundamental challenge to studying discrimination from the constructivist perspective is to overcome this identification problem. I discuss potential solutions further below. First, however, I highlight the basic implications of this model for common tests and theories of discrimination.

3.2 Benchmarking and the measurement problem

Empirical research typically confronts the challenge of decision-relevant observables and unobservables that correlate with perceived race by controlling for as many factors as possible when estimating the "effects" of race. So-called benchmarking regressions are thought to be more reliable when a particularly rich set of factors are accounted for, making it more likely that any residual differences in treatment are attributable to race. In cases where *all* factors observed by the decision maker are also observed by the agent, sufficiently flexible controls are often argued to identify the effect of race (and therefore discrimination) (Hangartner, Kopp and Siegenthaler, 2021).

Yet in most empirical benchmarking exercises, the data simply record categorical variables for race. Often these variables reflect the answer to a question asked of the individual. In other settings, racial data may reflect the categorization assigned by another observer. In addition to cases where reported race is intentionally manipulated, coded race may also simply not correspond to race as perceived by the decision maker.

This measurement problem interacts with the challenges of benchmarking in an important way. While conditioning on X may absorb differences in decision-relevant characteristics across individuals, it may also change the extent to which the decision maker views them as racially different. Imagine, for example, comparing bail decisions for two individuals who live in similar homes in the same neighborhood, went to the same high school and got the same grades, and have the same sets of tattoos, the same name, the same accent and patterns of speech, the same courtroom demeanor, the same jewelry and attire, and the same criminal conduct but differ in the color of their skin. The judge's decisions for these two individuals may be more similar than for two random individuals with different skin color. Yet the judge is also very likely to view the differences in social identity for the matched pair differently as well.

Controlling for successively more comprehensive sets of characteristics may therefore ensure that coded race is uncorrelated with potential confounds but also may attenuate the unmeasured first-stage effect of coded race on perceived racial differences.[9] If the goal is to detect whether race as a social category affects decisions, as I argue it should be, such attenuation is an important concern. An observed racial disparity that disappears after conditioning on a large set of controls may reflect either decisive evidence that race is not a factor in decisions or the seriousness of the measurement problems at hand.

I illustrate these issues using data from the 1997 NLSY cohort. In 2011 and 2012, respondents were recorded speaking in both formal and informal settings. Grogger (2019) recruited individuals to listen to the recorded speech and to classify each speaker's sex, race, and region of origin. Up to six separate listeners classified each participant's speech. Members of the NLSY97 cohort also had their skin color recorded by interviewers in several previous rounds using color cards that ranked shades from 1 (the lightest) to 10 (the darkest). The detailed data in the NSLY on education, employment, and scores on aptitude tests administered by the Department of Defense allow me to assess not only how racial gaps in wages are affected by detailed controls but also these other important racial cues.

Panel a of Table 1 first regresses log wages in 2011, when cohort members were in their late 20s and early 30s, on an indicator for coded race and increasingly detailed controls. I only include respondents who are coded as either Black or white, are not currently enrolled in school, and have a valid log wage for their primary job. Column 1 shows that the unconditional wage gap is large—roughly 25%. Including demographic controls, which capture sex, birth year, and census region of birth, reduce the gap to roughly 20%. Adding controls for highest grade achieved further attenuates the gap by roughly half. Finally, adding aptitude test controls reduces the gap by roughly 5%.

These results suggest that much of the unconditional Black-white wage gap may reflect differences in skills rewarded by employers. The rest of Table 1, however, shows that these same controls also meaningfully attenuate between-group differences in other important racial cues. Panel b shows that while Black NLSY97 respondents are naturally coded as having darker skin, adding the full suite of controls reduces between-group skin shade differences by about 5%. Panel c uses the share of listeners who classified each respondent's speech as Black as the outcome. While Black members of the NLSY97 cohort are more likely to speak in distinctive ways overall, the conditional difference is meaningfully smaller. Controlling for a large set of covariates thus changes not only the distribution of job-relevant skills between groups but also the conditional differences in how each group member looks and sounds.

