

Do Employers Prefer Workers Who Attend For-Profit Colleges? Evidence from a Field Experiment

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Abstract

This paper reports results from a resume-based field experiment designed to examine employer preferences for job applicants who attended for-profit colleges. For-profit colleges have seen sharp increases in enrollment in recent years despite alternatives, such as public community colleges, being much cheaper. We sent almost 9,000 fictitious resumes of young job applicants who recently completed their schooling to online job postings in six occupational categories and tracked employer callback rates. We find no evidence that employers prefer applicants with resumes listing a for-profit college relative to those whose resumes list either a community college or no college at all. © 2015 by the Association for Public Policy Analysis and Management.

INTRODUCTION

Enrollment in for-profit colleges has more than tripled in the past decade, while nonprofit college enrollment increased by less than 30 percent (National Center for Education Statistics [NCES], 2013a). The recent growth of the for-profit college sector is all the more remarkable given that for-profit colleges represent an expensive postsecondary alternative, especially compared to public community colleges (Cellini, 2012; Knapp, Kelly-Reid, & Ginder, 2011).¹ For-profit colleges claim that their programs address student demand for skills and training with direct labor market applications (Bailey, Badway, & Gumport, 2001; Gilpin, Saunders, & Stoddard, 2015), and it may be that the for-profit sector's rapid growth represents a market response to unmet educational needs. However, for-profit colleges have also been criticized for providing low-quality educational programs at high cost, and for engaging in questionable recruiting practices (Golden 2010a, 2010b; Goodman, 2010; U.S. Government Accountability Office, 2010; U.S. Senate Committee on Health, Education, Labor, and Pensions, 2012). These criticisms have drawn attention to the issue of whether students benefit from for-profit college attendance and motivated the recently proposed federal "gainful employment rule," which ties an institution's

¹ Partly reflecting the difference in the cost of attendance across sectors, for-profit students disproportionately receive federal Pell grants and subsidized student loan disbursements (Baum & Payea, 2013). The proportion of for-profit students receiving federal grants is approximately twice that of public and private nonprofit colleges (NCES, 2012). A 2012 report (U.S. Senate Committee on Health, Education, Labor, and Pensions, 2012) found that over 80 percent of revenues at the 30 for-profit colleges they reviewed came from federal funds.

eligibility to disburse federal financial aid to student loan repayments and income (Anderson, 2014; U.S. Department of Education, 2011; see the next section for further detail). Despite the active policy discourse surrounding for-profit colleges, to date there have been relatively few studies examining the labor-market returns to attending a for-profit college.²

We present results from a field experiment designed to examine employer preferences for job applicants who attended for-profit colleges. In the experiment, we randomly assign information about subbaccalaureate postsecondary education to the resumes of fictitious applicants for advertised job openings. Employer responses to the resumes are then used to make inferences about how the educational information affects employer interest in job applicants.³ This study is one of the first to experimentally examine the effect of for-profit college attendance on labor market outcomes and of subbaccalaureate education more generally.

Our primary comparison is between resumes that list for-profit and public community colleges. This comparison is important in light of research demonstrating that community colleges offer programs that are potentially close substitutes for those offered by many for-profit colleges (Cellini, 2009; Turner, 2006) but at much lower cost (Cellini, 2012). The cost differential makes it important to understand whether for-profit colleges offer labor market benefits that exceed those of community colleges. We focus on subbaccalaureate credentials because for-profit colleges award a sizable share—roughly one-third—of subbaccalaureate certificates and degrees in the United States (NCES, 2013a).

We also compare resumes that list a for-profit college to those that do not list any postsecondary schooling. The motivation for this comparison lies in the claim that the for-profit sector draws some students into postsecondary schooling who otherwise would not have attended college at all. This claim has been used to justify the disproportionate accrual of public financial aid spending at for-profit colleges and to argue against the gainful employment rule that strengthens regulations of for-profit institutions (e.g. Guryan & Thompson, 2010). Finally, our research design also allows us to compare resumes that list a public community college to those with no college. This comparison speaks to the question of the returns to subbaccalaureate postsecondary schooling in the public sector.

To carry out the experiment, we sent resumes to job postings in seven major cities in the United States (Atlanta, Boston, Chicago, Houston, Philadelphia, Sacramento, and Seattle). The postsecondary institutions listed on the resumes were randomly selected from among the for-profit and public community colleges in each metropolitan area. Thus, our findings pertain to a broad swath of postsecondary institutions across a geographically diverse set of major cities. The experiment was designed to cover “general” occupations used in other resume audit studies (e.g. Bertrand & Mullainathan, 2004; Kroft et al., 2013) as well as occupations requiring more

² Deming, Goldin, and Katz (2012), Lang and Weinstein (2013), and Chung (2008) use a “selection on observables” strategy to examine the differential return to for-profit relative to not-for-profit postsecondary schooling. Cellini and Chaudhary (2012) use a worker fixed-effects strategy to examine the return to subbaccalaureate credentials and the differential return by profit or nonprofit sector. These studies generally find null to negative effects of for-profit college attendance on earnings relative to community college attendance, although Cellini and Chaudhary (2012) find a positive relationship between for-profit attendance and earnings relative to no postsecondary schooling.

³ The “resume audit study” design has been used to examine discrimination based on race (Bertrand & Mullainathan, 2004), age (Lahey, 2008), gender (Riach & Rich, 2006), obesity (Rooth, 2009), and nativity (Oreopoulos, 2011). Kroft, Lange, and Notowidigdo (2013) and Eriksson and Rooth (2014) use resume audit studies to examine the effects of unemployment spells. In education, resume audit studies have been used to examine teacher employment (Hinrichs, 2013) and the effects of math skills (Koedel & Tyhurst, 2012).

specialized training that may be particularly relevant given the vocational focus of many for-profit colleges. We used resumes that randomly varied in the educational attainment level (i.e. associate degree, certificate, coursework with no credential) because attainment levels differ substantially among students who pursue subbaccalaureate higher education (NCES, 2012).

Our experiment does not reveal any evidence to suggest that resumes listing for-profit colleges are more likely to garner interest from employers relative to resumes that list public community colleges. In fact, while not statistically significant, our point estimates indicate that applicants who attend for-profit colleges receive less interest from employers than do applicants who attend public community colleges. This finding holds when we pool across educational attainment levels as well as when we allow the for-profit effect to vary by attainment level. We also find little evidence of a benefit to listing a for-profit college relative to no college at all—our point estimates for this comparison are close to zero and inconsistent in sign. The estimated effects of listing a public community college relative to no college are also statistically insignificant, although the point estimates are consistently larger and our confidence intervals leave open the possibility of somewhat higher returns to community college attendance.

THE FOR-PROFIT SECTOR IN HIGHER EDUCATION

Until the late 1990s, enrollment in for-profit colleges comprised only a small share of the higher education market. Since then the share of college students enrolled in for-profits has increased sharply and currently stands at approximately 11 percent (NCES, 2014).⁴ For-profit colleges tend to offer relatively short-degree programs with a strong vocational focus, flexible course scheduling, extensive on-line instruction, and support, and that aim to have real-world applicability (Bailey, Badway, & Gumport, 2001; Breneman, Pusser, & Turner, 2006; Turner, 2006). Gilpin, Saunders, and Stoddard (2015) provide evidence that for-profit colleges are more responsive than public colleges to local employment and wage growth and therefore can quickly meet local educational needs. And although for-profit colleges have been criticized for spending large sums on marketing and recruiting (U.S. Senate Committee on Health, Education, Labor, and Pensions, 2012), they also direct more resources toward student advising, career counseling, and job placement than public colleges (Rosenbaum, Deil-Amen, & Person, 2006).⁵

Despite these differences between for-profit and public colleges, the two sectors compete for students, especially at the two-year level (Cellini, 2009, 2010), and many for-profit institutions can be seen as providing alternatives to the vocational degree and certificate programs offered by community colleges. Indeed, studies comparing community and for-profit colleges have found substantial overlap in the programs offered by the two sectors (Cellini, 2009; Turner, 2006). These patterns can be seen in Table 1, which shows the fraction of associate degrees and vocational

⁴ As documented in Deming, Goldin, and Katz (2012), a significant fraction of this growth has been driven by national chains and institutions that provide much of their instruction online. They also show that for-profit colleges serve a disproportionate share of minorities and students from disadvantaged backgrounds.

⁵ For-profit colleges have also taken a number of steps to lower instructional expenditures relative to public community colleges. For instance, they are more likely to rent their facilities, have higher student-to-instructor ratios, and generally lower per-pupil expenditures than nonprofit institutions (Bennett et al., 2010; Hoxby & Avery, 2013). While student-to-instructor ratios are higher in for-profit colleges, they also tend to have fewer very large classes than public colleges (Bennett et al., 2010). Moreover, lower per-pupil expenditures could be beneficial if this reflects greater efficiency in the for-profit sector.

Table 1. Shares of certificate and associate degrees issued by for-profit colleges in the United States by field, 2011 to 2012.

