# The Labor Market Value of Community College Bachelor's Degrees: Initial Evidence from a Resume Audit Study in Early Childhood Education

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**ABSTRACT:** Community colleges are more financially, academically, and geographically accessible than four-year colleges. Despite most community college students intending to earn a bachelor's degree, few transfer to a four-year institution and even fewer earn bachelor's degrees, leading policymakers to explore alternative strategies for increasing postsecondary access and success. Community College Baccalaureate (CCB) programs have emerged as one such pathway, allowing community colleges to confer bachelor's degrees directly. However, little is known about how employers value these credentials in the labor market. To address this question, we conduct the first resume audit study of CCB degrees, submitting fictitious applications to real job vacancies while experimentally varying applicants' educational credentials, degree-granting institutions, and demographic signals. In this pilot study, we focus on the early childhood education (ECE) labor market, a rapidly growing CCB field characterized by labor shortages and increasing educational requirements. We find that CCB degrees are viewed comparably to both traditional bachelor's degrees and associate degrees by employers in this setting, with relatively precise, statistically indistinguishable rates interview requests across degree types. A text analysis of employer callback messages reveals little evidence that employers communicate differently with CCB applicants, while a net-price simulation suggests that sticker-price comparisons substantially overstate the affordability advantage of CCB programs. Together, these findings provide new evidence on the labor market value and affordability of CCB degrees and motivate a larger audit (launched summer 2026) across more fields of study and locations.

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# I. INTRODUCTION

The labor market returns to postsecondary education have risen substantially in recent decades, reflecting structural changes in the U.S. economy and growing demand for skilled workers (Autor, 2014; Ashworth and Ransom, 2019). The share of jobs requiring at least a bachelor's degree has more than doubled since the 1970s, rising from 16 percent to nearly 36 percent, and projections indicate continued growth in the kinds of occupations requiring some form of postsecondary credential (Carnevale, Smith, and Strohl, 2013; Carnevale, Smith, Van Der Werf, and Quinn, 2023). Although bachelor's degree attainment has increased meaningfully over time, progress has been uneven. Over the past three decades, gaps in college attendance and bachelor's degree completion have widened between underrepresented minority (URM) and non-URM students, and between low- and high-income students (Cahalan, Addison, Brunt, Patel, and Perna, 2021; Reber and Smith, 2023). Consequently, broadening pathways to a bachelor's degree is key to meeting a growing demand for skilled labor and expanding access to the economic mobility higher education affords.

Policy interventions aimed at increasing postsecondary enrollment and success largely focus on expanding access to four-year institutions. These efforts often address demand-side barriers that are well documented in the literature, such as college preparation in the K-12 sector, financial aid and credit constraints, and informational barriers (see Dynarski, Page, and Scott-Clayton, 2022 and Dynarski et al., 2022 for comprehensive literature reviews). Many of these interventions have proven successful and have led to large-scale reforms, such as required standardized testing regimes (Goodman, 2016; Hyman, 2017), mandated FAFSA completion (Deneault, 2023), and direct admissions programs (Odle and Delaney, 2025). However, these policy changes largely presume that the path to a bachelor's degree runs through traditional four-year colleges and universities, underemphasizing the role of community colleges as a central access point to higher education.

Community colleges serve about 8.6 million students per year—about 40 percent of all undergraduates in the United States—and disproportionately enroll nontraditional students (e.g., working adults, older students, and students with family responsibilities), as well as populations historically underrepresented in postsecondary education, including low-income and URM students. Moreover, the majority (roughly 80 percent) of students who enroll at a community college do so with the intention of ultimately transferring to a four-year institution to earn a

bachelor's degree. Despite these intentions, rates of transfer and bachelor's completion are very low among those who begin at a community college: only about one-third of students transfer to a four-year institution and only half of those who transfer earn a bachelor's degree within six years (Velasco, Fink, Bedoya, Jenkins, and LaViolet, 2024). A robust literature on transfer pathways identifies numerous frictions that slow a student's progress from community college to bachelor's degree (see, for example, recent work from Schudde and Jabbar, 2024). Recent evidence suggests that even those students who do successfully transfer and earn a bachelor's degree might not reap labor market rewards (Miller, 2026).

A recent national policy movement has sought to strengthen the role of community colleges as a pathway to bachelor's degree attainment while addressing concerns that traditional transfer pathways do not reliably convert community college enrollment into bachelor's degree completion. The community college baccalaureate (CCB), which is currently offered in 24 states (Community College Baccalaureate Association & Bragg & Associates, Inc., 2024) allows community colleges to offer bachelor's degrees directly, eliminating the need for students to transfer to a four-year institution. Ideally, bachelor's degrees offered by community colleges—institutions that are more financially, academically, and geographically accessible than traditional four-year colleges and universities *and* which are already disproportionately serving nontraditional and underrepresented students—can be an effective solution to expanding access to bachelor's degrees and reducing completion disparities by race-ethnicity and income (Acton, Cortes, and Morales, 2024; Acton, Cortes, Miller, and Morales, 2025). However, their potential as an effective mechanism to broaden economic opportunity ultimately depends on how this degree is valued in the labor market—a question that becomes increasingly consequential as these programs expand.

For community colleges to offer bachelor's degrees, states must pass legislation allowing them to do so. Although the first CCBs were authorized by West Virginia in 1989, most of the growth of CCB programs has concentrated in the last two decades.[1] As shown in Figure 1, between 2004 and 2022, the share of community colleges offering bachelor's degrees increased from 2.1 percent to 16.5 percent and the number of degrees awarded more than quadrupled, from 3,327 to 16,059. In states like Washington and Florida, which have expanded CCB granting authority statewide, community colleges now award between 5 percent and 10 percent of all bachelor's degrees.

[1] Several more states—California, Illinois, and Iowa as of June 2026—are actively considering legislation that would authorize the introduction or expansion of CCB programs (Draisey, 2025).

Importantly, CCB programs are often offered only in specific high-demand fields, aligned with community colleges' workforce development mission (Van Noy, Weaver, Forbes, and Bragg, 2023).

The relatively recent introduction of CCB programs has thus far limited the scope for causal research on the returns to these degrees. Indeed, most of the existing evidence on the returns to CCB programs relies exclusively on descriptive analyses comparing the earnings of students with CCB degrees with those of individuals holding either associate degrees from community colleges or bachelor's degrees from traditional four-year institutions. Studies drawing on data from single states indicate strong average earnings for CCB completers (Cominole, 2017; Kaikkonen and Quarles, 2018; Love, 2020; Meza and Bragg, 2022). In a separate study, we conduct a national-level descriptive analysis, and our findings suggest that CCB programs offer an intermediate credential, with median earnings typically falling in between those of associate degree holders and graduates with a bachelor's degree from a traditional four-year institution (Acton ⓡ Morales ⓡ Cortes ⓡ Turner ⓡ Miller, 2026). Despite the rapid expansion of CCB programs, causal evidence on how employers value these degrees relative to traditional bachelor's degrees and associate degrees remains scarce.

To circumvent identification and data challenges, we explore employers' valuation of CCB programs by conducting a resume audit study in which we apply to real job vacancies using fictitious resumes.[2] The resumes randomly vary the applicant's educational credential (i.e., associate versus bachelor's degree), the institution that conferred it (i.e., community college versus traditional four-year university), and their race and ethnicity (White, Black, or Hispanic) signaled through their first and last names. We are ultimately interested in understanding the labor market value of CCB degrees across many fields of study. In this pilot study, however, we focus on the early childhood education (ECE) labor market—a popular and rapidly growing CCB field, with active programs in 23 states nationwide, including seven approved since 2020 (CCBA, 2024).

The ECE field offers multiple advantages for our pilot study. *First*, the ECE workforce is overwhelmingly female—upwards of 97 percent—which simplifies the construction of fictitious applicant names. *Second*, ECE degree programs prepare students for a relatively well-defined set of occupations, simplifying both the identification of relevant job postings and the application

[2] The study was pre-registered in the AEA RCT Registry (AEARCTR-0016106), see Acton, et al. (2026b).

process. *Third*, the ECE sector is characterized by persistent labor shortages, high vacancy rates, and hiring difficulties, creating an active labor market in which employers are regularly seeking qualified applicants. *Fourth*, ECE CCB programs have the potential to reduce racial and ethnic earnings disparities and promote economic mobility, given the overrepresentation of women of color in the field, particularly among the lowest-paid positions (Austin, Edwards, and Whitebook, 2019). *Finally*, and most importantly, the field has undergone substantial professionalization over the past two decades, with federal and state policies increasingly requiring bachelor's degrees for early childhood educators, thereby increasing the importance of educational credentials in hiring decisions.

We conducted our pilot study over the course of 17 weeks across two major cities in Texas and Washington. Both Texas and Washington rank among the top five states with the highest number of authorized CCB programs, though the prevalence of CCB offerings varies considerably between them. Nearly 90 percent of community colleges in Washington offer at least one bachelor's degree, compared with just over 30 percent in Texas (Love, Bragg, and Harmon, 2021). As a result, students and employers in Washington may be more familiar with CCB degrees than their counterparts in Texas. We explore this dimension of heterogeneity through both interview-request analyses and a text analysis of employer responses to fictitious applications. Across the two cities, we submitted 4,698 resumes to 1,570 job vacancies and tracked employers' responses to identify differences in interview request rates across degree types, institutions, and applicants' implied race and ethnicity, as well as to examine whether perceptions of degree credentials vary across racial and ethnic groups.

We find that applicants with CCB degrees perform *similarly* to applicants with traditional bachelor's (BA) or associate (AA) degrees in the ECE labor market.[3] Although callback rates were relatively high—more than 20 percent of applicants received an interview request and more than 30 percent received either an interview request or a request for more information—we find no statistically or economically significant differences in interview requests or callback rates across the three credential types (AA, CCB, and traditional BA). For CCBs relative to traditional bachelor's degrees, we can rule out negative effects on interview requests larger than 0.8 percentage points (3.7 percent of the baseline mean), implying that CCB holders are unlikely to be

[3] Throughout the text, we will use BA to refer to bachelor's degrees from traditional four-year institutions, and CCB to refer to bachelor's degrees from community colleges. AA refers to associate degrees from community colleges.

disadvantaged in this labor market. However, we can also rule out positive effects greater than 1.9 percentage points (6.3 percent of the baseline mean) relative to associate degree holders.[4]

We note that our results may be specific to the ECE labor market, a tight labor market that is characterized by low wages, high turnover, and persistent vacancies. Most of the job postings for which we applied did not require a bachelor's degree, so employers in our sample may have thought that they would have a better chance of hiring or retaining someone with an associate or CCB degree relative to a traditional bachelor's. One possible explanation for our results is that even if employers may prefer to hire an applicant with a traditional bachelor's degree, they call back applicants with associate or CCB credentials since they view them as more likely to accept and remain in relatively low-wage ECE positions. This interpretation would be consistent with findings from an earlier audit study in the ECE market (Boyd-Swan and Herbst, 2018), which finds that providers are equally likely to extend interview requests to applicants with associate degrees and bachelor's degrees. However, they do not include CCB programs in their experiment.

To further understand hiring decisions and these potential mechanisms, we fielded a survey to employers and hiring managers in the ECE labor market. We sent the survey to email addresses collected through callbacks and job postings. In the survey, employers emphasize *experience*, *personality*, and *reliability* as the primary drivers of hiring decisions. A common theme revealed in employers' responses to the open-ended survey questions is concern about not being able to offer sufficiently high pay to attract applicants, especially those with higher levels of education.

Moreover, our text analysis of employer callback messages reveals only modest differences in how employers communicate with applicants across degree types. While employers in Texas were somewhat more likely to request additional credential-related information from CCB applicants relative to traditional BA applicants, suggesting greater scrutiny of nontraditional credentials, these patterns were largely absent in Washington. Across both states, we find little evidence that employers differ meaningfully in the overall tone, sentiment, warmth, or personalization of their responses to CCB applicants. If anything, callback messages to CCB applicants were slightly longer and no more likely to be generic or template-based than those sent to traditional BA applicants. Taken together, these findings suggest that employers generally view CCB applicants

[4] Note also that we fail to reject that all three-degree credentials are equal, as well as the pairwise difference of associate and traditional bachelor's holders.

similarly to traditional BA applicants, although perceptions of and familiarity with CCB credentials may vary somewhat across labor market contexts and state policy environments.

Lastly, consistent with Turner (2026), our net-price simulation suggests that sticker-price comparisons reported in Acton ⓡ et al. (2026) substantially overstate the affordability advantage of CCB programs relative to traditional four-year bachelor's degrees. Using representative student profiles and institution-specific net price calculators, we find that although four-year institutions generally have higher published tuition and fees, institutional and state grant aid often reduces net costs considerably for low- and middle-income students. For some student profiles, estimated annual net prices at community colleges exceed those at four-year institutions once grant aid is considered. These findings suggest that the affordability of CCB pathways is more nuanced than published tuition figures alone imply and underscore the importance of evaluating net, rather than listed, prices when assessing the affordability and cost-effectiveness of bachelor's degree options.

More broadly, this study contributes to several strands of literature. *First*, it contributes to a large body of research examining the returns to postsecondary education (see, for example, Lovenheim and Smith, 2022; Oreopoulos and Petronijevic, 2013) by providing some of the first evidence on employers' valuation of community college baccalaureate degrees. *Second*, it extends a long tradition of resume audit studies used to evaluate labor market returns to educational credentials and emerging postsecondary pathways, including community colleges, for-profit institutions, and online degrees (Darolia, Koedel, Martorell, Wilson, and Perez-Arce, 2014; Deming, Yuchtman, Abulafi, Goldin, and Katz, 2016; Zhu, 2023), as well as studies examining employer perceptions of applicant characteristics (Riach and Rich, 2002; Bertrand and Mullainathan, 2004; Boyd-Swan and Herbst, 2018; Hinrichs, 2021). To our knowledge, this is the first resume audit study designed to evaluate employer responses to CCB degrees. *Finally*, by combining an audit experiment with employer surveys, text analysis of callback messages, and net-price simulations, the paper provides a broader assessment of the economic value of CCB degrees than has previously been available in the literature.

Thus, results from this pilot study directly inform the design of our ongoing scaled-up audit study, which launched in summer 2026. Building on the lessons learned from the ECE pilot, the larger study expands to additional fields of study and labor markets to provide a more comprehensive assessment of how employers value CCB degrees across diverse occupational and geographic contexts. The study is expected to generate approximately 50,000 job applications,

roughly ten times the scale of the pilot, allowing us to examine employer responses to CCB degrees with substantially greater precision and to explore heterogeneity across fields of study, labor markets, employer characteristics, and applicant demographics.

## II. Policy And Labor Market Background

### *A. Community College Baccalaureate Degree Policy Landscape*

Although the community college baccalaureate degree was first authorized in West Virginia in 1989, momentum towards offering these degrees across the country has only recently gained traction and widespread attention. The CCB policy landscape is active and currently evolving, with 24 states currently offering these degrees and several others (i.e., Illinois and Iowa) currently in the process of introducing legislation at the state level. Even across the 24 states that have authorized CCBs, authorization strategies vary significantly. Florida and Washington state have granted near-universal authorization, while several large states—including California and Texas—cap degree awarding and number of programs with the goal of *limiting* competition between community colleges and traditional four-year institutions. The variation across states in familiarity with CCB programs in general and within the ECE industry is a key dimension of the heterogeneity that we explore in this pilot study and one that we hope to pursue further in the full study.

In our case, Texas and Washington provide two unique policy landscapes in which to study the labor market value of the CCB degree. Although the CCB legislation was introduced in Texas and Washington around the same time (2003 and 2005, respectively), CCBs have grown at a much more rapid pace in Washington than in Texas. In 2024, roughly 3 percent of Washington students enrolled in community colleges were in CCB programs, whereas CCB enrollment accounted for less than 1 percent in Texas (THECB, 2025; SBCTC, 2025; Carpenter, 2025). As of 2023, 100 percent of the community colleges in Washington state were enrolling students in CCB programs, whereas the reach of programs in Texas is still limited to fewer than half of all community colleges in the state. We hypothesize that the popularity of CCB programs across the state and especially in the major metropolitan areas in which we concentrate our resume submissions may affect employers understanding of and attitudes towards the degrees, which may in turn influence their probability of hiring CCB graduates.

A common feature of CCB legislation across states is the requirement that CCB programs be *tailored* to local workforce needs. Written into many state-level CCB legislative documents is the

requirement that programs be limited to industries in which labor demand is currently outstripping supply (Meza and Love, 2023). Figure 2 shows that the most common CCB industries across the country are Business, Health Professions, Computer and Information Sciences, and Education. Although business degrees dominate the CCB landscape with nearly 40 percent of CCBs awarded in 2022-2023 coming from business Classification of Instructional Programs (CIP) codes, education represents one of the fastest-growing CCB fields of study across the country, largely spurred by notable labor shortages across all levels of education in the wake of the COVID-19 pandemic (Kersenbrok, 2025; Meza and Love, 2023).

### *B. Labor Market Context: Early Childhood Education*

The early childhood education workforce in the U.S. is characterized by persistent challenges related to low wages, high turnover, and growing labor shortages—conditions rooted in what many have identified as market failure in the ECE sector (Council of Economic Advisers (CEA), 2023a, 2023b; Treasury, 2024). ECE workers are disproportionately female, with women representing upwards of 97 percent of the workforce, and women of color are overrepresented in the field, often in the lowest paid positions (Coffey, 2022; Evangelist, Tonsberg, Mattingly, Savage, and Chaganti, 2025). Despite limited data on this workforce, studies such as Austin et al. (2019) document substantial racial wage gaps in the ECE sector: Black early educators earn approximately 78 cents for every dollar earned by their white counterparts, while Hispanic educators earn roughly 90 cents on the dollar, even after controlling for education, experience, and work setting. Given the demand for credentials and certification among early childhood educators, the workforce has a relatively high rate of post-secondary attendance. The Center for American Progress reports that nearly 80 percent of the ECE workforce reports having some college, and at least half have obtained an associate degree (Coffey, 2022).

Wages in the ECE sector are relatively low compared to other occupations requiring similar levels of education and certification. As of 2025, the Bureau of Labor Statistics reports median wages for childcare workers were approximately $15.41 per hour, while preschool teachers earned around $17.85 per hour—both substantially lower than the median wage for kindergarten teachers with comparable credentials, who earned approximately 40 percent more annually (Bureau of Labor Statistics (BLS), 2025a, 2025b). The combination of low wages and limited benefits contributes to annual turnover rates of 14.9 percent in the child-care market—about 65 percent

higher than turnover in the median occupation and 75 percent higher than turnover among kindergarten teachers—creating instability for both workers and the children they serve (Fee, 2024).

The COVID-19 pandemic exacerbated longstanding workforce challenges in the ECE sector. Between February 2020 and April 2020, ECE employment fell more than 30 percent, and the industry is still recovering (CEA, 2023b). This workforce collapse, combined with increasing demand for ECE services as parents returned to work and states expanded public pre-K programs, has created acute labor shortages. In a 2024 survey conducted by the National Association for the Education of Young Children (NAEYC), 68 percent of directors of childcare facilities reported having significant vacancies within their program (NAEYC, 2024). This problem is further exacerbated by employers reporting difficulty filling positions and longer time-to-hire periods (Khattar and Coffey, 2023), conditions that lend themselves especially well to innovative policy solutions such as CCB program introductions.

The introduction of CCB programs in the ECE field are particularly well-timed given the shifting credential requirements for early childhood educators over the past two decades. The professionalization movement—which has seen federal and state policies increasingly mandate bachelor's degree attainment—gained significant momentum with the 2007 reauthorization of the Head Start Act, which required that at least 50 percent of Head Start teachers hold a bachelor's degree in ECE or a related field by the end of 2013 (U.S. Congress, 2007). What started as national legislation, however, proved tractable across states, with a 2020 National Institute for Early Education Research report finding that as of 2018, 78 percent of state-funded public preschool programs required teachers to hold at least a bachelor's degree alongside their teaching certification (Friedman-Krauss et al, 2020). The demand for bachelor's degrees in the field has contributed to the tightness of the labor market and could potentially create an important pay gradient by educational attainment. This policy landscape makes bachelor's degree accessibility in ECE particularly consequential for workforce equity and economic mobility.

## III. EXPERIMENTAL DESIGN DETAILS

We examine the labor market value of CCB degrees by tracking employer responses to fictitious resumes, where we randomize applicant's educational credentials along with a variety of other applicant characteristics in line with prior work (e.g., Riach and Rich, 2002; Bertrand and

Mullainathan, 2004; Boyd-Swan and Herbst, 2018; Hinrichs, 2021). In this section, we describe in detail the study setting, resume construction, and provide an overview of our experimental procedures.

### *A. Pilot Study Setting and Job Posting Collection*

Our pilot focused on two ECE CCB programs and the returns to these degrees in their associated local labor markets. While the two programs themselves were *similar,* they were situated in geographically *unique* labor markets. Although both Texas and Washington introduced CCB legislation nearly 20 years ago, Washington offers more than triple the number of CCB programs. The concentration of CCB degrees in local labor markets in Washington may result in higher levels of familiarity with these degrees across employers. In both states, however, the ECE CCB is relatively new. These conditions allow us to understand the value of a truly "new" credential in the eyes of employers across settings that vary in general familiarity with CCBs. Our post-experiment employer survey, described below, further explores employers' recognition and understanding of these degrees.

We submitted resumes to jobs located in the largest metropolitan area in each state near the selected CCB institutions. We initially focused on jobs in a 25-mile radius around the city in question; in Week 5, we expanded our search radius to 35 miles around the city to maximize the number of postings available. Our postings collection occurred once per week at the beginning of the week (Sunday night through Monday afternoon). To collect postings, our stellar research assistants (RAs) searched two large, commonly used job posting websites using the keyword phrase "early childhood education." The RAs then recorded every available job posting, collecting all available information (focusing on job title, employer name, location, salary, and benefits information) for each posting.[5]

Once collected, the job postings were fed into our resume randomizer program (described in more detail below). This resume randomizer program searched for (1) duplicate postings across weeks (using employer name and job title) and (2) duplicate employers across weeks. Duplicate postings across weeks were discarded (the first instance of each posting was kept), and duplicate employers across weeks were flagged such that employers did not receive multiple resumes with

[5] In addition to these standardized fields across postings, the RAs also collected any text that was included with the posting. These messages often included information about the job responsibilities and requirements not included in standardized fields. There is potential for future analysis using these text data.

the same applicant profile information (name, email, phone number), but different work histories. The construction of these resume features is discussed in more detail below.

