Research Statement, September 2021

Conrad Miller, UC Berkeley

I am a labor economist who studies inequality between social groups with a focus on race and gender. My research pursues three broad research questions: (1) what role do firms play in producing labor market inequality between social groups? (2) what are the consequences of discrimination? and (3) what are the effects of policy responses to discrimination?

Gender inequality and racial inequality are pronounced around the world. Economists and other social scientists have developed numerous theories for why these between-group differences persist. Groups may differ in the *skills* they possess or their *preferences* over job characteristics in ways that contribute to inequality in outcomes, including wages and employment rates. Labor market *discrimination* is another potential cause, including individual-level discrimination---where, for example, a hiring manager may decide whether or not hire someone on the basis of group membership---or institutional discrimination, where organizational practices perpetuate differential treatment by group.

Understanding the sources of between-group inequality is important, particularly for policy. The source of discrimination plays an essential role in determining: (a) whether interventions to address between-group inequality are ethically or economically justified; (b) what interventions are likely to be most effective; and (c) the costs and benefits of these interventions.

I contribute to the literatures on racial and gender inequality in part by using rich and large administrative data sets that have only recently become available to researchers to identify and incorporate novel mechanisms and empirical tests. In my work on labor markets, I use employer-level and matched employer-employee data to study firm behavior. By contrast, most prior research on between-group inequality in the labor market, lacking these types of data, examines the labor market as a whole, abstracting away from firms. This abstraction neglects the important role that employer personnel practices play, including firms' efforts to diversify their workforces, an area that is more typically studied by sociologists. In my work on contexts outside the labor market I use rich administrative data to better understand the discriminatory behavior of decision-makers, including police officers.

In addition to my focus on firms, I strive to push the frontier of economics research on discrimination in two ways. First, while most economics research focuses on two canonical models, taste-based and statistical discrimination, I also incorporate perspectives on discrimination from sociology, psychology, and political science. Second, I move beyond testing the null hypothesis that has been the focus of much of the prior economics literature---that discrimination does not exist---and focus on the implications of discriminatory behavior for policy.

In the remainder of this document I describe my research papers in more detail. Each paper can be found on my [website].

The Role of Firms in Between-Group Labor Market Inequality

In several of my papers I study whether firm characteristics contribute to firms' discriminatory behavior in hiring, *holding the nature of the work fixed*. The stylized fact that motivates my work in this area is that seemingly similar firms vary substantially in the racial or gender composition of their workforce. Across papers, the firm characteristics I study include firm size, the demographic composition of current employees, and investments in screening technology. A key implication of my findings is that there are multiple equilibria for the group composition of a firm's workforce and that even temporary policy interventions can persistently influence group composition.

In **"The Persistent Effect of Temporary Affirmative Action"** (*American Economic Journal: Applied Economics*, 2017), I study whether temporary affirmative action interventions have persistent effects on the racial composition of firms' employees. I study affirmative action regulations that apply to federal contractors in the United States. For many types of goods and services, the set of companies the government buys from at any given time is constantly changing. Turnover in these contractor relationships provides useful variation in which, and when, employers are subject to affirmative action regulation. I estimate the dynamic effects of affirmative action regulation on the racial composition of an employer's workforce using establishment-level data from the Equal Employment Opportunity Commission and an event study research design.

I find that affirmative action sharply increases an establishment's Black share of employees, with the share continuing to increase over time. Strikingly, I find that the Black share of employees continues to grow even after an employer is no longer subject to regulation. This persistence is evident more than a decade following deregulation.

Traditionally, economists have argued that a temporary affirmative action intervention can theoretically have persistent effects on the labor market by inducing targeted workers to invest in their human capital. But this mechanism is unlikely to be relevant in the context of this study. The policy variation I exploit should have minimal effects on the human capital investment incentives workers face in the broader labor market. Instead, I argue that this persistence is driven at least in part by employer investments in *screening capital*---investments that improve an employer's ability to recruit and screen potential workers. These investments have some sunk cost component, leading to persistence. For example, temporary affirmative action may induce firms to build relationships with new labor market intermediaries that diversify their candidate pools. These relationships may be costly to set up, but worth maintaining even after the regulation no longer applies. I use existing survey evidence to support this argument.