	For-profit college share
Business	0.25
Computer and information systems	0.37
Health professions	0.47
Liberal arts & sciences, general studies	0.02
Personal & culinary services	0.83
Other disciplines	0.25
Overall	0.32

Notes: Statistics generated from 2013 Digest of Education Statistics and IPEDS, for the 2011 to 2012 school year. For-profit college shares are the fraction of total associate degrees and certificates in a given field that are issued by for-profit colleges.

certificates awarded at for-profit institutions by field of study. Across all fields, for-profit colleges award about one-third of subbaccalaureate credentials. This exceeds the for-profit sector's share of total postsecondary enrollment and demonstrates that subbaccalaureate instruction is relatively important at for-profit colleges. At the same time, even in fields of study where the for-profit market share is relatively high, for-profit colleges award less than half of subbaccalaureate credentials, which suggests that public community colleges offer programs that are substitutes for those offered by for-profit colleges. Detailed analyses of the programs offered by for-profit and community colleges such as in Cellini (2009) also reveal considerable overlap consistent with the tabulations in Table 1. In addition to offering programs comparable to those in for-profit colleges, community colleges also resemble for-profit colleges in the extensive use of online instruction and scheduling courses at a variety of times to accommodate students' schedules (Deming, Goldin, & Katz, 2013). These observations motivate our interest in subbaccalaureate education and our choices regarding which occupations to include in the experiment.

Perhaps the most important difference between for-profit and public colleges is cost. In terms of the direct cost of attendance, average annual tuition is nearly five times higher at for-profit colleges than at public community colleges (Baum & Ma, 2013; Knapp, Kelly-Reid, & Ginder, 2011) and although for-profits may be more effective at securing financial aid for their students (Cellini, 2010; Rosenbaum, Deil-Amen, & Person, 2006), students attending for-profit colleges amass much larger student loan burdens than students who attend public colleges (Deming, Goldin, & Katz, 2012, 2013). And while public colleges are heavily subsidized by state and federal taxpayers, an analysis by Cellini (2012) that combines student and taxpayer expenses finds that the total social costs of attendance at for-profit colleges are significantly higher than at public community colleges. Cellini (2012) estimates that for a year of subbaccalaureate instruction in the for-profit sector to provide net benefits to students and taxpayers, the required earnings return is 36 percent higher than in the public sector. Students bear a large share of the additional costs associated with attending a for-profit college relative to a community college, so the breakeven private return is even higher (60 percent).

The cost differential and large student loan burdens accumulated by students attending for-profit colleges have motivated a variety of policies designed to strengthen regulation of the for-profit sector. A notable example is the above-mentioned "gainful employment rule" proposed by the United States Department of Education in 2010 and finalized in 2014. The new requirements stipulate that postsecondary programs would be at risk of losing eligibility for federal financial aid if graduates'

debt-to-earnings ratios do not meet minimum standards. Specifically, programs fail this accountability measure if graduates have annual loan payments that exceed 30 percent of discretionary income or 12 percent of total income. The proposed rule does not single out programs in a particular sector, although Secretary of Education Arne Duncan has indicated he expects for-profit programs to fail to comply at a higher rate (Fain, 2014).

EXPERIMENTAL DESIGN AND PROCEDURES

We examine for-profit college effects by tracking employer responses to fictitious resumes. The specific characteristics that ended up on each resume were randomly assigned using computer software developed by Lahey and Beasley (2009). In this section, we briefly describe the resume instruments and provide an overview of our experimental procedures. Appendix B elaborates on the information provided in this section.⁶

Educational Treatments

The resumes in the experiment indicate one of four education levels: (1) a high school diploma, (2) college coursework with no formal credential, (3) a nonacademic vocational certificate, or (4) an associate degree. Resumes that list coursework or an associate degree indicate two years of college experience and resumes that list a certificate indicate one year. Resumes with at least some postsecondary education denote attendance at either a for-profit or public community college. The proportion of resumes we sent to employers is roughly even across the for-profit and community college sector, with a smaller number of resumes indicating no postsecondary experience. This allocation was chosen to maximize statistical power for the comparison between for-profit and community colleges while still maintaining reasonable power to detect effects of the college treatments relative to high school, which we expected to be especially large given findings in the existing literature.

To maximize the chances that employers would be familiar with the colleges listed on the resumes, we used colleges with physical locations in each city.⁷ We selected the colleges at random based on an enrollment-weighted selection probability from the list of institutions in the Integrated Postsecondary Education Data System (IPEDS), restricting the sampling to institutions that offered a subbaccalaureate program that was relevant for one of the six occupational categories examined in the study. In each city we used about 14 public and for-profit colleges to populate the resumes. Because of the way we selected institutions, the for-profit colleges listed on our resumes include both established and newly opened institutions, as well as a mix of large national chains that have experienced rapid growth in recent years (Deming, Goldin, & Katz, 2012) and smaller, local institutions that may have relatively strong ties to local labor markets. Each resume also lists a high school that was randomly selected from the primary urban public school district or a surrounding suburban district. Resumes that indicate college attendance list the field

⁶ All appendices are available at the end of this article as it appears in JPAM online. Go to the publisher's website and use the search engine to locate the article at <http://onlinelibrary.wiley.com>.

⁷ While we used only colleges with some brick-and-mortar presence in a given city, many of the colleges included offer both online and face-to-face instruction. The extent to which online instruction varies by college sector and the extent to which employers are aware of such a difference is part of the treatment effect our estimates capture. Bowen et al. (2013) provide one of the few available assessments of online student learning and find effectively the same academic outcomes among students who experienced online hybrid and traditional face-to-face instructional delivery.

of study and degree/certificate conferred, if any. Resumes that do not indicate a degree or certificate indicate “coursework” in the field of study.

All resumes indicate that the applicant earned a high school diploma in 2010 and, for those who attended college, finished their postsecondary schooling in 2013. Thus, our experiment is structured to examine how for-profit college attendance affects the employability of young, recent entrants into the labor market. While a sizable share of students pursuing subbaccalaureate credentials are adults who return to school after a period of work, a large proportion of students in both for-profit colleges and public community colleges are quite young (nearly 50 percent and 60 percent of students in the for-profit and public sectors, respectively, are under the age of 25; see NCES, 2013a). We chose to focus on recent labor market entrants because educational treatments are more likely to influence outcomes for this group given that they have shorter and less informative work histories relative to older workers. This view is supported by research on employer learning that shows that the labor market learns about worker productivity quickly and educational signals are the most valuable early in a worker’s career (Altonji & Pierret, 2001; Lange, 2007).

Labor Markets and Occupations

We sent resumes to job openings advertised online in the following seven metropolitan areas: Atlanta, Boston, Chicago, Houston, Philadelphia, Sacramento, and Seattle. These cities represent a geographically diverse set of large urban areas in the United States. We focus on larger cities both because they have an ample supply of job advertisements and because they have a greater number of for-profit and community colleges than would be found in smaller cities. Using a larger number of institutions reduces the possibility that the idiosyncratic aspects of any one college drive our findings.

We sent resumes to positions in six broad occupational categories: administrative assisting, customer service, information technology, medical assisting (excluding nursing), medical billing/office, and sales. In doing so, we designed the experiment to examine for-profit college effects for credentials in fields represented in the first three rows of Table 1. Several considerations went into this decision. First, we chose occupational categories for which the for-profit and community college sectors both offer a large number of relevant programs. We avoided occupations where for-profit colleges provide almost all (e.g. personal and culinary services) or almost no (e.g. liberal and general studies) subbaccalaureate credentials. Second, we chose occupations for which there would be enough job advertisements to allow us to send a sufficient number of resumes. This is obviously important for generating data for the experiment and is also useful because it makes our study informative about the larger labor market into which students are entering. Finally, we wanted occupations that vary in the kinds of skills that they require. In particular, we wanted occupations for which the vocational training for-profit colleges purport to provide could be directly beneficial (information technology, medical assisting, and medical billing/office) as well as occupations that have less emphasis on specific technical skills but are still reasonable target occupations for for-profit college attendees (administrative assisting, customer service, and sales).

An important issue for interpreting our results is whether the jobs that we target for the experiment are suitable for workers with subbaccalaureate credentials. To address this issue, Table 2 shows tabulations from the American Community Survey of the educational attainment levels for individuals working in the occupational categories used for this study. The table shows that the most common education level for the occupational categories we use is “some college/associate

Table 2. Educational attainment level by occupational category in the American community survey.

Occupation category	Less than high school	High school diploma only	Some college/ associate degree	Bachelor degree	Postgraduate degree
Medical office/billing	4%	32%	51%	11%	2%
Medical assisting	3%	25%	63%	7%	2%
Information technology	1%	10%	43%	36%	11%
Customer service	7%	29%	45%	17%	2%
Sales	14%	29%	36%	18%	3%
Office administration	4%	31%	48%	14%	3%

Source: EEO-ALL08W Tabulation 2006 to 2010 (American Community Survey five-year estimates).

Notes: Occupation categories listed in the table include only detailed occupations from the Bureau of Labor Statistics Standard Occupational Classification system (see <http://www.bls.gov/soc/home.htm>) that reflect the types of jobs for which we applied.

degree.” Moreover, for all occupations except information technology, the second most common educational level is “high school degree only.” These tabulations suggest that applicants with either subbaccalaureate credentials or no postsecondary schooling are credible for the kinds of jobs to which we sent applications. They also suggests that when thinking about the return to postsecondary schooling for the occupations we examine, the most relevant margin is likely to be between high school and subbaccalaureate education.

Work Histories

Aside from the educational treatments the most important section of the resumes is the work history. The entries in each work history were constructed based on real resumes posted online by job seekers. The work histories include a combination of entry-level jobs related to the relevant occupational category and general low-skill jobs (e.g. retail clerk). Based on our perusal of real resumes, and similarly to previous audit studies (e.g. Bertrand & Mullainathan, 2004; Lahey, 2008), we generated some resumes with work-history gaps (see Table 3).

