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Young, Black, and Looking for a Job: A Field Study of Internships vs. Entry-Level Work

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Research Article

Keywords: Race, Labor Markets, Careers, Inequality, Organizations

Posted Date: June 19th, 2026

DOI: https://doi.org/10.21203/rs.3.rs-9944769/v1

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Additional Declarations: No competing interests reported.

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ABSTRACT

Using data from an audit study placed during the COVID-19 pandemic, this paper presents a novel investigation of the comparative effect of race on selection for internships versus entry-level jobs. After performing a "nested" audit that held aspects of fictive resumes constant, we find differences exist in employer interest for resumes with Black fictive names compared to White fictive names in entry level jobs. However, for intern profiles, there is no difference in employer interest across Black fictive names and White fictive names. Further, we find some evidence suggesting that internships might serve as a pathway into entry-level jobs, such as those technical fields like computer science, for Black workers, while not affecting access in fields related to economics,like finance and banking. We close with a discussion of the policy implications of the study for understanding internships as pathways of mobility for early career workers.

KEY WORDS:

Race, Labor Markets, Careers, Inequality, Organizations

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INTRODUCTION

In the labor market in the United States, the school-to-work transition is heavily segmented, with racial minorities disproportionately funneled into comparatively low-wage roles that establish a permanent baseline of disadvantage in early careers (Edin, Lein, and Nelson 2002; Haveman, Broschak and Cohen 2009; Storer, Schneider and Harknett 2020). Breaking this cycle requires identifying pathways into high-quality jobs. To this end, internships may be a critical mechanism for improving access.

Interships have begun to serve as an onramp into high paying jobs in the early career. From the mid-1980s to the mid-2000s, college graduates participating in at least one internship rose from less than 10 percent to over 80 percent at colleges and universities in the U.S. (National Association of Colleges and Employers 2019). In higher paying fields such as business and technology, internships are among the most common ways individuals find jobs after entering the workforce (Obukhova and Lup 2013, Greenberg and Fernandez 2016, Campero, 2023). Further, studies find that labor market advantages accrue to prior internships. Employers often go to their internship pool to make offers for full-time, entry-level jobs first prior to considering other applicants (Sterling and Fernandez, 2018).

The purpose of this study is to investigate this early pathway into jobs for young workers and how this might be affected by race. To date, there are differing arguments about the influence of race on internship hiring. On one hand, to the degree that discrimination in labor markets is occuring, then racial minorities may be less likely to be selected for internships (Altonji and Pierret, 2001). However, the nature of internships—i.e., their probationary nature and employers' lack of long-term commitment—could dampen the influence of race on hiring. Sterling and colleagues (e.g., Sterling and Fernandez, 2018; Sterling and Merluzzi, 2019) have argued that instead of discriminating,

employers "try out" potential candidates in more inclusive ways when they are selecting workers for internships compared to entry-level jobs.

In this study we ask, how does race influence selection for internships compared to selection for entry-level jobs? This is an important question from the vantage of racial inequality and labor markets. If young Black workers face discrimination when applying directly to full-time roles, evaluating the *relative* levels of discrimination across both hiring regimes matters. Hypothetically, if Black applicants experience less discrimination when applying for internships than they do for entry-level jobs, internships do more than provide experience: they also offer a lower-friction route into the workforce. An examination of possible differences in the influence of race across the two—internships and full-time jobs—would allow scholars to understand if internships might play an outsized role for racial minorities in accessing jobs after college (Kalleberg, 2011).

To do so here, we place a labor market field experiment. In labor market field experiments or audits, by randomizing variables like racially distinctive names on fictive resumes, researchers can directly observe employer hiring behavior (Kmec, 2006; Pager et al., 2009; Pager & Western, 2012). The audit methodology overcomes the limitations of observational studies, where unobservable variables like unmeasured human capital or personal networks often confound results (Nam, 2021). One difficulty of using them to study internships, however, is their low levels of accessibility for researchers. Regular entry-level jobs are advertised on company websites and third-party platforms. This has permitted researchers to apply to jobs and therefore run labor market audits (e.g., by measuring callbacks). By comparison, despite millions of internships occurring in the U.S. every year, available internships are often hidden from researchers. Employers commonly recruit interns through Career Centers accessible only to a specific college's students, or through on-campus sessions and word-of-mouth networks (Smith and Green 2021).

To address this difficulty, we place a field experiment on internships during COVID-19. During COVID-19, many employers that hire interns could not recruit them through traditional means. On-campus recruiting was prohibited. College students could not attend recruiting events in person, since many students did not attend school on campus due to public health concerns. Companies, many for the first time, placed internship job postings on company websites and other public forums (e.g., LinkedIn and Indeed).

Taking advantage of this shift, we placed an audit study for the 2021 summer recruiting cycle. During the first half of the year, we applied for openings on company websites by filling out full applications for internship and entry-level jobs with Black and White applicant profiles. Overall, our study helps us examine if internships could be a pathway for reducing racial inequality in the early career stage. Below we situate our study in literature on race, labor markets, and employer selection. We then turn to describe our field study and results.

RACE AND EARLY CAREER LABOR MARKETS

Researchers note the early years are a "stratification table-setter" (Settersten and Mayer 1997; Wilson and Maude 2014:118). Since jobs are path dependent, early jobs situate individuals onto varying trajectories of earnings and career options (Moen et al. 1992; DiPrete and Soule 1988). For instance, early career conditions (e.g. the market environment at the time one graduates) have persistent effects on earnings over time (Oyer 2008; Bianchi 2013). Early career jobs also set demographic groups onto different labor market trajectories – including by race and ethnicity – which promotes racial stratification in jobs (Tomaskovic-Devey et al. 2005; Marini and Fan 1997).

Early career experiences such as internships have been found to be important pathways into the labor market (Frenette 2015). Internships are short-term stints that early career workers have

with employers. The Apprenticeship Act of the 1990s spurred the growth of internships during a time when college enrollment was expanding. This led to systematic changes in the labor market for interns, including the rise of the "intern economy" (Perlin, 2013). Internships are now a common facet of early-stage labor markets. Over four million individuals in the U.S. completed internships in 2025 (Conn, 2024).

Internships often serve as steppingstones into good jobs, or those with consistent work schedules, flexible work, and other benefits (Kalleberg, 2011). In a study of a public university in the U.S., Moss-Pech (2021) found that internships provide a "career conveyor belt" or served as a "key social process that moved [college students] into entry-level work" (2021:90). Studies of school-to-work transitions indicate that internships can affect access to good jobs (Sterling and Fernandez 2018, Margaryan et al. 2020).

The importance of internships as a steppingstone to jobs for early career individuals is predicted by several literatures. In a series of studies, Bills (see discussion in Bills, Di Stasio, and Gerxhani 2017) found that organizational gatekeepers emphasize educational criteria less than actual work experience when selecting early career workers. In one study, the researchers found 70 percent listed work experience as a primary factor upon which a selection decision was made, compared to 10 percent that listed education (Bills, 2003). Along these same lines, Miller and Rosenbaum (1997) found that instead of giving weight to educational credentials, employers were somewhat suspicious of information from educational institutions. Overall, employers prefer to hire young workers with more labor market experience, despite the fact they are starting out in their careers.

