The Impact of University Prestige in the Employment Process: A Field Experiment of the Labor Market in Three Countries

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THE IMPACT OF UNIVERSITY PRESTIGE IN THE EMPLOYMENT PROCESS.

A FIELD EXPERIMENT OF THE LABOR MARKET IN THREE COUNTRIES

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Abstract

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Do employers prioritize the signal associated with the name of the university someone graduated from above an applicant's skills in the employment process? Using a field experiment of the labor market, 2,400 fictitious applications were submitted to job openings in three countries: United States, United Kingdom, and Australia. The resumes belonged to fictitious citizens with full working rights, both female and male, that have attended universities of varying prestige in the United States, United Kingdom, and Australia respectively. Two skill-intensive sectors of the labor market were chosen: information and communication technology and accounting. For each sector of the labor market, two resumes were designed. One resume had a high skills match with the generic requirements of entry level jobs in each sector. A second resume had a low skills match with the same requirements. For each country, one high-ranked university and one non-high-ranked university were selected to signal prestige. The name of the university the applicant graduated from and the sex of the applicant were randomly assigned on otherwise identical resumes.

This study distinguished between the effects of human capital (Becker, 1975; Mincer, 1974; Schultz, 1959; 1961) and the signaling effect of university prestige in the labor market (Spence, 1973), while controlling for networking effects (Bayer, Ross, & Topa, 2005; Petersen, Saporta, & Seidel, 2000).

The results suggest that human capital—as measured through the high and low skills match resumes—was statistically significant in predicting callbacks. Applications in the high skills match condition were 79% more likely to receive a callback than applications in the low skills match condition. The prestige condition and the interaction between university prestige and match were not statistically significant. This experiment detected no statistically significant differences in callback rates based on the sex of the applicant. These findings suggest that human capital, and not university prestige, predicts recruitment outcomes for applicants with a bachelor's degree only. These results support a call for skill building and human capital consolidation at higher education institutions.

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Many individuals and organizations have contributed to this dissertation. The idea for the study originated in 2011. After reading *Freakonomics* by Steven D. Levitt and Stephen J. Dubner, a conversation with Vanessa Andreotti and my colleagues at University of Oulu, Finland sparked the idea of using an experiment of the labor market to test the effect of university prestige in the hiring processes. The project did not quite align with the format and scope of a master thesis. However, Gordon Roberts—my thesis supervisor at the time—saw its potential and encouraged me to pursue it as part of a PhD. While studying as part of the Erasmus Mundus Masters in Research and Innovation in Higher Education, I had the opportunity to interview employers in Romania and in Germany to better understand how they use university prestige in their recruitment. The insights gained in this process were instrumental in planning my PhD proposal.

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Chapter 1: Introduction

Merit is the broad contemporary societal justification for why it is morally acceptable for some individuals to possess more power, property, and prestige than others. Under the assumption that contemporary society is built following the principles of equality of opportunity (Karabel, 2006; Rivera, 2015; Young, 1958), the acquisition of disproportionate benefits for few is seen as fair and even desirable. The role of education is key in a society where allocations are based on merit. Allegedly, education both grants equality of opportunity, thus ensuring the possibility for upward social mobility regardless of class, race, and gender, and also filters individuals according to ascribed meritorious features. However, evidence suggests that the filtering function of education is better achieved than its upward mobility function (Arrow, 1973; Bowen, Kurzweil, & Tobin, 2006; Posselt, 2016).

Prestige is one of the main mechanisms used by education entities to filter individuals. Prestigious schools, which often use more selective admission criteria, sort individuals into elites and non-elites (Bourdieu, 1998; Meyer, 1977) and pave the way towards future allocation of greater power, property, and status to few, according to meritocratic principles. Key to the narrative of merit is the assumption that allocations are justified by personal ability. It is the human capital—the skills and abilities that individuals possess—that draws added rewards. This mechanism is strongly reproduced by higher education, as ever more clear hierarchies among universities are established and reinforced globally (Altbach, Reisberg, & Rumbley, 2009).

Academic literature suggests that graduating from a prestigious university has a wide array of pecuniary and nonpecuniary benefits for individuals (Black & Smith 2004; 2006; Brewer, Eide, & Ehrenber, 1999; Long, 2008; 2010; Long, Allison, & McGinnis, 1979; Monks, 2000; Morley & Aynsley, 2007; Rivera, 2015). Under the meritocratic narrative, the assumed

explanation for these added benefits is that students attending prestigious universities possess greater human capital rightfully rewarded by the labor market. However, as noted by Dale and Krueger (2002; 2014), the prestige ascribed to the university one attended tends to correlate potentially with other relevant factors in the employment process beyond human capital. The correlational studies used to test the benefits that emerge from attending a prestigious university are unable to draw a causal connection between human capital and the resulting added financial and non-financial returns (Long, 2008). At the same time, and more importantly, current literature does not engage with the normative implications of the effects observed: to what extent and under what conditions is it fair to accept disproportionate employment benefits for attendees of prestigious institutions?