All resumes in a given occupation-city cell had work histories that were formed by randomly drawing work history elements (e.g. employer, occupation) from the same pool regardless of education treatment. This ensured that there would be no systematic differences across education treatments in the types of jobs or the number of years of experience included in the work histories. Irrespective of whether a resume lists college enrollment, all resumes list the same year of high school completion and work histories only include post-high school employment. We also set up the resumes so that there were not any new jobs listed after the college experience.⁸ Thus, the only difference between the work histories for college goers and high-school graduates was that the work histories for college goers were concurrent

⁸ For current employment at the time of the application, resumes for college goers indicate either the continuation of a pre/during-college job, or in the case of some resumes with work-history gaps, that the applicant is not employed. Not including any new jobs obtained after college helps ensure that the educational treatments are not diluted by work experience that an applicant acquired after finishing schooling. Another problem with listing randomly assigned postcollege work experience on the resume is that in principle it should be endogenous to the educational treatment.

Table 3. Descriptive statistics for submitted resumes, overall and by treatment condition.

	All	For-profit	Community college	High school
Female	0.49	0.51	0.49	0.47
African American	0.32	0.31	0.33	0.33
Hispanic	0.34	0.34	0.35	0.35
Some college	0.34	0.35	0.34	N/A
Certificate	0.33	0.32	0.33	N/A
AA degree	0.33	0.33	0.33	N/A
1-year work experience (2-year gap)	0.13	0.12	0.13	0.12
2-years work experience (1-year gap)	0.43	0.43	0.43	0.43
3-years work experience (no gap)	0.44	0.45	0.44	0.45
No relevant work experience	0.12	0.12	0.12	0.12
1-year relevant work experience	0.35	0.35	0.35	0.35
2-years relevant work experience	0.38	0.38	0.38	0.37
3-years relevant work experience	0.15	0.16	0.15	0.16
Admin share	0.23	0.23	0.24	0.22
Customer service share	0.19	0.19	0.18	0.20
Information technology share	0.11	0.11	0.11	0.09
Medical assisting share	0.12	0.12	0.12	0.14
Medical billing/office share	0.15	0.15	0.15	0.16
Sales share	0.21	0.21	0.21	0.20
Total resumes	8,914	3,883	3,752	1,279

Notes: As noted in the text, chi-squared tests for the null hypothesis that resume characteristics and treatment conditions are independent were performed jointly and indicate that the randomization procedure was successful. Education levels were not tested jointly across all conditions because of the obvious differences between the postsecondary and high-school-only resumes. Separate tests fail to reject the null hypothesis that education levels are independent of treatment in the postsecondary sample.

with schooling (it is common among two-year college students to work while in school—see Darolia, 2014; Scott-Clayton, 2012), a point to which we return below.

Other Resume Characteristics

The names and contact information on the resumes were chosen so that job applicants would vary in terms of gender and likely ethnicity. We assigned addresses in zip codes close to the center of each city so as to allow for a larger set of jobs for which applicants' commutes would be manageable. The final section of each resume provides a list of randomly assigned general skills and qualifications for the applicant, again based on resumes posted by real job seekers in each occupational category, with resumes randomly varying as to whether they have such a section.

Applying to Jobs and Recording Employer Responses

We sent job applications to postings for positions we deemed suitable for inclusion in the study. We did not send resumes to jobs for which the applicant was clearly underqualified (e.g. database administrator with 7-plus years of experience) or where the advertisement listed narrow skills that were not conveyed by any of our resumes (e.g. certified radiological technician). In cases where our applicants were on the margin of being qualified, we sent the resume(s) (e.g. bachelor's degree preferred but not required).

One practical issue was that job advertisements were more abundant in some fields than others. Openings for which our applicants were reasonably qualified were more common in administrative assisting, customer service, medical billing/office, and sales. The number of suitable advertisements in information technology and medical assisting was lower. The discrepancy in suitable job advertisements across fields is an important aspect of the labor market for individuals at this skill level and is reflected in our data in the shares of applications sent to jobs in each occupational category. That said, we did prioritize sending applications in response to job advertisements in medical assisting and information technology when they were available, so, if anything, our study overrepresents these fields that require more specialized skills.

We sent resumes to advertisements between May 2013 and May 2014. For a given city, we began sending applications to job postings once the resumes for that city had been prepared. This resulted in variation across cities in the timing and intensity of data collection, which as we describe below, resulted in some cities being overrepresented in the data. Nonetheless, there was substantial time overlap across cities in terms of when the data were collected, and no one city appears to be driving our results (see below in the section on Results).⁹

We sent at most two resumes to each job advertisement. The resumes sent to the same employer were in different formats and had no overlap in resume characteristics so that employers would not see a resemblance between the resumes. Employers responded to the resumes via email and phone and we generated two outcome variables based on their responses. The first is an indicator for the employer responding positively to the application (nonperfunctory) and the second is an indicator for the employer explicitly requesting an interview (interview requests are a subset of positive responses).

WHAT CAN WE LEARN FROM THE EXPERIMENT?

Our goal is to contribute to the understanding of whether for-profit colleges affect students' labor market outcomes. We do so by examining whether information about for-profit college attendance listed on a resume affects employer responses to job applicants. The rationale is that employer responses to fictitious job applications provide information as to how real applicants will fare in the labor market. While employer responses do not provide direct evidence about wage and employment outcomes, they are informative. As noted by Bertrand and 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. Further evidence of the usefulness of employer callback rates as a labor market outcome comes from Lanning (2013), who uses a search model calibrated with experimental audit study results and data from the National Longitudinal Survey of Youth to argue that differences in employer callback rates can lead to sizable differences in wages.

⁹ When designing the experiment we performed a power calculation using data from the pilot we conducted in Houston. Based on the observed response rate in Houston, we targeted a sample size that would allow us to detect an effect of listing a for-profit college relative to a community college on the likelihood of a positive employer response of about 1 percentage point, or roughly 10 percent of the sample mean. We powered the experiment to detect differences between the high school treatment and either the for-profit or community college treatment as small as 1.6 percentage points for the overall response rate, or 14 percent of the sample mean (we set the share of resumes with "high school only" to be less than the share of resumes with postsecondary schooling in either sector because we expected to find larger differential effects between any postsecondary schooling and a high school degree only, as compared to the differential effect of for-profit versus community college).

The effects captured by our experiment could be driven by several possible mechanisms. For the comparisons between resumes that list for-profit and community colleges, these mechanisms include differences in perceptions of the quality of instruction provided across sectors, name recognition and personal affinity for particular schools, and employer beliefs about differences in precollege student characteristics not included on the resume (e.g. family background).¹⁰ The effects of listing no college relative to listing a for-profit college (or community college) could be driven by perceived human capital effects of postsecondary schooling (Becker, 1964) or by employers using postsecondary schooling as a signal of unobserved skill (Spence, 1973).

Our experiment captures the reduced-form effect of the educational treatments and does not allow us to separately identify the influence of these various mechanisms. However, the total effect identified by our research design is an important parameter. For instance, knowing if employers prefer workers who have postsecondary schooling as well as knowing whether college sector influences this preference would be valuable to students deciding whether and where to attend college. Similarly, policymakers evaluating regulations such as the above-described gainful employment rule, or deciding how to allocate marginal public investments, would benefit from knowing whether for-profit colleges generate better or worse labor market outcomes than community colleges or not attending college at all.

As noted in the previous section, the work histories were made to be orthogonal to the education treatments in the experiment. This was to ensure that the effects of the schooling treatments would not be confounded with the impact of work history, which prior research (e.g. Kroft, Notowidigdo, & Lange, 2013; Nunley, Pugh, Seals, & Romero, 2014a) and our own results suggest has important effects on call-back rates. The fact that all resumes in our study list jobs that began prior to completing any college credential is realistic given that there are substantial shares of individuals with high school and two-year college qualifications working in the occupations we study (as shown in Table 2). Nonetheless, it may be possible that employers' value work experience acquired while in college differently from experience obtained while not in school, perhaps due to differences in perceived work intensity. Further, employers may perceive high school graduates who have relevant work experience as being differentially selected relative to individuals with relevant work experience who also have postsecondary schooling. We discuss how these issues affect the interpretation of our results later in the paper.

It is also important to recognize that our research design will produce estimates that do not capture some potential effects of for-profit college attendance. For example, any effects on skill differences that only become apparent to employers at the interview stage or later, or effects that arise because of differences in the ability of colleges to link students to employers (e.g. through differences in the effectiveness of job-placement services), will not be reflected in our estimates. Our estimates will also exclude any effect of college sector that arises through differences in degree attainment across sectors, as discussed in previous research (e.g. Deming, Goldin, & Katz, 2012).¹¹ We focus on larger cities with robust labor and educational markets to guard against findings that predominantly reflect the actions or reputations of

¹⁰ Whether differences in worker skills and backgrounds actually differ by college sector is an interesting question that cannot be addressed with our research design. However, to the extent that employers have imperfect information about a job applicant's skill at the time hiring decisions are made, initial employment and wage offers are likely to depend heavily on perceived skill differences. See Altonji and Pierret (2001) and Lange (2007) for empirical evidence on how quickly employers learn about worker productivity.

¹¹ As we explain below, college sector and educational attainment level are orthogonal in our resumes so that the effect of college attainment does not confound the effect of college sector (and vice versa).

Table 4. Raw differential response rates by treatment condition.

	All	For-profit	Community college	High school
Employer response rate	0.114	0.113	0.116	0.106
Employer interview request rate	0.049	0.047	0.053	0.042
Total resumes	8,914	3,883	3,752	1,279

Note: None of the differences across treatments are statistically significant.

a small set of employers and colleges. This calls for caution, therefore, when generalizing our results to rural areas or smaller cities. Our experiment also does not capture differences in other nonlabor market features that students may value, such as teaching delivery or program structure (e.g. online, shorter-term certificates). Finally, our estimates do not capture long-run effects of the educational treatments because our experiment is structured to capture effects that arise immediately after a job seeker finishes college. We return to these issues in more detail later.