Internships provide a period of first-hand observation of prospective employees' skills and abilities, which help employers "fill in" what is missing from an applicant's resume or CV (Campero, 2023). The early career stage is a time that individuals are largely "unknown entities" in the labor

market (Jovanovic, 1979). During this period a person's educational credentials (e.g., major, degree, GPA, university attended) provides some signal of their competency and skills. However, uncertainty remains about the quality and fit of candidates (Spence, 1974), as they lack actual work experience. Internships allow employers to "try out" a prospective employee prior to making a hiring decision (Sterling and Fernandez 2018).

Could Internships Serve as a Pathway into Good Jobs for Minorities?

We now turn to how race might matter to internships. Studies find racial inequality in early-stage labor markets among educated workers. Black college graduates with postsecondary degrees and elite education credentials do not garner the same interest from employers as White graduates with the same education credentials (Gaddis, 2015; see also Quillian et al., 2017 for a review). Among non-college-educated workers, racial minorities with equivalent backgrounds and skills do not garner the same attention as White workers (Grodsky & Pager, 2001; Settersten & Mayer, 1997; Wilson & Tienda, 1995).

Might internships serve as a pathway for racial minorities into regular, entry-level jobs? Internships might serve as a low-friction entry point into the workforce if Black applicants encounter less bias there than in full-time job markets. Investigating these racial dynamics across both internships and entry-level roles allows researchers to 1) see if internships are uniquely vital for transitioning into the professional world for racial minorities and 2) see if internship experience then disproportionatetly matters for racial minorities compared to White job-seekers.

However, examining this has been challenging. Prior studies have investigated how race influences selection for internships ***or*** regular, entry-level jobs. Notably, scholars have also studied the influence of race on internship selection, but not on the relative effects of race across internships

and entry-level jobs. For example, in a recent study, Nunley et. al, (2023) investigated the effect of prior internship experience on interest from employers for future internships. The researchers found Black fictive resumes generated less interest than White fictive resumes. Campero (2023) studied a Silicon Valley startup firm and found some evidence that minority candidates were less likely to be selected for internships compared to White candidates (see also Levkoe and Offen-Gyimah, 2020). While important, our point of departure in this study is to investigate relative effects of how race performs across jobs of both types: internships and regular, entry-level work. While these studies are important, thus far no study to our knowledge, has investigated both concurrently.

Internships and Racial Bias

Our research question is how does race affect the selection of candidates across job types—i.e., internships and regular, entry-level jobs. Notably, if we find that the influence of race is weaker for internships, we then consider if internships are disproportionately important to racial minorities for accessing entry-level jobs compared to White workers. To motivate our main prediction, we consider why race affects employer selection.

Racial minorities can be subject to cultural beliefs that can act as a deterrent for hiring managers. For instance, stereotypes exist that further the belief that Black workers are lazy and less reliable than other workers (Moss & Tilly, 2001). Studies have also found that these cultural beliefs affect hiring decisions in labor markets (Pager & Karafin, 2009).

We suggest even with these cultural beliefs, a candidate's race has less of an effect on internship selection compared to a candidate's race on regular, entry-level job selection. For workers in their early career stage, employer commitment varies in internships compared to entry-level jobs. The employment relationship for internships does not have the inherent obligations and expectations associated with them compared to regular, entry-level jobs (Sterling & Fernandez, 2018; Sterling &

Merluzzi, 2019). Since they are short stints within the organization, they have a predetermined endpoint to the employment relationship (Collins, 2020). Comparatively, after an entry-level worker is hired into a traditional job, there is no set end. If an employer were to terminate the relationship this would be viewed as an agentic act by the employer (i.e., opting out of a relationship that is already in place), which stands in contrast to how internship relationships end (i.e., due to a fixed end date). This increases the level of commitment in regular, entry-level jobs compared to internships.

As an example, consider an early career candidate who performs slightly below expectations as an intern. In that instance, the costs associated with the employer are relatively low. A manager can naturally let the internship come to an end, and the intern parts ways with the organization. However, if that same individual is instead hired for an entry-level job and performs slightly below expectations, the manager faces more constraints in whether to terminate. Other employees may believe it is short-sighted to terminate a new hire's contract for performing below average, and an employer may worry that doing so elicits backlash from other employees. There are normative expectations that exist between employers and their employees once an indefinite contract is in place.

Returning to our arguments about race, we expected there would be less racialized selection in internships compared to entry-level jobs. A primary reason is that internships are not long-term commitments on the part of employers. Internships allow a manager to learn "cheaply" about the competency of potential longer-term employees (Altonji and Pierret 2001; Leung 2018). They can then make more permanent offers for employment afterwards. We predict the following.

Main Hypothesis. The influence of candidate race on hiring decisions is stronger for regular entry-level jobs than for entry-level internships.

METHODS

Turning to our methods, studying internships is difficult, as they are often hidden from view from researchers. To do so, we leverage the unusual and tragic circumstances of the COVID-19 pandemic. The pandemic largely suspended on-campus recruiting during the 2020-2021 recruitment cycle, and many employers placed openings for internships on public company websites or other job platforms. This allowed us to run a labor market audit of internships and regular, entry-level jobs.

Data

To conduct the audit, we created "nested" profiles for the same job candidate for two job-types: internships and entry-level jobs, separated by one hypothetical year-in-time. Internships were applied to during the fictional candidate's third year in college for the summer period. At the internship application point, candidates had no prior experience that would be directly related to the skills related to good jobs. Entry-level jobs were applied to during a fictional candidate's senior year. At this point, the fictional candidates had internship experience that occurred in the prior year. See Figure 1.

[INSERT FIGURE 1 HERE]

By the fictional resumes being nested we mean that they take a candidate's profile, and separate it by a year across the internship and full-time job application stage. We develop a template for the resume that includes experience, relevant coursework, GPA, skills and languages, and extracurricular activities that correspond to the candidate's major and year in schoolSkills and extracurricular activities reflected membership in both community-service organizations (student mentoring and Amnesty International), as well as major-specific student organizations (Economics/Computer Science Student Association). Each unique resume included a different

telephone number and email address. In addition, we assigned each candidate an address corresponding to the city where their university was located.

On the resumes we include previous summer employment as an intern (for full-time candidates) and a camp counselor (for all candidates), as well as a position as a research assistant in the department of either economics or computer science (for all candidates). Because candidates for full-time jobs were seniors in college (compared to college juniors applying for internships) candidates for full-time jobs included one additional summer of employment (i.e., an internship) compared to candidates for internships. In this way, our study allows us to compare how race influences internships and regular, entry-level job selection. It also allows us to see if there are disportionate effects of prior internships by race on entry into regular jobs.