### *B. Resume Construction – Applicant Profiles*

The names on resumes were chosen so that job applicants would vary in terms of signaled race and ethnicity. As ECE is a female-dominated field, we chose names that uniformly signaled female-identifying applicants (Evangelist et al., 2025). We used Census Bureau data to identify common first names for each racial and ethnic group represented in our study: Black, Hispanic, and White. We selected 10 first- and last-name combinations within the 25 most relatively common female names for each race and ethnicity group. In light of research from Fryer and Levitt (2004), we avoided using names, especially for Black applicants, that are more commonly given to children from lower socioeconomic households, including names used as examples in Fryer and Levitt (2004), which could confound the effect of race with perceived socioeconomic background.

We created separate email addresses and phone numbers for each of these 30 names in Texas and in Washington (i.e., we created 60 total email addresses and phone numbers). Where possible, email addresses were some combination of the applicant's first and last names and a randomly assigned birthdate.[6] If necessary, we also assigned a (random) middle initial for email generation (i.e., catalina.b.ortiz@gmail.com). Phone numbers for each labor market were selected to have the same geographically relevant area code. Profiles on job-posting websites were also created for each applicant (60 in total across Texas and Washington); no information apart from email and first and last name was saved in the profile. Importantly, when applying to jobs and creating applicant profiles, incognito windows were used so that the submitting RA's IP location could not be collected. This, we believed, help minimize risk of detection.

### *C. Construction – Work Histories*

We populated resumes with randomly selected combinations of actual work histories, relying on resumes posted online by real job seekers who had attended the group of institutions we study. To collect these job histories, we had the RAs search the online resume bank for each institution and record the individual work experiences of any individual who had graduated from an ECE program at one of these institutions. We split these work experiences into two types: relevant

[6] Birthdates were randomly assigned to make the applicants between 23 and 24 years old. Birthdates were not included on resumes but were used if requested in the job application.

experience and other service experience. Relevant experience was any work history that included work at an early childhood education center or work with young children. Other service experience were traditional entry-level jobs in retail or food service (i.e., Starbucks barista, retail worker at Best Buy, etc.). We include one of each type of experience, of similar length (i.e., one year), on each resume. From the resume bank we also collected short descriptions to accompany each job. We used these descriptions, along with similar descriptions generated by ChatGPT, to create comparable versions of these bullet-pointed job descriptions to accompany each job experience. We developed our own resume randomizer program to aid us in the randomization and collection of bullet points included with each service job and relevant job experience on the resumes.[7]

Ensuring the comparability of these work histories across applicants is incredibly important for the strength of the education signal, so for each resume, we drew from the same city-specific pool of work histories. Additionally, we structured work history such that each individual had similar years of work experience (within 1 year of difference) and all work histories only included post-high school employment. We set up resumes such that—with the exception of a program-mandated work experience—there were no new jobs listed after or during the college experience.

All six programs (i.e., two AA, two CCB, and two BA) we study require students to complete a mandatory "residency" program in which they participate in ECE-related work experience during their time in college. In order to maximize comparability of this experience while minimizing chance of detection, we listed that each of our applicants completed these experiences in an unspecified school in the nearest large, public school district.[8] We also varied the title of the work experience across applicants (for example, "Student Teaching Intern" versus "Classroom Intern"). Finally, we ensured that all applicants completed the student teaching experience in the Spring semester of their degree program (i.e., January-May 2025).

### *D. Other Resume Characteristics*

Our resumes also included information on high school attended and additional skills. Additional skills were of two types: required and non-required. Required skills were those that appeared on 90 percent or more of resumes viewed in the resume bank and that we deemed

[7] The resume randomizer program will soon be available through GitHub and/or J-PAL North America research resources.

[8] This choice of experience site was chosen after conversations with administrators at one of our focal colleges, who expressed that the nearby public-school districts were the most common place for students to complete their student teaching requirements.

"common" for individuals applying to ECE jobs in each state. These included: driver's license, first aid certification, and CPR (Cardiopulmonary Resuscitation) certification. All applicants had these skills listed in the skills portion of their resume. To minimize detection, we then included a randomly selected group of non-required skills to round out this skills section. These skills were also collected from the resume banks and included skills such as customer service, Microsoft Office, and computer literacy.

Moreover, the high school names listed on resumes were carefully selected as not to provide an unintended signal about socioeconomic status or academic performance of the applicant. We used National Center for Education Statistics data on local high school characteristics to specifically select high schools that were near-median performers in terms of aggregate state test scores and that were in near-median household income areas. In Texas, we further used administrative data from the University of Texas at Dallas Education Research Center (ERC) to identify high schools that were commonly attended by college students at our Texas focal community college. The three high schools chosen in each state were then double checked with authors that are familiar with each of the cities to ensure that the chosen high schools did not "stand out" in any way.

Lastly, we were also concerned about the formatting of resumes providing a basis for employer detection. To avoid this, our resume randomizer program randomized three key features of the resumes: font, spacing, and organization. Six common, similar fonts were chosen (i.e., Calibri, Times New Roman, etc.) and randomized across resumes. Ensuring that all resumes fit on only one page, the randomizer program also varied spacing and justification (centering the applicant's name, adding space between applicant email and the first section, etc.) in order to slightly alter the overall look of the resume. Finally, the organization of the resumes (e.g., whether education or work history was listed first) was also randomized. These features were randomized and the randomizer program standardized several key features (e.g., applicant name and information at the top of each resume). For the interested reader, Appendix A provides two resume examples used in the pilot study.

### *E. Resume Sending*

We had a large volume of postings available in the beginning of the summer, when many new graduates are entering the labor market and employers are seeking new talent. Figure 3 shows the

growth in cumulative postings over the course of the pilot submission period (beginning June 2025 and ending October 2025), which began to level off around Week 13 (after Labor Day). Note also that resume submissions did not keep pace with postings over the course of the submission period.[9] This is due to several factors, some of which were resolved over the course of submission and some of which were not. A major issue in the ECE submission space is the requirement of a Social Security Number (SSN) to apply for a position. Many jobs with public school districts require an SSN to apply. We did not submit any resumes to these positions. Additionally, over the course of the first two weeks, we encountered many job postings that required an applicant address and/or a cover letter. We ultimately generated a bank of both addresses and cover letters to be randomly used when required by the posting. The creation of both addresses and cover letters is discussed further in Appendix B. Note that these features were *only* included in the application when explicitly required by the job posting. In some cases, we did not submit resumes if the job posting expired between the time that it was collected and when an RA was available to apply.

Applications were sent to two types of jobs: those that require at most an associate degree (i.e., did not require a bachelor's degree), and those that require a bachelor's degree. When applying to jobs that did not require a bachelor's degree, RAs submitted three resumes that varied by degree type: an associate degree, a CCB, and a BA from a nearby open-access public four-year institution. When applying to jobs that required a bachelor's, we submitted only two resumes: a CCB, and BA from an open-access four-year (see Table 1). Among jobs to which we applied in this pilot study, only 13 percent of job postings that listed an education requirement listed a bachelor's degree as required (see Table 2 for descriptive statistics on job postings, which we discuss in more detail in section IV).[10] We believe a major factor in the relatively low education requirements is that we were not able to apply to public school positions, which typically required bachelor's, due to the requirement of a social security number on the application.

The RAs were assigned a group of job postings each week with associated randomized resumes to submit. Resumes were generated using our randomizer program. A specific set of resumes was generated for each recorded job posting. This set of resumes included 2-3 resumes (based on the

[9] Note that the totals here are at the job posting level, so the total submissions collapses 2-3 resumes submitted to a single job posting down to a single submission.

[10] In our full estimation sample (not conditional on listing an education requirement), only 8 percent of listings required a bachelor's degree.

educational requirement listed on the posting) of the *same* race and ethnicity.[11] The randomizer script ensured no profile overlap within employers week-to-week. The RAs were instructed to send all resumes to a single employer within one 5-hour window, but to leave at least 30 minutes between resume submissions to the same employer in order to minimize detection. We also collect data on submitting RA identity in order to test and control for any inadvertent submission strategy effects, but inclusion of submitting RA fixed effects does not impact results. Importantly, even if the RAs were submitting slightly differently, one RA submitted all resumes to a single job posting, so that any cross-RA differences in submissions would not undermine the randomization.

### *F. Employer and Hiring Manager Questionnaire*

After the conclusion of the audit study, we fielded an original survey of employers and hiring managers to better understand how they *perceive* and *evaluate* different postsecondary credentials, including CCBs (refer to Appendix C for the questionnaire). The survey was sent to email addresses that we collected from callbacks and job postings, such that it was received by the same individuals that likely encountered our resumes in the field (but they were not informed of the deception). Emails were sent roughly three months after conclusion of resume submissions, informing recipients that we are a research team conducting a study about hiring practices and education and asking them to complete a 10-minute survey in exchange for $25 in compensation.

The employer and hiring manager questionnaire collects detailed information about respondents' educational backgrounds, professional roles, and responsibilities in the hiring process (e.g., resume review, interviewing, and salary setting). We also ask if the employer uses AI tools in the resume screening process. Our questionnaire elicits employer evaluations of key resume characteristics such as degree type, institution attended, and field of study. A central module of the survey also presents a *vignette* in which respondents choose who to hire and assign starting salaries to three hypothetical, equally qualified candidates who differ only by credential: an associate degree from a local community college, a bachelor's degree from a community college, and a bachelor's degree from a four-year university. The survey concludes with a series of questions assessing respondents' awareness of community colleges offering bachelor's degree.

[11] Note that we randomize race and ethnicity across posting in order to minimize the number of resumes sent to each employer (i.e., to avoid sending 9 resumes to each employer (one for each race-education pair)).

The data collected from our survey, described further in section VI, provides an important interpretive complement to the resume audit experiment. While the audit design captures employers' revealed preferences in actual hiring behavior, the survey reveals their stated preferences, beliefs, and rationales. Together, these two data sources allow us to estimate not only the empirical labor market returns to CCB degrees, but also to illuminate the mechanisms underlying those outcomes.

## IV. MAIN EMPIRICAL APPROACH

The main outcome variable of interest for this study is interview request rates from employers. As a secondary outcome variable, we define a more general "callback" outcome, which includes any personalized communication from the employer, including both interview requests and requests for more information.[12] Whereas an interview request explicitly indicates the employer is moving ahead with the hiring process, many employers followed up with a request for more information (e.g., Would you be willing to commute *x* minutes?, Do you have any experience running a classroom?, etc.). Here, to avoid wasting an employer's time, we simply record the response as a request for information (which we consider a *positive* signal, but not as positive as an explicit interview request) and inform the employer that the applicant has accepted another position. Note that we use "callbacks" as shorthand for contact from the hiring employer, even though it usually an electronic communication (email or job posting platform message) rather than an actual call.[13]

We use these interview requests and callbacks as a signal of perceived value of the post-secondary degree in the local labor market. Given the experimental nature of the study, the assessment of results is largely straightforward: we compare interview request and callback rates across the different types of degrees to understand how CCB applicants are valued relative to associate degrees and traditional bachelor's degrees applicants from open-access public four-year institutions. Formally, the estimating equation takes the following general form:

$$Y_v = \alpha + \beta \cdot CCB + \gamma \cdot X' + \varepsilon_v \qquad (1)$$

[12] We do not include receipt of application emails or other automated emails that appear to be sent to all applicants as a "callback." We also do not include rejection messages.

[13] In the text analysis of employer callback messages, we further explore these three modes/channels of communications.

where $Y_v$ is an indicator variable for the two outcomes of interest: an interview request or a callback from the potential employer $v$. $CCB$ is an indicator variable equal to one when the resume submitted listed a CCB. We estimate equation (1) separately with each reference degree type (associate or traditional bachelor's). Thus, we present separate estimates of the CCB effect relative to associate and the CCB effect relative to traditional bachelor's degree. In the baseline results, we do not include covariates, but results are not sensitive to the inclusion of a vector of covariates $X'$ (e.g., fixed effects for job posting characteristics, submitting RA, and resume characteristics).

Lastly, we use the same specification with race-ethnicity subgroups to examine how differences in interview request rates across degree types interact with applicant race and ethnicity. We also conduct heterogeneity analyses along several job characteristics, including location, educational requirements, posted wages and salaries, and benefit provisions.

Table 2 reports the summary statistics of job postings for all collected postings, our estimation sample (i.e., job postings to which we submitted resumes), and our estimation sample separately by state. Overall, our estimation sample is representative of the broader set of all job posting that we collected. Note that we stopped collecting postings for public school positions after we realized that we would not be able to apply to any of them since they all required SSNs, so our collected postings may not be representative of the full ECE industry, especially in terms of required education. Nonetheless, Table 2 shows that apart from the public-school postings, the characteristics of the postings to which we were not able to apply did not differ significantly from the ones to which we applied.

Approximately 60 percent of our estimation sample comes from Texas, with the remainder coming from Washington. Most job postings either required only a high school degree or did not specify a required education level, with only 8 percent each listing an associate degree as required and another 8 percent listing a bachelor's as required. This is important context that should be kept in mind while interpreting our results. We believe the relatively low education requirements are specific to the ECE industry, and that our scaled-up audit study across more industries, launched summer 2026, will include a much larger fraction of job postings that require bachelor's degrees.

In terms of listed benefits, 33 percent of job postings advertised retirement benefits, 48 percent listed health insurance, and 41 percent listed dental insurance. Approximately 80 percent listed pay ranges, which averaged just under $20/hour. The third and fourth column of Table 2 reports job

posting characteristics separately by state. The most notable difference is in listed pay, likely because of minimum wage difference between Texas and Washington.

## V. MAIN RESULTS

### *A. Overall Results*

Figure 4 presents the raw callback rates across the three-degree credentials. Callback rates were relatively high overall: approximately 22-23 percent of applicants received an interview request, while an additional 10-13 percent received a request for more information, often accompanied by an indication that the employer was interested in scheduling an interview pending a response. Interview request and callback rates were broadly similar across all three-degree types, although CCB holders were slightly more likely to receive a callback than applicants with the other degree credentials.

Next, Figure 5 presents results from our main estimating equation for interview requests to applicants with CCB degrees relative to applicants with either an associate degree or a bachelor's from a traditional four-year institution. The top (red circle) is the estimated coefficient for CCB relative to AA holders, and the bottom (blue triangle) is the estimated coefficient for CCB relative to traditional BAs. The lines plot 95 percent confidence intervals for each estimated coefficient. Overall, we do not find any statistically or economically significant differences in interview requests between the three-degree credentials.

For CCB applicants relative to traditional bachelor's degree holders, we can rule out *negative* effects larger than 0.8 percentage points (3.7 percent of the baseline mean) for interview requests, suggesting that CCB holders may not be disadvantaged in this labor market. However, we also do not find evidence that CCB degree holders are being called back more often than associate degree holders and can rule out *positive* effects greater than 1.9 percentage points (6.3 percent of the baseline mean).[14] Results using callback as the outcome, shown in Appendix Figure E.1, are statistically insignificant and broadly consistent with the interview request results, albeit with slightly higher point estimates.

[14] Note also that we fail to reject that all three-degree credentials are equal, as well as the pairwise difference of associate and traditional bachelor's holders. This latter result is consistent with an earlier resume audit study conducted in the ECE market in 2016, which finds that traditional bachelor's degree holders are no more likely to receive an interview request than associate degree holders Boyd-Swan and Herbst (2018).

There are several reasons why we might not see reduced interview request or callback rates for associate and CCB holders relative to traditional bachelor's degree holders. As discussed earlier, we could not apply to job postings in the public school district because they asked for SSNs. As a result, most of the job postings that we applied to did not require a bachelor's degree (see Table 2 for the frequencies of listed education requirements in job postings). Thus, employers in our sample may have thought that they would have a better chance of hiring someone with an associate or CCB degree (i.e., higher expected yield) or might not be willing to pay the market rate for bachelor's degree holders. This could be amplified by the fact that the early childhood education market is a very *tight* labor market (Khattar and Coffey, 2023). This sentiment was expressed in our employer survey, the results of which we describe in more detail in Section VI. One possibility is that employers who request interviews from any of our applicants are contacting all of them. However, Figure 6, which collapses data to the job posting level and shows the total number of applicants contacted for an interview for each job posting, shows that employers who contacted our applicants are approximately evenly spread across contacting one, two, or three of our applicants.[15]

To explore the impact of bachelor's degree requirements on our results, we separately estimate interview request rate differences between CCB and traditional bachelor's degree holders among the subset of job postings that explicitly required a BA. Figure 7 presents those results. While the point estimates are negative for CCB degree holders, the confidence intervals are wide—reflecting the relatively small sample size—and include effects ranging from negative impacts of up to 7.3 percentage points to positive impacts of up to 5.6 percentage points for interview requests. However, we anticipate being able to estimate these effects much more precisely in the scaled-up study, where we expect to apply to a substantially larger number of positions requiring a bachelor's degree.

Lastly, our main results are robust to the inclusion of a large host of control variables. In Table 3 we iteratively add sets of covariates to examine how it impacts the estimated effects of CCBs relative to traditional bachelor's (Panel A) and associate degrees (Panel B), respectively. The first

[15] Along job postings where employers extended an interview request to the BA applicant, 68 percent of them also requested an interview with the CCB holder and 63 percent also requested an interview with AA the holder. Along job postings where employers extended an interview request to the AA applicant, 67 percent of them also requested an interview with the CCB holder and 60 percent also requested an interview with the BA holder. This suggests that employers may see CCB degrees as a "middle" credential between AAs and traditional BAs.

column of each table represents our baseline model without covariates. The second column additionally includes controls for the name of the applicant (and its implied race or ethnicity), the third column adds controls for the applicant's high school of attendance and high school graduation year, the fourth column adds fixed effects for work experience and skills included on the resume, the fifth column controls for the education requirement posted in the job posting, the sixth column includes the week of submission and platform (i.e., Indeed or ZipRecruiter) of the job posting, the seventh column includes fixed effects for the RA responsible for the submissions, the eight column controls for location (i.e., state: Texas), the ninth column controls for whether the posting advertises health insurance, dental insurance, and/or retirement benefits, and the final column controls for hourly pay (of jobs that included wage/salary information). As shown across all columns in Table 3, the coefficients remain stable across all regression specifications.

### *B. Heterogenous Results: Race-Ethnicity and Job Characteristics*

Given results of prior audit studies which find discrimination against underrepresented minority applicants and the over-representation of Black and Hispanic women in the ECE workforce, we are interested in whether the impacts of degree type on callbacks may vary across race and ethnicity. We also explore heterogeneity by state (i.e., Texas or Washington), whether job posting advertised any benefits, and posted hourly pay. Overall, we do not find any meaningful differences along any of these dimensions. However, we caution that our power for detecting heterogenous effects in our pilot study is limited and we anticipate being able to explore these dimensions more in the full study.

Figure 8 presents heterogeneity in interview request rates by applicant race and ethnicity. Across White, Black, and Hispanic applicants, the estimated differences between CCB holders and applicants with either associate or traditional bachelor's degrees are generally small in magnitude and are statistically insignificant in all cases. For Hispanic applicants, the point estimates are somewhat more positive relative to associate degree holders, though these estimates remain imprecise. Overall, the findings provide little evidence that the labor market value of CCB credentials differs systematically by race and ethnicity within the ECE sector.

Figure 9 reports on the heterogeneity in interview request rates by location, comparing results between Texas and Washington. Despite the differences in the policy landscapes between the states and the larger proliferation of CCB programs in Washington, the point estimates are nearly

identical, implying that we do not detect any evidence of meaningful geographic variation in employer responses to CCB credentials across the two labor markets.

Figure 10 presents the heterogeneity in interview request rates by hourly pay among the set of job postings that listed some form of expected pay. Job postings that listed pay in terms of salary were converted to hourly pay assuming full-time, full-year employment. When job postings listed a range of pay, we use the midpoint of the range. Because the average pay differs significantly between Texas and Washington (see Table 2), we create an indicator for this hourly pay being above or below the median of our sample within state. Once again, no statistically significant differences emerge.

Finally, Figure 11 examines heterogeneity in callback rates by whether job postings advertised any benefits (i.e., health insurance, dental insurance, and/or retirement benefits). There is a meaningful difference in the point estimates for CCBs relative to AAs, with CCBs exhibiting a 2-percentage point *advantage* in jobs with benefits, but a 2-percentage point *disadvantage* in jobs without listed benefits. However, the estimates are not statistically different from one another, nor are they statistically different from zero.

Taken together, the heterogeneity analyses suggest that employer responses to CCB credentials in the ECE labor market are broadly similar across demographic groups, geographic regions, and job characteristics. Across race-ethnicity, location, hourly pay, and benefit offerings, we find little evidence of statistically or economically significant differences in callback rates between CCB holders and applicants with either associate or traditional bachelor's degrees. In appendix figures E2-E6, we produce analogous figures using the more general "callback' as an outcome instead of interview requests. Results are broadly similar; nearly all subgroup estimates are statistically insignificant and the estimates across each dimension of heterogeneity are not statistically difference from each other. While we caution drawing too much from the heterogeneity analyses given the limited statistical power of the pilot study, the findings suggest that the null results we estimate in our main analysis are broad-based across our sample. At the same time, the scaled-up study will allow for substantially more precise estimates and a deeper examination of whether employer perceptions of CCB degrees vary across labor market contexts and applicant characteristics.

## VI. SURVEY RESULTS: EMPLOYERS AND HIRING MANAGERS

To complement the revealed preference evidence from the audit study, we supplement our analysis with results from a survey of ECE employers and hiring managers. During the resume submission process, we collected the email addresses (when available) of employers whose job postings we applied to with fictitious resumes. Several months after we concluded resume submission, we emailed these employers with the opportunity to complete a survey on ECE hiring practices (a 10-minute Qualtrics survey). Individuals who completed the survey were compensated $25 for their time.[16] A total of 70 employer and hiring managers (12 percent response rate) were collected. While the response rate is low and these survey results should be interpreted as suggestive given the relatively small sample size, nonetheless, several interesting patterns emerge that underscore potential mechanisms at play in the ECE labor market.