EMPIRICAL ANALYSIS AND RESULTS

Descriptive Statistics

Table 3 shows descriptive statistics for the analytic sample overall and by treatment condition (Appendix Table A1 provides additional details and breaks out the data by city).¹² The table shows that over 40 percent of the resumes have a one-year work-history gap and an additional 13 percent have a two-year gap (recall that these are young workers and many of them have concurrent schooling). Most resumes have one to two years of work experience in the relevant occupation. Appendix Table A1 documents some variation in the occupational shares across cities, likely reflecting differences in local labor markets, but consistent patterns emerge. Most notably, job advertisements in information technology and medical assisting were less common than in the other fields. Despite some small differences in resume characteristics across treatments as shown in Table 3, joint tests fail to reject the null hypothesis that resume characteristics are independent of treatment. This indicates that the randomization was implemented successfully.

Results

Table 4 shows response rates and interview request rates overall and by treatment condition. Across the entire sample, 11.4 percent of resumes received a positive employer response and 4.9 percent received an interview request.¹³ Responses and interview requests are highest for resumes listing community college and lowest for resumes listing no college. However, none of the differences across treatments in Table 4 are statistically significant.

Table 5 shows estimated marginal impacts of listing a public community college or no postsecondary experience on the resume, relative to listing a for-profit

¹² All appendices are available at the end of this article as it appears in JPAM online. Go to the publisher's website and use the search engine to locate the article at <http://onlinelibrary.wiley.com>.

¹³ Prior resume field experiments indicate response rates in the range of 8 to 12 percent, with interview request rates of 3 to 5 percent (Hinrichs, 2013; Koedel & Tyhurst, 2012; Kroft, Lange, & Notowidigdo, 2013; Lahey, 2008; Oreopoulos, 2011). Our response rates are in line with the extant literature.

Table 5. Logistic regression results, marginal effects are reported.

	Dependent variable: Positive employer response				Dependent variable: Interview request			
	Model 1		Model 2		Model 1		Model 2	
Public community college	0.0039 (0.0053)	0.0052 (0.0063)	0.0041 (0.0053)	0.0053 (0.0063)	0.0041 (0.0034)	0.0064 (0.0042)	0.0041 (0.0033)	0.0059 (0.0041)
% of sample mean	3.4%	4.6%	3.7%	4.6%	8.4%	13.1%	8.4%	12.0%
Lower bound of 95% CI	-0.0065	-0.0074	-0.0062	-0.0070	-0.0026	-0.0020	-0.0024	-0.0021
High school	-0.0039 (0.0084)	-0.0021 (0.0100)	-0.0038 (0.0083)	-0.0025 (0.0098)	-0.0022 (0.0056)	0.0023 (0.0071)	-0.0026 (0.0054)	0.0013 (0.0067)
% of sample mean	-3.4%	-1.8%	-3.3%	-2.2%	-4.5%	4.7%	-5.3%	2.7%
Lower bound of 95% CI	-0.0204	-0.0217	-0.0201	-0.0217	-0.0132	-0.0116	-0.0132	-0.0118
Public CC – HS	0.0078	0.0073	0.0080	0.0078	0.0063	0.0041	0.0067	0.0046
% of sample mean	6.8%	6.4%	7.0%	6.8%	12.9%	8.4%	13.7%	9.4%
P-value for public CC = HS	0.38	0.48	0.36	0.44	0.27	0.56	0.23	0.49
Equal city weights	NO	YES	NO	YES	NO	YES	NO	YES
Basic application details	X	X	X	X	X	X	X	X
City indicators	X	X	X	X	X	X	X	X
Occupation indicators	X	X	X	X	X	X	X	X
Flexible time trend			X	X			X	X
Race & gender			X	X			X	X
Basic work history			X	X			X	X
N	8,914	8,914	8,914	8,914	8,914	8,914	8,914	8,914

** Indicates statistically significant difference between two variables at the 5 percent level.

* Indicates statistically significant difference between two variables at the 10 percent level.

Notes: The omitted treatment is for-profit college. Standard errors are clustered by job posting. Most postings received two resumes. City weighting is such that all cities receive equal weight in the data. Basic application details include whether the resume was the first or second resume sent and whether it came with a (marginally) more-positive greeting from the applicant. The flexible time trend includes indicators for one-month timespans over the course of the experiment. The basic work history includes indicators for general and occupation-specific experience levels. Appendix Table A2 reports coefficients for the control variables from Model 2. All appendices are available at the end of this article as it appears in JPAM online. Go to the publisher's website and use the search engine to locate the article at <http://onlinelibrary.wiley.com>.

college, based on logistic regressions. Consistent with previous studies, all of our standard errors are clustered at the level of the job advertisement (e.g. Bertrand & Mullainathan, 2004; Oreopoulos, 2011). The table reports estimates from two different models that differ by the number of control variables, and for each model we report results with and without city weights.¹⁴ The city weights reweight the data so that each city contributes equally to the estimates. Because of variability in city start dates, the availability of job openings, and the availability of research-assistant time, the cities are unevenly represented in the raw data. The rationale behind the city weights is that there is no reason to expect data from one city to be more valuable than data from another in terms of informing our understanding of the effect of for-profit colleges.

Focusing first on our primary comparison between for-profit and public colleges, the results in Table 5 provide no indication that employers prefer applicants who attended for-profit colleges. In fact, all of the point estimates suggest employers prefer applicants from community colleges, although none are statistically significant. The point estimates from the richer specification of the positive employer response model in Table 5 are about 0.4 to 0.5 percentage points, or roughly 4 percent of the sample mean. The point estimates for the analogous interview-request models are between 0.4 and 0.6 percentage points, or 8 and 12 percent of the sample mean. For both outcomes, the results are not very sensitive to whether the cities are weighted equally, although the estimates are somewhat more precise when the city weights are not used.

Crucially, we have sufficient statistical power to rule out all but very small negative effects of community college relative to for-profit college. For the positive employer response outcome, and using Model 2, the lower bound of the 95 percent confidence interval is about -0.7 percentage points, or 6 percent of the sample mean. When we examine interview requests, we can rule out negative community college effects below -0.24 percentage points, or approximately 5 percent of the sample mean. In comparison, a work history indicating two or more years of relevant work experience relative to a work history with no relevant work experience increases the likelihood of a positive employer response by over 3 percentage points, and an interview request by over 1 percentage point.¹⁵

Turning to the comparisons between for-profit college attendees and high-school graduates, we again find no evidence that job applicants benefit from attending a for-profit college. The point estimates are all small and statistically insignificant. Estimates from the richer positive employer response model in Table 5 are between -0.0025 and -0.0038 , or 2 to 3 percent of the sample mean, depending on whether we apply the city weights. We can rule out positive for-profit effects on employer responses of about 2 percentage points, or 18 percent of the sample mean. For the interview-request models the point estimates are not consistent in sign; if taken at

¹⁴ Estimates of the effects of the other resume characteristics can be found in Appendix Table A2. We also estimated models with more detailed sets of control variables and obtained similar results, which are available from the authors upon request. All appendices are available at the end of this article as it appears in JPAM online. Go to the publisher's website and use the search engine to locate the article at <http://onlinelibrary.wiley.com>.

¹⁵ These numbers are based on a modified version of the Model 2 that groups resumes with two or more years of relevant work experience together and compares them to resumes without any relevant work experience. Related, disaggregated estimates are shown in Appendix Table A2. Also note that in results omitted for brevity we used the procedure proposed in Neumark (2012) to examine whether differences in employer perceptions about the variance of unobservable skill by education treatment status influence the likelihood of a positive employer response. We cannot reject the null hypothesis that residual variance is equal between any two education treatments, and interpret this finding as evidence that employer beliefs about differences in the variances of unobserved skill are not an important issue in our study. All appendices are available at the end of this article as it appears in JPAM online. Go to the publisher's website and use the search engine to locate the article at <http://onlinelibrary.wiley.com>.

Table 6. Logistic regression results for separate educational treatments. Marginal effects are reported.

	Model 2: Any response		Model 2: Interview request	
High school	-0.0081 (0.0099)	-0.0098 (0.0115)	-0.0009 (0.0070)	0.0023 (0.0086)
Public CC coursework	-0.0047 (0.0101)	-0.0096 (0.0115)	0.0082 (0.0075)	0.0099 (0.0090)
For-profit coursework	-0.0106 (0.0098)	-0.0135 (0.0113)	0.0020 (0.0070)	0.0027 (0.0084)
Public CC certificate	0.0007 (0.0099)	0.0013 (0.0116)	0.0037 (0.0066)	0.0052 (0.0081)
For-profit certificate	-0.0030 (0.0104)	-0.0094 (0.0117)	0.0035 (0.0074)	0.0004 (0.0083)
Public CC AA degree	0.0021 (0.0102)	0.0003 (0.0121)	0.0065 (0.0074)	0.0070 (0.0088)
Equal city weights	NO	YES	NO	YES
Basic application details	X	X	X	X
City indicators	X	X	X	X
Occupation indicators	X	X	X	X
Flexible time trend	X	X	X	X
Race & gender	X	X	X	X
Basic work history	X	X	X	X
<i>N</i>	8,914	8,914	8,914	8,914

Notes: The omitted treatment is an associate degree from a for-profit college. Standard errors are clustered by job posting. Most postings received two resumes. City weighting is such that all cities receive equal weight in the data. Basic application details include whether the resume was the first or second resume sent and whether it came with a (marginally) more-positive greeting from the applicant. The flexible time trend includes indicators for one-month timespans over the course of the experiment. The basic work history includes indicators for general and occupation-specific experience levels.

face value, the city-weighted models imply that the resumes without postsecondary experience fare better. We can rule out positive for-profit effects larger than about 1.3 percentage points, or 27 percent of the sample mean, in the richer model.