I conducted a field experiment of the labor market that investigated the interaction between the prestige associated with the name of a university as a signal and the skills demonstrated by an applicant in the employment process. A field experiment of the labor market requires the submission of fictitious applications to job openings and measuring the callback rate. This experiment was conducted in three countries: Australia, the United States (US), and the United Kingdom (UK). The study answered two research questions: (1) to what extent does the prestige associated with the name of the university someone graduated from affect the employment prospect of this individual; and more importantly, (2) how does the effect of the prestige associated with the name of a university interact with the level of skills an individual demonstrates in predicting the employment prospect? I postulate that added labor market benefits associated with university prestige may be either a proxy for merit, as predicted by human capital theory, or more problematically, evidence of discrimination, as predicted by signaling theory.

Many societal concerns guide my effort to conduct this dissertation. However, before I elaborate on them, I need to address a number of deeply rooted societal beliefs about merit, talent, and the role of prestigious universities. This justification is needed because many individuals believe that the added societal benefits for graduates of prestigious universities are not only justified, but appropriate and necessary for a well-functioning society. First, I highlight how the history of equality has shaped the contemporary narrative of merit. This narrative disallows researchers, policymakers, and lawmakers from engaging critically with the societal benefits received by those who are perceived as meritorious, and thus deserving. Second, this chapter discusses the present-day accentuating stratification, both within and outside education, and brings into attention the continuous presence of discrimination against individuals. Third, I introduce the theoretical framework used for the purpose of this research.

Prologue

The question of how to best organize a fair society, has guided religions, utopias, and revolutions, including the one that founded the United States of America (Carson, 2007; Pole, 1993). Equality, or the lack thereof, has served as a leading focus for philosophers such as Plato, Hobbes, Marx, and Weber (Tumin, 1967), for economists such as Piketty (2013) and Roemer (2009), and significant social movements. Many have shaped how equality is understood today, and many divergent views on what equality means exist but the dominant conception of equality today has strict ties to merit and equality of opportunity. The related concepts of merit, talent, and ability follow the development of Western society, and are rooted in the historical tension between stratification and equality.

The struggle for equality as defined today took the form of rebellion against the natural arrangements of social hierarchies, or the natural state of inequality between humans within

traditional and agrarian societies. It was the Enlightenment that attempted to reject this notion, only to revive the ancient Greek conception of societal arrangements, where humans were considered naturally equal (Crompton, 2008). But while the realization that humans are equal by birth is somewhat straightforward, both in hindsight and in the direct clash with the norms of hereditary based societies, the articulation of what equality should actually look like is not. For many historical reasons, nowadays, the prevailing view is that equality of opportunity, and not outcome, is the appropriate societal application of the equality principle (Karabel 2006; Phillips, 2004).

It was in the context of the American Revolution where the conception of equality of rights, or equality of opportunity took root. The preference for a framework where equality of rights was prioritized over equality of outcomes was influenced by many factors. These factors included the need to rightfully educate citizens to support the republic envisioned by the founders of the country, the new industrial imperatives, the prospect of immigration, and the need to justify slavery (Pole, 1993). Those that embraced this notion still needed to offer a justification as to why differences between individuals continue to be noticed, if all are equal by birth. This justification occurred in two steps.

As a first step, thinkers needed to justify that inequalities are not rooted in biology or hereditary, but mostly emerge after birth through different exposure to stimuli and the environment. Here, the work of John Locke, who argued that humans are born tabula rasa and character is shaped primarily by environment, becomes important. Noteworthy, Locke tried to answer a question about human nature, and his answer was philosophical rather than empirical. Today there is plenty of evidence to suggest genetics have a great influence on who people become (Pinker, 2003). Regardless, the framework of talent, as manifested through hard work

and personal effort (Roemer, 2009), becomes very powerful, and its connection to education explicit (Coleman, 1968; Pole, 1993).

