

Race and Gender Effects on Employer Interest in Job Applicants: New Evidence from a Resume
Field Experiment

August 2015

Rajeev Darolia, University of Missouri
Cory Koedel, University of Missouri
Paco Martorell, University of California-Davis
Katie Wilson, RAND
Francisco Perez-Arce, RAND

We sent nearly 9,000 fictitious resumes to advertisements for job openings in seven major cities in the United States across six occupational categories. We randomly assigned names to the resumes that convey race and gender but for which a strong socioeconomic connotation is not implicated. We find little evidence of systematic employer preferences for applicants from particular race and gender groups.

Keywords: Discrimination, Field experiment, Resume audit study

JEL: J71, J64

Acknowledgements

The authors thank Scott Delhommer, Jared Dey, Lucas Singer, Trey Sprick and David Vaughn for research assistance. This work was supported by the Spencer Foundation, the Economic and Policy Analysis Research Center at the University of Missouri, and CALDER. The usual disclaimers apply.

1. Introduction

The causes and consequences of race- and gender-based gaps labor market outcomes have been studied by economists for decades (e.g., Altonji and Blank 1999).¹ Within this larger area of inquiry, the specific question of how much these gaps are driven by discrimination in the labor market – whether preference-based or statistical – has received considerable attention. Seminal studies by Bertrand and Mullainathan (2004) and Fryer and Levitt (2004) have contributed to an ongoing debate about the extent to which racial discrimination by employers drives observed gaps by race in the United States. These US studies focus on differences between black and white applicants, and related studies have examined ethnic-based discrimination in Sweden (Carlson and Rooth 2007) and Canada (Oreopolous 2011). Gender-based gaps have also received considerable attention in the literature (e.g., see Blau and Kahn 2000; Booth and Leigh 2010; Croson and Gneezy 2009; Gerhart 1990; Riach and Rich 2006).

This note provides new evidence on employer preferences for applicants by race and gender based on a resume field experiment. We sent nearly 9,000 resumes of fictitious young job applicants to job advertisements in seven major cities in the United States across six occupational types. We randomly assigned names to the resumes that we selected to convey race and gender but for which a strong socioeconomic connotation is not implicated beyond what is implied by the applicant’s race. We find little evidence of systematic employer preferences for applicants of particular race and gender groups.

2. Experimental Design and Empirical Approach

We sent fictitious resumes to online job postings in seven cities (Atlanta, Boston, Houston, Philadelphia, Chicago, Seattle, and Sacramento) and six occupational categories (administrative assisting, customer service, information technology, medical assisting (excluding nursing), medical

¹ For ease of exposition, throughout the note we use the term “race” to indicate race/ethnicity.

office/billing and sales). The resumes were constructed based on real resumes posted online by job seekers in the relevant occupational categories. All resumes indicated that the applicant had attained his or her high school diploma and approximately 85 percent of resumes indicated at least some college coursework at a 2-year institution.

Each resume contained four sections: contact information; education; work experience; and qualifications and skills. The experiment was designed to observe employer preferences for relatively young applicants soon after finishing their education, with all resumes indicating that the applicant graduated from high school in 2010. We sent up to two resumes to each job advertisement, each with a different format and without overlapping content. A detailed description of the experimental design can be found in Darolia et al. (forthcoming).

We selected last names suggestive of race for black, Hispanic and white applicants. Applicants' first names were used to convey gender, and in the case of Hispanic applicants also were indicative of ethnicity. Specifically, we used three female-sounding first names – Isabella, Megan and Chloe – and three male-sounding first names – Brian, Carlos and Ryan. The first names Isabella and Carlos were paired with Hernandez and Garcia to suggest Hispanic origin, while Chloe and Ryan were paired with Washington and Jefferson to indicate an African American applicant. For white applicants, the first names Megan and Brian were paired with Anderson and Thompson.

The above-listed surnames are strong indicators of race. For example, based on data from the United States Census, 90 and 75 percent of individuals with Washington and Jefferson surnames are African American, respectively. Similarly, 90 percent of individuals with a surname of either Hernandez or Garcia are Hispanic, and 70 percent of Andersons and Thompsons are white.² Unlike in Bertrand and Mullainathan (2004), we did not use distinctly African American-sounding first names because these names are associated with relatively low socioeconomic status among African

² Per 2000 Census data, see <https://www.census.gov/genealogy/www/data/2000surnames/>.

Americans (Fryer and Levitt, 2004), and we wanted to avoid confounding employers’ perceptions of race and socioeconomic status. A tradeoff is that the surnames in our experiment may not indicate racial background to employers as strongly as the distinctly African-American sounding names in their study. On the other hand, the Hispanic names we chose are strong signals of ethnicity and have been less studied in the recent experimental literature.