First, employer and hiring managers (hereafter referred to as hiring managers) are a relatively educated group: roughly 86 percent hold a degree above a high school diploma, with 27 percent holding a BA, 22 percent holding an associate degree, and 37 percent holding a graduate degree of some sort.[17] This breakdown suggests that many hiring managers are themselves credentialed to a level comparable to or above the applicants they are evaluating. The vast majority of hiring managers (80 percent) report that their employer does not use AI tools in the hiring process, with only 11 percent confirming AI use and the remaining 9 percent noting specific cases or uncertainty ("only if Indeed uses [AI tools]"). Although this is relevant context for interpreting the audit results, as it suggests that screening decisions in this sector are largely driven by human reviewers, we argue that even if AI screening tools were to influence our results, this would be an important result—rather than a methodological limitation—as these tools reflect "real-world" hiring practices that CCB graduates encounter.

When asked to rate the importance of various resume characteristics for an entry-level hire on a scale of 1 to 10, hiring managers ranked work experience highest by a substantial margin (mean of 7.7), followed by degree type (5.1) and major or field of study (4.7). The specific college or university attended was rated nearly irrelevant, with a mean score of just 2.0. This pattern is consistent with the ECE labor market's traditionally low post-secondary education requirements, favoring an emphasis on practical experience and skills. Moreover, open ended responses from

[16] Refer to Appendix C for the employer and hiring manager questionnaire.
[17] See Appendix Table E3 for the descriptive statistics discussed within this section.

hiring managers repeatedly emphasize experience, personality, and reliability as the primary drivers of hiring decisions. Illustrative of this sentiment, several hiring managers wrote:[18]

| Employer Type | Verbatim Quote |
|---|---|
| Private Religious | ***"I would hire the same someone who has a bachelor from a community college or university. It does not change anything for me. It would be based on the experience and personality of the person. However, I would privilege someone with a bachelor compared to an associate due to the knowledge and investment they put toward their education."*** |
| Private Secular | ***"A Bachelors degree is a Bachelor's degree. Only really look at school if it's their first job."*** |
| Private Secular | ***"I have hired many people for entry level at our early childhood center. Their degrees vary from associates through Masters, from community colleges through ivy league universities. For us it doesn't really matter where they came from or where they got their degree. We use their experience, abilities and past references to make our hiring decisions."*** |

As an important comparison to our audit study results, the survey also included a *vignette* in which hiring managers were asked to choose among three hypothetical applicants—Taylor (who has an AA), Alex (CCB), and Jordan (BA)—who were otherwise equally qualified for an entry-level ECE position and asked the hiring managers to assign them each hypothetical applicant a starting salary. Among respondents who made a hiring choice, Taylor (the AA holder) was selected most often, by 50 percent of hiring managers, followed by Jordan (the traditional BA holder) at 33 percent, with Alex (the CCB holder) selected by only 17 percent. At face value, this stated preference ordering appears to diverge from the revealed preference evidence in the audit, where CCB applicants appeared as likely to receive employer attention than either AA or traditional BA applicants. Importantly, however, unlike the audit experiment, employers were forced to choose just one applicant to hire in the survey vignette. This divergence between the survey and audit study may underscore the tightness of the ECE labor market, which causes real-world employers to call back applicants who may be less than their first choice.

Moreover, the open-ended survey responses provide some evidence of these patterns. A recurring theme across responses is that salary budgets in the ECE sector are severely constrained,

[18] See Appendix Table E4 for the complete set of open-ended responses to Question 16 of the survey.

and that degree level carries real cost implications for employers—even when they express indifference to credentials on principle. As one hiring manager respondent stated: ***"We typically do not hire many employees with BA degrees due to salary restrictions."*** Another hiring manager noted: ***"I DO NOT CARE WHERE THE DEGREE IS EARNED. I JUST NEED THE DEGREED TEACHER AND PRAY SHE WILL ACCEPT WHAT I AM ABLE TO PAY."*** This suggests a plausible mechanism underlying the audit results: employers in this market may be willing—or even prefer—to hire CCB and AA holders precisely because they offer a lower-cost alternative to traditional BA graduates. This possibility is consistent with tight labor market conditions in the ECE market and with the yield-based explanations discussed in the context of the audit results.

Responses to the vignette salary question further support this interpretation. Hiring managers were asked to estimate the starting salary they would offer to each of the three hypothetical candidates, regardless of who they hired. Hiring managers offer meaningfully lower salaries to Taylor (the AA holder) than to Jordan (the BA holder), with Alex (the CCB holder) receiving offers that fall between the two. Importantly, this wage gradient is consistent with our descriptive national earnings analysis (Acton ⓡ et al., 2026) and suggests that employers tend to perceive CCBs as an intermediate credential occupying a space between the associate and traditional bachelor's degrees. Taken together, these stated salary differentials may help explain the revealed behavior in the audit: if employers believe CCB and AA applicants will accept lower starting pay, they may be more likely to extend interview requests to these applicants precisely because they expect to be able to hire them.

Finally, one potential concern when CCB graduates enter the labor market is that employers may not be aware of exactly what the degrees are. This uncertainty could cause bias against applicants in favor of more established degrees. Although we don't see these patterns in the ECE labor market, the uncertainty or level of knowledge about these degrees is worth trying to better understand. In this spirit, the survey asked hiring managers what types of degrees are offered by community colleges in their area. Approximately 60 percent of them reported knowing that community colleges in their area offer bachelor's degrees—a level of awareness that is notably higher than we might have anticipated given the relatively recent introduction of CCB programs,

especially in Texas, but still leaves four in ten hiring managers *unaware* of this credential type.[19] This variation in employer and hiring manager awareness represents a potentially important mechanism for heterogeneity in the audit results, and one that we intend to explore more fully in the scaled-up audit study. The remaining 41 percent of hiring managers who were unaware that community colleges offer bachelor's degrees at the time of our study may have interpreted CCB credentials differently when they appeared on resumes, either discounting them or conflating them with more familiar credentials—a possibility that the ongoing scaled-up audit study, conducted across additional settings and labor markets, will allow us to examine more directly.

## VII. TEXT ANALYSIS: EMPLOYER CALLBACK MESSAGES

This section presents results from a text analysis of employer callback messages. We use these messages to provide additional insight into the findings from the resume audit experiment and to better understand whether employers communicate differently with applicants based on degree type conveyed in resumes. Specifically, the text analysis examines two related questions:

1. **Question-Asking** — Are employers more likely to ask questions or request additional information from CCB applicants relative to applicants with associate or traditional bachelor's degrees?
2. **Tone** — Does the tone, sentiment, or warmth of employer responses vary by degree type?

### *A. Data and Text Analysis Sample*

Of the 4,698 applications submitted, 1,610 (34.3 percent) received a callback containing non-empty text, which forms the analytic sample for this portion of the study.[20] It is worth noting here that callbacks arrived via email (64.9 percent), employer platform (24 percent), or phone (9.1 percent). Phone callbacks typically contain transcribed notes rather than verbatim text; our texts analysis treats all channels uniformly. Channel type is not expected to differ systematically by degree type; however, we conducted a robustness check on the type of callback channel and results are not affected by specific channel type.[21]

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[19] By comparison, 99 percent of hiring managers were aware that community colleges offered associate degrees, while 79 percent were aware that community colleges offered certificates.

[20] Two observations have missing race-ethnicity identifiers (both AA degree type); these are retained in degree-only specifications but excluded from race-interaction regressions.

[21] See Appendix D for a description of the text-analysis pre-analysis diagnostic checks. Appendix Table E2 summarizes the key diagnostic checks on selected outcomes.

### *B. Text Measures: Constructed Outcomes*

The text measures are constructed following Hassan, Hollander, Kalyani, van Lent, Schwedeler and Tahoun (2025), and Gentzkow, Kelly and Taddy (2019). All continuous measures use the *proportion-of-sentences* approach: rather than raw counts, we compute the share of sentences in a callback message that exhibit a given feature. This normalizes for message length. We construct two general themes of outcomes of interest: *question-asking* and *tonality*.

Specifically, to examine whether employers request additional information differently across degree credentials, we construct several measures capturing question-asking behavior and requests for credential verification within employer callback messages. First, *"Has question"* is a binary indicator equal to one if the message contains at least one question mark. We also construct *"Question exposure"*, defined as the proportion of sentences within a message that contains a question mark, allowing us to capture the relative intensity of employer questioning.

In addition, we develop two measures focused specifically on requests for supplemental applicant information or credential verification: *"Has info request"* is a binary indicator capturing whether a message contains phrases requesting additional documentation or clarification, while *"Info request exposure"* measures the proportion of sentences containing such language. These measures are based on a curated dictionary of credential-verification phrases commonly used by employers (e.g., "please provide" or "please send your transcript"). Importantly, we exclude routine scheduling language and assessment-related links from these measures to isolate requests that may reflect greater employer scrutiny or uncertainty regarding applicant qualifications.

Next, to examine differences in employer tone and sentiment, we construct several complementary text-based measures from employer callback messages. First, *"Sentiment (net, winsorized)"* captures overall word-level sentiment and is calculated as the difference between the number of positive and negative words divided by the total number of words in the message. Following the approach of Loughran and McDonald (2011), the measure is winsorized at the 1st and 99th percentiles to reduce the influence of extreme values. The underlying positive and negative word dictionaries were customized to reflect language commonly used in ECE hiring contexts.

We additionally construct sentence-level sentiment measures based on the approach developed by Hassan et al. (2025). Specifically, *"Sentiment positive exposure"* measures the share of

sentences containing positive language and no negative language, while *"Sentiment negative exposure"* measures the share of sentences containing negative language and no positive language. Comparing these sentence-level indicators with the word-level sentiment measure provides an internal robustness check across levels of textual aggregation. Finally, we construct *"Warmth exposure"*, defined as the proportion of sentences containing multi-word expressions signaling enthusiasm or interpersonal warmth, such as "looking forward to meeting you" or "great fit."

Table 4 reports descriptive statistics for the text-analysis sample, overall and by degree type, and all the constructed outcomes of interest. The sample is evenly distributed across degree types, with 547 CCB applicants, 517 AA applicants, and 546 traditional BA applicants. Approximately 62 percent of observations originate from Texas and 38 percent from Washington, and approximately 64 percent include an interview request.

Employers frequently included questions in their responses, with roughly one-third of callback messages containing at least one question and about 8 percent requesting additional information from applicants. Measures of sentiment and message structure are slightly different across degree credentials, providing preliminary evidence that employers may communicate with CCB, AA, and BA applicants in broadly comparable ways. Callback messages average approximately 71 words and five sentences in length, while between one-third and one-half of messages appear to contain standardized or template-based language.

Overall, the descriptive statistics suggest some similarity in employer communication patterns across educational credentials, motivating the subsequent regression analyses that formally test for differential treatment by degree type.

### *C. Regression Specifications*

The primary regression specification for the degree-type analysis is as follows:

$$Y_{ij} = \beta_0 + \beta_1 \cdot CCB_{ij} + \beta_2 \cdot AA_{ij} + \alpha_j + \varepsilon_{ij} \qquad (2)$$

where $Y_{ij}$ is one of the outcomes of interest (i.e., question-asking or tonality) for application *i* sent to job posting *j*, $\alpha_j$ is a job posting fixed effect, and standard errors are clustered by *j*. The reference degree category is BA throughout. All specifications include callback-channel controls (i.e., phone and platform indicators; email omitted) and are suppressed from all tables for brevity. The job fixed effects absorb all variation at the posting level (i.e., employer, job requirements, state, response templates), thus, the coefficients $\beta_1$ and $\beta_2$ are identified from within-posting comparisons. Each

posting receives one CCB, one AA, and one BA application, meaning degree-type differences are estimated holding the employer and posting constant.[22]

### *D. Results: Question-Asking and Information Requests*

Table 5 presents the estimates from equation (2) for the four question-asking and information-request outcomes for the pooled sample (Panel A) as well as separately by state (Panels B and C). As shown in Panel A, the coefficient on the CCB indicator for *"Has question"* is positive and marginally statistically significant (+0.019, $p < 0.10$), suggesting that CCB applicants are 1.9 percentage points more likely than traditional BA applicants to receive a callback message containing a question, conditional on callback channel. The corresponding coefficient for AA applicants is also positive, though smaller in magnitude (+0.015) and not statistically significant. Results for the information-request outcomes reveal a similar pattern. Specifically, the coefficient on "*Has info request"* for CCB applicants is positive and marginally significant (+0.009, $p < 0.10$), indicating a modest increase in the likelihood of receiving requests for additional information relative to BA applicants. In contrast, the continuous exposure measures, including *"Question exposure"* and *"Info request exposure"*, are substantively small and statistically close to zero, as shown in columns (2) and (4).[23]

Panels B and C further examine whether these patterns differ across Texas and Washington. In Texas (Panel B), the estimated effects for *"Has question"* and *"Question exposure"* are small and statistically insignificant for both CCB and AA applicants. However, CCB applicants are significantly more likely than traditional BA applicants to receive an information request (+0.017, $p < 0.05$), with a corresponding positive effect on *"Info request exposure"* (+0.004, $p < 0.05$). AA applicants in Texas exhibit a similar, though slightly weaker, pattern for "*Has info request"* (+0.020, $p < 0.10$). These findings suggest that employers in Texas may request additional documentation or clarification somewhat more frequently from applicants with nontraditional credentials. In contrast, results for Washington (Panel C) reveal little evidence of systematic

[22] Note that singleton postings (i.e., only one application in the text sample) are dropped because we include job fixed effects in this specification. As a result, 11.1 percent (178 observations) are excluded in this analysis (i.e., Tables 5, 6, and 7).

[23] We also examine a hand coded *"More info"* indicator constructed from approximately 960 manually coded callback messages capturing whether employers requested additional information from applicants. Analyses indicate that this behavior is overwhelmingly driven by employer- or posting-level practices rather than applicant characteristics, as evidenced by the extremely high intraclass correlation coefficient (ICC = 0.92)—a measure of the proportion of total variance in an outcome attributable to group-level (here, employer-level) clustering. This finding suggests that requests for additional information largely reflect standardized hiring procedures or recruitment pipelines used by employers, rather than differential scrutiny based on degree type.

differences in employer questioning behavior across degree types. Estimates for *"Has question"* and *"Question exposure"* are statistically insignificant and generally close to zero. The information-request measures are also substantively small, although coefficients for *"Info request exposure"* are slightly negative and marginally significant for both CCB and AA applicants. The relatively higher information request rates for CCBs being driven by Texas rather than Washington fits with the higher concentration of CCB programs in Washington.

### *E. Results: Sentiment and Warmth*

Table 6 reports the estimates for the four tone-related outcomes for the pooled sample (Panel A) and again separately by state (Panels B and C). In the pooled specification, the word-level sentiment measure, *"Sentiment (net, winsorized)"* (column (1)), reveals no statistically significant differences across degree types. Relative to traditional BA applicants, the estimated coefficients for CCB and AA applicants are both small and negative (CCB: −0.001, $p = 0.150$; AA: −0.001, $p = 0.221$). Similarly, the warmth measure shown in column (4) indicates no meaningful differences in the use of enthusiastic or interpersonally warm language across applicant groups.

In contrast, the sentence-level sentiment measures reveal more pronounced differences in employer communication patterns. As shown in column (2), callback messages sent to both CCB and AA applicants contain a significantly lower share of purely positive sentences relative to messages sent to traditional BA applicants (CCB: −0.012, $p < 0.05$; AA: −0.016, $p < 0.05$). Notably, this pattern is not detected by the word-level sentiment measure, suggesting that word-level approaches may obscure meaningful variation in tone within hiring communications. In ECE hiring contexts, polite rejection messages and enthusiastic interview invitations often rely on overlapping positive vocabulary, making sentence-level measures better suited to identifying differences in overall tone and affective framing.

Results for negative-sentence exposure (column (3)) further suggest that callback messages to AA applicants tend to adopt a more neutral or matter-of-fact tone relative to those sent to traditional BA applicants. Specifically, AA applicants receive significantly lower levels of negative-sentence exposure (−0.010, $p < 0.05$), whereas the corresponding estimate for CCB applicants is statistically insignificant. The difference between the AA and CCB coefficients is itself statistically significant at the 10% level in the full sample (F-test, $p = 0.060$). Overall, the findings indicate that while employers do not appear to communicate with markedly different levels of overt warmth across

degree types, subtle differences in sentence-level tone may nonetheless shape how applicants experience employer responses.

Panels B and C examine whether these tone-related patterns differ across Texas and Washington. In Texas, the sentence-level measures suggest somewhat less positive communication toward CCB and AA applicants relative to traditional BA applicants, alongside modestly higher levels of information-request language, consistent with earlier evidence that Texas employers may apply greater scrutiny to nontraditional credentials. In contrast, estimates for Washington are generally smaller in magnitude and less consistently estimated, with confidence intervals frequently overlapping zero. This difference may partly reflect both the smaller Washington sample and greater employer familiarity with CCB programs in that state. Overall, the results suggest that differences in employer tone and communication style are modest and context-dependent, with somewhat stronger evidence of differential communication patterns emerging in Texas than in Washington.

### *F. Callback Personalization: Are Employer Responses to CCB Applicants More Template-Based?*

A natural question arising from the question-asking and sentiment analyses is whether employers' lack of familiarity with CCBs may lead them to be less likely to send *generic* or *template-style* responses to CCB applicants relative to traditional BA applicants applying to the same job posting. To examine this possibility, we construct two within-job indicators capturing the extent to which callback messages appear standardized across applicants.

The first measure, *"Template, greeting stripped"* equals one if an applicant's callback message—after removing the personalized greeting (e.g., "Hi [Name]")—is identical to at least one other callback message sent within the same job posting. The second measure, *"Template, exact duplicate"*, applies the same logic to the full unedited text, identifying exact byte-for-byte duplicates across applicants. Both measures are estimated using the same specification as equation (2), including degree indicators, job fixed effects, and callback channel controls. We additionally examine message length using word count and sentence count as complementary indicators of message personalization.

As shown in Panel A of Table 7, the results provide little evidence that employers send more or less template-based responses to CCB applicants relative to BA applicants. The coefficients on both *"Template, greeting stripped"* and *"Template, exact duplicate"* are substantively close to

zero and statistically insignificant (−0.018 and +0.001, respectively). However, the third and fourth columns show that callback messages sent to CCB applicants are slightly longer than those sent to BA applicants (+2.9 words, $p < 0.05$) and contain marginally more sentences (+0.16, $p < 0.05$), consistent with a higher degree of question-asking or requesting more information. We also see differences for AA applicants. Relative to BA applicants within the same job posting, AA applicants are approximately 5 percentage points less likely to receive template-style responses under both measures and receive marginally longer messages in terms of sentence count. The gaps between AA and CCB applicants on the template measures are also statistically significant at conventional levels—F-tests reject equality of the two coefficients for both the greeting-stripped measure ($p = 0.050$) and the exact-duplicate measure ($p = 0.001$)—suggesting that AA applicants are less likely to receive a template response than their CCB peers. In contrast, the AA and CCB coefficients on sentence count are not statistically distinguishable from one another (F-test, $p = 0.322$).

Panels B and C examine whether these patterns differ across Texas and Washington. Consistent with the pooled results, there is little evidence in either state that CCB applicants are more likely than traditional BA applicants to receive template-style callback messages. In Texas, the estimated effects for CCB applicants on both the strict and loose template measures are small and statistically insignificant (−0.023 and +0.005, respectively), while message length and sentence count are also statistically indistinguishable from those of BA applicants. In Washington, the corresponding estimates are similarly close to zero (−0.003 and −0.004), providing further evidence that employers do not rely more heavily on standardized responses when communicating with CCB applicants. The more pronounced patterns continue to emerge among AA applicants. In Texas, AA applicants are significantly less likely than BA applicants to receive template-style responses under both the strict (−0.059, $p < 0.01$) and loose (−0.040, $p < 0.05$) measures. A similar, albeit somewhat weaker, pattern is observed in Washington, where AA applicants are less likely to receive exact-duplicate responses (−0.048, $p < 0.05$). Taken together, the state-specific results suggest that relative to BA applicants, employers do not communicate significantly differently with CCB applicants but seem less likely to send template-style responses to AA applicants.

Moreover, these findings are broadly consistent with the earlier sentiment analysis for AA applicants. Although callback messages sent to AA applicants exhibited lower levels of positive-sentence exposure, they also appeared more differentiated in content and less likely to rely on

template-style responses. One possible interpretation is that employers who compose more customized messages for AA applicants tend to adopt a more neutral or matter-of-fact communication style. However, the pilot study is not sufficiently powered to formally evaluate this mechanism. Future analyses using the full-scale study will permit a more rigorous examination of the relationship between message personalization, employer tone, and degree type.

In summary, the callback text analysis complements the audit-study findings by showing that employers not only call back CCB applicants at rates comparable to traditional BA applicants but also communicate with them in broadly similar ways. Across measures of question-asking, information requests, sentiment, warmth, and message personalization, we find little evidence that employers systematically differentiate between CCB and traditional BA applicants. While some evidence suggests that Texas employers are somewhat more likely to request additional credential-related information from CCB applicants, these differences are modest and do not extend to broader measures of sentiment, warmth, or the use of template-style responses. Overall, the text-analysis results provide additional evidence that CCB credentials are not systematically viewed as inferior to traditional bachelor's degrees in the ECE labor market, although employer perceptions may vary somewhat across labor market contexts and the maturity of state-level CCB systems.

## VIII. CCB PROGRAM AFFORDABILITY: NET PRICE VS. STICKER PRICE

An understudied dimension of any CCB program is the affordability concern of how the net price *compares* to the sticker price (i.e., published tuition and fees). As Turner (2026) documents for Washington State, two- and four-year institutions often differ substantially in their capacity to provide institutional grant aid, meaning that sticker price comparisons (as in Acton ⓡ et al., 2026) may systematically understate the true cost of these degrees for students. Four-year institutions, which tend to be better resourced, frequently offer merit- and need-based aid that drives net costs well below posted tuition rates. Community colleges, by contrast, typically have fewer discretionary dollars to devote to institutional aid, which can leave students facing costs that more closely track the sticker price. This resource disparity has the potential to invert the conventional wisdom that CCB programs provide a more financially accessible pathway to a bachelor's degree.

Hence, to examine how financial aid affects the affordability of CCB programs relative to traditional bachelor's degree pathways, we follow Turner (2026) and conduct a *net-price*

*simulation* using standardized student profiles. This approach applies representative student profiles to institution-specific net price calculators to estimate the total cost of attendance, grant aid, and resulting net price that students would face at different institutions.[24] The following subsection provides a detailed description of the simulation methodology.