As a second step, if humans are to be given equal opportunity, the environment, or society should be structured in such a way as to offer actual opportunities to individuals. At its inception, following this position, the policy application of equality of opportunity within the United States and elsewhere required the provision of free education, the provision of a common curriculum, and bringing children from different backgrounds together in the same schools and classrooms. With important consequences for equality today (Roemer, 2009), financial support for schools was provided through property taxes. This arrangement derived from the notion that equality needs to be granted locally, and not at a national level (Coleman, 1968).

If all have equal access and equal opportunity through free schooling, then any emerging differences in outcome between individuals are due to an individual's ability and work, or through their merit and talent (Carson, 2007; Pole, 1993). As the framework of equality of opportunity became the new rationale to justify social arrangements, the existence of strata in society could yet again be explained, using the narrative of merit and talent. Paradoxically, stratification, or "the arrangement of any social group or society into a hierarchy of positions that are unequal with regard to power, property, social evaluation, and/or physical gratification" (Tumin, 1967, p. 12) could be supported in a society where equality is thought to exist. Noteworthy, formal and state-sponsored schooling is justified as a way to educate and select talent. Indeed, education is imagined as an effective allocation system, where the most talented can reach important social positions, regardless of the family or condition they are born into. In this way, merit is not only fair, but also an appropriate and effective criterion to organize society (Carson, 2007; Bowen, et al., 2006).

This view has had its important historical exceptions, as ethnic, racial, and gender criteria have been used to justify social and legal barriers to inclusion within the framework of equality of opportunity. While some historical and legal reparations have been conducted to address inequality across racial and gender lines, such inequalities persist today both at the level of opportunities and at the level of outcomes (Kluger, 2011). Indeed, the leading critique of the narrative of merit and talent has been that it has failed—and continues to fail—to ensure equal rights for individuals and groups who originate in different social circumstances. Experiments have shown that meritocratic framework disadvantage women and racial minorities (Castilla, 2008; Castilla & Benard, 2010). Breen and Jonsson (2005) suggest that the framework of equality of opportunity fails to acknowledge the difference between inequality of opportunity and inequality of condition. For the authors, inequality of condition is given by differential societal rewards offered to different groups for similar activities.

Another but equally important critique of merit problematizes the very premise of favoring those with talent for powerful positions in society. The prioritization of talent comes at a severe cost, and it has resulted in justifying increasingly clear distinctions between individuals, and supporting disproportionate allocations of power and influence to few within society. Young (1958) coined the term meritocracy in the late 1950s, and did so in the context of a dystopian sociological text, *The rise of the meritocracy*, where the new strata between individuals, clustered across talent lines, were infinitely more difficult to break than any stratification criteria used in the past, including class, race, and gender.

In a parallel development, the framework of equality of opportunity soon met its own challenges within the educational arena itself—an arena that was designed to ensure its implementation. It is within this space that the perceived tension between equality and excellence

emerges (Bowen, et al., 2006). The field of education started a long internal struggle in order to determine if breeding talent, as opposed to ensuring the success of all, should become its main responsibility. At this point, the pursuit of excellence and the pursuit of equality become competing goals, each with strong advocates. Tangible effects derived from the fact that education was no longer solely seen as an opportunity granter. Education entities themselves segregated between those focused on attracting and training existing talent and potential, and those aimed for the masses. Hierarchies between educational opportunities cemented. As such, in a circular association, talent became associated with those specific education institutions known for attracting talent. Universities that are perceived as the best worldwide have employed the strategy of being seen as attracting the best input, and thus specialize in conducting the filtering function of education. Best universities have become equivalent to talented students (Harvey & Green, 1993). In return, the individuals that attend best universities are perceived as deserving of best societal positions (Rivera, 2005). Further, through meritocratic priming (McCoy & Major, 2007) both society at large and students and graduates of prestigious universities feel they deserve to receive added societal benefits.

The architecture around the construct of equality of opportunity developed over time. Educational entities have gained almost hegemonic control in defining talent and have become experts at filtering talent using their own definitions for broader societal purposes. While some might disagree that this practice is intrinsically problematic, I argue that it leads to problematic effects insofar as current conceptions of merit steer away further detailed investigation on the potential misuse of prestige. The present dissertation aims to fill this empirical gap with a particular focus on prestigious universities.

Problem Statement

The primary manifestation of inequality in society is stratification. In agrarian societies stratification took the form of hereditary natural arrangements. In pre-civil rights America and beyond, stratification occurred and occurs across racial lines. Nowadays stratification is more complex, and the criteria it emerges from are more difficult to identify. For the purpose of this research, two societal arenas are of particular interest: higher education and the labor market. The very presence and intensification of stratification today within both arenas justify the timeliness of this research.