All resumes had the same GPA (3.57/4.00) regardless of whether the profile was used to apply for an internship or regular, entry-level job. We decided on the GPA in order to be well-above the requirements for most internships and entry-level jobs (e.g., most required a minimum of a 3.0). We purposefully did not create resumes with candidates with an exceptionally high GPA, given the effects that this has on the possible interest of employers (Quadlin, 2019).

To indicate race and gender we pre-tested a few different names. We verified that Ryan Walsh and DeAndre Washington could be used for the White and Black male candidates, respectively without meaningful differences in perceptions in social class (see summaries of the pretests in the appendix, Tables A1 and A2). In addition to signaling race using names, we signal respondents' race using student extracurricular activities. For the resume reflecting a Black candidate, this was done by including an "Exceptional Service Award from the Black Community Services Center" at the candidate's undergraduate institution. For White candidates, an analogous "Exceptional Service Award" was included from the Department of Economics/Computer Science

at the candidates' undergraduate institution. In pretesting, we found the addition of the award strengthened the racial signal, allowing us to be confident that employers would infer the race of the candidates as we intended.

Half of the jobs applied for were in fields for economics graduates (e.g., finance, marketing, banking) and half of the jobs applied for were in fields for computer science graduates (e.g., data science, software development, information technology). While both were profiles for good jobs, they varied in their nature. Computer science jobs required programming and technical skills, while economics-related jobs required quantitative and interpersonal skills (e.g., in client-facing services). By testing both, we were able to explore if there are distinctions across the two given their distinctive nature.

With our candidate profiles we applied to approximately 1440 jobs, or roughly 720 internship and 720 entry-level jobs. To adjust for the skills differences in these jobs, the applicant profile we used to apply for financial and banking jobs was pursuing a B.S. in economics. The applicant profile we used to apply for technical jobs was pursuing a B.S. in computer science.

In this study we directly applied to internships and entry-level jobs through company websites through an intensive-audit approach. Typically, large scale audits utilize short, standardized application forms and send in résumés on third party websites (e.g. Indeed). One problem this poses for our aims is that platform websites do not widely advertise open internship positions. A second problem is that applications on third-party sites can be gathered and sold as 'candidates leads' that may never be evaluated by an employer. These are reasons that internship audit studies are rare.

To overcome these challenges, a team of twenty research assistants, of whom 14-15 worked at a time within a given week, applied for open positions over a period of six months. This was a time-intensive process because it was impossible to know *ex ante* if the application required

information not available from the résumé on a company website (e.g., if questions on a job application require open-ended responses). Whenever applications required information that was not included in the résumés, the application was not submitted, even if several minutes were already spent filling out application questions. Overall, direct applications on websites took approximately 2,400 hours, or 100 minutes per fully completed application. Many of the applications required filling in information directly on the application.

The applications for jobs were sourced in two main ways. The first main source was the sampling frame of the entire set of U.S.-based NYSE and NASDAQ publicly traded companies. The second sampling frame were additional jobs posted on third party cites. We created algorithms to scrape job advertisements from the website internship.com, as well as public job search platforms (e.g. Indeed). This provided a list of companies with job or internship openings.

Variables

The main dependent variable, *callback*, is equal to 1 if an application received a response from an employer, else 0. We created fictionalized email addresses and paid for phone numbers to record callbacks on email and voicemail, with voicemail messages that matched the fictionalized person's perceived race. A callback is equal to 1, if there was any inquiry for more information about a candidate (e.g., 'can you work remotely?') or a request for a conversation or interview. For these analyses, all types of callbacks are grouped together (phone + email across all types of inquiries). When we ran robustness checks using more restricted measures of callbacks (e.g., removing requests for assessments), the results are substantively similar.

The independent variables are race and the type of job. The variable *Black*, is equal to 1 for DeAndre Washington, else 0 for Ryan Walsh. Although we were not predominantly interested in

gender, we knew of no studies testing the influence of gender on access to internships. For this reason, we also placed one White female candidate in the study, whose race is also coded as White, and include the variable *female* in the models.

Control Variables

We filled out a single application for each employer, for either an internship or for a regular, entry-level position. The [school name – blinded for review] IRB which gave approval for the study was concerned about employers receiving multiple applications due to the state of the labor market. Since employers only received a single resume, we collect additional data on attributes of employers. Dummy variables were included to indicate the *size of the employer* (i.e., < 500 employees, 501-5000 employees, 5001-50,000 employees, 50,001-100,000, more than 100,000 employees) as well as whether the employer is publicly traded on the *NASDAQ* or *NYSE*.

Additionally, we control for other demographic and background factors of candidates. The study was designed so that fictional candidates came from similarly ranked schools across two prestige tiers (i.e., elite and mid). We selected an elite institution for each region based on US News and World report rankings. The elite universities were as follows: Harvard University (northeast), Duke University (southeast), Northwestern University (midwest), Rice University (south), and Stanford University (west). We matched these institutions with schools that were mid-tier, and in close proximity, to each of these institutions: University of Massachusetts Amherst, North Carolina State University, Indiana University Bloomington, Texas A&M, and University of California Riverside, respectively. All of the latter institutions fell within the 50-100 rank. We used the institution nearest to the job to apply. A dummy variable for each institution was included in the models.

RESULTS

Table 1 shows the descriptive results of callbacks by race across internships and regular, entry-level jobs. The callback rate was 9.0% overall across all jobs for the résumés of male candidates, with 8.4% for internships and 9.7% for entry-level jobs, respectively. These rates of callbacks are in line with prior research. There were no statistical differences in overall callbacks by race for either internships or entry-level jobs. The internship callback rate is 8.7% and 8.0% for presumed White and Black male candidates, respectively. The entry-level job callback rate for entry-level jobs requiring backgrounds in computer science and economics is 9.1% and 10.0% for presumed White and Black male candidates. None of the callback rates are statistically different by race.

[INSERT TABLE 1 ABOUT HERE]

The Effect of Race on Internship Selection

We begin by assessing, for the 718 internships, whether there are racial differences for the two fictive profiles. In Model 1 of Table 2, we see that there are no differences in internship callbacks by race. This is a model without the inclusion of controls. In Model 2 of Table 2, we add the female variable and the dummy variables for the institution attended, and do not find evidence of racialized effects. There was also no difference in callbacks for those that did and did not attend a more elite higher educational institution.

In Model 3 we add the other controls, including for the type of job applied, dummy variables for stock exchange, and the employer size variables. In none of the models do we find that Black fictive resumes lower callback rates for internships than White fictive resumes. We do find that it was more difficult to be called back for internship for computer science majors, and if the job was

listed on the NASDAQ. None of the other variables have a statistically significant effect. There is not evidence that differences exist by race in receiving callbacks for internships.

[INSERT TABLE 2 ABOUT HERE]

Next, we regress the callbacks for regular, entry-level jobs for those with backgrounds in computer science and economics on the race variable in Table 3. Similar to the results in Table 2, in Models 1-3 of Table 3 we do not find evidence of an effect by race. This suggests that there is not a main effect for race.