Temporary interventions can also have persistent effects on the composition of a firm's workforce through referral hiring. A change in the racial composition of incumbent employees may influence the racial composition of future hires if those incumbents provide referrals and referral networks are racially segregated. Theory suggests that the widespread practice of referral hiring may perpetuate or exacerbate racial disparities in labor market outcomes by funneling opportunities within groups. Yet the extent to which referral hiring contributes to racial inequality in practice is not well understood. I study the dynamic role of referral hiring in the production of racial inequality in **"The Dynamics of Referral Hiring and Racial Inequality: Evidence from Brazil"** (working paper, 2021) with Ian Schmutte.

We develop a simple job search model where (1) referral networks are racially segregated, (2) firms are more informed about the match quality of job seekers who are referred by an incumbent employee, and (3) at least some referrals are made by non-referred employees. The model predicts that firms with white founders are more likely to hire white employees than comparable firms with nonwhite founders and that firms are less likely to dismiss recent hires of the same race as the founder. Yet these differences in hiring and dismissal behavior disappear as firms' cumulative number of hires increases. The reason is that, as firms mature, employees that were originally hired from the external market generate referrals themselves, so that the racial composition of the referral pool converges to that of the external market.

We confirm these model predictions using employer-employee data from Brazil, a country with well-documented racial disparities in employment and wages. We then show that our findings, given that founders are disproportionately white, help to explain three stylized facts about racial differences in labor market outcomes: nonwhite workers are more likely to be dismissed by their employers, have less seniority, and sort to larger employers than white workers.

My third paper on this topic is **"Missing Women, Integration Costs, and Big Push Policies in the Saudi Labor Market"** (*American Economic Journal: Applied Economics*, forthcoming), which is co-authored with Jennifer Peck and Mehmet Seflek. Women's employment rates are particularly low in the Middle East, North Africa, and South Asia. These low employment rates are often attributed to social norms regarding gender roles and their effects on labor supply. We argue that these norms influence labor *demand* in important ways as well. In particular, in settings where social norms promote gender segregation, firms may find it costly to employ both men and women. Accommodating social norms may require providing a physically or socially segregated workplace, so that employing both men and women necessitates substantial fixed cost investments and constrains the production process. Firms that would otherwise hire women in the absence of these "integration" costs---particularly small firms where fixed integration costs are difficult to justify---may decide to employ only men instead, hindering women's employment outcomes.

We test this idea in Saudi Arabia, a country where cultural norms around gender segregation are particularly strict and, until recently, labor regulations explicitly mandated gender-segregated workplace facilities. Motivated by a simple model of firm hiring, we develop a methodology that uses the distribution of women's employment across firms to assess whether and how integration costs constrain women's employment at firms. The idea is to identify the excess mass of firms with exactly zero women employees, borrowing from the public finance literature on bunching. We apply and validate the methodology using administrative data on Saudi citizens' employment in the private sector. We find that the majority of Saudi firms employ only men because they face binding integration costs. We then show that Nitaqat---a gender-neutral quota program designed to increase the number of Saudi nationals working in the private sector---led to a dramatic increase in female share of the Saudi workforce at least in part by inducing firms to integrate. Though cultural norms are particularly strict in Saudi Arabia, we use World Bank data to document similar workplace segregation patterns in other countries in the Middle East, North Africa, and South Asia.

The notion that gender integration involves substantial, largely fixed costs has important implications for policy. In particular, our results suggest that "big push" demand-side policies like Nitaqat that incentivize firms to integrate can substantially change firm hiring preferences at the margin. These policies can also have the potential for feedback effects by attracting more women to the labor market, which could in turn induce more firms to integrate.

A series of recent papers show that between-group wage disparities can in part be explained by differences in where people work and the wage premiums associated with those firms. Most of this genre focuses on gender inequality, though there are also papers that study racial inequality and differences between immigrants and natives. A key open question is why social groups differ in where they sort. A common finding in this literature is that between-group differences in firm pay premiums cannot be explained by differences in worker-specific pay premiums, where firm and worker pay premiums are typically derived from regressions of wages on worker and firm fixed effects. These worker-specific pay premiums are generally interpreted as an index of worker quality or skill. Hence, researchers have argued that skill differences play a limited role in explaining gender differences in firm pay premiums in particular, and have instead focused on discrimination- and preference-based explanations.