### *A. Methodology: Net-Price Simulation Using Representative Student Profiles*

We construct four representative student profiles that represent common financial circumstances: (1) a dependent student from a low-income family (approximately 100 percent of the federal poverty line [FPL]), (2) a dependent student from a middle-income family (approximately 250 percent of the FPL), (3) a dependent student from a high-income family (approximately 500 percent of the FPL), and (4) an independent student working part time. Across all student profiles, we hold family size, number of dependents enrolled in college, age, and marital status constant to ensure that differences in estimated aid packages were driven primarily by income and dependency status.[25]

Next, each profile was entered into the net price calculator maintained by every two-year and four-year institution included in the study sample. For each institution-profile combination, we recorded the estimated total cost of attendance (COA), including tuition and fees, books and supplies, and living expenses, as well as the estimated amount of grant aid. Net price was calculated as the difference between total COA and estimated grant aid. All profiles were assumed to qualify for in-state tuition.

Lastly, to facilitate comparability across institution types, the primary analysis assumes that students reside off campus rather than in institution-operated housing. This assumption avoids confounding differences in housing availability and pricing between two-year and four-year institutions. As a robustness check, Appendix Table E1 separately reports estimates under alternative living arrangements, including living with parents or at home.[26]

Our net-price simulation approach is intended to illustrate how institutional aid policies affect affordability for otherwise similar students. Unlike sticker-price comparisons, which rely solely

[24] The Higher Education Opportunity Act of 2008 requires all Title IV eligible institutions to make available a net price calculator to prospective students. We access these net price calculators via institution websites.
[25] The following characteristics are held constant across all four student profiles: family size (N = 4), number of dependents enrolled in college (N = 1), age (i.e., 18), and marital status (not married).
[26] Refer to Appendix Table E1 for a detailed breakdown of costs and aid, separately by living arrangement (i.e., living alone or with roommates off campus versus living with parents or at home) and institutional location (i.e., state). The results shown in the appendix table do not differ qualitatively from those reported in Table 9.

on published tuition and fee schedules, net price calculations incorporate institutional, state, and federal grant aid. Consequently, this methodology provides a more realistic assessment of the costs that students are likely to face when choosing between a CCB program at a two-year institution and a traditional bachelor's degree program at a four-year institution.

Several limitations should be noted. Net price calculators generate estimates rather than actual financial aid awards and may not fully capture the complexity of institutional aid policies. In addition, because most community college net price calculators are designed around associate-degree programs, they may understate the costs associated with upper-division CCB coursework. Thus, the resulting estimates reported in the next sub-section should therefore be interpreted as illustrative approximations rather than precise predictions of student-level costs.

### *B. Results: Net Price Simulation*

Figure 12 and Table 8 summarize the results of the net-price simulation for the four representative student profiles. Each bar in Figure 12 represents the average estimated annual net cost across all two-year (light gray) and four-year (navy) institutions in our sample for a given student profile. To ensure comparability across institution types, all estimates assume students live off campus rather than in university housing.

These results reinforce Turner's (2026) core finding: sticker-price comparisons substantially *overstate* the *cost advantage* of community colleges relative to four-year institutions. Although four-year institutions in our sample have higher total costs of attendance across all student profiles, institutional and state grant aid substantially narrows the gap in net prices for many students. For a low-income student (100% FPL), the estimated annual net price is $17,889 at a two-year institution offering a CCB program, compared with $18,185 at a four-year institution—a difference of only $296. A similar small gap emerges for the independent student profile, for whom the estimated annual net price is $17,889 at two-year institutions and $18,185 at four-year institutions. For middle-income students (250% FPL), however, the net price advantage shifts in favor of four-year institutions, with estimated net prices of $25,466 at two-year institutions and $18,267 at four-year institutions, a difference of $7,200. In contrast, among high-income students (500% FPL), grant aid is substantially lower, causing net prices to more closely reflect underlying sticker-price differences. For these students, the estimated net price is $26,148 at a two-year institution compared with $32,284 at a four-year institution, yielding a gap of $6,136 in favor of

the CCB pathway. Taken together, these results suggest that the affordability advantage of CCB programs is concentrated among higher-income students, whereas for low- and middle-income students the greater availability of grant aid at four-year institutions substantially narrows—and in some cases reverses—the apparent cost advantage implied by published tuition and fee schedules alone.

Two additional considerations suggest that the estimates reported above may understate the relative affordability challenges faced by CCB students. First, as Turner (2026) notes, the net price calculators offered by most community colleges are calibrated to the cost structure of associate-degree programs. Tuition and fees for CCB programs, which include upper-division coursework, can exceed the AA-level costs on which these calculator estimates are based (see Acton ⓡ et al., 2026, and Meza and Pawlicki, 2025 for breakdowns of pricing structures across states).[27] Consequently, the averages reported in Figure 12 and Table 8 represent a lower bound on the net cost faced by CCB students. Second, four-year institutions may be better positioned to target institutional aid toward students with demonstrated financial need. To the extent that aid packages at four-year institutions are more responsive to financial circumstances, net price comparisons based on standardized student profiles may understate the affordability advantages available to some low-income students.

Taken together, this evidence, while necessarily limited by the individualized nature of financial aid determination, suggests that sticker-price comparisons provide an incomplete picture of CCB affordability. The net-price simulation demonstrates that institutional and state grant aid can substantially alter students' actual costs and, in some cases, reverse the affordability rankings implied by published tuition and fee schedules alone. Consequently, policymakers and prospective students should focus on net, rather than listed, prices when evaluating the affordability and cost-effectiveness of this pathway to a bachelor's degree.

## IX. CONCLUDING REMARKS

As the labor market returns to a bachelor's degree have grown and employer demand for credentialed workers continues to rise, ensuring access to bachelor's degrees has become an

[27] Specifically, Acton ⓡ et al. (2026) identify two common pricing structures in CCB programs: a *constant structure*, in which tuition remains the same across lower- and upper-division coursework, and an *escalating structure*, in which upper-division courses are priced at higher rates.

increasingly important policy concern. Community college baccalaureate degrees represent one solution to this challenge, leveraging the geographic, financial, and academic accessibility of community colleges to deliver a bachelor's degree without requiring students to navigate the transfer process. Yet the promise of CCBs as a mechanism for closing attainment and earnings gaps hinges critically on whether employers recognize and value them. Our pilot study provides the first causal evidence on how employers value CCB degrees.

Using a resume audit study in early childhood education labor markets of Texas and Washington, we find no evidence that employers systematically discount CCB degrees relative to traditional bachelor's degrees. Relative to traditional bachelor's degree holders, we can rule out negative effects larger than 0.8 percentage points (3.7 percent of the baseline mean) for interview requests. Simultaneously, we do not find evidence that employers favor CCB degrees relative to associate degrees and rule out positive effects greater than 1.9 percentage points (6.3 percent of the baseline mean). These estimates are robust to the iterative inclusion of controls for applicant characteristics, resume features, job posting characteristics, and research assistant fixed effects.

Our employer survey results provide important interpretive context for these findings. ECE employers in our sample rate work experience as by far the most important resume characteristic for entry-level hiring, with degree type and field of study ranked considerably lower and the specific institution attended rated as nearly irrelevant. Taken together, these patterns are consistent with a labor market that is both extremely tight and highly constrained by salary budgets—conditions under which employers may be willing, or even prefer, to hire CCB and AA holders who offer comparable credentials at a lower expected cost. This interpretation is further supported by the salary gradient observed in the survey vignette, in which respondents offered CCB holders starting salaries between those of AA and traditional BA holders—a pattern consistent with our descriptive national earnings analysis Acton ⓡ et al. (2026). Complementary evidence from the callback text analysis and net-price simulation points in a similar direction. We find little evidence that employers communicate differently with CCB applicants than with traditional BA applicants, while the net-price simulation suggests that the affordability advantages of CCB pathways are more nuanced than sticker-price comparisons alone imply.

Several important caveats apply. Our ECE pilot study is necessarily limited in scope, focusing on a single field of study in two labor markets over a 17-week submission window. ECE is characterized by specific features, including persistent labor shortages, constrained salary budgets,

and relatively low education requirements, that may not generalize to other industries or settings in which CCBs are offered, such as business, information technology, or healthcare. Additionally, our study speaks to employer callback behavior rather than to the wages that CCB graduates ultimately earn, and these may reflect distinct margins of employer response. The extent to which employer responses to CCB credentials vary across applicant demographic characteristics also remains an important open question. Although we do not detect statistically significant heterogeneity across racial-ethnic groups in this pilot study, our power to detect such effects is limited.

We are currently conducting a large-scale follow-up audit study that will address many of these limitations directly. By extending the analysis to additional fields of study and labor markets that vary in CCB program saturation and employer familiarity, the larger study will provide a more comprehensive assessment of how employers value CCB degrees across diverse occupational and geographic contexts. It will also enable substantially richer analyses of heterogeneity by field of study, labor market, employer characteristics, and applicant demographics. Nonetheless, the findings from this pilot study provide an important early signal that CCB graduates are not systematically penalized in the ECE labor market, suggesting that employers may not discount this relatively new credential. As the CCB policy landscape continues to expand, understanding how employers value these degrees—and how that valuation compares to traditional bachelor's and associate degrees—will be essential for assessing whether CCB programs can fulfill their promise of broadening access to bachelor's degree attainment and economic opportunity.

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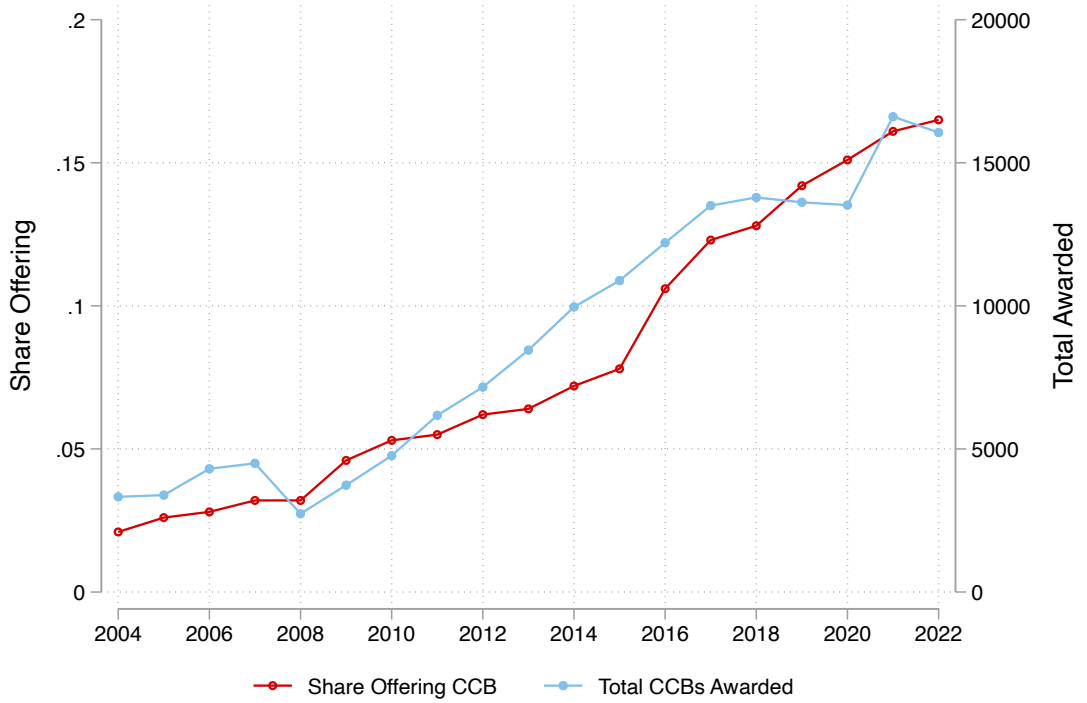
Wilburn, C. (2025). Texas community college bachelor's degree programs are booming. Why aren't more students enrolling? *Kinder Institute for Urban Research.*

Zimmerman, S. D. (2014). The returns to college admission for academically marginal students. *Journal of Labor Economics, 32*(4), 711–754.

Zhu, Z. (2023). Discrimination against community college transfer students: Evidence from a labor market audit study. *Economics of Education Review, 97*, 102482.

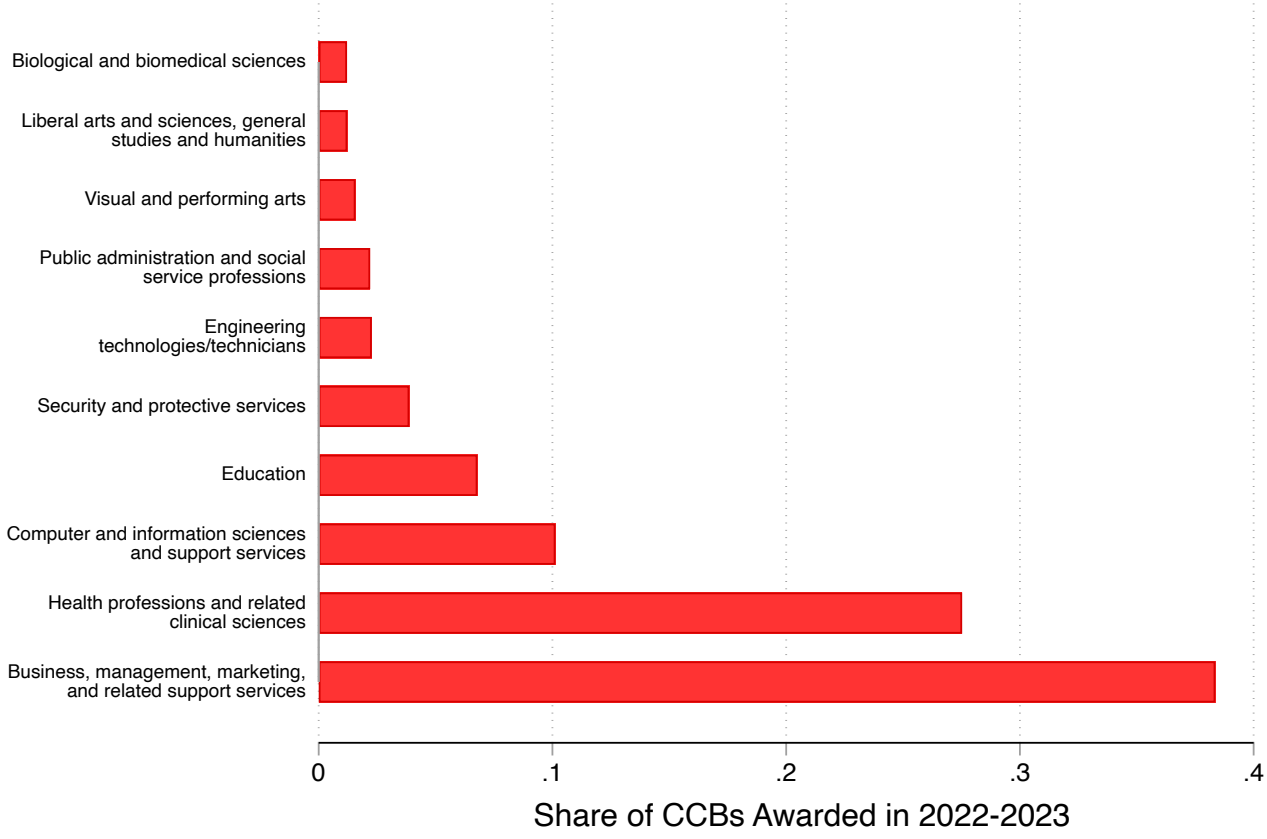
# FIGURES AND TABLES

**Figure 1. Share of Community Colleges Awarding CCBs and Total Number Awarded**



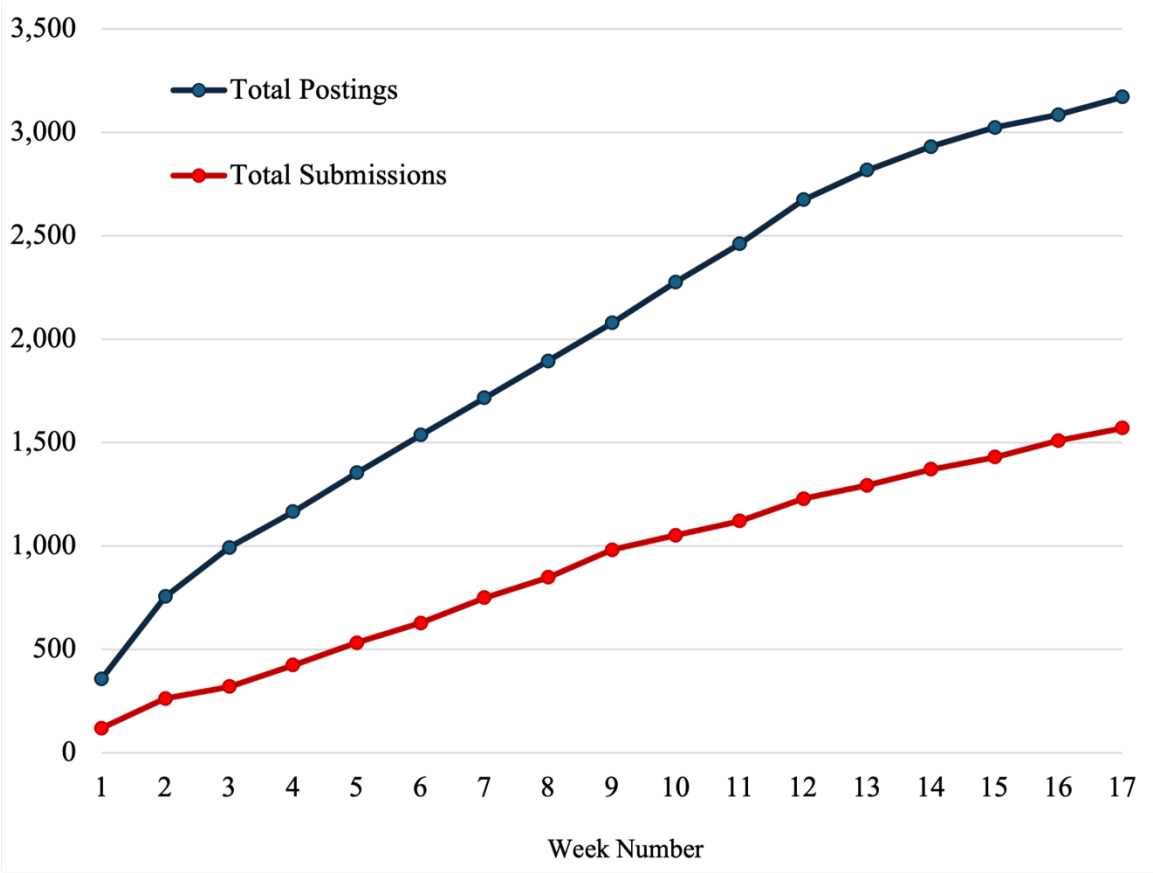

***Notes:*** Author's tabulations using data from the Integrated Postsecondary Education Data System (IPEDS) to plot the share of community colleges (defined as public postsecondary institutions that predominantly award degrees and certificates below the bachelor's degree level) offering bachelor's degrees and the total number of community college baccalaureates (CCBs) awarded between the 2004 and 2022 academic years.

**Figure 2. Share of Community College Baccalaureates (CCBs) Awarded by Field of Study**



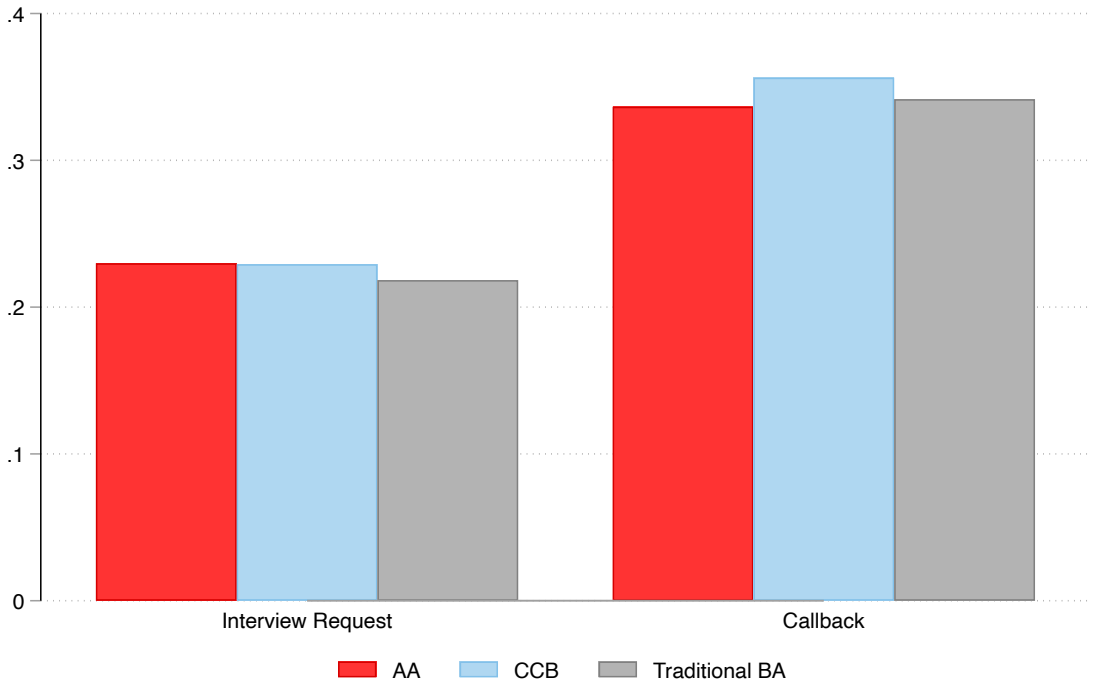

***Notes:*** Author's tabulations using data from the Integrated Postsecondary Education Data System (IPEDS), degrees are considered community college baccalaureates (CCBs) if they are bachelor's degrees awarded by an institution that predominantly awards associate degrees. Share of CCBs awarded in academic year 2022-2023 by field of study using the Classification of Instructional Programs (CIP) codes. Fields of study with less than 1 percent of the share of total awards are excluded.