[INSERT TABLE 3 ABOUT HERE]

Overall, our results are inconclusive regarding whether there is a weaker effect for race on internship selection than there is for entry-level jobs (failure to find support for H1). We now turn to the second question we examine, whether internships are disproportionately important for racial minorities in accessing good jobs compared to White job-seekers.

Examining Field: CS and Economics

In a deeper analysis, we examined our callback rates by job type (internships or full-time jobs) and job field (economics and CS). Consistent with our other results, we found that for internships, there were no notable differences between Black and White applicants for callbacks in internships in CS (3.4% and 4.6%, respectively), or for internships in economics fields (10.8% vs. 10.7%, respectively). We did find larger racial gaps in callback rates for full-time jobs for both fields. We plot these in Figure 2

[INSERT FIGURE 2 HERE]

The callback rate for Black and White applicants in full-time jobs in CS was 12.3% and 7.9%, respectively, or a 57% difference (t-stat=1.4). The Black applicant profile received more

callbacks than the White applicant profile for full-time jobs in CS. The callback rate for economics jobs was 5.6% and 8.7%, respectively, for Black and White applicants in economics, with the latter receiving more callbacks.

Overall, this analysis is suggestive of a revisiting of the results–i.e., there appears to be some evidence of reduced racialized effects for the selection of interns compared to regular, entry-level workers. However, because the interest of employers was amplified (in a positive direction) for Black workers in CS, and moved in a different direction for Economics-related jobs, this masked the overall differences between job types by race.

We also consider the question, are internships relatively more important for Black early career job-seekers compared to White early career job-seekers? Returning to Table 3, in Model 4 which includes profiles with prior internship experience, we include *Black* x *CS* interaction term with the main variables included in the models. We find that there is a positive interaction effect. In other words, once individuals had internship experience, in CS fields, Black candidates got a boost in the interest of employers.

A Promising Pathway?

Overall, the results above suggest that internships could be a "promising pathway" for racial minorities, at least in certain types of jobs (i.e., in CS), while Econ-related jobs might be more limited as a pathway. Why? We explore this question post-hoc with an abductive approach, or we use available data to explore the boundary conditions of internships as a pathway.

To begin, we reason that econ-related jobs may have higher levels of expectations in terms of cultural knowledge and social interaction that computer science jobs. Sociologists and organizational scholars note that cultural "skills" are perceived as inherited, meaning they come through intergenerational transmission from parents to children through a social environment

(Lareau, 2015). Culturally-embedded behaviors are associated with upper-class dispositions and tastes (Khan, 2012). These behaviors are *embodied* and can be gleaned from years of socialization (e.g., through parents and especially parents' interactions with their children).

Black applicants might be disadvantaged in entry level job applications, even with prior internships. If there is more uncertainty surrounding whether Black applicants, compared to White applicants, possess cultural skills, we reasoned this might be why we found differences across economics and CS. Computer science jobs require skills that are not viewed as inherited, but learned. Tech skills can be signaled through coursework or by indicating the programming languages one has on a résumé. In other words, it is the CS related skills that are taught in higher educational institutions (Hemelt et al., 2021), as well as bootcamps and other technical training (Lyon & Greene, 2019) that can serve as indications of competency. Internships, which may have lower levels of discrimination for the reasons we discussed, then become important precursors for entry-level employment for Black workers in fields like computer science. However, it appears there are boundary conditions for this, and limited effects in other fields (i.e., economics-related fields).

Natural Language Processing of Job Descriptions

We now consider if we can measure these differences across fields empirically. To do so, we first conducted a text analysis of job descriptions across CS and economics-related jobs. Specifically, we gathered internship postings and entry-level job postings in the summer of 2021 (see an example in the appendix). After collecting the job descriptions, a subset of RAs, blind to our hypothesis on economics jobs being more *culturally laden*, coded these job descriptions. We had RAs independently code the technical skills and cultural skills for 250 internships and 250 regular jobs. Every job description was evaluated by two RAs, and the average count of technical and cultural skills was averaged across the two. A technical skill would involve, for example, the ability to code

in a certain language, while a cultural skill would involve a way of communicating or behaving (e.g., "drive the business forward"). The number of technical skills was higher in CS than for economics/finance jobs (see the appendix).

Next, we further analyzed CS and economics-related job descriptions with Latent Dirichlet Allocation **(**LDA) topic modeling to assess the primary topics, or content, in each set of job descriptions. Our initial goal with this method was to identify prominent themes among CS and economics jobs. We needed a larger corpus to conduct topic modeling, so we supplemented our job description dataset with publicly available job postings data from two major job platforms, retaining CS and economics job descriptions that were for internship and entry-level job postings, totaling 8,700 postings (see the appendix for details). We generated two separate LDA models for CS and economics-related jobs. After model validation and hyperparameter tuning, we selected a topic model of 20 topics for the CS job postings and a topic model of 20 topics for the economics job postings (see the appendix for the LDA validation methods and topic word clouds). We noted from the job descriptions that cultural skills were infused with status meanings. For example, in economics-related jobs, we surmised that culturally-embedded meanings, like *take ownership*, might indicate a way of behaving based on status.

[INSERT FIGURE 3 HERE]

To further investigate this, we followed an approach by Kozlowski et al. (2019) in building a cultural dimension of status via word embedding vectors. This was done by averaging the distance between pairs of words that were associated with high and low status (e.g.,). We then projected the word embeddings of each unique word from the CS and economics topic models onto our status dimension to understand their association with status (see Figure 3). Using cosine similarity to measure status associations of topic words, we found that economics/finance jobs had higher

measures of status than computer science jobs (avg_cos_sim(Econ, Status) = 0.062, avg_cos_sim(CS, Status) = 0.024). Additionally, the status similarity distributions of the topic words differed significantly ($U = 4127.0$, $n_1 = 102$, $n_2 = 110$, $p < 0.001$).

As a robustness check, we also inferred status associations via the Word-Embedding Association Test (WEAT; Caliskan et al., 2017). WEAT informed us about how associated an attribute was to a comparison set of words. To perform this test, we used the top 20 words for CS and economics job descriptions from our topic models as the target word sets and the positively and negatively associated words from the Kozlowski et al. (2019) status pair list as attribute word sets. Computing the true p-value for the test statistic with our word sets was computationally infeasible because of the number of comparisons needed between the target and attribute word sets. We, therefore, approximated the null distribution using Monte Carlo resampling on 1,000,000 random word permutations. The observed WEAT test statistic was $S = -2.85$, corresponding to an effect size of -0.152. The resulting p-value was $p = 0.032$, indicating that status is more strongly associated with economics jobs than with CS jobs. Overall, these results suggest that differences in outcomes across job types likely coheres with differences in the cultural (status-related) knowledge and skills needed to perform these jobs, as signaled by job postings.