Next, we examine whether resumes listing community colleges elicit more callbacks than resumes listing no college experience. In the employer-response and interview-request models, the estimates of the community college effect are consistently positive but not statistically significant. The estimates for positive employer responses range from 0.7 to 0.8 percentage points for positive employer responses, or 6 to 7 percent of the mean response rate. For interview requests, the estimates as a percent of the sample mean are a little larger (8 to 14 percent). Using the most precisely estimated coefficients from the employer-response and interview-request models, we can rule out community college effects larger than about 22 and 30 percent of the sample mean, respectively.

The results in Table 5 pool the educational attainment levels for applicants who attended college. This is done to maximize power for detecting for-profit effects and also because it reflects the fact that students who enter two-year college leave with a variety of credentials, and most do not earn an associate degree (NCES, 2012). It is also interesting to examine whether the relative attractiveness of for-profit colleges varies by educational level (e.g. does an associate degree from a for-profit college elicit more callbacks than a certificate from a community college?). We do so in Table 6, which shows estimates from a model that includes education level/sector interactions. Although the estimated effects are too small to be statistically

significant, point estimates suggest that job applicants with public-college credentials nominally outperform applicants with for-profit credentials within each education level. Moreover, no particular education credential establishes itself as clearly preferred to the others. This last finding is important as it suggests that our results would not differ substantively to what we report in Table 5 if we chose to reweight the data so that the educational-level shares would be different from what they are in the raw data. Similarly, it suggests that the results would not be different if we only focused on a single level of attainment (e.g. applicants who completed an associate degree).

In results omitted for brevity we also verify that our findings are not sensitive to excluding data from a particular city or occupation by estimating models that leave out data from one city and one occupation in turn. In addition to verifying the general robustness of our findings, the analysis omitting each occupation in turn helps to indirectly address a potential limitation of our study related to our coverage of the medical-assisting field. Specifically, we do not indicate medical certifications on the resumes (other than, of course, credentials that come directly from the colleges), which creates two issues. One is that we did not send resumes to medical-assisting jobs that explicitly requested certification from a regulatory agency, and thus our findings may not be broadly representative of the field. Another is that part of the real-world effect of for-profit colleges may include, for example, aid in completing the certification process, which would correspond to higher certification rates and access to more jobs. This is a narrow illustration of the above-described general qualification to our study—by randomly assigning for-profit and public college credentials to resumes, our research design is not informative about some of the ways that colleges may affect student outcomes. Our findings are not qualitatively sensitive to omitting data from the medical-assisting field or any other field. Although this does not resolve any potential limitations related to our partial coverage of the medical-assisting field, it does suggest that our primary findings are not unduly affected by the medical-assisting resumes, and thus at the very least they are applicable for the other fields in the experiment.¹⁶

DISCUSSION

Effects of For-Profit Colleges Relative to Community College

Our results provide no indication that resumes listing for-profit college credentials generate more employer interest than resumes listing community college credentials. If anything, the opposite may be true. A simple explanation for this result is that job applicants who attended for-profit or community colleges who otherwise have similar characteristics do not systematically differ in skills valued by employers. This interpretation is consistent with several recent nonexperimental studies that find that the earnings returns to for-profit college attendance are equal to or lower than the returns to attending public community college (Cellini & Chaudhary, 2012; Deming, Goldin, & Katz, 2012; Lang & Weinstein, 2013). If true, this would have the important implication that the high cost of attending a for-profit college (both in absolute terms and relative to public community college) results in little labor market payoff.

¹⁶ We also looked for evidence of interaction effects between the education treatments and a number of resume characteristics including occupation, race-gender group, and worker experience (both general and occupation specific). There is no evidence of heterogeneous effects along any of these dimensions, although a caveat is that we do not have sufficient statistical power to detect moderately-sized heterogeneous effects of for-profit college attendance.

However, other explanations could also account for our findings. One possibility is that employers are simply unaware of differences in quality across sectors. If this is the case then it may be possible for for-profit college attendance to affect worker productivity, thereby improving wage and employment outcomes, without the effect showing up in initial employer responses. We cannot rule out this explanation empirically. However, it is worth noting that the amount of information that employers have with regard to which institutions are for-profit and public colleges, and their expectations regarding skill accumulation across institutions in each sector, represents an equilibrium outcome. In particular, employers would benefit from knowing of the existence of large skill differences between workers who attended for-profit and community colleges, and the absence of effects of college sector on employer responses to job applications suggests such differences may be small or nonexistent. This interpretation is also consistent with a survey of employers by Hagelskamp, Schleifer, and DiStasi (2014) showing that employers either perceive few differences between for-profit and community colleges, or view community colleges as more effective at preparing students.

Another issue is that our research design is only relevant for jobs posted on online job search sites, and misses effects for jobs filled through referrals or with direct job-placement assistance from the college. While such linkages with employers are emphasized in the marketing materials used by some for-profit colleges, there is no evidence to indicate that for-profit colleges actually offer more effective career placement services. Deming, Goldin, and Katz (2013) express skepticism of the claim that for-profit colleges offer superior student services by noting that for-profit college students have lower levels of satisfaction with their programs than comparable students who attend non-profit institutions. Moreover, the callback rates in our study are in line with those seen in other audit studies, which suggest that online job boards are no less relevant for the applicants in our study than in other studies using the same research design.

Our estimates fail to capture any effect of for-profit college attendance operating through different degree completion rates across sectors. This is because college sector and attainment are orthogonal in our experiment. In fact, while Rouse (1998) makes a case that community colleges provide a cost-efficient means of increasing educational attainment in a state, data suggest that for-profit college students are more likely to complete subbaccalaureate programs than students in public community colleges (Deming, Katz, & Goldin, 2012).¹⁷ However, the evidence in Table 6 reveals no clear payoff to completing an associate degree relative to earning only a vocational certificate or leaving college without a credential. This suggests that any benefit of for-profit college attendance in terms of a higher likelihood of earning a degree may have limited labor market benefits, at least at the subbaccalaureate level. Furthermore, the differences in observed degree completion rates across sectors are difficult to interpret. They may reflect differences in unobserved student characteristics, less rigorous programs in for-profit colleges, or differences in student aspirations across sectors (in particular, the fact that community-college students are much more likely to transfer to a four-year college).

A final possibility is that there may be larger effects of for-profit colleges in other occupations and for different kinds of workers than were used in this experiment.

¹⁷ Data from the NCES (2013b) based on the 2008 cohort of entering two-year college students indicates that 60 percent of for-profit college students obtain a certificate or degree. The corresponding number reported for public college students is only 20 percent. While these numbers suggest attainment rates are higher at for-profit colleges, the American Association of Community Colleges (AACC) argues that the comparison is flawed because it does not account for students who transfer to four-year colleges, with such transfers being more common in the public sector (Marcus, 2012; also see Mullin, 2012).

For instance, it may be that for certain specialized occupations, for-profit colleges provide stronger instruction and have better ties to employers than public community colleges. Against this claim, though, some of the occupations we examine do require technical training and as noted earlier, are in fields in which for-profit colleges are well represented. Furthermore, observational evidence reported in Deming, Goldin, and Katz (2013) suggests that students who attended for-profit colleges have worse labor market outcomes than community college students even when they pursue programs in rapidly growing industries requiring specialized training such as allied health.

In terms of the types of workers in our study, probably the most serious threat to external validity is that we used resumes only of young workers. However, as noted above, a large proportion of students in both for-profit colleges and public community colleges are quite young (NCES, 2013a). Moreover, if anything, the effect of listing a for-profit college is likely to be stronger for younger workers given research showing that educational signals are strongest early in a worker's career (Altonji & Pierret, 2001; Lange, 2007).

To summarize, while we cannot rule out several alternative possibilities, a plausible explanation for our findings is that workers who attended for-profit colleges are no more likely to possess skills demanded by employers than are workers who attended much less costly community colleges.

Effects of For-Profit and Community College Relative to No Postsecondary Schooling

Our results provide little indication that job applicants with subbaccalaureate postsecondary schooling, either at a for-profit or public community college, draw any more interest from employers than those with only a high school diploma. These results are surprising given the large nonexperimental literature documenting the returns to education in general (Card, 1999; Oreopolous & Petronijevic, 2013), and specifically to subbaccalaureate education (Jacobson, LaLonde, & Sullivan, 2005; Jepsen, Troske, & Coomes, 2014; Kane & Rouse, 1995, 1999; Stevens, Kurlaender, & Grosz, 2015). They also suggest that students deciding to pursue subbaccalaureate schooling may be making a poor investment.

With respect to the difference between our findings and the findings from the nonexperimental literature on the return to subbaccalaureate education, one obvious reason for the difference is that the estimates reported in those studies may be biased due to unobserved differences between workers who have and do not have postsecondary schooling. Indeed, a primary contribution of this study is that the experimental manipulation of postsecondary schooling on the resumes ensures that the estimated impacts of the education treatments are not contaminated by selection bias. Differences in the samples used in our study and in the nonexperimental research in terms of age, geography, and background characteristics could also help explain why we find different results. With respect to the possibility that investments in subbaccalaureate schooling are a mistake, this may be mitigated by low schooling costs. For instance, weak wage growth among young workers (Mishel, 2012) and high rates of employment while in college (Scott-Clayton, 2012) imply the opportunity cost of schooling may be low, and, at least at public community colleges, direct tuition costs are also low (College Board, 2012).