At their inception and throughout most of their history, all universities gathered the elite few. In the last few decades, this has changed at an accelerated pace through the massification, differentiation, and stratification of higher education. Soon after, qualitative ways to distinguish among institutions within the academic hierarchy followed: university rankings in return placed a greater emphasis on the importance of prestige as a globally portable signal.

Outside the field of higher education, the stratification of the job market facilitates a greater receptivity of employers to signals associated with university prestige. At the same time, both within and outside higher education, evidence for discrimination and the underrepresentation of minorities and disadvantaged populations abound. These factors potentially facilitate the increased use and misuse of university names as sorting signals by employers.

Stratification in Higher Education

Around the globe more students attend universities than at any other point in history. Higher education has been marked by a shift from an elite higher education system, where less than 15% of students are enrolled in universities (Trow, 1973), to a massified higher education

system. This expansion is not a new phenomenon (Trow, 2006), but it has intensified in recent years (Teichler, 2008; Wan, 2011; Zha, 2009). The demand for higher education has led to the creation of higher numbers of new tertiary education providers, but also of more diverse post-secondary education institutions (Altbach, 2017; Birnbaum, 1983) equipped to meet the increasingly diverging needs of potential students (Bastedo & Gumport, 2003; Brennan & Osborne, 2008; Reimer & Jacob, 2011).

Higher education scholars describe two diverging types of differentiation: horizontal and vertical differentiation (Altbach, Reisberg, & de Wit, 2017; Vught, 2008). Horizontal differentiation manifests itself through the differentiation of mission between tertiary education institutions. However, in many cases, diversification took the form of increased stratification, or vertical differentiation among institutions (Altbach, Reisberg, & Rumbley, 2009; Teichler, 2008; Vught, 2008), where different tiers of institutions emerge (Reimer & Jacob, 2011). As such, differentiation within higher education is often at odds with other policy goals, such as the promotion of socio-economic equality (Arum, Gamoran, & Shavit, 2007; Mok, 2016; Singh, 2008). The stratification process fueled the public attention that university prestige is receiving, more recently in the form of university rankings (Eckel, 2008; Hazelkorn, 2009; Vught, 2008).

In an elite tertiary education system, the signal used by employers to distinguish between job applicants was the presence or absence of a tertiary education degree (Spence, 1973). In a massified system, employers are faced with the challenge of distinguishing between a significantly larger number of university graduates that originate from highly diverse tertiary education institutions. The presence or absence of a university degree is no longer sufficient to differentiate between applicants. In this context, names of tertiary education institutions in vertically differentiated or stratified systems become markers easy to identify and associate with

quality. As such, prestige markers may have become one of the signals utilized to differentiate between job applicants with postsecondary degrees.

The repercussions of higher education stratification are further amplified by the barriers faced by students of disadvantaged background in being admitted to (Kidder, 2001; Posselt, 2016), attending (McKinley & Brayboy, 2004; Tett, 2004) and completing (Roksa, 2011) an elite post-secondary degree program in the US and elsewhere (FengLiang & Morgan, 2008; Hao, Hu, & Lo, 2014; Lee, 2014; Lee, 2016; Reay, Crozier, & Clayton, 2009). Overwhelmingly, the evidence suggests that prestigious or selective institutions pose significant barriers to minority students (Cook & Frank, 1993; Mok & Neubauer, 2016; Posselt, 2016; Seider, 2008). Indeed, few would claim that elite universities serve to offer equality of opportunity. A recent study illustrates that mid-tier public universities are more effective at ensuring intergenerational mobility that elite institutions (Chetty, Friedman, Saez, Turner, & Yagan, 2017).

The effects of educational differentiation have led to and perpetuated stratified educational systems that in return contributed to perpetuating the existent social order time and time again throughout history. This has been the case in England, where the split between voluntary schools and fee-paying schools have helped reproduce the class structure of the country, a phenomenon replicated by public and private schools around the world. In the US, a relatively classless society at its formation, differentiated educational opportunities for Blacks and Whites have served to perpetuate the social divide (Coleman, 1968).

While low-income students have gained greater access to highly selective institutions over time, the access gap between students of different economic backgrounds persists, as wealthier students become more equipped to match admission requirements (Bastedo & Jaquette, 2011; Mkrtchian & Shakin, 2005). In many ways, the massification and differentiation of higher

education has not delivered on the promise of offering equal access to students, but has created yet another mechanism for social reproduction by shifting the marker of success from attending a university to attending a prestigious university (Bourdieu, 1998; Macris, 2011; Seider, 2008; Winkle-Wagner, 2010). However, most frequently, elite universities have been criticized on different grounds. Some evidence suggests that the admission to prestigious institutions is not solely based on academic merit or standardized criteria, but includes considerations such as legacy status and athletic ability (Espenshade, Chung, & Walling, 2004; Golden, 2007).