DISCUSSION

In this study, we examine patterns in racial discrimination across internships and full-time jobs. In doing so, this study adds to a growing body of literature documenting hiring racial bias across different sectors and job types, which in turn provides a fuller picture of how stratification emerges in the earliest career years. We use an audit study, paired with a computational investigation of the job descriptions themselves, to examine the extent to which there exists racial bias in hiring

for Whites and Blacks in internships and full-time jobs (post-internship) across two fields. We find two patterns: first, we find no statistical differences in hiring for *internships* for Black and White men, which held for both economics and computer science jobs. Second, when find no statistial differences for full-time job hiring overall (i.e., and do not have support for our main hypothesis in across the sample). Third, however, we find that Black men are called back at higher rates for full-time jobs than White men in computer sciences jobs, while the opposite is true in economics jobs. Given the fictive profiles for full-time jobs included internship experience, this evidence is consistent with there being fields where internships present viable pathways for early career minority job-seekers. This may occur because a) internship selection is not affected by candidate race such that b) once candidates have internships experience, this appears to attract employer interest.

To understand these findings further including differences by field, we also examined the text of the job descriptions. Using a range of computational and text-as-data methods, we find that employers emphasizing 'hard skills' (including technical and computational skills in particular) in job descriptions preferred Black candidates over White candidates in the full-time job setting. In contrast, those who listed soft skills or who did not list a clear set of required skills and experiences were more likely to privilege the applications of the fictitious White candidates. Taken together, this suggests that perceptions of specific sets of skills that one may (or may not) gain during an internship is an important predictor of whether racial bias may occur.

These findings align with literature on cultural matching and hiring discrimination that suggest that such discrimination persists, in part, because of the perception that certain kinds of skills and dispositions are inherently ingrained rather than 'teachable' (Binder, Davis, and Bloom 2016; Khan 2012; Hemelt et al. 2021; Rivera 2012). For positions where the skills are technical (and therefore perceived as teachable), the 'rubber stamp' of a successful internship may serve to bolster

the hiring potential for Black applicants. Taken together, these results also align with prior studies that have documented racial discrimination in hiring across a range of fields (Quillian et al. 2017). However, our study extends and builds upon this work in that we examine the earliest points of entry for 'good jobs' in today's economy: internship positions and the full-time jobs that follow them.

There are a number of limitations of this study that warrant additional scrutiny. While the timing of our study and overlap with the COVID-19 pandemic allowed us to investigate internship hiring when on-campus recruiting was moved online, the pandemic itself also introduces a number of situations that may have impacted our findings. For example, the immense and unprecedented loss of life disrupted the livelihoods, the economy, and the global hiring market in ways that are still being studied and understood. As such, our results are likely not generalizable to hiring for all internships and full-time jobs – particularly once on-campus recruiting resumed.

In closing, our study makes an important empirical and theoretical contribution to our broader understanding of early-career hiring and the extent to which internships may disrupt these broader patterns. It appears that the structural value of an internship depends heavily on how a field defines and evaluates applicants. In technical domains, the objective credential of an internship effectively counters racial bias, whereas fields reliant on subjective "soft skills" remain vulnerable to cultural replication. Recognizing these distinct dynamics is an essential step toward designing more equitable entry points into the labor market.

Statements and Declarations

Human Ethics and Consent to Participate: This study was approved by the Stanford University Institutional Review Board (no. 59617). Given the nature of the research and the study design this study was conducted under a waiver of consent.

Clinical trial number: not applicable.

Funding: No funding was received for this study's execution.

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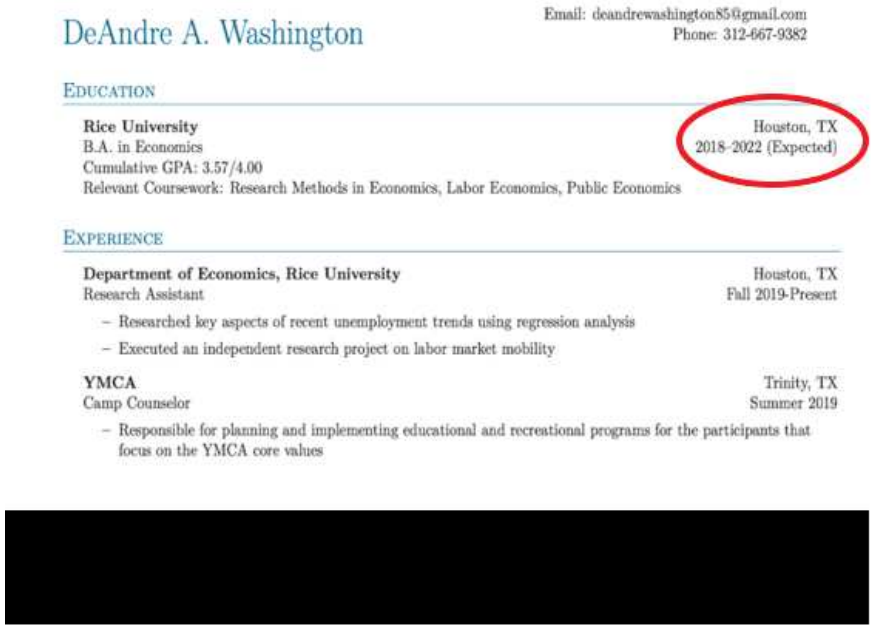
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Figure 1. Entry-Level Job and Internship Résumés

Figure 1.A—College Senior



DeAndre A. Washington

Email: deandrewashington85@gmail.com
Phone: 312-667-9382

EDUCATION

Rice University — Houston, TX
B.A. in Economics — 2018–2022 (Expected)
Cumulative GPA: 3.57/4.00
Relevant Coursework: Research Methods in Economics, Labor Economics, Public Economics

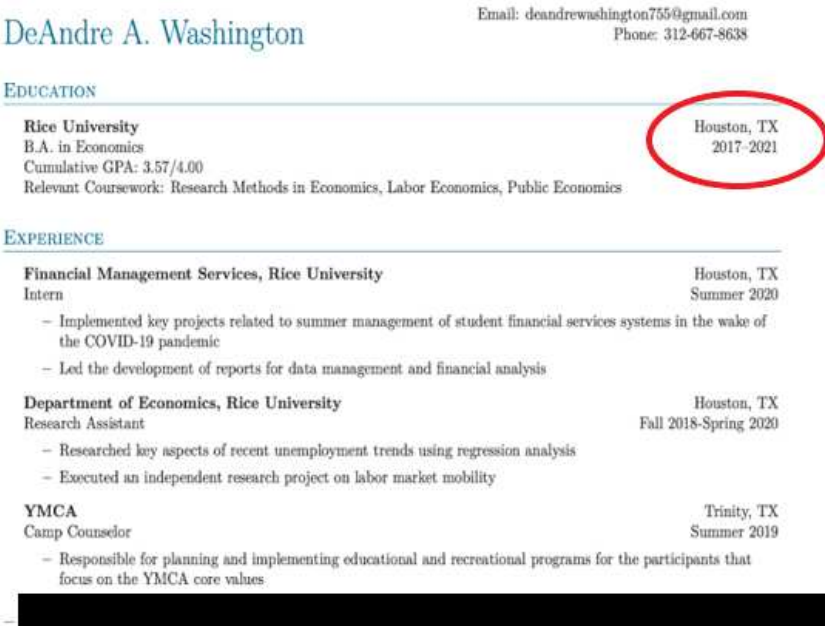
EXPERIENCE

Department of Economics, Rice University — Houston, TX
Research Assistant — Fall 2019-Present
- Researched key aspects of recent unemployment trends using regression analysis
- Executed an independent research project on labor market mobility