There are also reasons why our findings may understate the returns to subbaccalaureate schooling relative to high school. First, it is important to acknowledge that despite our efforts to obtain narrow confidence intervals we cannot rule out moderate effects, particularly for public community colleges where our estimates relative to high school are consistently positive. Second, the courses of study and occupations that we focus on in the experiment may not be the ones for which the

returns to subbaccalaureate education are largest. This explanation is noteworthy given that Stevens, Kurlaender, and Grosz (2015) find a large degree of heterogeneity in the return to college across fields of study, with larger returns in programs aimed at allied health occupations and relatively smaller returns for business and information technology. However, it is also the case that some college experience is common for workers in all of the occupations represented in our experiment (see Table 2). Third, our estimates only reflect impacts shortly after a job applicant would have completed her schooling. Standard human capital theory predicts that investments in schooling will not immediately lead to higher wages because workers who invest in schooling will be competing with workers who have acquired greater work experience (Mincer, 1974). Thus, the effects we estimate may miss returns to schooling that materialize in the future. To guard against work-experience differences confounding the educational attainment effects we constructed the work histories so that educational attainment and the work histories are orthogonal. However, it is possible that employers discount work experience listed on a resume concurrent with schooling. If this is the case, work experience will be less valued among college-goers in our experiment. Additionally, high school graduates who have relevant work experience might be perceived as being differentially selected relative to college graduates with relevant work experience. Therefore, our estimates should be interpreted as average causal effects of listing postsecondary schooling on a resume conditional on the distribution of work histories in our data.¹⁸

To summarize, our results suggest that subbaccalaureate vocational schooling in either a for-profit or community college may not have a large labor market payoff. However, we are hesitant to interpret this result too strongly because we cannot statistically rule out modest effects of subbaccalaureate postsecondary schooling and there are several reasons why our study may not have captured the returns to this type of postsecondary education along all dimensions.

CONCLUSION

The for-profit college sector in the United States has experienced remarkable growth in recent years. Students who attend for-profit colleges are disproportionately supported by federal financial aid programs and disproportionately low-income and at-risk students (Baum & Payea, 2013; Deming, Goldin, & Katz, 2012, 2013). Given their rising prominence, high tuition costs, dependence on federal subsidies, and unique student demographic, for-profit colleges are facing increasing scrutiny. Recent high-profile government reports have been critical of for-profit colleges (U.S. Government Accountability Office, 2010; U.S. Senate Committee on Health, Education, Labor and Pensions, 2012), and concerns about their efficacy are embodied in the recent “gainful employment rule” adopted by the United States Department of Education.

This paper contributes to the understanding of how for-profit colleges affect labor market outcomes by presenting experimental evidence on the impact of listing for-profit college credentials on a resume. We find no evidence that job applicants who attended for-profit colleges attract greater interest from employers than those who attended public community colleges or no college at all. These findings are

¹⁸ In principle, the average causal effects we estimate may differ from the average effect among individuals with less (or more) relevant work experience. In omitted results, we investigated this possibility by interacting the education treatments with resume experience in various ways and found no evidence that the effects of the education treatments differ by work history characteristics. However, a caveat to this null result is that our experiment was not powered to detect moderately sized heterogeneous treatment effects, so this finding is merely suggestive.

particularly noteworthy considering the high cost of for-profit college attendance, and are corroborated by a recent study by Deming et al. (2014) that uses a similar research design to examine the returns to postsecondary education.¹⁹

We interpret our findings to indicate that the labor market payoff to attending a for-profit college is likely limited in comparison to the much-cheaper community college alternative. While our research design does not allow us to address all possible ways that for-profit colleges can affect labor market outcomes (e.g. effects that materialize at the interview stage of the hiring process or later) or benefit students (e.g. preferences for course delivery or program structures), our findings contribute to the growing body of evidence showing limited labor market benefits to attending a for-profit college (Cellini & Chaudhary, 2012; Deming, Katz, & Goldin, 2012; Deming et al., 2014; Lang & Weinstein, 2013).

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ACKNOWLEDGMENTS

The authors thank Damon Clark, Julie Cullen, Philip Oreopoulos, Stephen Porter, and numerous seminar participants for useful comments and suggestions and Scott Delhommer, Jared Dey, Lucas Singer, Trey Sprick, and David Vaughn for research assistance. They thank the Spencer Foundation, the Economic, and Policy Analysis Research Center at the University of Missouri, and CALDER for research support. The usual disclaimers apply.

¹⁹ There are several differences between our study and Deming et al. (2014) that make them complementary. First, Deming et al. focus on job postings in the health and business fields only, whereas we send applications to a broader set of occupational categories, including information technology, which is important for the for-profit sector. Second, we focus on subbaccalaureate schooling whereas Deming et al. also analyze jobs that require a baccalaureate degree. Our approach maximizes power for the analysis of subbaccalaureate education, where for-profit colleges are particularly prevalent. Finally, we only consider higher education institutions with a physical presence in each of the metropolitan areas that we examine. This excludes online-only institutions, which tend to be national chains that potentially have lesser reputations and weaker connections to local labor markets (Deming, Goldin, & Katz, 2012, 2013). One might therefore expect to find more positive effects of for-profit colleges using our sample of institutions, making our findings especially notable. Despite these differences, for the subset of their findings for which there is overlap across the two studies in occupations and educational levels, our results are very similar. The one exception is that they find negative and statistically significant effects of having a certificate from a for-profit college for health jobs that do not require a certificate.

REFERENCES

- Altonji, J., & Pierret, C. (2001). Employer learning and statistical discrimination. *Quarterly Journal of Economics*, 116, 313–350.
- Anderson, N. (2014). New Obama administration proposal to regulate for-profit colleges. *Washington Post* (03/13/2014). From http://www.washingtonpost.com/local/education/new-obama-administration-proposal-to-regulate-for-profit-colleges/2014/03/13/40ad4768-aafa-11e3-98f6-8e3c562f9996_story.html.
- Bailey, T., Badway, N., & Gumport, P. J. (2001). *For-profit higher education and community colleges*. Stanford, CA: National Center for Postsecondary Improvement.
- Baum, S., & Payea, K. (2013). *Trends in student aid 2013*. New York, NY: College Board.
- Baum, S., & Ma, J. (2013). *Trends in college pricing 2013*. New York, NY: College Board.
- Becker, G. (1964). *Human capital: A theoretical and empirical analysis, with special reference to education*. Chicago, IL: University of Chicago Press.
- Bennett, D. L., Lucchesi, A. R., & Vedder, R. K. (2010). *For-profit higher education: Growth, innovation and regulation*. Washington, DC: Center for College Affordability and Productivity.
- Bertrand, M., & Mullainathan, S. (2004). Are Emily and Greg more employable than Lakisha and Jamal? A field experiment on labor market discrimination. *American Economic Review*, 94, 991–1013.
- Bowen, W. G., Chingos, M. M., Lack, K. A., & Nygren, T. I. (2013). Interactive learning online at public universities: Evidence from a six-campus randomized trial. *Journal of Policy Analysis and Management*, 33(1), 94–111.
- Breneman, D., Pusser, B. & Turner, S. (2006). *The rise of for-profit universities*. Albany, NY: SUNY Press.
- Card, D. (1999). The causal effect of education on earnings. In O. Ashenfelter & D. Card (Eds.), *The handbook of labor economics*, Vol. 3A. Amsterdam, Netherlands: Elsevier.
- Cellini, S. R. (2009). Crowded colleges and college crowd-out: The impact of public subsidies on the two-year college market. *American Economic Journal: Economic Policy*, 1, 1–30.
- Cellini, S. R. (2010). Financial aid and for-profit colleges: Does aid encourage entry? *Journal of Policy Analysis and Management*, 29, 526–552.
- Cellini, S. R. (2012). For-profit higher education: An assessment of costs and benefits. *National Tax Journal*, 65, 153–180.
- Cellini, S. R., & Chaudhary, L. (2012). The labor market returns to a for-profit college education. NBER Working Paper No. 18343.
- Chung, A. S. (2008). Effects of for-profit training on earnings. Unpublished manuscript.
- College Board. (2012). *Trends in pricing 2012*. From <http://trends.collegeboard.org/sites/default/files/college-pricing-2012-full-report-121203.pdf>.
- Darolia, R. (2014). Working (and studying) day and night: Heterogeneous effects of working on the academic performance of full-time and part-time students. *Economics of Education Review*, 38, 38–50.
- Darolia, R., Koedel, C., Martorell, P., Wilson, K., & Perez-Arce, F. (2015). Race and gender effects on employer interest in job applicants: New evidence from a resume field experiment. Unpublished manuscript.
- Deming, D. J., Goldin, C., & Katz, L. F. (2012). The for-profit postsecondary school sector: Nimble critters or agile predators? *Journal of Economic Perspectives*, 26, 139–164.
- Deming, D. J., Goldin, C., & Katz, L. F. (2013). For-profit colleges. *Future of Children*, 23, 137–163.
- Deming, D. J., Yuchtman, N., Abulafi, A., Goldin, C., & Katz, L. F. (2014). The value of postsecondary credentials in the labor market: An experimental study. NBER Working Paper No. 20528.