**Figure 3. Total Postings vs. Total Submissions**



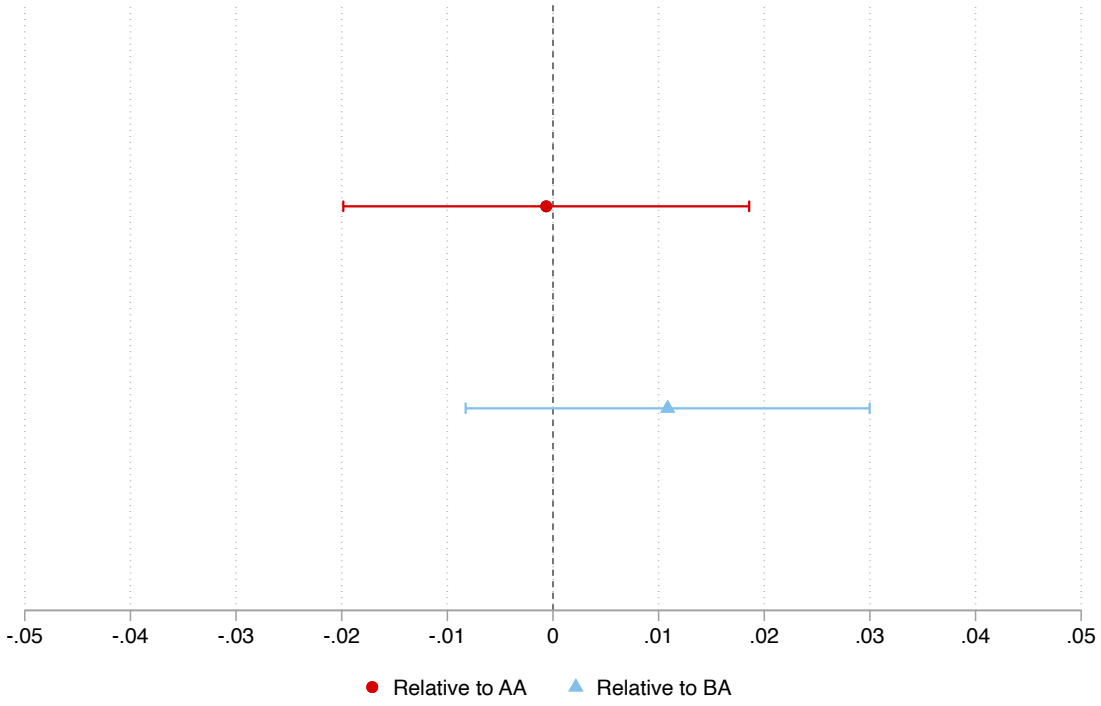

***Notes:*** Total job postings collected versus total postings with completed submissions are plotted. Each submission consists of 2-3 resumes, thus submission in this case simply refers to a completed submission set for each posting.

**Figure 4. Callback Rates Across Degree Credentials**



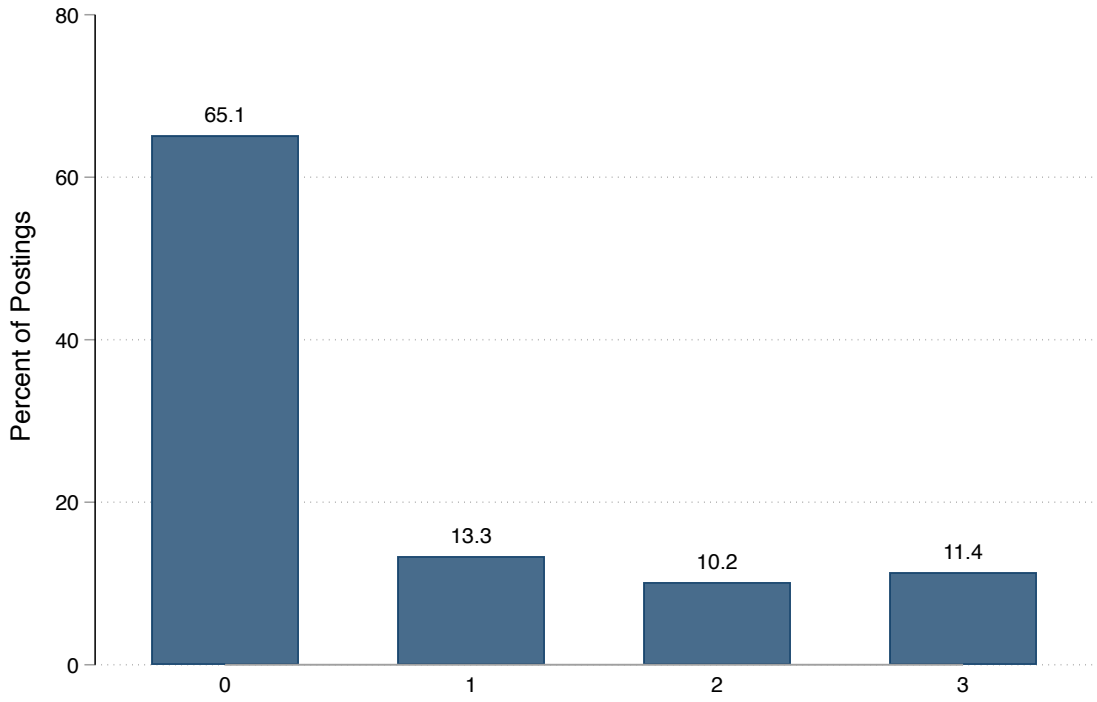

***Notes:*** This figure plots the share of resume submissions that received an interview request or a callback (i.e., any personalized follow-up from employer including a request for more information), across degree credentials.

**Figure 5. Interview Requests Results:**
**CCB Degrees Relative to Associate and Traditional Bachelor's**



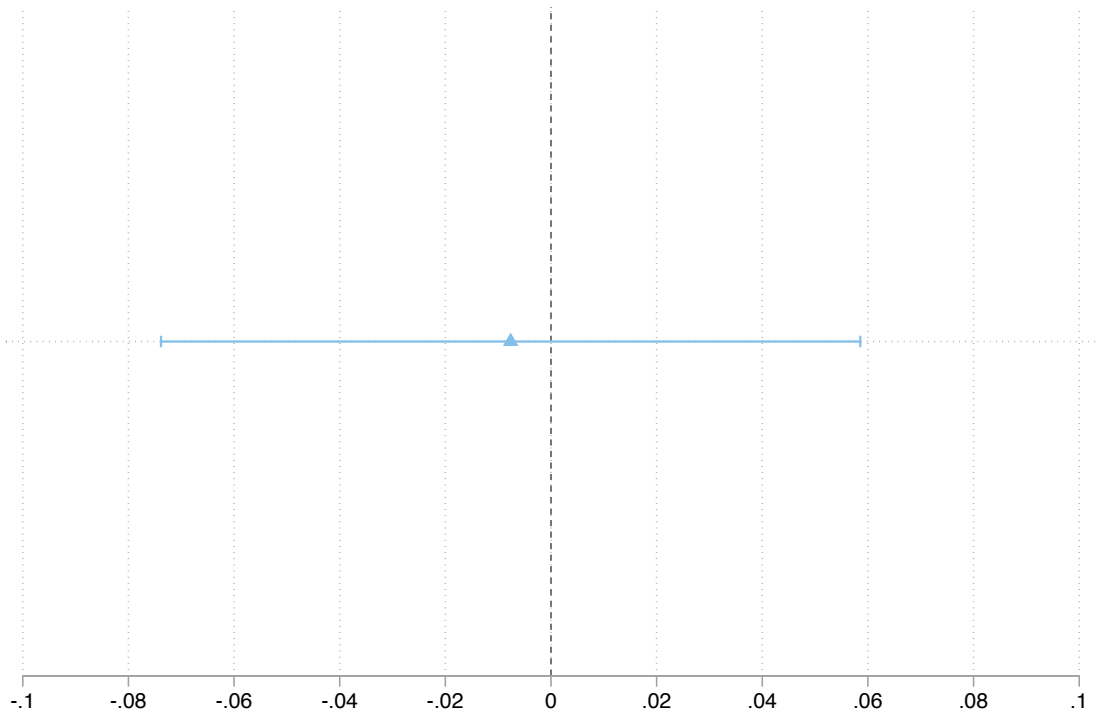

***Notes:*** This figure plots the estimated effects of resumes including CCB degrees on interview request rates from equation (1) without covariates or fixed effects, where the red circles are relative to resumes with associate degree and the blue triangles are relative to resumes with traditional bachelor's degrees. The horizontal lines represent 95% confidence intervals. We cluster standard errors at the job ad level.

## Figure 6. Number of Interview Requests Per Job Posting



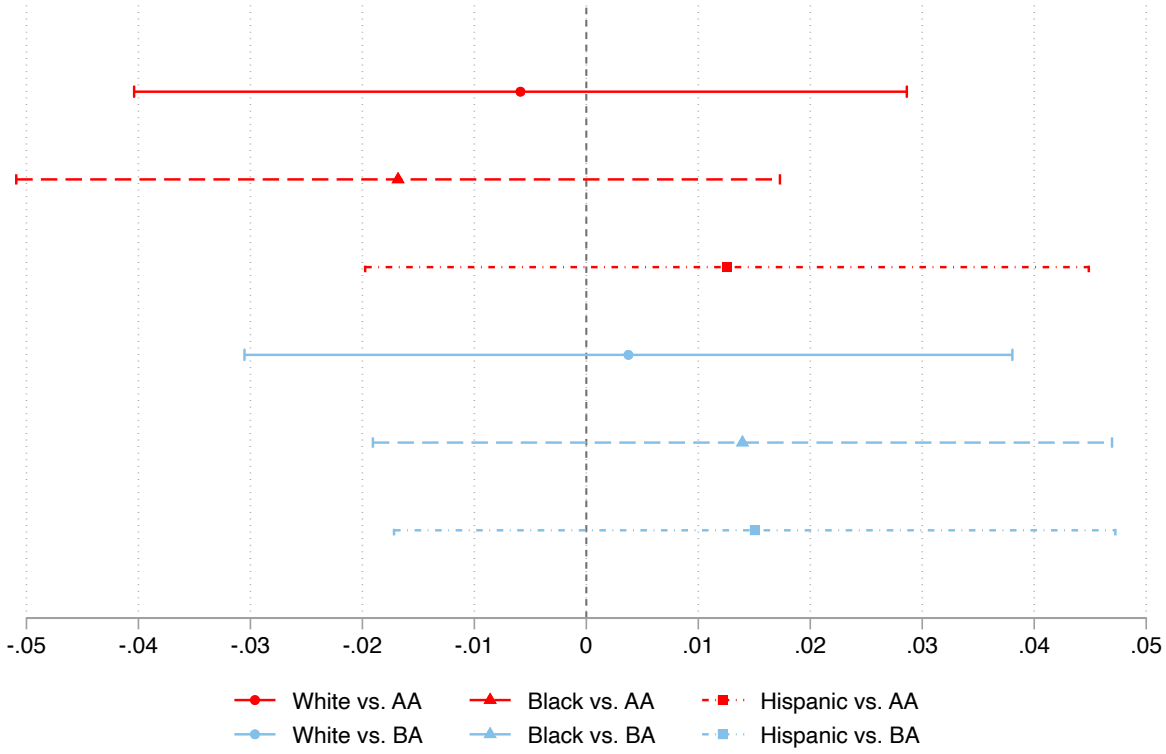

***Notes:*** Observations at the job posting level. This figure plots the share of job postings in which the employer requests an interview from 0, 1, 2, or 3 of our fictitious applicants.

**Figure 7. Interview Request Results for Job Postings Requiring a Bachelor's Degree**



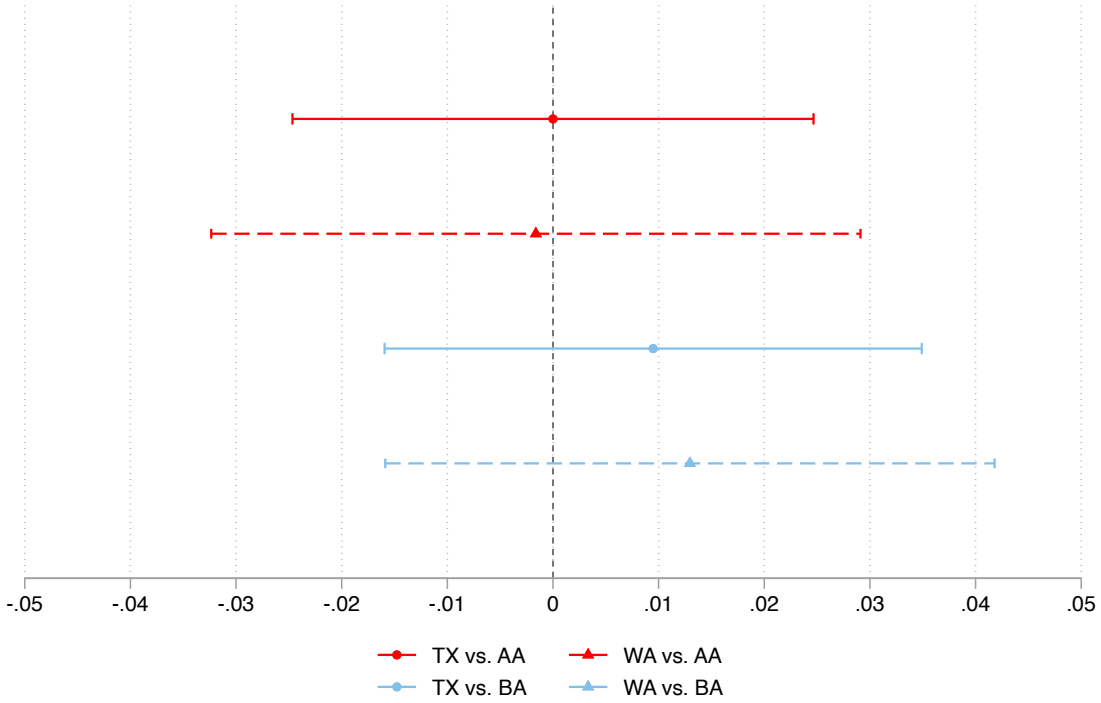

***Notes:*** This figure plots the estimated effects of resumes including CCB degrees on interview request rates from equation (1) without covariates or fixed effects, relative to resumes with traditional bachelor's degrees. The horizontal lines represent 95% confidence intervals. We cluster standard errors at the job ad level.

## Figure 8. Heterogenous Interview Request Results by Race and Ethnicity



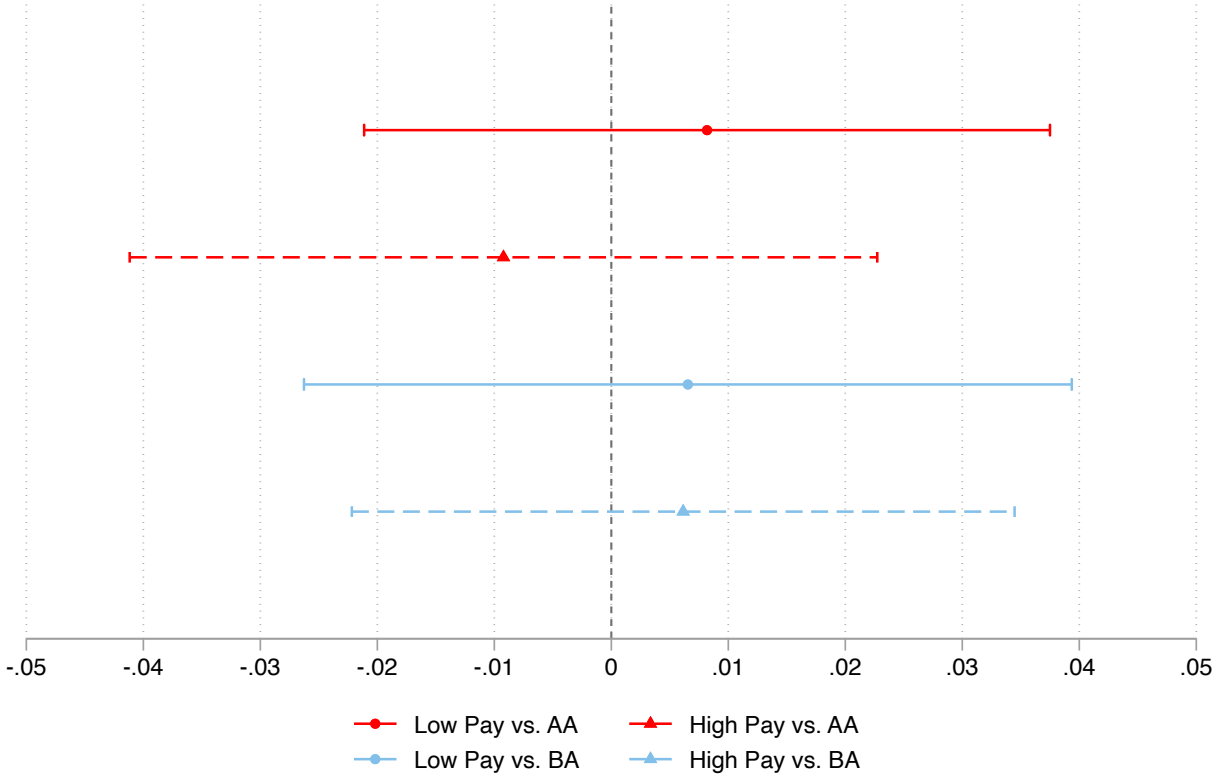

***Notes:*** This figure plots the estimated effects of resumes including CCB degrees on interview request rates from equation (1) without covariates or fixed effects, where the red symbols are relative to resumes with associate degrees and the blue symbols are relative to resumes with traditional bachelor's degrees. The top estimate (circles) among each set are for White applications, second (triangles) are for Black applicants, and third (squares) are for Hispanic applicants. The horizontal lines represent 95% confidence intervals. We cluster standard errors at the job ad level.

## Figure 9. Heterogenous Interview Request Results by State



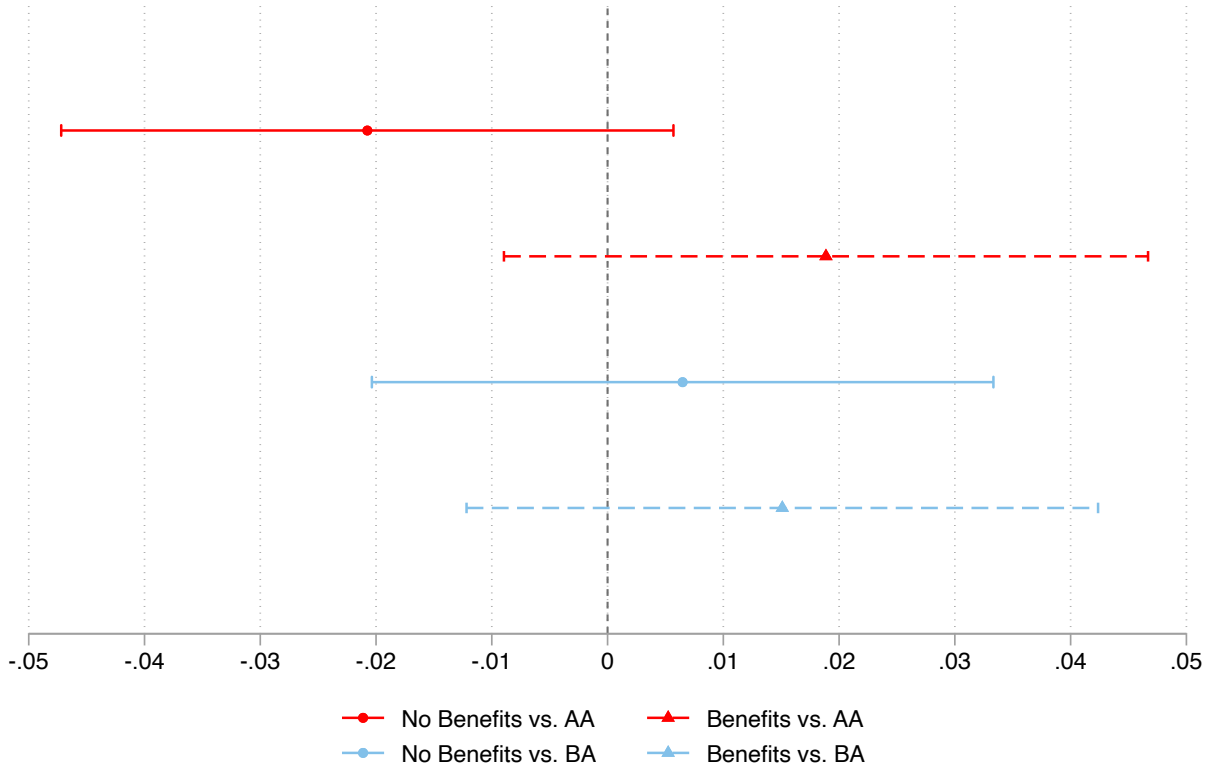

***Notes:*** This figure plots the estimated effects of resumes including CCB degrees on interview request rates from equation (1) without covariates or fixed effects, where the red symbols are relative to resumes with associate degrees and the blue symbols are relative to resumes with traditional bachelor's degrees. The top estimates (circles) among each set are for job postings in Texas and the bottom (triangles) are for Washington. The horizontal lines represent 95% confidence intervals. We cluster standard errors at the job ad level.