YMCA — Trinity, TX
Camp Counselor — Summer 2019
- Responsible for planning and implementing educational and recreational programs for the participants that focus on the YMCA core values

[redacted]

Figure 1.B—College Junior



DeAndre A. Washington

Email: deandrewashington755@gmail.com
Phone: 312-667-8638

EDUCATION

Rice University — Houston, TX
B.A. in Economics — 2017–2021
Cumulative GPA: 3.57/4.00
Relevant Coursework: Research Methods in Economics, Labor Economics, Public Economics

EXPERIENCE

Financial Management Services, Rice University — Houston, TX
Intern — Summer 2020
- Implemented key projects related to summer management of student financial services systems in the wake of the COVID-19 pandemic
- Led the development of reports for data management and financial analysis

Department of Economics, Rice University — Houston, TX
Research Assistant — Fall 2018-Spring 2020
- Researched key aspects of recent unemployment trends using regression analysis
- Executed an independent research project on labor market mobility

YMCA — Trinity, TX
Camp Counselor — Summer 2019
- Responsible for planning and implementing educational and recreational programs for the participants that focus on the YMCA core values

[redacted]

Figure 2. Callback Rates by Race Across Type of Job

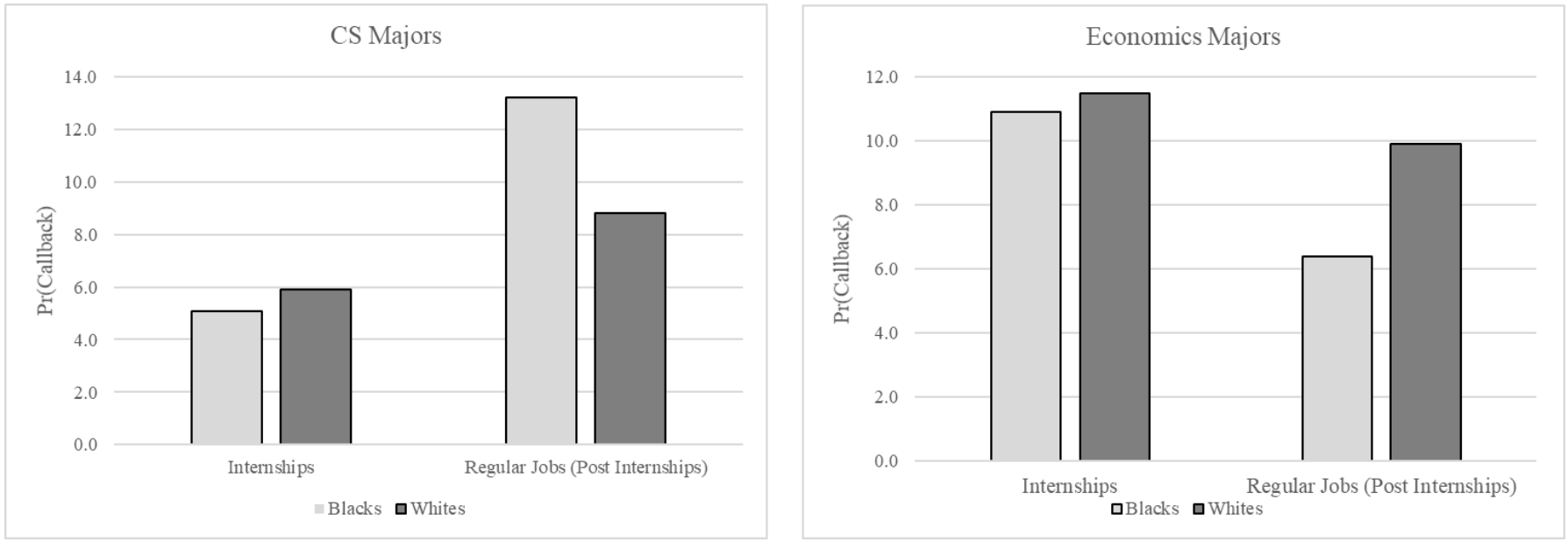
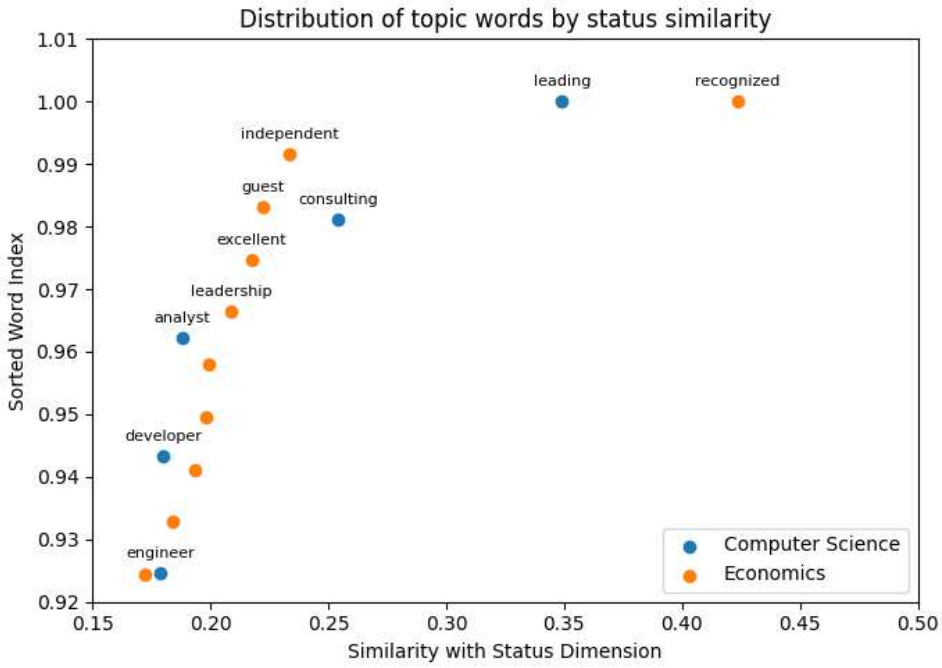


Figure 3. Status Distribution of Computer Science and Economics Topic Words (Top 5 words)



Note. Distributions of cosine similarity between topic words and status embedding dimension.