One can go further by taking seriously the idea that regressions with race dummies on

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[9]If the researcher observed perceived race, she could correct for attenuation by re-scaling the reduced-form effects of coded race on outcomes.

the right-hand side should be viewed as reduced forms. Indeed, if panels b or c reflect the typically unmeasured first stage—implying that perceived race is captured entirely by skin shade or speech—the reduction in the racial wage gap due to Neal and Johnson (1996)-style proxies for pre-market skills would be 5% or 40% smaller, respectively, than what is suggested in panel a.[10] Of course, in reality, coded race, skin shade, and speech may all be imperfect proxies for how race is perceived in the labor market. More complicated models that formalize this idea in the style of Bound (1991) are an interesting area for future research.

If including *all* individual characteristics is not a foolproof strategy, the benchmarker faces the challenge of deciding when to stop. Which characteristics are decision-relevant confounds and which ones are simply racial cues that should only affect utility through race itself? While there are some characteristics that are uncontroversially non-racial (perhaps) and others that are not, there is a vast gray area in between. Faced with this ambiguity, the empirical tendency has been to control for as much as possible. The constructivist perspective suggests this approach may be misguided, or at the very least highly conservative.

3.3   Within- and between-group statistical discrimination

Putting aside measurement issues, another key lesson from the constructivist perspective is the distinction between direct and indirect—or race-based—statistical discrimination. Making statistical inferences about other people based on how they look and behave is an innate part of human cognition. We frequently do so automatically and uncontroversially. But what does it mean to reason about others' unobserved traits on the basis of race? If race reflects not physical characteristics but how individuals are socially categorized, then race-based reasoning reflects statistical discrimination based on social identity. The agent observes traits that make her more likely to view someone as white and makes inferences based on the characteristics of white people generally.

Superficially, reasoning on the basis of social identity may appear no different than reasoning about impending weather from cloud formations. From the perspective of the decision maker, social categories exist. She knows generally who fits into which group and how members of the group typically behave. Using group identity to make judgments about people is therefore just a simple application of Bayes' rule. Unlike verifiable characteristics like years of schooling or behaviors like slurring one's speech, however, social categories are not facts about people. They are facts about how people are viewed and constructed by political and social processes. While social categories may contain decision-relevant information, they are just one of many potential ways people

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[10]These calculations compare the reduction in panel a (–0.248 to –0.047) to the reduction in the implied instrumental variable estimates (e.g., $\frac{-0.248}{4.289}$ to $\frac{-0.047}{4.095}$).

Table 1: Wage, Skin Shade, and Speech Gaps in the NLSY97

	(1)	(2)	(3)	(4)
	(a) Log wages			
Black	-0.248***	-0.202***	-0.115***	-0.0471
	(0.0283)	(0.0303)	(0.0281)	(0.0304)
Constant	2.822***	2.974***	3.132***	3.036***
	(0.0166)	(0.0440)	(0.356)	(0.359)
	(b) Skin shade			
Black	4.289***	4.209***	4.167***	4.095***
	(0.0879)	(0.0946)	(0.0975)	(0.104)
Constant	1.812***	1.551***	1.038*	1.140*
	(0.0275)	(0.0908)	(0.479)	(0.484)
	(c) Distinctive speech			
Black	0.284***	0.164***	0.143***	0.111***
	(0.0154)	(0.0153)	(0.0152)	(0.0160)
Constant	0.169***	0.0630***	0.174	0.220
	(0.00748)	(0.0162)	(0.122)	(0.122)
N	1,905	1,905	1,905	1,905
Demographics		Yes	Yes	Yes
Education			Yes	Yes
ASVAB				Yes

Notes: This table reports regressions of log wages, skin shade, and racially distinctive speech patterns on an indicator for coded race and demographic, educational, and aptitude test controls. The outcome in panel a is the log wage. In panel b it is interviewer-coded skin shade on a 1–10 scale. In panel c it is the share of listeners who classified the respondent's recorded speech as Black. The sample includes all NLSY97 respondents surveyed in 2011 with a valid log wage, skin shade measure, and speech measure whose indicated race is either Black or white. Respondents currently enrolled in school are dropped. Demographic controls include year of birth, sex, and census region at age 12 dummies. Educational controls include indicators for highest year of education. ASVAB includes a linear effect of scores on the Armed Services Vocational Aptitude Battery test. Robust standard errors are in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

can be grouped and categorized. And in the case of race, research shows that racial categories are not neutrally constructed.