## Figure 10. Heterogenous Interview Request Results by Hourly Pay



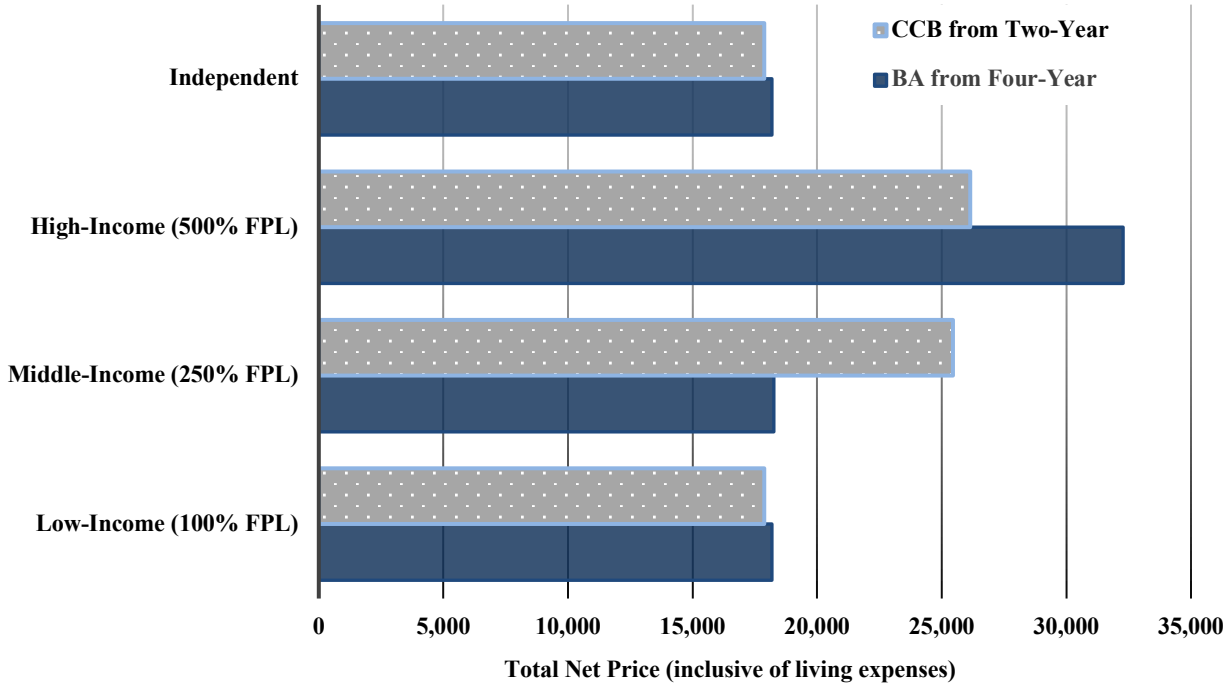

***Notes**:* This figure plots the estimated effects of resumes including CCB degrees on interview request rates from equation (1) without covariates or fixed effects. Red symbols report estimates relative to resumes with associate degrees, while blue symbols report estimates relative to resumes with traditional bachelor's degrees. The top (circle) estimate within each set corresponds to job postings with hourly pay below the state-specific sample median, whereas the bottom (triangle) estimate corresponds to job postings with hourly pay above the state-specific sample median. Hourly pay is measured in U.S. dollars. For postings reporting annual salaries, compensation was converted to an hourly wage assuming full-time, full-year employment, and for postings reporting a wage range, the midpoint of the range was used. Horizontal lines represent 95% confidence intervals. Standard errors are clustered at the job-posting level.

## Figure 11. Heterogenous Interview Request Results by Job Benefits




***Notes:*** This figure plots the estimated effects of resumes including CCB degrees on interview request rates from equation (1) without covariates or fixed effects, where the red symbols are relative to resumes with associate degrees and the blue symbols are relative to resumes with traditional bachelor's degrees. The top (circle) estimates among each set are for job postings that list at least one of retirement, health, and dental benefits; the bottom (triangle) is for job postings that do not list benefits. The horizontal lines represent 95% confidence intervals. We cluster standard errors at the job ad level.

## Figure 12. Average Net Price by Student Income Profile: Community College Baccalaureate versus Traditional Bachelor's Programs




***Notes:*** Bars show average annual net price (cost of attendance minus grant aid) for illustrative student profiles at Community College Baccalaureate (CCB) and traditional bachelor's degree programs. Net prices were generated using institution-specific net price calculators and include tuition and fees, books and supplies, and living expenses. Profiles represent dependent students at approximately 100%, 250%, and 500% of the federal poverty line (FPL) and an independent student working part time. All estimates assume in-state tuition and off-campus residence. Values are averaged across institutions in the sample. See Appendix Table E1 for institutional state level estimates and additional cost breakdowns.

**Table 1. Degree Required by Employer and Type of Resume Submission**

| *Degree Required by Employer* | *Resume Submission Types* |
|---|---|
| Associate Degree (AA) or less | Type 1: AA<br>Type 2: CCB<br>Type 3: BA - Public, Open Access |
| Traditional Bachelor's Degree (BA) | Type 1: CCB<br>Type 2: BA - Public, Open Access |

***Notes:*** Each job posting received multiple fictitious applications that differed only in educational credential. For positions requiring an associate degree (AA) or less, employers received three applications representing an AA degree, a Community College Baccalaureate (CCB) degree, and a traditional public bachelor's degree (BA) from an open-access institution. For positions requiring a bachelor's degree, employers received two applications representing a CCB degree and a traditional public bachelor's degree from an open-access institution. Applicant characteristics, work experience, skills, and other resume attributes were held constant across applications within a job posting, with degree type randomly assigned.

**Table 2. Descriptive Statistics: Job Postings in the Audit Study Sample**

| | All Collected Postings (N = 2,178) | Estimation Sample (N = 1,566) | Texas Estimation Sample (N = 949) | Washington Estimation Sample (N = 617) |
|---|---|---|---|---|
| **Panel A: Categorical Variables** (in percent) | | | | |
| ***Location*** | | | | |
| Texas | 55.9 | 60.6 | - | - |
| Washington | 44.1 | 39.4 | - | - |
| ***Education Required*** | | | | |
| High School | 37.7 | 39.5 | 45.5 | 30.3 |
| Certification | 6.1 | 5.6 | 7.9 | 2.1 |
| Associate Degree (AA) | 8.7 | 8 | 5.7 | 11.7 |
| Some College | 0.4 | 0.3 | 0.3 | 0.3 |
| Traditional Bachelor's Degree (BA) | 8.8 | 8.4 | 8.4 | 8.3 |
| Not Listed | 38.3 | 38.1 | 32.1 | 47.3 |
| ***Benefits and Compensation*** | | | | |
| Lists Retirement Benefits | 34.7 | 32.6 | 27.8 | 40.2 |
| Lists Health Insurance | 49.9 | 47.5 | 43.3 | 54.3 |
| Lists Dental Insurance | 42.9 | 40.6 | 35.4 | 48.9 |
| Lists Pay | 81.1 | 80.6 | 71.4 | 94.7 |
| **Panel B: Continuous Variables** (mean and standard deviation) | | | | |
| Hourly Pay (U.S. dollars) | 19.71 | 19.25 | 16.11 | 22.88 |
| | (5.74) | (5.48) | (4.03) | (4.63) |

***Notes:*** Observations are at the job-posting level. The *All Collected Postings* column reports descriptive statistics for all vacancies identified during the data collection process (N=2,178), while the *Estimation Sample* columns report statistics for the subset of postings to which applications were successfully submitted and that were retained for analysis (N=1,566). Texas and Washington columns report descriptive statistics separately by state. Panel A reports categorical variables as percentages of job postings. Panel B reports continuous variables as means, with standard deviations shown in parentheses. Lists Retirement Benefits, Lists Health Insurance, and Lists Dental Insurance are indicator variables equal to one if the job posting advertised the corresponding benefit. Lists Pay is an indicator equal to one if the posting reported wage or salary information. Hourly pay is reported in U.S. dollars. For postings reporting annual salaries, compensation was converted to an hourly wage assuming full-time, full-year employment. For postings reporting a wage range, the midpoint of the range is used.

**Table 3. Regression Results - Employer Interview Requests by Degree Credential**

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
|---|---|---|---|---|---|---|---|---|---|---|
| | **Panel A: Community College Baccalaureate Applicants Relative to Traditional Bachelor's Degree Applicants** | | | | | | | | | |
| CCB Degree | 0.0109 | 0.0124 | 0.0152 | 0.0151 | 0.0151 | 0.0151 | 0.0142 | 0.0148 | 0.0148 | 0.0115 |
| | (0.00975) | (0.00988) | (0.00985) | (0.0102) | (0.0102) | (0.0103) | (0.00965) | (0.0103) | (0.0103) | (0.0104) |
| Constant | 0.218*** | 0.218*** | 0.216*** | 0.216*** | 0.216*** | 0.218*** | 0.219*** | 0.218*** | 0.218*** | 0.228*** |
| | (0.0104) | (0.0104) | (0.0104) | (0.0105) | (0.0104) | (0.0105) | (0.0123) | (0.0104) | (0.0104) | (0.00854) |
| Obs | 3,132 | 3,132 | 3,132 | 3,132 | 3,132 | 3,092 | 3,034 | 3,092 | 3,092 | 2,480 |
| | **Panel B: Community College Baccalaureate Applicants Relative to Associates Degree Applicants** | | | | | | | | | |
| CCB Degree | -0.000639 | -0.00339 | -0.00428 | -0.00555 | -0.00474 | -0.00521 | -0.00529 | -0.00504 | -0.00504 | 0.000606 |
| | (0.00979) | (0.0100) | (0.0100) | (0.0103) | (0.0103) | (0.0105) | (0.00975) | (0.0105) | (0.0105) | (0.0112) |
| Constant | 0.230*** | 0.232*** | 0.233*** | 0.234*** | 0.233*** | 0.236*** | 0.236*** | 0.236*** | 0.236*** | 0.237*** |
| | (0.0106) | (0.0108) | (0.0108) | (0.0108) | (0.0106) | (0.0107) | (0.0140) | (0.0107) | (0.0107) | (0.0102) |
| Obs | 3,132 | 3,111 | 3,111 | 3,111 | 3,111 | 3,071 | 3,013 | 3,071 | 3,071 | 2,468 |
| Controls added? | None | Applicant name (race-ethnicity signal) | Age & high school name | Previous jobs & skills | Education required | Submission week & job platform | Submitting RA fixed effects | State fixed effects | Job insurance & benefits | Job hourly pay |

***Notes:*** Standard errors are clustered by job ID. Panel A reports estimated differences in callback rates between Community College Baccalaureate (CCB) applicants and traditional bachelor's degree applicants. Panel B reports estimated differences in callback rates between CCB applicants and associate degree applicants. Columns (1)–(10) incrementally introduce additional controls. Column (1) represents our baseline model without covariates. Column (2) additionally includes controls for the name of the applicant (and its implied race or ethnicity). Column (3) adds controls for the applicant's high school of attendance and high school graduation year. Column (4) adds fixed effects for work experience and skills included on the resume. Column (5) controls for the education requirement posted in the job posting. Column (6) includes the week of submission and platform (i.e., Indeed or ZipRecruiter) of job posting. Column (7) includes fixed effects for the RA responsible for the submissions. Column (8) controls for state (i.e., Texas). Column (9) controls for whether the posting advertises health insurance, dental insurance, and/or retirement benefits. Column (10) controls for hourly pay of jobs that included wage or salary information in their job posting. Significance levels are denoted as follows: *** $p < 0.01$, ** $p < 0.05$, and * $p < 0.10$.

**Table 4. Descriptive Statistics: Text Analysis Sample**

| | Overall Sample (N=1,610) | CCB (N=547) | AA (N=517) | BA (N=546) |
|---|---|---|---|---|
| **Panel A: Sample Composition** | | | | |
| Share of all applications with text | 0.343 | 0.349 | 0.330 | 0.349 |
| Texas | 0.622 | 0.614 | 0.631 | 0.621 |
| Washington | 0.378 | 0.386 | 0.369 | 0.379 |
| Interview requested | 0.644 | 0.638 | 0.679 | 0.617 |
| **Panel B: Outcomes** | | | | |
| Has question (%) | 32.8 | 34.6 | 32.5 | 31.3 |
| Question exposure | 0.096 | 0.102 | 0.093 | 0.094 |
| Has info request (%) | 7.9 | 8.8 | 7.4 | 7.7 |
| Info request exposure | 0.015 | 0.016 | 0.013 | 0.015 |
| Sentiment (net, wins.) | 0.019 | 0.019 | 0.019 | 0.018 |
| Sent. pos. exposure | 0.253 | 0.251 | 0.250 | 0.257 |
| Sent. neg. exposure | 0.044 | 0.044 | 0.036 | 0.050 |
| Warmth exposure | 0.068 | 0.069 | 0.068 | 0.068 |
| Template, greeting stripped (%) | 52.5 | 54.8 | 49.7 | 52.9 |
| Template, exact duplicate (%) | 34.2 | 36.0 | 31.7 | 34.6 |
| Mean word count | 71.0 | 72.3 | 71.7 | 68.9 |
| Mean sentence count | 5.2 | 5.3 | 5.3 | 5.0 |

***Notes:*** *Has Question* indicates whether a callback contains at least one question; *Question Exposure* is the share of sentences containing a question. *Has Info Request* identifies requests for additional applicant information or documentation, excluding scheduling language, survey links, and generic requests; *Info Request Exposure* is the share of sentences containing such requests. *Sentiment (Net, Wins.)* = (positive words − negative words)/total words, following Loughran and McDonald (2011), and is winsorized at the 1st and 99th percentiles. *Positive (Negative) Sentiment Exposure* is the share of sentences containing positive (negative) language and no language of the opposite type, following Hassan et al. (2025). *Warmth Exposure* is the share of sentences containing expressions of enthusiasm or interpersonal warmth. *Template, Greeting Stripped* indicates that a callback message is identical to another callback for the same job after removing the personalized greeting; *Template, Exact Duplicate* indicates an exact text match. *Word Count* and *sentence Count* measure message length.

**Table 5. Text Analysis of Employer Callback Messages - Question-Asking and Information Requests by Degree Credential**

| | (1) Any Question | (2) Question Share | (3) Any Info. Request | (4) Info. Req. Share |
|---|---|---|---|---|
| **Panel A: Full Sample** | | | | |
| CCB Degree | 0.019* | 0.005 | 0.009* | 0.001 |
| | (0.011) | (0.004) | (0.005) | (0.001) |
| AA Degree | 0.015 | 0.003 | 0.008 | 0.001 |
| | (0.014) | (0.005) | (0.009) | (0.002) |
| Obs | 1,610 | 1,610 | 1,610 | 1,610 |
| $R^2$ | 0.834 | 0.849 | 0.817 | 0.800 |
| **Panel B: Texas** | | | | |
| CCB Degree | 0.003 | 0.004 | 0.017** | 0.004** |
| | (0.011) | (0.005) | (0.007) | (0.002) |
| AA Degree | 0.009 | 0.004 | 0.020* | 0.004 |
| | (0.014) | (0.006) | (0.010) | (0.003) |
| Obs | 1,001 | 1,001 | 1,001 | 1,001 |
| $R^2$ | 0.942 | 0.940 | 0.916 | 0.943 |
| **Panel C: Washington** | | | | |
| CCB Degree | 0.015 | 0.003 | -0.000 | -0.001* |
| | (0.016) | (0.005) | (0.000) | (0.001) |
| AA Degree | -0.012 | -0.009 | -0.014 | -0.003* |
| | (0.023) | (0.007) | (0.010) | (0.002) |
| Obs | 609 | 609 | 609 | 609 |
| $R^2$ | 0.930 | 0.938 | 0.972 | 0.978 |
| Job Fixed Effects | Yes | Yes | Yes | Yes |
| Channel Type Controls | Yes | Yes | Yes | Yes |

***Notes:*** Standard errors are clustered by job ID. The omitted category is a traditional BA degree. *Any Question* is a binary indicator equal to one if a callback message contains at least one question. *Question Share* is the proportion of sentences in a callback message that contain a question. *Any Info. Request* is a binary indicator equal to one if the employer requests additional applicant information or documentation (e.g., transcripts or credential verification), excluding scheduling language, survey links, and generic requests. *Info. Req. Share* is the proportion of sentences containing such requests. Panel A uses the full callback-text sample (N = 1,610), while Panels B and C report estimates separately for Texas and Washington. All models include job fixed effects (job posting identifiers) and callback-channel controls (phone and platform indicators, with email omitted as the reference category). Significance levels are denoted as follows: *** $p < 0.01$, ** $p < 0.05$, and * $p < 0.10$.

**Table 6. Text Analysis of Employer Callback Messages - Sentiment and Warmth by Degree Credential**

| | (1) Net Sentiment | (2) Pos. Sent. Share | (3) Neg. Sent. Share | (4) Warmth Share |
|---|---|---|---|---|
| **Panel A: Full Sample** | | | | |
| CCB | -0.001 | -0.012** | -0.003 | 0.002 |
| | (0.001) | (0.006) | (0.003) | (0.003) |
| AA | -0.001 | -0.016** | -0.010** | -0.000 |
| | (0.001) | (0.007) | (0.004) | (0.004) |
| Obs | 1,608 | 1,610 | 1,610 | 1,610 |
| $R^2$ | 0.823 | 0.799 | 0.843 | 0.757 |
| **Panel B: Texas** | | | | |
| CCB | -0.001 | -0.012** | -0.000 | -0.004 |
| | (0.001) | (0.006) | (0.005) | (0.004) |
| AA | -0.001 | -0.016* | -0.011* | -0.007 |
| | (0.001) | (0.009) | (0.006) | (0.005) |
| Obs | 999 | 1,001 | 1,001 | 1,001 |
| $R^2$ | 0.927 | 0.911 | 0.915 | 0.926 |
| **Panel C: Washington** | | | | |
| CCB | -0.001 | -0.013 | -0.006 | 0.004 |
| | (0.001) | (0.010) | (0.005) | (0.004) |
| AA | -0.001 | -0.016 | -0.010 | -0.001 |
| | (0.001) | (0.010) | (0.006) | (0.005) |
| Obs | 609 | 609 | 609 | 609 |
| $R^2$ | 0.881 | 0.917 | 0.847 | 0.912 |
| Job Fixed Effects | Yes | Yes | Yes | Yes |
| Channel Type Controls | Yes | Yes | Yes | Yes |

***Notes:*** Standard errors are clustered by job ID. The omitted category is a traditional BA degree. *Net Sentiment* equals (positive words − negative words) divided by total word count, following the word-level sentiment approach of Loughran and McDonald (2011), and is winsorized at the 1st and 99th percentiles. *Pos. Sent. Share* is the proportion of sentences containing positive language and no negative language, while *Neg. Sent. Share* is the proportion of sentences containing negative language and no positive language, following Hassan et al. (2025). *Warmth Share* is the proportion of sentences containing expressions of enthusiasm or interpersonal warmth. Panel A uses the full callback-text sample (N = 1,610), while Panels B and C report estimates separately for Texas and Washington. All models include job fixed effects (job posting identifiers) and callback-channel controls (phone and platform indicators, with email omitted as the reference category). Significance levels are denoted as follows: *** $p < 0.01$, ** $p < 0.05$, and * $p < 0.10$.

**Table 7. Callback Personalization and Template-Based Responses by Degree Credential**

| | (1) Template, Greeting Stripped | (2) Template, Exact Duplicate | (3) Word Count | (4) Sentence Count |
|---|---|---|---|---|
| **Panel A: Full Sample** | | | | |
| CCB | -0.018 | 0.000 | 2.891** | 0.158** |
| | (0.015) | (0.011) | (1.259) | (0.074) |
| AA | -0.053*** | -0.046*** | 5.114 | 0.314* |
| | (0.018) | (0.015) | (3.624) | (0.175) |
| Obs | 1,610 | 1,610 | 1,610 | 1,610 |
| $R^2$ | 0.782 | 0.810 | 0.775 | 0.843 |
| **Panel B: Texas** | | | | |
| CCB | -0.023 | 0.005 | 1.690 | 0.048 |
| | (0.018) | (0.013) | (1.236) | (0.074) |
| AA | -0.059*** | -0.040** | 0.226 | 0.052 |
| | (0.021) | (0.018) | (1.142) | (0.072) |
| Obs | 1,001 | 1,001 | 1,001 | 1,001 |
| $R^2$ | 0.869 | 0.919 | 0.965 | 0.979 |
| **Panel C: Washington** | | | | |
| CCB | -0.003 | -0.004 | 1.948 | 0.151 |
| | (0.021) | (0.011) | (1.887) | (0.105) |
| AA | -0.018 | -0.048** | 11.691 | 0.605 |
| | (0.027) | (0.021) | (10.159) | (0.477) |
| Obs | 609 | 609 | 609 | 609 |
| $R^2$ | 0.898 | 0.895 | 0.714 | 0.775 |
| Job Fixed Effects | Yes | Yes | Yes | Yes |
| Channel Type Controls | Yes | Yes | Yes | Yes |

***Notes:*** Standard errors are clustered by job ID. The omitted category is a traditional BA degree. *Template, Greeting Stripped* is a binary indicator equal to one if a callback message is identical to at least one other callback for the same job posting after removing the personalized greeting (e.g., "Hi [Name]"). *Template, Exact Duplicate* is a binary indicator equal to one if the full callback message is an exact duplicate of another callback sent within the same job posting. *Word Count* and *Sentence Count* measure the length of the callback message. Panel A uses the full callback-text sample (N = 1,610), while Panels B and C report estimates separately for Texas and Washington. All models include job fixed effects (job posting identifiers) and callback-channel controls (phone and platform indicators, with email omitted as the reference category). Significance levels are denoted as follows: *** $p < 0.01$, ** $p < 0.05$, and * $p < 0.10$.

**Table 8. Net-Price Simulation: Estimated Annual Cost of Attendance, Grant Aid, and Net Price for Representative Student Profiles by Institution Type**

| | Student Profile #1: Low-Income (100% FPL) | | | Student Profile #2: Middle-Income (250% FPL) | | | Student Profile #3: High-Income (500% FPL) | | | Student Profile #4: Independent Part-Time | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total COA | Grant Aid | Net Price | Total COA | Grant Aid | Net Price | Total COA | Grant Aid | Net Price | Total COA | Grant Aid | Net Price |
| Two-Year Public Institutions | $25,585 | $7,696 | $17,889 | $26,425 | $959 | $25,466 | $26,425 | $277 | $26,148 | $26,425 | $7,696 | $17,889 |
| Four-Year Public Institutions | $34,097 | $15,912 | $18,185 | $34,097 | $15,830 | $18,267 | $34,097 | $1,813 | $32,284 | $34,097 | $15,912 | $18,185 |
| *Net Price Difference* | | *-$296* | | | *$7,200* | | | *-$6,136* | | | *-$296* | |

***Notes:*** The table reports estimated annual cost of attendance (COA), grant aid, and net price for illustrative student profiles attending Community College Baccalaureate (CCB) programs at two-year institutions and traditional bachelor's degree (BA) programs at four-year institutions. Estimates were generated using institution-specific net price calculators and represent total cost of attendance minus estimated grant aid. Student profiles include dependent students with family incomes at approximately 100 percent, 250 percent, and 500 percent of the federal poverty line (FPL), as well as an independent student working part time. All profiles are assumed to qualify for in-state tuition and are held constant on other characteristics, including family size, age, marital status, and number of dependents enrolled in college. Net price equals total cost of attendance (COA) minus estimated grant aid. Because most community college net price calculators are designed for associate-degree students, estimates for CCB programs should be interpreted as approximations and may understate the actual cost of upper-division CCB coursework. Refer to Appendix Table E1 for a detailed breakdown of costs and aid, separately by living arrangement (i.e., living alone or with roommates off campus versus living with parents or at home) and institutional location (i.e., state).