Table 1. Callbacks for Internship and Entry-Level Jobs

Callbacks	**Count**	**Percent**	**Total**
Overall	143	9.8%	1460
Internships	67	9.3%	718
Regular Jobs	76	10.2%	742
White Candidates (Overall)	98	10.1%	966
Black Candidate (Overall)	45	9.1%	494
White Candidates, Internships	47	10.0%	471
Black Candidates, Internships	20	8.1%	247
White Candidates, Regular Jobs	51	10.3%	495
Black Candidates, Regular Jobs	25	10.1%	247

Table 2: Logistic Regression of Callbacks for Internships

	(1)	(2)	(3)	(4)
Call Back				
Black	-0.230	-0.164	-0.183	-0.183
	(0.280)	(0.344)	(0.357)	(0.357)
Female		0.245	0.214	0.214
		(0.316)	(0.321)	(0.321)
NYSE			-0.407	-0.407
			(0.316)	(0.316)
NASDAQ			-0.713	-0.713
			(0.368)	(0.368)
CS Major			-0.665*	-0.665*
			(0.297)	(0.297)
Constant	-2.200***	-2.764***	-2.144**	-2.144**
	(0.154)	(0.632)	(0.672)	(0.672)
Employer Size	No	No	Yes	Yes
University Controls	No	Yes	Yes	Yes
Observations	718	718	718	718
Degrees of freedom	1	12	19	19
Log likelihood	-222.3	-208.5	-200.8	-200.8

* $p<0.05$, ** $p<0.01$, *** $p<0.001$

Table 3: Logistic Regression of Callbacks for Full-Time Jobs

	(1)	(2)	(3)	(4)	(5)
Call Back					
Black	-0.0198	0.0432	0.0690	0.0690	-0.733
	(0.258)	(0.340)	(0.355)	(0.355)	(0.512)
Female		0.302	0.360	0.360	0.369
		(0.316)	(0.322)	(0.322)	(0.323)
NYSE			-0.774*	-0.774*	-0.905*
			(0.372)	(0.372)	(0.374)
NASDAQ			-0.564	-0.564	-0.679
			(0.337)	(0.337)	(0.349)
CS Major			0.130	0.130	-0.307
			(0.257)	(0.257)	(0.315)
Black x CS Major					1.390*
					(0.593)
Constant	-2.164***	-2.802***	-2.639***	-2.639***	-2.290**
	(0.148)	(0.654)	(0.764)	(0.764)	(0.765)
Employer Size	No	No	Yes	Yes	Yes
University Controls	No	Yes	Yes	Yes	Yes
Observations	742	732	732	732	732
Degrees of freedom	1	11	18	18	19
Log likelihood	-245.1	-219.4	-215.5	-215.5	-212.7

* $p<0.05$, ** $p<0.01$, *** $p<0.001$

APPENDIX

A. Pretests of Names and Steps Taken

We selected three names to signal the race and gender of the fictitious applicants: Ryan Walsh (White man), DeAndre Washington (Black man), and Anne Meyer (White woman). To choose names we consulted existing research articles. Our aim was to select both a first and a last name that would signal race while signaling the same social class across the conditions. The names chosen are all relatively popular baby names for the races that we intended to signal based on New York State birth data as reported and published in Gaddis (2017).

Prior to fielding the audit experiment, we pretested the names and the résumés in a series of surveys on Amazon Mechanical Turk (mTurk). First, we placed a survey among 97 respondents about their perception of race and gender for each of the three first and last names in isolation (not on a resumé). We tested the names Ryan Walsh, Andre Washington and Anne Meyer. We asked respondents, "What is the most likely race/ethnicity of the person with the name above?" In this pretest, perceptions of these names matched expectations: 95% or more respondents correctly identified the race and gender intended (see Table A1).

Table A1. Results from Initial Name Pretests (n=97)

	Anne Proportion	Ryan Proportion	Andre Proportion
Perception of Candidate's Gender			
Female	1.00	.01	.01
Perception of Candidate's Race			
White	.98	.98	.03
Black	-	-	.95
Other/Unsure	.02	.02	.02

In a second pretest we tested the names within the fictionalized résumés in the context of two types of jobs: data science and finance jobs. After informing participants about the jobs and showing participants the résumés, we then asked, "Based on what you read, what is MOST LIKELY the race or ethnicity of the applicant?" Once we placed Andre's name alongside information on his background and education, the racial signal using "Andre" was not strong enough to confidently assume that employers would pick up on his being Black not White.

Therefore, we performed a third pretest where we replaced Andre with *DeAndre*. We took one further step to signal race. In accordance with prior work that has used extracurricular activities to indicate social category membership (e.g., Tilcsik 2011), we created an Exceptional Service Award from the Black Community Services Center at the candidate's undergraduate institution. Once we included this award, this signal was stronger that the candidate was Black. For White candidates, an analogous Exceptional Service Award was included from the Department of Economics/Computer Science at the candidates' undergraduate institution. The results indicated that respondents were more likely to perceive *DeAndre* as Black compared to *Andre* (see Table 2A).

Table 2A. Results of Résumé Pretest (n=230)

Panel A: By Name/Race						
	Andre		DeAndre		Ryan	
	Mean/Prop.	SD	Mean/Prop.	SD	Mean/Prop.	SD
Resume Information	2.07	.61	2.18	.61	2.20	.78
Interview Recommendation	5.97	1.28	5.82	1.25	5.98	1.07
Interview Suitability	5.98	1.02	5.84	1.17	5.95	.98
Perceptions of Candidate's Race						
White	.29		.21		.87	
Black	.61		.74		.02	
Other Race	.11		.05		.11	
Panel B: By Industry						
	Data Science		Finance			
	Mean/Prop.	SD	Mean/Prop.	SD		
Resume Information	2.17	.71	2.13	.70		
Interview Recommendation	5.95	1.19	5.93	1.09		
Interview Suitability	5.92	1.04	6.05	.99		

Notes: Resume information indicates respondents' response to "Compared to what you expected, how much information was on the resume?", ranging from 0 (Much less than what I expected) to 4 (Much more than what I expected). The middle value, 2, indicates "About what I expected". Interview recommendation indicates responses to "Based on your review of the information, please rate how strongly you recommend interviewing the candidate", ranging from 1 (Strong do not recommend) to 7 (strongly recommend). Interview suitability indicates responses to "Based on your review of the information, please rate the applicant's suitability for making an offer for an interview", ranging from 1 (Not suitable at all) to 7 (Extremely suitable).

Class. One of our final concerns about using names to signal race is that they may also signal social class. Scholars have suggested in the past that race effects in audits are social class effects that influence perceptions of human capital (see Gaddis 2015, 2017 for discussion). We therefore asked respondents in pretests about the expected social class backgrounds of the names of the fictional applicants. We found that slightly more respondents believed that Ryan Walsh had an upper middle class background than DeAndre Washington (45% for Ryan relative to 16% for DeAndre, $p<0.01$). DeAndre was more likely to be perceived as having a middle class background (63% for DeAndre relative to 40% for Ryan, $p<0.05$). Combining upper middle and middle class categories indicated no difference across the two (85% for Ryan and 81% for DeAndre). Other class perceptions (likelihoods of being perceived as lower, lower-middle, or upper class) did not differ significantly between Ryan and DeAndre. Overall, this suggests negligible differences in perceptions of social class.