I revisit the role of gender differences in pre-labor market skills in **"Firm Sorting, College Major, and the Gender Earnings Gap"** (working paper, 2021), joint work with Federico Huneeus, Christopher Neilson, and Seth Zimmerman. Our key insight is that when skill is multidimensional, estimated worker-specific pay premiums are unlikely to be a sufficient statistic for a worker's bundle of skills. Gender differences in pre-market skill bundles, including well-documented gender differences in field of study among college-educated workers, may play an important role in explaining why women sort to lower-paying firms..

To test this hypothesis we use unusually rich data from Chile that combines employer-employee tax data with administrative data on college admissions. We find that differences in college major account for more than two-thirds of the firm contribution to the gender earnings gap among college admits. In particular, degrees in Technology, which are numerous, male-dominated, and associated with high firm premiums, drive this result.

In **"When Work Moves: Job Suburbanization and Black Employment"** (*Review of Economics and Statistics*, accepted) I bring new data and a new research design to a classic subject in labor and urban economics: the spatial mismatch hypothesis. The theory attributes U.S. racial disparities in employment rates in part to spatial frictions in the labor and housing markets. Black households tend to live relatively far from work opportunities, reducing their access to gainful employment. This distance increased after World War II, as firms and white households began relocating from central cities to suburban rings at an accelerated pace. Black households, who faced discrimination in housing and mortgage markets, remained concentrated in central cities. As a result, Black households tend to live further away from the portions of metropolitan areas experiencing substantial job growth, depressing their labor market outcomes.

I examine whether job suburbanization caused declines in Black employment rates from 1970 to 2000. I use establishment-level data from the Equal Employment Opportunity Commission to document that Black workers are less likely than white workers to work in observably similar jobs that are located further from the central city, and that this pattern is stable over time. I use establishment relocations to show that this relationship at least in part reflects the causal effect of job location. At the local labor market level, I find that job suburbanization is associated with substantial declines in Black employment rates relative to white employment rates. I find similar results when I instrument for suburbanization using nationally planned highway infrastructure to address potential concerns about reverse causality. The estimates imply that job suburbanization can explain over half of the relative decline in Black men's employment rates and 15%–20% of the increase in white women's employment rates relative to Black women's over this period.

In ongoing work I am pursuing multiple projects centered on the following research question: how do labor market frictions affect labor demand for workers with criminal records? For example, in a project with Marcus Casey, Benjamin Feigenberg, and David Phillips, we are partnering with a reentry organization that provides programming for those exiting the correctional system to successfully enter the workforce. We are evaluating their personalized employment matching services in a randomized controlled trial. We are also incorporating administrative employer-employee and arrest records to unpack the mechanisms through which the services work and to understand how successful employment of workers with criminal records varies across firms.

Racial Discrimination Outside the Labor Market

I also study racial discrimination in contexts outside the labor market, including in the criminal justice system and online platforms.

In many respects, the United States criminal justice system is exceptionally punitive. In **"Racial Divisions and Criminal Justice: Evidence from Southern State Courts"** (*American Economic Journal: Economic Policy*, 2021), joint with Ben Feigenberg, we ask whether this exceptionalism can be explained in part by the fact that the United States is more racially diverse than peer countries. An established political economy and public finance literature finds that racially heterogeneous places—countries, states, cities--tend to provide fewer public goods and less generous social safety nets. Researchers have argued this pattern may be driven by ingroup bias. The electorate prefers less generous social provisions when they perceive that outgroup members will receive much of the benefit. We apply the same reasoning to criminal justice, where the electorate may prefer more punitive policy when they perceive that outgroup members are more likely to be punished.