# APPENDIX A: SAMPLE RESUMES

## Erin Miller

[redacted]@gmail.com | [redacted]8-6653

### Work Experience

**Student Teaching Intern** | [redacted] Unified School District | [redacted] WA

Jan 2025 - May 2025

- Assisted in classroom management and instruction
- Engaged students in group work and collaborative projects
- Implemented classroom activities and educational games

**Child Care Counselor** | Laser Sand Point Elementary | [redacted] WA

May 2020 - May 2021

- Supervised outdoor and indoor activities and off site field trips.
- Assist in planning meals, activities, and mediating issues within the community of children.

**Team Member and Cake Manager** | Coldstone Creamery | [redacted] WA

Jun 2019 - May 2020

- Trained new employees on company standards, procedures, and daily duties.
- Assisted with shift change by counting money in cash drawer at the beginning and end of a shift.

### Education

[redacted] WA

BA in Educational Studies, Graduated 2025

[redacted] WA

High School Diploma, Graduated 2019

### Skills

Driver's License, First Aid Certified, CPR Certified | Leadership, Food Prep/Service, Teaching

# Kathryn Schmidt

[redacted]@gmail.com | [redacted]66-6224

## Education

[redacted], WA
BAS in Early Childhood Education, Graduated 2025

[redacted] WA
High School Diploma, Graduated 2019

## Work Experience

**Student Teacher/Observer** | [redacted] Public Schools | [redacted] WA

Jan 2025 - May 2025

- Designed and delivered mini-lessons under supervision
- Worked with mentor teacher to develop lesson plans

**Assistant Preschool Teacher** | Kids R Us | [redacted] WA

May 2020 - May 2021

- Meet with parents for parent-teacher conferences.
- Helped prepare materials and set up activities

**Sales Associate** | World Market Cost Plus | [redacted] WA

Jun 2019 - May 2020

- Operate cash registers, take payments, and build sales through effective customer service techniques.
- Maintained accurate records and updated files in a timely manner
- Listen to customers' concerns and handle complaints and returns.

## Skills

**Core Skills:** Driver's License, First Aid Certified, CPR Certified

**Additional Skills:** Lesson Planning, Teaching, Organizational Skills

# APPENDIX B: ADDRESS AND COVER LETTER GENERATION

During the first two weeks of the ECE pilot audit study, we observed that a subset of employers required applicants to provide a mailing address and/or submit a cover letter as part of the application process. To maximize the number of eligible applications while maintaining consistency across treatment conditions, we developed standardized procedures for generating addresses and cover letters.

For applications requiring a mailing address, we created a pool of 20 addresses for each study city. The research assistants (RAs) were instructed to randomly assign and record these addresses across applications. To minimize potential socioeconomic signaling, addresses were selected from census tracts with median household incomes near the metropolitan-area median. In addition, to avoid correspondence with actual job seekers, addresses were drawn from large apartment complexes and were submitted without apartment unit numbers.

Lastly, for applications requiring cover letters, we developed a small bank of standardized templates generated using ChatGPT and subsequently reviewed and edited by the research team. The cover letters were intentionally designed to be highly similar in structure, tone, and content while varying slightly in wording to avoid exact duplication across applications. All cover letters emphasized comparable qualifications, skills, and work-related attributes and were written broadly enough to be applicable across a wide range of ECE positions. When a cover letter was required, RAs randomly assigned one of the approved templates to accompany the submitted resume.

# APPENDIX C:
# EMPLOYERS AND HIRING MANAGERS QUESTIONNAIRE

## Part 1. Demographics and Background

**Question 1. What is your highest degree obtained?**
**[*choose one*]**

a. High school diploma
b. Associate degree
c. Bachelor's degree
d. Master's degree or higher

**Question 2. What college did you earn this degree from**
**[*text entry response*]**

**Question 3. How long have you lived in the city (or surrounding area) in which you currently live? [*choose one*]**

a. Less than 2 years
b. 2-3 years
c. 4-10 years
d. More than 10 years

## Part 2. Employer Information

**Question 4. Who is your current employer?**
**[*text entry response*]**

**Question 5. What is your role at your current employer?**
**[*choose one*]**

a. Recruiter
b. Manager (non-HR)
c. Other (please describe)

**Question 6. How long have you held this role for your current employer?**
**[*choose one*]**

a. Less than one year
b. 1-3 years
c. 3-5 years
d. Over 5 years

**Question 7. Which of the following responsibilities do you regularly handle in your organization's hiring process?**
**[*select all that apply*]**

a. Writing and posting job descriptions
b. Resume review
c. Initial interview
d. Follow-up interview
e. Making final hiring decisions
f. Setting salary offers
g. Negotiating compensation packages
h. Onboarding new employees
i. Supervising new hires
j. Other (fill in the blank)

**Question 8. Does the employer use any AI tools in the hiring process?**
**[*choose one*]**

a. Yes
b. No
c. I don't know (*explain*)

**(*IF YES*) Which AI tools does your organization currently use in the hiring process?**

**Please include details such as: What does the tool do? (examples: resume screening, video interview analysis, skills assessment)? When do you use it? (examples: before interviews, during interviews)? Why do you use it?**
**[*text entry response*]**

## Part 3. Resume Screening Questions

**Question 9. When you review resumes, how important is it that the person will say yes if you offer them the job?** (i.e., are you more likely to interview an applicant if you are confident that they will accept a job offer?)

**The likelihood that an applicant would accept a job offer is…**
**[*scale of 0 (not at all important) to 10 (very important)*]**

**Question 10. What factors help you predict if someone will accept your job offer?**
**[*select all that apply*]**

a. Location (e.g., applicant address)
b. Education (e.g., applicant college or degree)
c. Work history
d. Other (please specify)

**Question 11. On a scale of 1 to 10, how important is *each these factors* (based on resume characteristics) when hiring a new, entry-level employee.**
**[*scale of 0 (not at all important) to 10 (very important)*]**

a. Work Experience
b. Degree Type (AA, BA, etc.)
c. College or University attended
d. Major or field of study
e. Other (please explain)

## Part 4. Candidates

**Imagine you are hiring for an entry-level position at your company. You have three qualified applicants who have identical work experience, skills, and personal qualities. The only difference between them is where they went to school. For each applicant below, please read the brief profile and then answer the questions that follow.**

| |
|---|
| **Taylor:** Taylor has an associate degree from a local community college. Taylor has 2 years of relevant internship and part-time work experience, strong references, and demonstrated technical skills required for the job. Taylor is punctual, reliable, and completed several practical projects related to the role. |
| **Alex:** Alex has a bachelor's degree from a local community college. Alex has the same 2 years of relevant internship and part-time work experience, the same strong references, and equivalent technical skills. Alex is punctual, reliable, and completed the same practical projects as the other candidates. |
| **Jordan:** Jordan has a bachelor's degree from a local four-year university. Jordan has the same 2 years of relevant internship and parttime work experience, the same strong references, and equivalent technical skills. Jordan is punctual, reliable, and completed the same practical projects as the other candidates. |

**Question 12. What starting annual salary would you likely offer to each of the candidates if you hired them?**
**[*text entry response*]**

**Question 13. Which of these candidates would you hire for the entry-level position?**
**[*choose one*]**

a. Taylor
b. Jordan
c. Alex

**Question 14. How accurately do you feel like you've estimated the salary above?**
**[*choose one*]**

a. Not accurately at all
b. Somewhat accurately
c. Moderately accurately
d. Very accurately
e. Extremely accurately

## Part 5. Community College Bachelor's Degrees

**Question 15. What type of degrees are offered by community colleges in your area?**
**[*select all that apply*]**

a. Certificates
b. Associate degrees
c. Bachelor's Degrees

**Question 16. This survey is part of a research project about bachelor's degrees offered at community colleges.**

**With that in mind, is there anything else you would like to share about your hiring practices as it relates to your experiences with these degrees?**
**[*text entry response*]**

# APPENDIX D: TEXT ANALYSIS DIAGNOSTIC CHECKS

Before estimating differences in employer communication patterns across degree credentials, we conducted a series of diagnostic checks to assess the validity of the text-analysis sample and the robustness of our empirical approach. Appendix Table E2 summarizes the results of these diagnostics.

**1. Selection into the Text Sample**

The text-analysis sample consists only of applications that received a callback containing non-empty text. A potential concern is that selection into this sample may differ systematically by degree type or applicant race-ethnicity, thereby biasing the subsequent text analyses. To evaluate this possibility, we tested whether the likelihood of receiving a text-based callback varied across degree credentials or race and ethnicity signals. We find no evidence that text-callback rates differ by degree type ($\chi^2$ = 1.65, p = 0.44), consistent with our experimental null results. Likewise, there is no statistically significant difference by race and ethnicity signal at conventional levels (p = 0.06). These results suggest that the subset of callbacks containing text is broadly representative of the underlying ECE pilot audit-study sample.

**2. Balance in the Text Sample**

Because the ECE pilot audit study relies on random assignment of degree credentials, it is important to verify that randomization remains intact within the text-analysis subsample. We examined the relationship between degree type and race-ethnicity among observations included in the text sample. Consistent with successful randomization, the cross-tabulation shows no evidence of dependence between these variables ($\chi^2$= 1.14, p = 0.89), indicating that random assignment was preserved and that balance remains strong within the analytic sample.

**3. Singleton Dropout**

Several specifications include job-posting fixed effects (shown in Tables 5, 6, and 8). Fixed-effects estimation necessarily excludes singleton postings—that is, postings for which only one application remains in the estimation sample. As a result, 178 observations (11.1 percent of the text-analysis sample) are excluded from some fixed-effects specifications. Although this loss is not trivial, the dropout rate is moderate and does not appear large enough to threaten identification or substantially alter the composition of the sample.

**4. Effective Cluster Count**

Because standard errors are clustered at the job-posting level, reliable inference requires a sufficiently large number of clusters. After accounting for singleton dropout, the analysis retains 488 unique job-posting clusters containing at least two observations. This number substantially exceeds conventional thresholds for cluster-robust inference, suggesting that standard-error estimates are likely to be reliable.

**5. Outcome Distributions**

We next examined the distributions of the text-analysis outcome variables. Some outcomes, particularly the sentence-level exposure measures, exhibit substantial right-skewness, with many observations equal to zero. Such distributions are expected because many callback messages contain no questions, information requests, or sentiment-related language. Although these features

warrant caution in interpretation, they do not invalidate the use of linear regression models and are typical of textual outcomes derived from short employer messages.

**6. Minimum Detectable Effects**

To assess statistical power, we calculated minimum detectable effects (MDEs) for the primary text-analysis outcomes. The ECE pilot study is best powered for the binary question-asking measures, particularly *"Has question"*, for which the MDE is approximately 8.5 percentage points at 80 percent power. By contrast, the study is substantially less powered for the information-request, sentiment, and warmth outcomes because of their lower base rates and the high prevalence of zero-valued observations. Given that the largest observed treatment effects are approximately 2.2 percentage points, the current sample is underpowered to detect many of the modest differences observed in the data, especially for the sentiment- and warmth-related measures. These results underscore the importance of interpreting null findings cautiously and revisiting these outcomes in the larger-scale audit study launched in Summer 2026.

**7. Robustness to State Fixed Effects**

Because some specifications rely on job-posting fixed effects while others incorporate state fixed effects, we compared results across alternative modeling approaches. Estimated coefficients remain stable across specifications, indicating that neither the choice of fixed effects nor the exclusion of singleton postings meaningfully alters the substantive conclusions. This consistency increases confidence that the findings are not driven by model specification.

**8. Callback "Quality"**

Although overall callback rates are similar across degree types, we also examined whether the "quality" of callbacks differs. Specifically, we compared the share of callbacks classified as positive employer responses. We find modest differences across degree groups, with traditional BA applicants receiving slightly fewer positive callbacks than AA and CCB applicants (93.8 percent versus approximately 96 percent). Although the magnitude of this difference is small, it suggests a potential dimension of heterogeneity that warrants further examination in the larger-scale study.

**9. Callback Channel Selection**

Employer callbacks occurred through multiple channels, including email, phone, and online platforms. Because communication style may vary across channels, we tested whether callback channel differed systematically by degree credential or race-ethnicity. We find no statistically significant evidence of differential channel selection. Callback channel does not differ significantly by degree type ($\chi^2 = 4.61$, $p = 0.595$) or race and ethnicity signal ($\chi^2 = 10.36$, $p = 0.110$). There is weak evidence that CCB applicants are slightly more likely to receive platform-based callbacks (+0.018, $p = 0.109$), but this estimate is not statistically significant at conventional levels. Overall, callback channel appears balanced across experimental conditions.

**10. Callback Channel Characteristics**

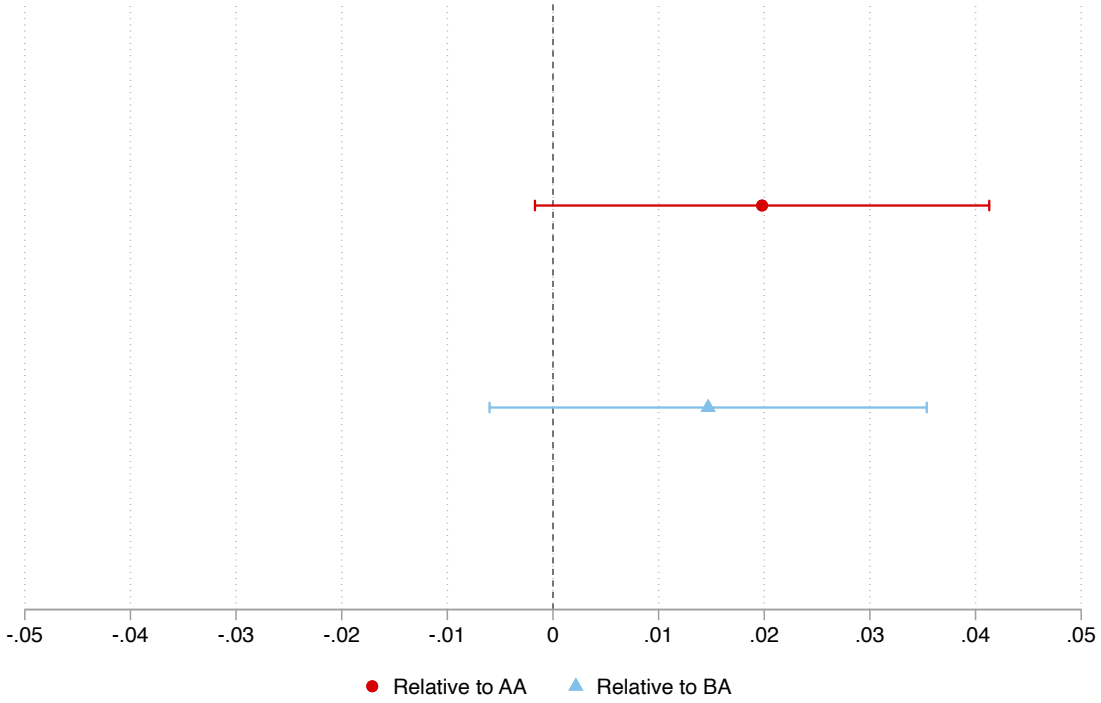
Finally, we examined whether callback messages differ systematically across communication channels (i.e., email, phone call, or platform). Relative to email callbacks, platform-based callbacks are approximately 53 words shorter ($p < 0.01$), contain a higher incidence of questions (+0.216 on the *"Has question"* measure, $p < 0.01$), and exhibit lower positive-sentence exposure

(−0.045, $p < 0.01$). Phone callbacks are even shorter, averaging approximately 85 fewer words than email callbacks ($p < 0.01$), and often contain very little substantive text. These differences confirm that communication channel influences message content and justify the inclusion of callback-channel controls in all text-analysis regressions. By accounting for these systematic differences, the analysis isolates variation attributable to applicant credentials rather than the medium through which employers communicate.

**Diagnostic Check Summary:** Overall, the diagnostic checks provide strong support for the validity of the text-analysis framework. Randomization remains balanced within the text sample, selection into the sample does not vary systematically across treatment conditions, and the number of effective clusters is sufficient for reliable inference. The primary limitation is statistical power: with a minimum detectable effect of approximately 8.5 percentage points for key outcomes, the ECE pilot audit study is not well suited to detect the small communication differences that are likely to characterize employer perceptions of CCB credentials. Nonetheless, the stability of results across specifications and the absence of major diagnostic concerns suggest that the findings reported in the main text provide a credible assessment of employer communication patterns.

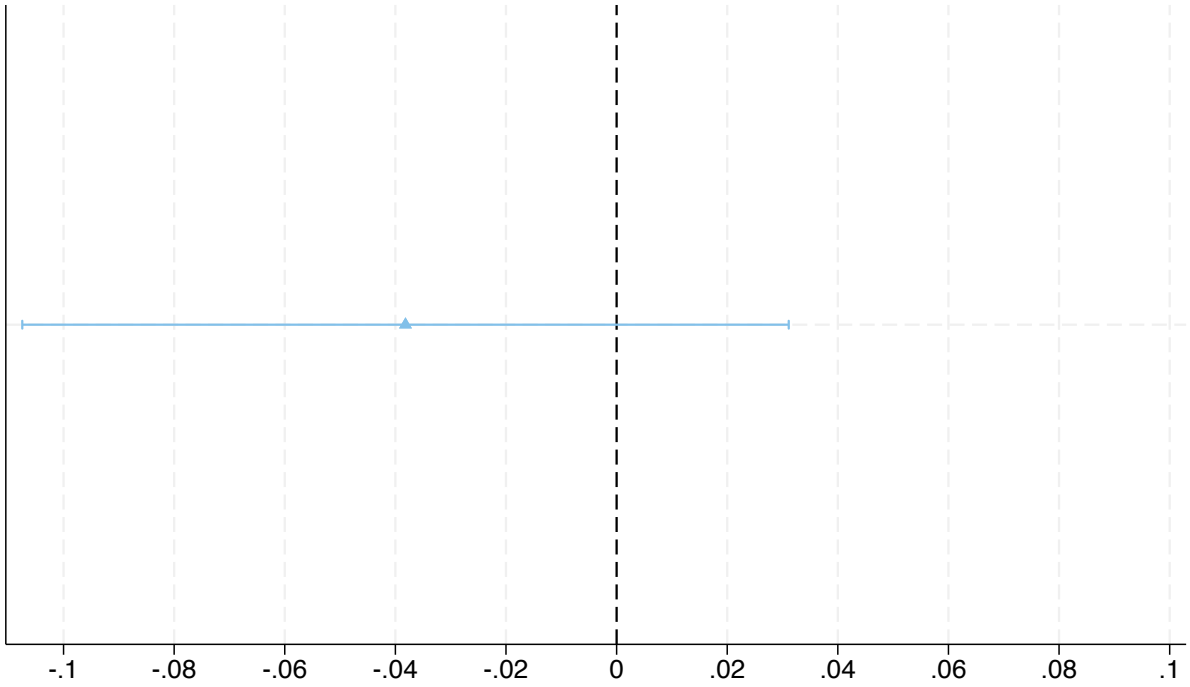
# APPENDIX E: SUPPLEMENTAL FIGURES AND TABLES

**Figure E1. Callback Results:**
**CCB Degrees Relative to Associate and Traditional Bachelor's**



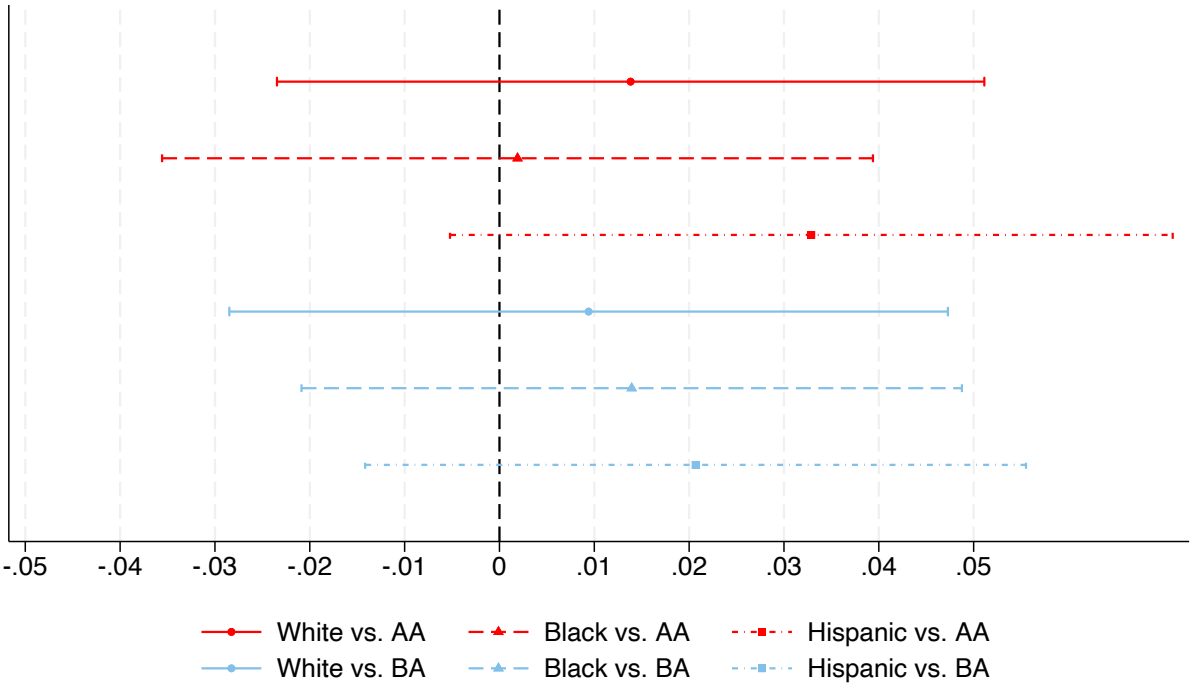

***Notes:*** This figure plots the estimated effects of resumes including CCB degrees on callback (i.e., any personalized follow-up from employer including a request for more information) from equation (1) without covariates or fixed effects, where the red circles are relative to resumes with associate degree and the blue triangles are relative to resumes with traditional bachelor's degrees. The horizontal lines represent 95% confidence intervals. We cluster standard errors at the job ad level.