B. Résumés

As indicated, we test the profiles of two fictitious candidates: Ryan Walsh (White male) and DeAndre Washington (Black male). We also placed a profile for Anne Meyer (a White female). The candidates were either applying for internships (as college juniors) or to entry-level positions (as college seniors) with majors in either computer science (CS) or economics.

Candidates were divided up to have attended either an elite or a mid-tier university in the same geographic region. We did this because we did not have the power to explicitly do an investigation of race x job type x institutional prestige, though some prior work suggests this may be an important future step (Gaddis 2015). Our approach instead was to divide the proportion of mid-tier and elite educational institutions for each condition. We selected an elite institution for each region based on US News and World report rankings as follows (region in parentheses): Harvard University (Northeast), Duke University (Southeast), Northwestern University (Midwest), Rice University (South), and Stanford University (West). These were each matched to nearby mid-tier institutions as follows: University of Massachusetts Amherst (Northeast), North Carolina State University (Southeast), Indiana University Bloomington (Midwest), Texas A&M (South) and University of California Riverside (West), respectively. All of these mid-tier institutions fell within the 50-100 rank.

A template was used that included experience, relevant coursework, skills and languages, and extracurricular activities that corresponded to the candidate's major and year in school (see the full résumé example below). For entry-level job applications, the candidate profiles included internship experience specific to a good-job field. For the internship application, we included general work experience not within a good-job field. Because candidates for entry-level jobs were seniors in college (compared to college juniors applying for internships) candidates for entry-level jobs included one additional summer of employment compared to internship candidates. Skills and extracurricular activities reflected membership in both community-service organizations (student mentoring and Amnesty International), as well as major-specific student organizations (Economics/Computer Science Student Association).

Each resume included a different telephone number and email address within the same state as the hypothetical candidate's university. Phone numbers were purchased using Sonotel. A fictional address corresponding to the city where their university was located was also included. This was

based on a Google map search that located an address close to the university the applicant was attending.

C. Sourcing Jobs for Applications

The applications for jobs were sourced in three main ways. The first source was a list of U.S.-based NYSE and NASDAQ publicly traded companies. The second main source were proprietary algorithms we employed that were created for scraping job advertisements from a public website. The third source were searches on public job search platforms (e.g. Indeed), and other public searches for jobs (including Google and similar search engines) that were not specific to internships but that advertised internships nonetheless. After a job was found through one of our three methods, the jobs were applied to directly through the company websites, regardless of its source. This allowed us to avoid the problems that exist in labor markets with third parties (e.g., Indeed) "selling in" leads to companies. Based on the recruiting cycle, we applied for internships from March-May 2021, and entry-level jobs June-August 2021. Every job applied for was assessed by the first co-author, in order to verify that it was an entry-level job in the domain of either CS or economics.

We also applied to over 300 entry-level jobs from March-May 2021. However we found there was a low callback rate (< 5%). We surmised employers were only interested in hiring for entry-level jobs among workers that could start immediately, not after individuals graduated. For this reason, we decided to wait to apply for entry-level jobs until post-graduation for the hypothetical senior candidates.

D. Applications Process

In this study we completed one full application per single employer. There were several reasons that we did not send multiple resumes to the same employer. First, the IRB was concerned that sending multiple resumes would divert attention from actual applicants during a difficult economic time (i.e. during the middle of a pandemic). Second, if we were to send multiple resumes, we would want to do so across internships and entry-level jobs. There were not always similar internship and regular, full-time jobs available. Finally, based on our research, we understood that it is common that the same HR team handles internship applications and entry-level applications (e.g.,

single teams of HR often work on college recruitment overall). We did not wish to compromise the integrity of the audit study.[1]

E. Categorizing Callbacks

We recorded all employer responses, which included phone (voicemail and SMS) and email messages. In addition, for emailed callbacks, we followed up with employers to decline interest after several days had passed. We additionally collected information on the type of callback requested, which fell into three broad categories: assessments, interviews or requests for a conversation, or more generic inquiries. We combined these into a single category of callbacks, but in robustness checks where we removed assessments, for instance, we find substantively the same effects.

F. Qualitative Analyses

To perform the qualitative coding, approximately 500 job descriptions were pulled for both internship and entry-level positions from the hiring audit. For each job description, two RAs were assigned to independently perform the coding. These job descriptions were assigned over the span of two weeks. A separate training was held to train all RAs on how to do the coding. In total, we had eight RAs participate in the coding. They were asked to scan through the job description text and record the prior experience required, the prior experience preferred, the number of hard and soft skills mentioned, and other factors.

We show a comparison of the hard and soft skills across internships and entry-level jobs below (see Deming 2017 for discussions on hard and soft skill sets). Overall, we find that job descriptions indicate the importance of hard and soft skills. More hard and soft skills are required for entry-level jobs than internships, but it is clear that hard and soft skills are important.

[1] Further per the requirements of the IRB we did not apply to more than one job (internship or entry-level job) at each company given that we placed this study during a pandemic.

(White male), Anne Meyer (White female), and DeAndre Washington (Black male). Each of the candidates were either applying for internships (as college juniors) or full-time positions (as college seniors) with majors in either computer science (CS) or economics. Finally, candidates were assigned either to an elite or a mid-tier university in the same geographic region.

G. Qualitative Coding Process

To perform the qualitative coding, around 500 job descriptions were pulled for both internship and entry-level positions from the existing data from the hiring audit. For each job description, two RAs were assigned to independently perform the coding. These job descriptions were assigned over the span of two weeks, and each RA coded around 250 descriptions. In total, we had 8 RAs participate in the coding. They were asked to scan through the job description text and code the following variables:

Variable Name	**Description**	**Type**	**Possible Values**
Prior Experience Required	Previous experience (internship, co-op, work, etc.) listed as a required qualification	Dichotomous	Y (yes), N (no)
Prior Experience Preferred	Previous experience (internship, co-op, work, etc.) listed as a preferred qualification	Dichotomous	Y (yes), N (no)
Provides growth, learning, or development	Learning on the job provided, growth opportunities, etc., listed in job description	Dichotomous	Y (yes), N (no)
Number of hard skills mentioned	Amount of lines containing a hard skill (technical skill); Microsoft Office, programming languages, etc.	Numeric	0, 1, 2, …
Number of soft skills mentioned	Amount of lines containing a soft skill: Leadership, communication, organization, etc.	Numeric	0, 1, 2, …
B.S Degree Required	Bachelor's degree listed as a required qualification	Dichotomous	Y (yes), N (no)
B.S. Degree Preferred	Bachelor's degree listed as a preferred qualification	Dichotomous	Y (yes), N (no)
GPA Minimum	A GPA minimum threshold (e.g., 3.3) is listed in description	Dichotomous	Y (yes), N (no)

Degree in Progress OK	A current student (undergraduate or graduate level) is an acceptable applicant for job	Dichotomous	Y (yes), N (no)

H. Descriptions of coding for requirements across internships and entry-level jobs