Importantly, the decision maker's reasoning is not necessarily statistically flawed. Given any population, it is always possible to group people into different categories and to form accurate beliefs about the behaviors of each category as whole. But doing so may also not be the "efficient" solution to a decision problem under uncertainty, as statistical discrimination is typically understood. In other words, "accurate" statistical

discrimination is only accurate if one conditions on social categories and social meaning. The decision maker could do weakly better if she used all information available to her and ignored social identities. Doing so may be hard, however, and many models of cognitive inattention could rationalize the use of coarse categories in decision-making (Mullainathan, 2002; Fryer and Jackson, 2008).

Of course, the decision maker may also hold inaccurate beliefs. She may, for example, overestimate the prevalence of some group traits that are relatively more common (Bordalo et al., 2016). Non-neutral construction of social categories may exacerbate mistaken beliefs if groupings respond to inaccurate beliefs as well, leading to a hardening of perceived social differences. If the decision maker, for example, mistakenly believes that *all* Asian students are mathematically talented, then she may also be more likely to view a strong mathematics student as Asian, reinforcing the belief. Indeed, if racial social identity is flexible enough, initially inaccurate beliefs about group behavior may ultimately be confirmed as the decision maker reshapes group membership to better reflect her beliefs.

The distinction between direct and race-based statistical discrimination presents some interesting challenges. In principle, it is possible to reason statistically on the basis of an important racial cue without reference to social identity. Is this discrimination? Although the agent is not using race-based reasoning, their utility still depends on a characteristic that would surely enter the race function as well. Given the obvious identification challenges, normative claims are needed. Most people would recognize that preferences over skin color are wrong, however motivated. Yet many other physical characteristics, such as height and build or the friendliness of a smile, routinely and uncontroversially affect decisions. Discrimination is thus defined only through a normative restriction that one *ought* not to have preferences over skin color. I return to this important point further below.

Economic research on statistical discrimination has historically elided any difference between direct and race-based statistical inferences, both from a modeling and welfare perspective. Canonical frameworks beginning with Phelps (1972) and Aigner and Cain (1977) assume there are typically two groups (indexed by an observable $b_i \in \{0, 1\}$). The agent observes group membership and updates their beliefs according to the population distributions of behavior. Learning models and their empirical applications (e.g., Altonji and Pierret, 2001; Bohren, Imas and Rosenberg, 2019) typically make similar assumptions.[11]

In contrast, the constructivist perspective does not imply statistical discrimination is poorly defined or uninteresting. Instead, it offers new directions for research that seeks to better understand how race is used in decision-making and to distinguish between

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[11]Tests for learning and the accuracy of beliefs face the same challenges as benchmarking discussed above. As the decision maker accumulates more experience and information, their perceptions of social identity may fluctuate as well.

race-based and direct inference. Because the former fundamentally relies on between-versus within-group comparisons, there are important empirical implications that can be explored. While substantial work has explored the motivations and applications of stereotypic thinking (Hilton and Von Hippel, 1996), the formation and maintenance of groups over which stereotypes are formed has received less attention, especially in economics.

4 Solutions

There are many ways to study discrimination that acknowledge the socially constructed nature of racial social identities. Many classic projects, such as Bertrand and Mullainathan (2004)'s correspondence study of employment discrimination, have a simple interpretation under the constructivist model. Viewing race as a social category, however, does raise new challenges for several common strategies, and I discuss these below.

4.1 Exclusion

By now, one potential strategy for studying discrimination should be clear: racial instruments. If the researcher has access to variables that shift the race function but not utility, then it is straightforward to study the reduced-form effect of these variables on outcomes. Continuing with the potential outcomes notation introduced above, instruments statisfy:

Definition 1 (Racial instruments) *The variable Z is a valid racial instrument if $r(Z, X) \neq$* *$r(Z', X)$ and $Y(r, Z) = Y(r, Z')$.*

Ideally, one would use these variables to instrument for a measurement of perceived race, but in many cases the empirical goal is to simply test whether discrimination exists at all. In such cases the reduced form alone is sufficient.