Given the experimental design our empirical approach is straightforward. We estimate models of the following form using a linear probability model:

$$Y_{ijk} = X_{ijk}\beta + A_i\gamma_1 + H_i\gamma_2 + F_i\gamma_3 + \varepsilon_{ijk} \quad (1)$$

In equation (1), Y_{ijk} is an indicator for applicant i in occupation j and city k receiving a positive employer response. A_i and H_i are indicator variables signaling whether the resume indicates that the applicant is likely African-American or Hispanic, respectively, with whites serving as the omitted group. F_i is an indicator for the applicant being female, with males serving as the reference group. We include information about the application in the X -vector to improve the precision of our estimates.³ Standard errors are clustered at the level of the job advertisement as in previous resume-based audit studies (Bertrand and Mullainathan 2004; Oreopoulos 2011).

We estimate the model in equation (1) where the dependent variable is an indicator for whether the employer responded to the resume in a non-perfunctory way.⁴ The mean value for this binary outcome in the experimental data is 11.4%. Similar to other resume audit studies, we cannot make direct inferences about wage and employment outcomes. However, as noted by Bertrand and

³ The X -vector includes controls for whether the resume is the first one to be sent to the employer, whether it was accompanied by a more-enthusiastic greeting, city and occupation indicators, a flexible time trend to account for seasonality in employer responses, information on work-history gaps, and education credentials. The findings we present below are not substantively sensitive to which controls we include in the models, which is not surprising given the random assignment of names to resumes.

⁴ We also estimate models where the dependent variable is an indicator for an explicit interview request and obtain similar results to what we report below. These confirmatory results are omitted for brevity but available from the authors upon request.

Mullainathan (2004), as long as there are frictions in the job-search process, employer response rates will translate into job offers, which will translate into employment and wage outcomes.

3. Results and Discussion

The first column of Table 1 reports results from equation (1) as shown above. The gender effects are small and inconsistent in sign across specifications, suggesting that on the whole employers do not exhibit a strong gender preference. The coefficients for African American and Hispanic applicants are consistently negative in sign but not statistically different from zero. In column 2 we add race-by-gender interactions to the models, but these interactions offer little additional insight. While the differences in the estimates by race in Table 1 could be interpreted as implying a modest employer preference for white applicants, they do not suggest a strong preference, and statistically we cannot distinguish a difference despite our fairly small standard errors.

We are unaware of any comparable evidence from resume audit studies that examine differential outcomes for Hispanic and white applicants, although several small-sample audit studies that involved person-to-person interactions from the 1990s show negative outcomes for Hispanics relative to whites at various stages of the hiring process (see Riach and Rich 2002 for discussion). For the comparison between African Americans and whites, Bertrand and Mullainathan (2004) find significantly larger differences in their earlier resume audit study.⁵ One explanation is that the name signals we use for African Americans may convey different information than in their study, which uses distinctly sounding African American names. Fryer and Levitt (2004) show that after taking into account the socioeconomic correlates of distinctively African-American sounding names, the large

⁵ The lower bound of the 95-percent confidence interval for the African American effect in columns 1 and 2 of Table 1 rules out an effect as large as the one found in Bertrand and Mullainathan (2004)

effect of these names on employer responses attenuates. Our findings provide evidence consistent with this point using newer, experimental data.

A related explanation is that because we did not use such distinctly sounding African American names, some employers may not have perceived the intended race of our fictional African American applicants. This possibility can be framed as a measurement error problem in the variable A_i in equation (1), and would be expected to attenuate our findings for African Americans. We explore the potential for this issue to influence our results by applying standard errors-in-variables corrections to equation (1) under different assumptions about errors in employer inference for the African American applicants. If we assume “factually accurate” error rates based on the racial proportions in surname data from the US Census (10-25 percent), our findings are qualitatively unaffected (our point estimates for African American applicants range from -0.012 to -0.017 and remain statistically insignificant). We can also ask how high the error rate would need to be for our point estimates for African Americans to be similar to what is found by Bertrand and Mullainathan (2004). This analysis shows that the error rate would need to be nearly 60 percent.

Next, in Table 2 we split out the results from Table 1 by occupational category.⁶ Inference from Table 2 is limited to some degree by our larger standard errors, which are the result of the reductions in sample size. Taking the estimates at face value, employers appear to prefer white applicants for sales positions and female applicants for medical office openings. However, we do not offer a strong interpretation of these results because the number of statistically significant results in the table is not far from what we would expect to observe purely by chance.