## Figure E2. Callback Results for Job Postings Requiring a Bachelor's Degree



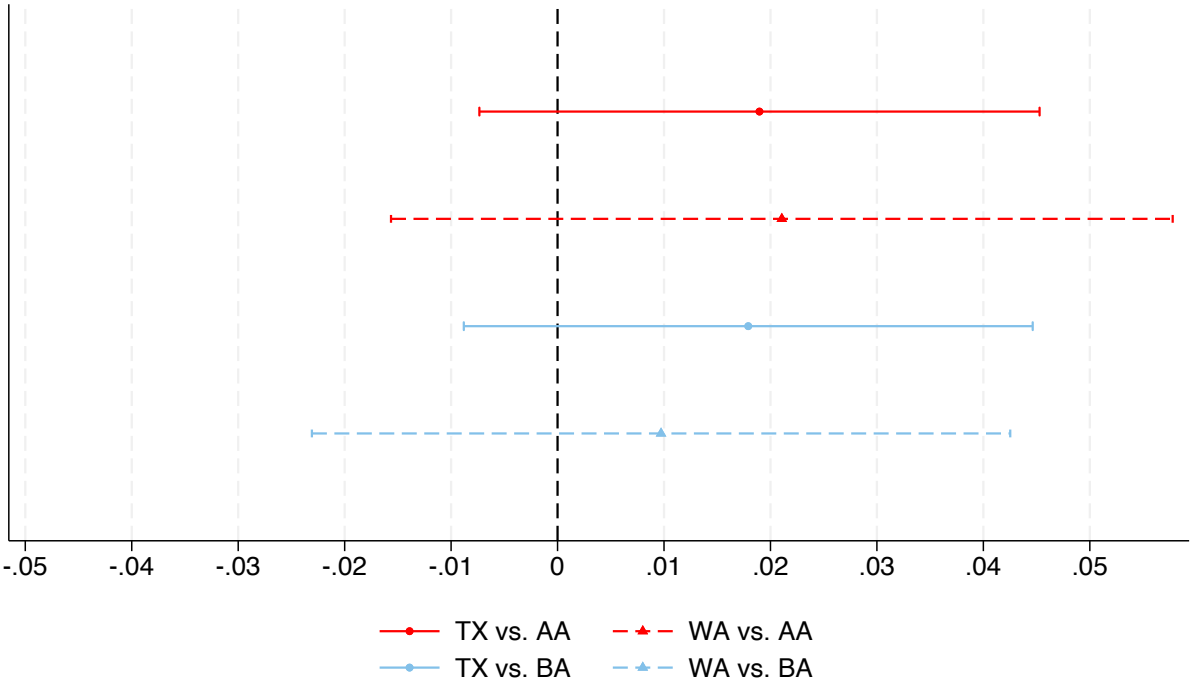

***Notes:*** This figure plots the estimated effects of resumes including CCB degrees on callback (i.e., any personalized follow-up from employer including a request for more information) rates from equation (1) without covariates or fixed effects, relative to resumes with traditional bachelor's degrees. The horizontal lines represent 95% confidence intervals. We cluster standard errors at the job ad level.

## Figure E3. Heterogenous Callback Results by Race and Ethnicity



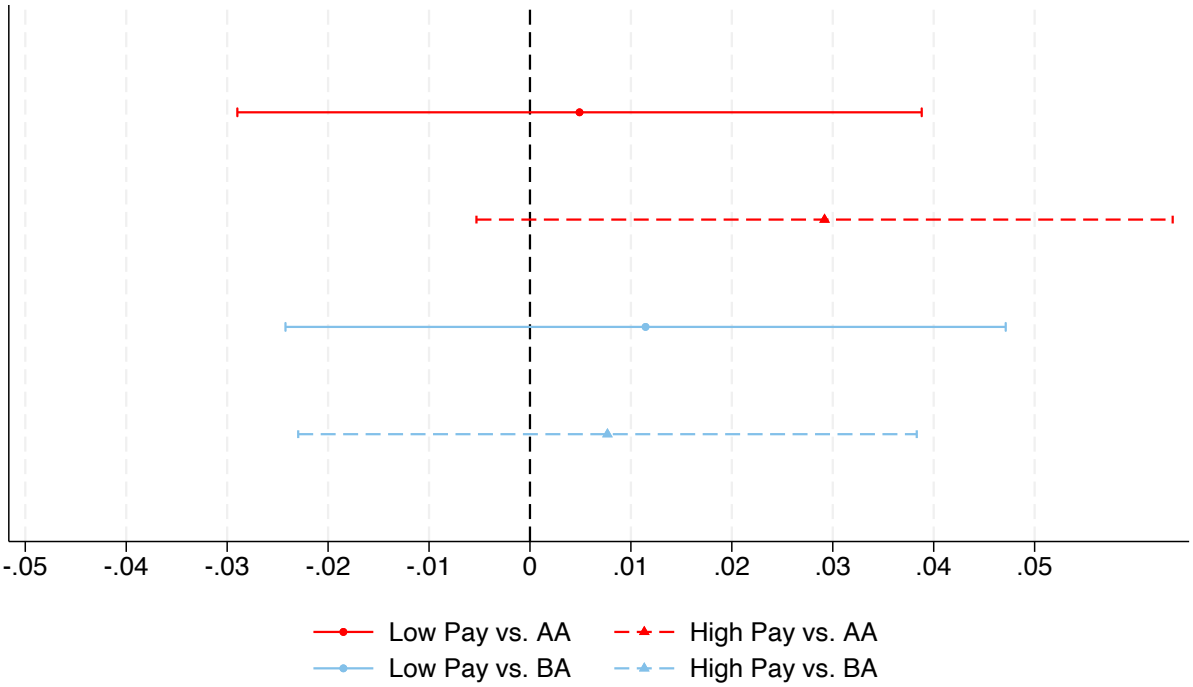

***Notes:*** This figure plots the estimated effects of resumes including CCB degrees on callback (i.e., any personalized follow-up from employer including a request for more information) rates from equation (1) without covariates or fixed effects, where the red symbols are relative to resumes with associate degrees and the blue symbols are relative to resumes with traditional bachelor's degrees. The top estimate (circles) among each set are for White applications, second (triangles) are for Black applicants, and third (squares) are for Hispanic applicants. The horizontal lines represent 95% confidence intervals. We cluster standard errors at the job ad level.

## Figure E4. Heterogenous Callback Results by State



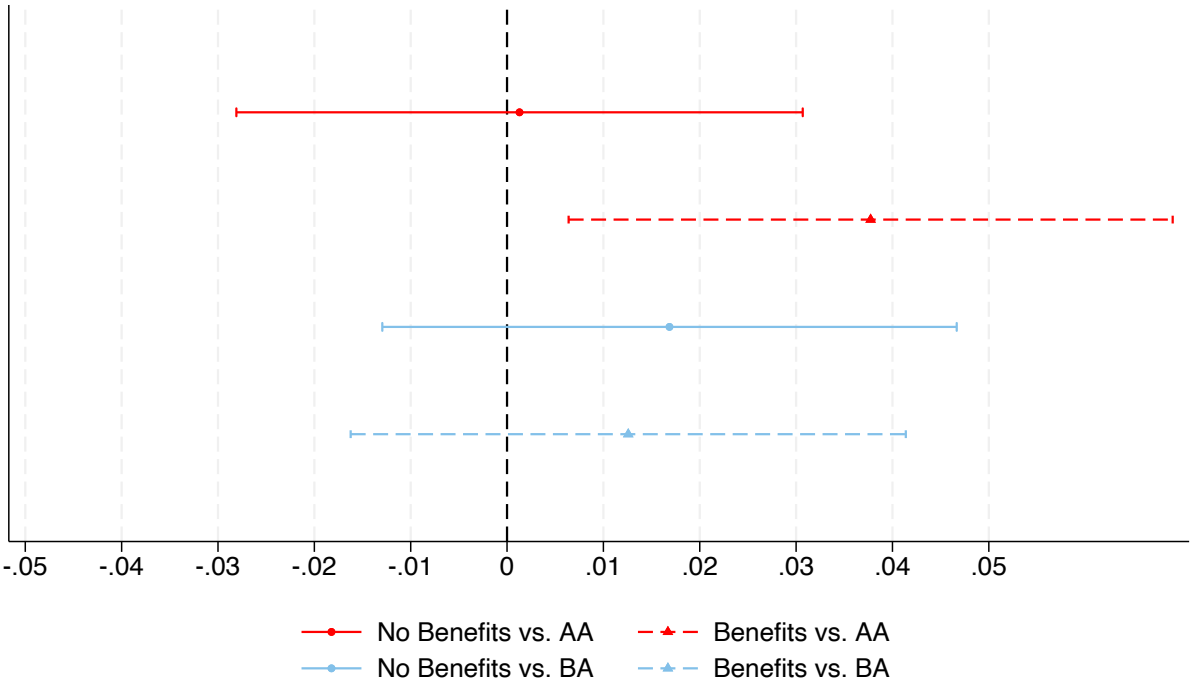

***Notes:*** This figure plots the estimated effects of resumes including CCB degrees on callback (i.e., any personalized follow-up from employer including a request for more information) rates from equation (1) without covariates or fixed effects, where the red symbols are relative to resumes with associate degrees and the blue symbols are relative to resumes with traditional bachelor's degrees. The top estimates (circles) among each set are for job postings in Texas and the bottom (triangles) are for Washington. The horizontal lines represent 95% confidence intervals. We cluster standard errors at the job ad level.

## Figure E5. Heterogenous Callback Results by Hourly Pay




***Notes**:* This figure plots the estimated effects of resumes including CCB degrees on callback (i.e., any personalized follow-up from employer including a request for more information) rates from equation (1) without covariates or fixed effects, where the red symbols are relative to resumes with associate degrees and the blue symbols are relative to resumes with traditional bachelor's degrees. The top (circle) estimate among each set are for job postings with a midpoint of hourly pay less than the sample median within state, whereas the bottom (triangle) estimate corresponds to job postings with hourly pay above the sample median within state. The horizontal lines represent 95% confidence intervals. We cluster standard errors at the job ad level.

## Figure E6. Heterogenous Callback Results by Job Benefits




***Notes:*** This figure plots the estimated effects of resumes including CCB degrees on callback (i.e., any personalized follow-up from employer including a request for more information) rates from equation (1) without covariates or fixed effects, where the red symbols are relative to resumes with associate degrees and the blue symbols are relative to resumes with traditional bachelor's degrees. The top (circle) estimates among each set are for job postings that list at least one of retirement, health, and dental benefits; the bottom (triangle) is for job postings that do not list benefits. The horizontal lines represent 95% confidence intervals. We cluster standard errors at the job ad level.

**Appendix Table E1. Net-Price Simulation:**
**Estimated Cost of Attendance, Grant Aid, and Net Price for Representative Student Profiles by Institution Type and Living Arrangement**

| | Student Profile #1: Low-Income (100% FPL) | | | Student Profile #2: Middle-Income (250% FPL) | | | Student Profile #3: High-Income (500% FPL) | | | Student Profile #4: Independent | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total COA (1) | Grant Aid (2) | Net Price (3) | Total COA (4) | Grant Aid (5) | Net Price (6) | Total COA (7) | Grant Aid (8) | Net Price (9) | Total COA (10) | Grant Aid (11) | Net Price (12) |
| **Panel A: Living Alone or with Roommates (off-campus)** | | | | | | | | | | | | |
| ***Texas Institutions*** | | | | | | | | | | | | |
| Two-Year College (CCB) | 23,164 | 3,073 | 20,091 | 24,844 | 711 | 24,133 | 24,844 | 553 | 24,291 | 24,844 | 3,073 | 20,091 |
| Four-Year College (BA) | 31,684 | 6,268 | 25,416 | 31,684 | 6,104 | 25,580 | 31,684 | 3,625 | 28,059 | 31,684 | 6,268 | 25,416 |
| ***Washington Institutions*** | | | | | | | | | | | | |
| Two-Year College (CCB) | 28,005 | 12,318 | 15,687 | 28,005 | 1,206 | 26,799 | 28,005 | 0 | 28,005 | 28,005 | 12,318 | 15,687 |
| Four-Year College (BA) | 36,509 | 25,556 | 10,953 | 36,509 | 25,556 | 10,953 | 36,509 | 0 | 36,509 | 36,509 | 25,556 | 10,953 |
| **Panel B: Living With Parents or at Home** | | | | | | | | | | | | |
| ***Texas Institutions*** | | | | | | | | | | | | |
| Two-Year College (CCB) | 7,408 | 2,773 | 4,635 | 7,408 | 711 | 6,697 | 7,408 | 1,019 | 6,389 | 7,408 | 2,773 | 4,635 |
| Four-Year College (BA) | 18,592 | 6,304 | 12,288 | 18,592 | 6,104 | 12,488 | 18,592 | 3,000 | 15,592 | 18,592 | 6,304 | 12,288 |
| ***Washington Institutions*** | | | | | | | | | | | | |
| Two-Year College (CCB) | 15,535 | 12,318 | 3,217 | 15,535 | 1,206 | 14,329 | 15,535 | 0 | 15,535 | 15,535 | 12,318 | 3,217 |
| Four-Year College (BA) | 24,110 | 20,675 | 3,435 | 24,110 | 16,877 | 7,233 | 24,110 | 0 | 24,110 | 24,110 | 20,675 | 3,435 |

***Notes:*** The table reports estimated annual cost of attendance (COA), grant aid, and net price for illustrative student profiles attending Community College Baccalaureate (CCB) programs at two-year institutions and traditional bachelor's degree (BA) programs at four-year institutions. Estimates were generated using institution-specific net price calculators and represent total cost of attendance minus estimated grant aid. Student profiles include dependent students with family incomes at approximately 100 percent, 250 percent, and 500 percent of the federal poverty line (FPL), as well as an independent student working part time. All profiles are assumed to qualify for in-state tuition and are held constant on other characteristics, including family size, age, marital status, and number of dependents enrolled in college. Panel A assumes students live independently off campus (alone or with roommates), while Panel B assumes students reside with parents or at home. Dallas-area institutions include Dallas College (CCB) and the nearest public four-year institution used in the study; Seattle-area institutions include the Community Colleges of Spokane (CCB) and the nearest public four-year institution used in the study. Net price equals total cost of attendance (COA) minus estimated grant aid. Because most community college net price calculators are designed for associate-degree students, estimates for CCB programs should be interpreted as approximations and may understate the actual cost of upper-division CCB coursework.

**Appendix Table E2. Text Analysis: Pre-Analysis Diagnostic Checks**

| Check | Finding | Status |
|---|---|---|
| 1. Selection into text sample | Text-callback rate does not differ by degree type ($\chi^2$=1.65, p=0.44) or race (p=0.06). | **OK** |
| 2. Balance in text sample | Degree × race cross-tab shows no dependence ($\chi^2$=1.14, p=0.89). Randomisation held. | **OK** |
| 3. Singleton dropout | 178 obs (11.1%) lost to job FE absorption. Moderate but not severe. | **Moderate** |
| 4. Effective cluster count | 488 job IDs with ≥2 observations. Well above the 50-cluster threshold for reliable clustered SEs. | **OK** |
| 5. Outcome distributions | has_question base rate 32.8%; has_info_request base rate 7.9%. Exposure variables heavily right-skewed (% zero: 67–92%). | **Note** |
| 6. Minimum detectable effect | MDE for has_question ≈8.5 pp at 80% power; observed effect ≈2.2 pp. Study underpowered by ≈4× for sentiment outcomes. | **Underpowered (sentiment outcomes)** |
| 7. State FE robustness | Estimates stable across Job FE and State FE specifications. Singleton dropout is not distorting the story. | **OK** |
| 8. Callback quality | positive_callback rate differs marginally by degree type (p=0.038); BA slightly lower (93.8% vs. 96%+). Worth monitoring in scaled-up audit study. | **Monitor** |
| 9. Channel selection | Callback channel does not differ significantly by degree type ($\chi^2$=4.61, p=0.595) or race ($\chi^2$=10.36, p=0.110). CCB marginally more likely to receive platform callback (+0.018, p=0.109); all others null. | **Monitor** |
| 10. Channel characteristics | Platform callbacks are substantially shorter (−53 words, p<0.01), question-heavy (+0.216 on has_question, p<0.01), and less positive (−0.045 on sent. pos. exposure, p<0.01) than email. Phone callbacks are near-empty (−85 words, p<0.01). Channel controls should be inlcuded in all regressions. | **OK** |

***Notes:*** Checks 1–10 are pre-analysis diagnostics conducted before interpreting regression results. 'OK' = no concern; 'Moderate'/'Monitor' = noteworthy but not invalidating; 'Underpowered' = power constraint identified; 'Note' = distributional feature to be aware of.

**Appendix Table E3. Employer Survey Results:**
**Hiring Practices, Credential Preferences, and Community College Awareness**

**Total sample: 70**

**Question 1. Highest degree (of respondent)**

| | | |
|---|---|---|
| High school diploma | 9 | 12.9% |
| Associate degree | 16 | 22.9% |
| Bachelor's degree | 19 | 27.1% |
| Master's degree or higher | 26 | 37.1% |
| *Total* | *70* | *100.0%* |

**Question 8. Does your employer use AI tools in the hiring process?**

| | | |
|---|---|---|
| No | 56 | 80.0% |
| Yes | 8 | 11.4% |
| Other | 6 | 8.6% |
| *Total* | *70* | *100.0%* |

**Question 9. When you review resumes, how important is it that the person will say yes if you offer them the job?**

| ***Mean*** | ***Med*** | ***Min*** | ***Max*** |
|---|---|---|---|
| 7.28 | 8 | 3 | 10 |

**Question 10. What factors help you predict if someone will accept your job offer? - Selected choices.**

| | | |
|---|---|---|
| Education (e.g., applicant college or degree) | 46 | 65.7% |
| Work history | 67 | 95.7% |
| Location (e.g., applicant address) | 56 | 80.0% |
| Other (please specify) | 16 | 22.9% |

**Question 11. On a scale of 1 to 10, how important is each these factors (based on resume characteristics) when hiring a new, entry-level employee?**

| | ***Mean*** | ***Med*** | ***Min*** | ***Max*** |
|---|---|---|---|---|
| Work experience | 7.73 | 8 | 2 | 10 |
| Degree type (AA, BA, etc.) | 5.10 | 5 | 0 | 10 |
| College or University attended | 2.04 | 1 | 0 | 10 |
| Major or field of study | 4.66 | 5 | 0 | 10 |

**Question 13. Which of these candidates would you hire for the entry-level position?**

| | | |
|---|---|---|
| Taylor (AA) | 35 | 50.0% |
| Alex (CCB) | 12 | 17.1% |
| Jordan (BA) | 23 | 32.9% |
| *N* | *70* | *100.0%* |

**Question 15. What type of degrees are offered by community colleges in your area? - Selected choices.**

| | | |
|---|---|---|
| Associate degrees | 69 | 99% |
| Certificates | 55 | 79% |
| Bachelor's Degrees | 42 | 60% |

***Notes:*** This table reports descriptive statistics from the employer survey administered to hiring managers and employers associated with job postings in the audit study sample (N = 70). Questions 1, 8, 10, 13, and 15 are reported as frequencies and percentages. Percentages may not sum to 100 due to rounding or because respondents could select multiple responses where applicable. Questions 9 and 11 are reported as means, medians, minimums, and maximums. For Question 11, respondents rated the importance of each resume characteristic on a scale from 0 to 10, with higher values indicating greater importance in hiring decisions. For Question 13, respondents were presented with three hypothetical applicants whose credentials corresponded to an associate degree (AA), a community college bachelor's degree (CCB), and a traditional bachelor's degree (BA), and were asked which applicant they would hire for an entry-level position. For Question 15, Bachelor's Degrees refers to respondents indicating that community colleges in their area offer bachelor's degrees.

**Appendix Table E4. Employer Open-Ended Responses on Community College Bachelor's Degrees and Hiring Practices**

| Employer Type | Verbatin Quote |
|---|---|
| ***Private - Religious*** | ***"I would hire the same someone who has a bachelor from a community college or university. It does not change anything for me. It would be based on the experience and personality of the person. However, I would privilege someone with a bachelor compared to an associate due to the knowledge and investment they put toward their education."*** |
| Private - Religious | "I've been working in the childcare industry since 2010. In the many positions I have held from starting out as a floater to now being a Director, those who have degrees are the ones who don't stay. We also end up paying them more, but then are not working as hard as someone who doesn't have a degree. Not saying this is all but I would say 85%." |
| Private - Religious | "I do not hire according to education as much as experience, skills, character .... We are currently not able to pay more simply due to education & starting pay generally the same. I have regretted doing otherwise with the unfortunate high turnover in childcare. Not doubting partly due to pay as well." |
| Private - Religious | "I prefer to hire those who go to local community colleges as we are a non-profit and they probably attend the community college as they will live at home and the costs are more affordable. This tells me that this applicant will better understand the children from under resourced communities as they may have had similar experiences & conditions as our students." |
| Private - Secular | "In childcare, degrees are rarely used to determine eligibility for hiring" |
| ***Private - Secular*** | ***"A Bachelors degree is a Bachelor's degree. Only really look at school if it's their first job."*** |
| Private - Secular | "We have found that work experience is more meaningful than degree or education in terms of success in our setting" |
| ***Private - Secular*** | ***"We typically do not hire many employees with BA degrees due to salary restrictions."*** |
| Private - Secular | "ECE is a low funded, underpaying field. A lot of times, centers cannot afford to hire candidates whom have a lot of educational experience. In Tx only a HS diploma is required, most centers don,Äôt require above that when hiring." |
| ***Private - Secular*** | ***"I DO NOT CARE WHERE THE DEGREE IS EARNED. I JUST NEED THE DEGREED TEACHER AND PRAY SHE WILL ACCEPT WHAT I AM ABLE TO PAY."*** |
| ***Private - Secular*** | ***"I have hired many people for entry level at our early childhood center. Their degrees vary from associates through Masters, from community colleges through ivy league universities. For us it doesn't really matter where they came from or where they got their degree. We use their experience, abilities and past references to make our hiring decisions."*** |
| Private - Secular | "In my opinion sometimes those even with the highest degrees are not as successful in this field. When it comes to working with children, handling intense situations, implementing work and helping to teach, redirect, etc! Some things cannot be taught, you have to be comfortable in this role, know how to engage with families and talk through hard situations. Yes a degree helps for licensing purposes, but in my over 20 years of experience those without college degrees have been the ones that excelled within this profession." |
| Unknown | "I would give the job to the person with the associates degree, because our school is a ministry of a church and we believe in giving people chances who may otherwise be passed over." |

***Notes:*** This table reports the complete set of verbatim responses to Question 16 of the employer survey. Question 16 asked: “This survey is part of a research project about bachelor's degrees offered at community colleges. With that in mind, is there anything else you would like to share about your hiring practices as it relates to your experiences with these degrees?” Responses are reproduced exactly as entered by survey participants. Employer type is reported based on respondents’ answers to Question 1. Quotations highlighted in bold italics are discussed in the body of the manuscript.