Perhaps the most famous example of racial instruments comes from correspondence studies (Bertrand and Mullainathan, 2004; Bertrand and Duflo, 2017; Kline, Rose and Walters, 2021). These studies test whether employers respond differently to resumes with distinctively Black names, such as Latisha and Jamal, than those with distinctively white names, such as Emily or Greg. Exclusion is central to the audit study's claim to measure racial discrimination. Names must affect employers' perceptions of race but not other decision-relevant factors; that is, they must enter the race function but not utility directly.

Much ink has been spilled on testing this assumption, including the question of whether employers respond to information about social class encoded in names. This critique argues that employers would be no more likely to contact a "Cleatus" than a Jamal (Fryer and Levitt, 2004; Gaddis, 2017).[12] One might be tempted to compare audit

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[12] I use this name here in homage to Cletus Spuckler, the stereotypical "yokel" portrayed on *The Simpsons*.

study responses to distinctively Black and white names typically given to people from similar socio-economic backgrounds. But as in the benchmarking example above, doing so may both eliminate a potential confound and attenuate names' perceived racial differences (Gaddis, 2017). These tests therefore either require an analogous exclusion restriction—that socio-economic measures associated with names do not enter the race function—or strategies to correct for attenuation. Actually measuring the first-stage effects on perceptions is a promising route forward.

There are myriad other examples of racial instruments, mostly focused on experimental settings where manipulating explicit racial cues is possible. As in cases where researchers use instruments to identify causal effects, the plausibility of the instrument is context and design specific. The researcher must take a stand on how and why the instrument affects utility and (carefully) test those assumptions against plausible alternatives.

4.2 Observed dimension reduction

Rather than taking a stand on how experimentally manipulated racial cues affect utility, researchers can alternatively take a stand on everything else. This strategy requires arguing that all decision-relevant factors can be observed or isolated by the researcher. The classic example is Becker (1957)'s analysis of labor market discrimination, where workers' value to firms is characterized by a single dimension of heterogeneity: productivity. If the researcher observes productivity, she can simply examine how factors that affect racial categorization impact treatment (e.g., wages) conditional on productivity. The virtue of this approach is that many observed and unobserved characteristics may contribute to qualification as long as the research design isolates qualification itself.

Definition 2 (Observed dimension reduction) *There exists an index Z such that no discrimination implies $Y(r(X), Z, X) = Y(r(X'), Z, X') \ \forall \ X, X'$.*

Goncalves and Mello (2021) present a very simple contemporary example. Studying the ticketing behavior of Florida Highway Patrol officers, they argue minority motorists are less likely to receive a reduced penalty conditional on being caught driving at the same speed as a white motorist. Here, decision-relevant factors can be collapsed to a single number: driving speed. Since the officers' job is to catch speeders, this seems fairly uncontroversial. Yet even in this simple case, the implicit dimension reduction does not come for free. Goncalves and Mello (2021)'s approach requires that absent discrimination, officers would be equally likely to ticket Black and white motorists when caught driving at the same speed. This means factors such as the vehicle's features, the driver's attitude, or even the duration the motorist sustained the driving speed are either irrelevant or uncorrelated with perceived race.

Since one can likely always invent potential omitted decision-relevant factors, dimension reduction should be viewed as a normative exercise. The argument is that Black and white motorists *ought* to face the same penalties if caught speeding to the same degree regardless of what else the officer may observe about them. The normative aspects of dimension reduction are even clearer in the famous example of Goldin and Rouse (2000). By studying gender differences in musicians' evaluations when performing behind a screen that obscured their appearance, all that *ought* to matter is the quality of the performance. Because dimension reduction hinges on normative restrictions on what factors should be decision relevant in the absence of discrimination, it faces distinct challenges relative to testing for discrimination using racial instruments.