We face two significant empirical challenges to answering this question. First, our research question is motivated by a cross-country comparison, but a cross-country comparison is not feasible given data constraints. Instead, we exploit variation in criminal justice practices across jurisdictions within the United States. This approach is feasible because judges and prosecutors have significant discretion in determining punishment and in the US they are typically locally elected so that local punishment is tied to local preferences. So the question we ask is: within the US, are more racially heterogeneous jurisdictions more punitive?

A second key challenge for us is that it is potentially difficult to isolate differences in punishment practices across jurisdictions from differences in crime. We use rich administrative data from four

Southern states to estimate what we call *punishment severity*, variation in how different jurisdictions treat equivalent cases. In other words, we estimate the causal effect of jurisdiction on arrest charge outcomes. To do this, we exploit the fact that we can identify the same defendant arrested in multiple jurisdictions and measure the role of jurisdiction while holding defendant characteristics fixed.

We reach two main findings. First, there is substantial variation in punishment severity across jurisdictions within states. A defendant charged in a jurisdiction in the top quartile by punishment severity is two to four times more likely to be incarcerated for a given charge than the same defendant charged in a jurisdiction in the bottom quartile. Second, consistent with a model of ingroup bias in electorate preferences, the relationship between local severity and Black population share follows an inverted U-shape. Punishment severity is relatively low in jurisdictions with large white or Black majorities, and high in more racially diverse areas. Within states, defendants are 27–54 percent more likely to be incarcerated in “peak” heterogeneous jurisdictions than in homogeneous jurisdictions.

In a related ongoing project, joint with Ellora Derenoncourt, Ben Feigenberg, and Heather Sarsons, we are examining whether Black inflows to the North and West during the Great Migration led to more punitive criminal justice policies and laws in destination jurisdictions.

I study racial profiling in motor vehicle searches in **“Would Eliminating Racial Disparities in Motor Vehicle Searches Have Efficiency Costs?”** (*Quarterly Journal of Economics*, forthcoming), joint with Ben Feigenberg. Among motorists stopped for traffic violations, police are more than twice as likely to search Black and Hispanic motorists. These disparities invite allegations that police engage in racial profiling, using race as one factor when deciding whether to search someone. Profiling is a controversial practice in part because it may pose an equity-efficiency tradeoff. On the equity side, perceived profiling undermines trust in police, and profiling likely contributes to racial disparities in arrests and exposure to police use of force. On the other hand, profiling can potentially make policing more efficient if race predicts who is likely to have contraband.

Some argue that there is no tradeoff, and that equalizing search rates across motorist racial groups would not decrease overall contraband yield. This perspective is motivated by the fact that the percentage of searches that yield contraband---known as the (average) hit rate---among Black and Hispanic motorists is typically equal to or lower than the hit rate for white motorists. But economists have emphasized that, to evaluate whether police are on the efficient frontier, one must compare the hit rate for the *marginal* motorist---the motorist deemed just suspicious enough to be searched---across motorist racial groups. Marginal hit rates are notoriously hard to measure, and the fact that average and marginal hit rates may differ is known as the inframarginality problem.

We evaluate whether racial profiling in fact poses an equity-efficiency trade-off using data on traffic stops for speeding violations conducted by Texas Highway Patrol troopers. We assess whether search rate equalization would reduce contraband yield by exploiting variation in search behavior across troopers. In our setting, the identity of the trooper conducting a speeding stop is plausibly exogenous conditional on the location and time of the stop. We measure variation across troopers in the rate at which they search motorists---their search rate. Across troopers, we estimate the relationship between search rates and the percentage of stops that yield contraband (the unconditional hit rate), where we calculate these rates separately by motorist racial group. Strikingly, we find that the relationship between search rates and the percentage of stops that yield contraband is approximately linear within each motorist group, implying approximately constant returns to search across troopers. In other words, troopers who search motorists twice as often find contraband twice as often. We show that, under conditions consistent with our setting, this result implies that there is no inframarginality problem because average and marginal hit rates are similar. Among motorists searched with positive probability, troopers appear unable to distinguish between those who are more or less likely to carry contraband. Our findings imply that it is feasible for troopers to (1) search all motorist racial groups at the same rate, (2) maintain the status quo overall search rate, and (3) increase contraband yield.