- Eriksson, S., & Rooth, D.-O. (2014). Do employers use unemployment as a sorting criterion when hiring? Evidence from a field experiment. *American Economic Review*, 104, 1014–39.
- Fain, P. (2014). Gainful employment's partial unveiling. Inside higher Ed (03/14/2014). From <http://www.insidehighered.com/news/2014/03/14/details-gainful-employment-proposal-expected-friday#sthash.tVOSaEWn.dpbs>.
- Fryer, R., & Levitt, S. (2004). The causes and consequences of distinctively black names. *Quarterly Journal of Economics*, 119, 767–805.
- Gilpin, G. A., Saunders, J., & Stoddard, C. (2015). Why has for-profit colleges' share of higher education expanded so rapidly? Estimating the responsiveness to labor market changes. *Economics of Education Review*, 45, 53–63.
- Golden, D. (2010a). Homeless high school dropouts lured by for-profit colleges. Bloomberg (04/29/2010). From <http://www.bloomberg.com/news/articles/2010-04-30/homeless-dropouts-from-high-school-lured-by-for-profit-colleges-with-cash>.
- Golden, D. (2010b). Kaplan quest for profits at taxpayer expense ensnares veteran. Bloomberg (11/01/2010). From <http://www.bloomberg.com/news/articles/2010-11-01/kaplan-quest-for-profit-at-taxpayer-expense-ensnares-disabled-u-s-veteran>.
- Goodman, P. S. (2010). In hard times, lured into trade school and debt. *The New York Times* (03/13/2010). From <http://www.nytimes.com/2010/03/14/business/14schools.html?pagewanted=all&r=0>.
- Guryan, J., & Thompson, M. (2010). Comment on the proposed rule regarding Gainful Employment described in the NPRM released by the Department of Education on July 26, 2010 (Docket ID. ED-2010-OPE-0012). From <http://www.regulations.gov/#!documentDetail;D=ED-2010-OPE-0012-13610>.
- Hagelskamp, C., Schleifer, D., & DiStasi, C. (2014). Profiting higher education? What students, alumni and employers think about for-profit colleges. New York, NY: Public Agenda.
- Hinrichs, P. (2013). What kind of teachers are schools looking for? Evidence from a randomized field experiment. Unpublished manuscript.
- Hoxby, C. M., & Avery, C. (2013). The missing “One-Offs”: The hidden supply of high-achieving, low income students. *Brookings papers on economic activity*. Spring 2013, 1–65.
- Jacobson, L., LaLonde, R., & Sullivan, D. G. (2005). Estimating the returns to community college schooling for displaced workers. *Journal of Econometrics*, 125, 271–304.
- Jepsen, C., Troske, K., & Coomes, P. (2014). The labor market returns to community college degrees, diplomas, and certificates. *Journal of Labor Economics*, 32, 95–121.
- Kane, T., & Rouse, C. (1995). Labor-market returns to two- and four-year college. *American Economic Review*, 85, 600–614.
- Kane, T., & Rouse, C. (1999). The community college: Educating students at the margin between college and work. *Journal of Economic Perspectives*, 13, 63–84.
- Knapp, L. G., Kelly-Reid, J. E., & Ginder, S. A. (2011). Postsecondary Institutions and Price of Attendance in the United States: 2010–11, Degrees and Other Awards Conferred: 2009–10, and 12-Month Enrollment: 2009–10. U.S. Department of Education, National Center for Education Statistics.
- Koedel, C., & Tyhurst, E. (2012). Math skills and labor-market outcomes: Evidence from a resume-based field experiment. *Economics of Education Review*, 31, 131–140.
- Kroft, K., Lange, F., & Notowidigdo, M. J. (2013). Duration dependence and labor market conditions: Evidence from a field experiment. *Quarterly Journal of Economics*, 128, 1123–1167.
- Lahey, J. N. (2008). Age, women, and hiring: An experimental study. *Journal of Human Resources*, 43, 30–56.
- Lahey, J. N., & Beasley, R. A. (2009). Computerizing audit studies. *Journal of Economic Behavior and Organization*, 70, 508–514.
- Lang, K., & Weinstein, R. (2013). The wage effects of not-for-profit and for-profit certifications: Better data, somewhat different results. NBER Working Paper No. 19135.
- Lange, F. (2007). The speed of employer learning. *Journal of Labor Economics*, 25, 1–35.

- Lanning, J. (2013). Opportunities denied, wages diminished: Using search theory to translate audit-pair study findings into wage differentials. *The B. E. Journal of Economic Analysis & Policy*, 13, 921–958.
- Marcus, J. (2012). Community colleges want to boost grad rates—By changing the formula. *The Hechinger Report* (03/08/2012).
- Mincer, J. (1974). *Schooling, experience, and earnings*. New York, NY: Columbia University Press for the National Bureau of Economic Research.
- Mishel, L. (2012). Entry-level workers' wages fell in lost decade. Economic Policy Institute, Issue Brief #327.
- Mullin, C. M. (2012). Why access matters: The community college student body. American Association of Community Colleges, Policy Brief 2012–01PBL.
- National Center for Education Statistics. (2014). Digest of Education Statistics: 2013. Advanced release of digest tables. From http://nces.ed.gov/programs/digest/2013menu_tables.asp.
- National Center for Education Statistics. (2013a). Digest of education statistics: 2012. Washington, DC: U.S. Department of Education.
- National Center for Education Statistics. (2013b). Condition of education: 2013. Washington, DC: U.S. Department of Education.
- National Center for Education Statistics. (2012). Digest of education statistics: 2011. Washington, DC: U.S. Department of Education.
- Neumark, D. (2012). Detecting discrimination in audit and correspondence studies. *Journal of Human Resources*, 47, 1128–1157.
- Nunley, J. M., Pugh, A., Romero, N., & Seals, R. A. Jr. (2014a). Unemployment, underemployment, and employment opportunities: Results from a correspondence audit of the labor market for college graduates. Auburn University Department of Economics, Working Paper Series 2014–04.
- Nunley, J. M., Pugh, A., Romero, N., & Seals, R. A. Jr. (2014b). College major, internship experience, and employment opportunities: Estimates from a resume audit. Auburn University Department of Economics, Working Paper Series 2014–03.
- Oreopoulos, P. (2011). Why do skilled immigrants struggle in the labor market? A field experiment with thirteen thousand resumes. *American Economic Journal: Economic Policy*, 3, 148–171.
- Oreopoulos, P., & Ptronijevec, U. (2013). Making college worth it: A review of research on the returns to higher education. NBER Working Paper # 19053.
- Riach, P. A., & Rich, J. (2006). An experimental investigation of sexual discrimination in hiring in the English labor market. *Advances in Economic Analysis & Policy*, 6, 1–20.
- Rooth, D.-O. (2009). Obesity, attractiveness, and differential treatment in hiring: A field experiment. *Journal of Human Resources*, 44, 710–735.
- Rosenbaum, J. E., Deil-Amen, R., & Person, A. E. (2006). *After admission: From college access to college success*. New York, NY: Russell Sage Foundation.
- Rouse, C. E. (1998). Do two-year colleges increase overall educational attainment? Evidence from the states. *Journal of Policy Analysis and Management*, 17, 595–620.
- Scott-Clayton, J. (2012). What explains trends in labor supply among U.S. undergraduates? *National Tax Journal*, 65, 181–210.
- Spence, M. (1973). Job market signaling. *Quarterly Journal of Economics*, 111, 1007–47.
- Stevens, A., Kurlaender, M., & Grosz, M. (2015). Career technical education and labor market outcomes: Evidence from California community colleges. Mimeo. University of California–Davis.
- Turner, S. (2006). For-profit colleges in the context of the market for higher education. In D. Breneman, B. Pusser, & S. Turner (Eds.), *The rise of for-profit universities*. Albany, NY: SUNY Press.

- U.S. Department of Education. (2011). Obama administration announces new steps to protect students from ineffective career college programs. U.S. Department of Education Press Release, June 2.
- U.S. Government Accountability Office. (2010). For-profit colleges: Undercover testing finds colleges encouraged fraud and engaged in deceptive and questionable marketing practices. GAO-10-948T. Washington, DC: Government Accountability Office.
- U.S. Senate Committee on Health, Education, Labor and Pensions. (2012). For profit higher education: The failure to safeguard the federal investment and ensure student success.

APPENDIX A: SUPPLEMENTARY TABLES

Table A1. Descriptive statistics for submitted resumes overall and by city.

	All	Atlanta	Boston	Chicago	Houston	Philadelphia	Sacramento	Seattle
Female	0.49	0.49	0.50	0.50	0.48	0.50	0.47	0.50
African American	0.32	0.32	0.31	0.32	0.33	0.32	0.33	0.32
Hispanic	0.34	0.34	0.35	0.36	0.36	0.35	0.33	0.33
High-school graduate	0.14	0.13	0.15	0.13	0.11	0.16	0.15	0.16
Community College: Some college	0.14	0.14	0.15	0.14	0.15	0.14	0.14	0.15
For profit: Some college	0.15	0.15	0.15	0.14	0.15	0.15	0.16	0.18
Community College: Certificate	0.14	0.15	0.14	0.15	0.16	0.13	0.13	0.11
For profit: Certificate	0.14	0.14	0.14	0.16	0.12	0.13	0.14	0.13
Community College: AA Degree	0.14	0.15	0.14	0.14	0.14	0.14	0.12	0.13
For profit: Some AA degree	0.15	0.14	0.15	0.14	0.18	0.15	0.15	0.15
1-year work experience (2-year gap)	0.13	0.12	0.14	0.13	0.12	0.12	0.11	0.15
2-years work experience (1-year gap)	0.43	0.42	0.43	0.46	0.43	0.42	0.41	0.42
3-years work experience (no gap)	0.44	0.46	0.43	0.41	0.45	0.46	0.48	0.43
No relevant work experience	0.12	0.07	0.15	0.16	0.19	0.11	0.08	0.15
1-year relevant work experience	0.35	0.32	0.39	0.35	0.33	0.36	0.31	0.39
2-years relevant work experience	0.38	0.43	0.34	0.36	0.34	0.39	0.38	0.35
3-years relevant work experience	0.15	0.18	0.12	0.13	0.14	0.14	0.23	0.11
Admin share	0.23	0.23	0.27	0.27	0.19	0.20	0.20	0.21
Customer service share	0.19	0.17	0.19	0.23	0.16	0.18	0.17	0.17
Information technology share	0.11	0.12	0.09	0.09	0.14	0.10	0.07	0.18
Medical assisting share	0.12	0.13	0.08	0.10	0.13	0.14	0.17	0.11
Medical billing/office share	0.15	0.14	0.15	0.12	0.18	0.16	0.16	0.15
Sales share	0.21	0.21	0.22	0.18	0.20	0.22	0.22	0.19
Total resumes	8,914	1,637	1,592	1,368	468	1,800	1,280	769
Total unique job advertisements	5,209	992	943	787	354	1,012	702	419

Notes: Houston was the pilot city and some resumes were sent out before the structure of the experiment was changed so that we could send two resumes to (most) employers. Thus, the total number of resumes in Houston is lower than in the other cities and the ratio of total resumes to unique job advertisements is lower as well.