On the whole, we interpret our findings optimistically. Using experimental data from a recently-performed field experiment, our analysis reveals little evidence to suggest that employers discriminate by race or gender in responding to resumes from job applicants. One explanation for

⁶ Qualitatively similar results are obtained using the interview-request models (results are omitted for brevity).

our findings is that we selected names for the resumes to indicate race and gender without further indications of socioeconomic status. It may also be that our findings are partly attributable to the recency of our data; racial discrimination during job application review may be less prevalent than when researchers conducted prior studies.

References

- Altonji, Joseph G. and Rebecca M. Blank. "Race and Gender in the Labor Market." In *Handbook of Labor Economics, Volume 3*, edited by Orley Ashenfelter and David Card. Amsterdam: Elsevier.
- Bertrand, Marianne and Sendhil Mullainathan. 2004. "Are Emily and Greg More Employable than Lakisha and Jamal? A Field Experiment on Labor Market Discrimination." *American Economic Review* 94(4): 991-1013.
- Blau, Francine D. and Lawrence M. Kahn. 2000. "Gender Differences in Pay." NBER Working Paper No. 7732.
- Booth, Alison and Andrew Leigh. 2010. "Do Employers Discriminate by Gender? A Field Experiment in Female-Dominated Occupations." *Economics Letters* 107: 236-238.
- Carlson, Magnus, and Dan-Olof Rooth. 2007. "Evidence of Ethnic Discrimination in the Swedish Labor Market Using Experimental Data." *Labour Economics* 14(4): 716-729.
- Croson, Rachel and Uri Gneezy. 2009. "Gender Differences in Preferences." *Journal of Economic Literature* 47(2), 448-474.
- Darolia, Rajeev, Cory Koedel, Paco Martorell, Katie Wilson, and Francisco Perez-Arce. Forthcoming. "Do Employers Prefer Workers Who Attended For-Profit Colleges? Evidence from a Field Experiment." *Journal of Policy Analysis and Management*.
- Fryer, Roland and Steven Levitt. 2004. "The Causes and Consequences of Distinctively Black Names." *Quarterly Journal of Economics* 119(3): 767-805.
- Gerhart, Barry. 1990. "Gender Differences in Current and Starting Salaries: The Role of Performance, College Major and Job Title." *Industrial and Labor Relations Review* 43(4), 418-433.
- Oreopoulos, Philip. 2011. "Why Do Skilled Immigrants Struggle in the Labor Market? A Field Experiment with Thirteen Thousand Resumes." *American Economic Journal: Economic Policy* 3(4): 148–171
- Riach, Peter A. and Judith Rich. 2002. "Field Experiments of Discrimination in the Market Place." *Economic Journal* 112: F480-F518.
- Riach, Peter A. and Judith Rich. 2006. "An Experimental Investigation of Sexual Discrimination in Hiring in the English Labor Market." *B.E. Journal of Economic Analysis and Policy* 5(2): 1-20.

Table 1: Employer Response Rates by Signaled Race/Ethnicity & Gender (n = 8,914)

	(1)	(3)
Female	0.0068 (0.0066)	0.0106 (0.0115)
African American	-0.0112 (0.0079)	-0.0123 (0.0110)
Hispanic	-0.0085 (0.0076)	-0.0022 (0.0104)
Female X African American		0.0020 (0.0158)
Female X Hispanic		-0.0130 (0.0153)
Dependent Variable Mean	0.114	0.114

Table 2: Employer Response Rates by Signaled Race/Ethnicity & Gender. Occupation-Specific Models.

	Admin (1)	Customer Service (2)	Sales (3)	IT (4)	Medical Assisting (5)	Medical Office /Billing (6)
Female	-0.0025 (0.0100)	0.0206 (0.0161)	-0.0085 (0.0201)	0.0095 (0.0208)	-0.0075 (0.0171)	0.0453*** (0.0127)
African American	0.0004 (0.0109)	0.0046 (0.0211)	-0.0470** (0.0223)	0.0276 (0.0270)	-0.0144 (0.0189)	-0.0094 (0.0156)
Hispanic	0.0183* (0.0109)	-0.0090 (0.0199)	-0.0338 (0.0222)	-0.0153 (0.0245)	-0.0172 (0.0196)	0.0030 (0.0149)
Observations	2,047	1,661	1,848	944	1,092	1,322
Dependent Variable Mean	0.050	0.131	0.222	0.120	0.087	0.056

*** p < 0.01, ** p < 0.05, * p < 0.10

Notes to tables: Effects from models specified as in equation (1) in the text are reported. The omitted groups are male and white. Standard errors are clustered by job posting and provided in parentheses. Other controls include whether the resume is the first one to be sent to the employer, whether it was accompanied by the more-enthusiastic greeting, city and occupation indicators, a flexible time trend to account for seasonality in employer responses, information on work-history gaps, and education credentials. These controls are based Model 2 from Darolia et al. (forthcoming).