4.3   Unobserved dimension reduction

The decision makers in the preceding examples observe the relevant dimension—the motorists' speed or the musicians' performance—directly. The more common case involves situations where even if utility can be inarguably restricted to depend on a single or set of latent factors, these factors are not observed. In this case, the decision maker acts on her best guess of the relevant factor based on other characteristics. The relevant definition of non-discrimination is the following:

Definition 3 (Unobserved dimension reduction) *There exists a mapping $g(X)$:* $\mathbb{R}^p \to \mathbb{R}^k$ *such that no discrimination implies*

$$Y(r(X), g(X), X) = Y(r(X'), g(X'), X') \ \forall \ X, X' \ such \ that \ g(X) = g(X').$$

Now the researcher must identify not only the relevant latent factor (e.g., productivity) but also the appropriate information set the decision maker uses to make inferences about the latent factor. Doing so requires another type of normative claim. One might posit, for example, that $g(\cdot)$ captures the expected net benefits of taking a particular action given all information observed by the decision maker. But what information she uses and how is not always uncontroversial. Even if she forms rational expectations, she may use extra information unobserved by the researcher or rely on only a subset of the information the researcher observes.

An important example comes from pretrial detention decisions in criminal courts (Arnold, Dobbie and Yang, 2018; Arnold, Dobbie and Hull, 2020; Marx, 2021). The dimension reduction in this context argues that all that matters is the defendant's likelihood of pretrial misconduct. Judges detain defendants whose expected costs of misconduct exceed the costs of detention. They discriminate if they act as if detention costs are lower for Black versus white defendants, either because they place less value on Black defendants' freedom or because they systematically overestimate their probability of misconduct.

Many factors can contribute to expected misconduct, including defendant characteristics unobserved to the researcher.

One natural response to the problem posed by unobserved dimension reduction is to collect information on decision makers' subjective beliefs about latent factors directly, as suggested by Manski (2004). It would then be straightforward to test whether expectations are systematically biased for some groups (relative to $g(\cdot)$, assuming it can be estimated), whether choices appear to be consistent with the model sketched above, and whether there are racial gaps in detention rates conditional on beliefs. An even better approach would be to simultaneously collect data on perceived race so that the researcher can also tease out how beliefs about misconduct affect racial perceptions conditional on other observed factors.

Various other quasi-experimental approaches to measuring discrimination in this setting have also been developed. The definitional and econometric issues involved in doing so are beside the point of this paper, but the solution to the challenge posed by the constructivist model remains the same: restrict utility such that comparisons across groups can be made while holding fixed factors that ought to explain behavior in the absence of discrimination. Just as in the observed case, the validity of this approach hinges on the plausibility of the restrictions.

5   Conclusion

Constructivist theories of race—the idea that race refers to socially constructed identity groups and not innate biological factors—can seem loosely defined and difficult to grapple with empirically. A wealth of evidence suggests, however, that constructivist perspectives offer a better description of how race is deployed in the real world. How one perceives both one's own and others' race can change over time, depend on contextual factors, and be infected by various "non-racial" characteristics. Even when someone might be relatively unambiguously categorized *demographically*, the *social meaning* of race depends on other complex cues, as shown by the diversity of peoples' views on how "Black" President Obama is.

This paper offers a framework for operationalizing constructivist ideas in empirical research on racial discrimination. Rather than treating race as a fixed characteristic of people, I model race as a process of social categorization based on observable and contextual factors. The model offers new perspectives on when traditional approaches, such as the Oaxaca-Blinder benchmarking exercise, capture discrimination, and draws a novel distinction between race-based and direct statistical discrimination. Two avenues for testing for discrimination are offered: one relying on instruments that shift social identity but are not decision relevant themselves and another that requires inherently normative claims about the isolable set of decision-relevant factors.

Does acknowledging the constructed nature of race invalidate a vast body of work in the social sciences that has largely treated race as coded in data as no different than age or place of birth? Absolutely not. Many research projects have interesting and useful interpretations under a constructivist lens, and measures of inter-group disparities based on self-reported or census-provided racial categorizations are still useful. The challenge for future research on discrimination, however, is to develop new tools that directly measure and study the influence of race as a social category, both to understand the impacts of discrimination and as an end in itself.

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