Table A2. Marginal effect estimates for control variables from Model 2 in Table 5, with City Weights.

	Model 2: Any response	Model 2: Interview request
Public Community College	0.0041 (0.0053)	0.0041 (0.0033)
High School	-0.0038 (0.0083)	-0.0026 (0.0054)
<u>Basic application details</u>		
Positive greeting	0.0041 (0.0049)	-0.0001 (0.0031)
First resume	0.0147 (0.0051)**	0.0083 (0.0032)**
<u>Applicant race/gender (as implied by name)</u>		
African American Female	0.0015 (0.0096)	-0.0085 (0.0052)
African American Male	-0.0098 (0.0092)	-0.0069 (0.0053)
Hispanic Female	-0.0025 (0.0095)	-0.0071 (0.0053)
Hispanic Male	-0.0012 (0.0089)	-0.0034 (0.0051)
White Female	0.0091 (0.0100)	-0.0022 (0.0055)
<u>Work history (categories are mutually exclusive)</u>		
2-years work experience (1-year gap)	0.0182 (0.0111)*	0.0018 (0.0066)
3-years work experience (no gap)	0.0200 (0.0115)*	0.0019 (0.0072)
1-year relevant work experience	0.0257 (0.0108)**	0.0091 (0.0067)
2-years relevant work experience	0.0326 (0.0115)**	0.0109 (0.0072)
3-years relevant work experience	0.0340 (0.0157)**	0.0217 (0.0113)*
<u>Occupational category</u>		
Administrative	-0.105 (0.0061)**	-0.0436 (0.0039)**
Customer service	-0.0470 (0.0067)**	-0.0187 (0.0040)**
Information technology	-0.0514 (0.0071)**	-0.0261 (0.0038)**
Medical assisting	-0.0663 (0.0063)**	-0.0327 (0.0037)**
Medical billing/office	-0.0090 (0.0056)**	-0.0359 (0.0035)**
<u>City</u>		
Boston	0.1305 (0.0224)**	0.0350 (0.0122)**
Chicago	0.0679 (0.0324)**	0.0364 (0.0239)
Houston	0.0465 (0.0543)	0.0275 (0.0401)
Philadelphia	0.0935 (0.0202)**	0.0326 (0.0124)**
Sacramento	0.1286 (0.0318)**	0.0407 (0.0200)**
Seattle	0.2163 (0.0566)**	0.1400 (0.0555)**

**Indicates statistically significant difference between two variables at the 5 percent level.

*Indicates statistically significant difference between two variables at the 10 percent level.

Notes: Standard errors are clustered by job posting. The marginal effects for the control variables are qualitatively similar with and without weighting. Time trend coefficients are omitted for brevity. Omitted groups are for-profit college, less-positive greeting, second resume, white male, two-year work history gap, no relevant work experience, occupation = sales, city = Atlanta. City weighting is such that all cities receive equal weight in the data.

APPENDIX B EXPERIMENT DETAILS

APPENDIX B1

Resume Construction

In this section, we elaborate on how the resumes were constructed for the experiment. As noted in the text, computer software developed by Lahey and Beasley (2009) was used to generate a large bank of randomly generated resumes. All resumes share a common structure but the specific characteristics that end up on each resume are randomly assigned. The resumes include up to four sections.

The first section indicates the applicant's name and contact information (street address, local phone number, and email address). Applicants' first names were chosen to convey gender. We used census data to identify common first names for each racial/ethnic group represented in our study: African American, Hispanic, and white. Only the Hispanic first names have an obvious racial/ethnic connotation. We selected three female-sounding first names and three male-sounding first names. Only the first names for the Hispanic applicants indicate racial/ethnic origin. Last names were chosen to indicate that the applicant was likely to be African American (Washington and Jefferson), Hispanic (Hernandez and Garcia), or White (Anderson and Thompson), again using census data to identify names that strongly associate with a particular racial/ethnic group.²⁰

We listed local phone numbers and email addresses for all applicants, which we used to track responses. We selected home addresses in zip codes where median household incomes were in the middle quintile in the metropolitan area. We used zip codes close to the center of each city to allow for a larger set of jobs for which applicants' commutes would be manageable.

The second section of each resume lists education credentials starting with a randomly assigned local high school. High schools were chosen from the primary urban public school district as well as from surrounding suburban districts. We selected schools with demographically diverse student bodies and with average statewide test scores in the middle or fourth quintile. As noted in the text, resumes that indicate college attendance list the field of study and degree/certificate conferred, if any. Resumes that do not indicate a degree or certificate indicate "coursework" in the field of study.²¹

The third section of each resume details the applicant's work history. For each job the resume indicates the dates of employment, employer name, job title, and a bulleted list of job responsibilities. The work histories are modeled based on real resumes for job seekers collected in the design phase of the experiment. The work histories include a combination of entry-level jobs that are relevant to the occupational category and general low-skilled jobs (e.g. retail clerk). Similarly to

²⁰ In contrast to Bertrand and Mullainathan (2004) we did not use distinctly African American-sounding first names as these names are more commonly given to children from lower SES households (Fryer & Levitt, 2004), which could confound the effect of race. The cost of doing so is that the "Washington" and "Jefferson" surnames may be less strong signals of race than a distinctive first name. Appendix Table A2 reports selected estimates of race and gender effects on employer responses. See Darolia et al. (2015) for a more-detailed discussion of the race and gender results from this experiment.

²¹ The randomizer selected level of schooling, college name and field of study simultaneously. These elements were not chosen independently because the name of the field of study depends on the level of schooling and in resumes where the field of study is allowed to be college-specific, this depends on the college.

previous audit studies, we constructed some resumes with work-history gaps (e.g. see Bertrand & Mullainathan, 2004; Lahey, 2008).

The final section of each resume provides a list of randomly assigned general skills and qualifications for the applicant, again in bulleted format. For each occupational category we selected skills from real resumes of relatively inexperienced workers seeking jobs in the appropriate occupation. Examples of skills and qualifications included in this section are: “Dedicated, customer-focused administrative professional,” “Proven interpersonal communication and multi-tasking skills,” “Adept at Microsoft Office, records management, database administration, spreadsheets, and reports,” “Proficient in various office software programs,” “Detail oriented,” “Strong leadership ability,” “Team player,” and “Proficient with PC and MAC platforms.” Some resumes do not include the final section. Based on our review of real resumes posted by job seekers, it is quite common for resumes at this level to omit this information.

APPENDIX B2

Applying to Jobs and Recording Employer Responses

In this section, we elaborate on the procedures we used to apply to jobs and track responses. In selecting appropriate job advertisements, in addition to avoiding jobs for which the applicant was clearly under-qualified or that listed narrow skills that were not conveyed by any of our resumes, we also trained research assistants to use their judgment to avoid job postings that were unlikely to be credible—for example, sales jobs promising substantial earnings for limited work. We sent resumes in application for jobs that would be most relevant to their degrees, although we note other research that has examined labor market prospects when job applicants’ education credentials mismatch with job opportunities (Nunley et al. 2014b). We also avoided sending resumes to recruiters to the extent possible.

We sent up to two resumes to each employer. The resume sampling procedure was structured to ensure that the resumes were in a different format and had no overlapping information. The second resume was sent at least four hours after the first. Most second resumes were sent within 48 hours of the initial resume (Appendix Table A2 shows that second resumes received less interest). The ratio of resumes to job postings in each city in Appendix Table A1 is always less than two because the random resume generator sometimes produced resumes with errors and when the second resume in a sampled pair had an error, we sent just the first resume (when the first resume had an error, we resampled).²²

Employers responded to the resumes via email and phone. Phone calls were sent to voicemail. The “any response” outcome was coded as a binary indicator for whether the employer legitimately responded to the resume (we did not code perfunctory emails as responses). The second outcome variable was coded as a binary indicator for whether the employer explicitly requested an interview with the applicant. We did not specify any rules about the time between the initial application and the employer response, although most responses came within one to three days of the initial application.

²² The errors were related to the construction of the work histories where we sampled jobs with replacement. More information about this procedural issue is available from the authors upon request.

Do Employers Prefer Workers

APPENDIX B3

Unformatted Example Resume

First name, Last name

Address, City State

Email

Phone

Education

Postsecondary (if any, with degree type and name)

High School Name, City, State, Class of 2010

Work Experience (up to three entries)

Start date—End date, Company Name, City, State

Title

Job Responsibilities

Qualifications and Skills (omitted on some resumes)

Skill1

Skill2

Skill3