Broadly speaking, the movement to increase access to higher education has been supported by an economic rationale and a sociopolitical rationale. The economic rationale suggests that increased access to higher education supports economic growth by ensuring that enough qualified individuals are ready to take and create high-skilled jobs (Becker, 2010; Healy & Cote, 2001; Schultz, 1961). The socio-political rationale created a moral imperative around the distribution of privileges derived from education to new groups and more individuals. However, about the same time as access was granted to more individuals, the diversification of higher education accelerated (Vught, 2008), thus potentially amplifying some of the broad benefits of higher education for some universities rather than all. If indeed such effects occur, the socio-political mission of higher education access is diminished under the current stratification arrangements of higher education (Bastedo & Gumport, 2003).

Stratification of the Labor Market

The labor market too is stratified (Baron, 1984). Some jobs are more desirable than others (Jencks, Perman, & Rainwater, 1988), some jobs receive higher wages than others (Mouw & Kalleberg, 2010), and some jobs have higher social recognition and provide individuals with more access to power and influence than others (Rivera, 2015). Many economists and

sociologists postulate that individuals operate in a dual labor market, where institutional structures condition the access of individuals to certain jobs regardless of their skill levels. Dual markets or segmented markets include the primary sector, with highly desirable jobs, and the secondary labor sector, which includes less desirable occupations and positions (Beck, Horan, & Tolbert, 1980; Reich, Gordon, & Edwards, 1973; Sakamoto & Chen, 1991; Wial, 1991). Access to the primary labor sector is secured from outside challenges through varied mechanisms, such as bargaining, increased cost of replacing an individual with firm-specific knowledge, discrimination, and citizenship status (Hudson, 2007). Using observation studies and interviews with recruiters, Rivera (2015) cogently describes how university prestige becomes the entry gate to high paying and high prestige jobs, a subsection of the primary job segment.

Some argue that stratification represents an effective and necessary function in society and that prestige and differentiated rewards are required to attract rare talents to functionally important social positions (Davis & Moore, 1945; Pole, 1993). At the same time, others caution that stratified systems benefit the established elites and promote social inequality (Baron, 1984; Tumin, 1967) through multiple mechanisms such as the disproportionate opportunities to succeed available to individuals based on their familial backgrounds (Piketty, 2013; Solon, 1999), and discrimination (Bonacich, 1972; Hudson, 2007). As part of this dissertation, I suggest that stratification conditions may lead to unfair uses of university prestige.

Discrimination and Stratification

In addition to limited de facto equality of opportunity, evidence of discrimination abounds in society. Substantial progress has been made in documenting discrimination based on sex (Gander, 2014; Gunderson, 1989), race (Bendick, Rodriguez, & Jayaraman, 2010), ethnicity (Widner & Chicoine, 2011), and disability (Seeman, 2009). Traditionally, such research

investigates inequality and discrimination based on individual and group features generally referred to as indices, or unchangeable, observable characteristics (Spence, 1973). Indices such as gender, race, and disability status are relatively straightforward to measure.

However, the academic literature gives little attention to the possible discriminatory effects of signals such as the level of education and the level of prestige of the school one attends. The lack of engagement with prestige as a discriminatory signal is due to two factors. First, the study of prestige as a discrimination proxy poses increased methodological difficulties. Second, such a research endeavor would challenge the general perception that the use of university prestige as a selection criteria or proxy represents a fair mechanism for allocating positions and rewards in society (Posselt, 2016; Warikoo & Fuhr, 2014). This leap is possible due to the belief that attending a prestigious institution represents the meritorious achievement of individuals. Evidence suggesting the added societal benefits to attending a prestigious university is generally not interpreted as a source of discrimination, but as consistent with meritocratic principles. However, given the stratification conditions currently in place both within higher education and within the labor market, it is conceivable that abuses might occur. In order to prevent the misuse of prestige as a signal in the labor market, further research and empirical scrutiny is required.

Theoretical Framework

There are three generic mechanisms that have been recognized to significantly impact the employment process. First, it is inferred that employers seek to maximize productivity, and thus hire individuals with the skills and abilities that best contribute towards this very productivity. This mechanism, better known under as human capital theory (Becker, 1975; Mincer, 1974; Schultz, 1959; 1961), explains why attending a university yields better employment returns for

graduates: universities equip individuals with additional skills recognized and rewarded by the labor market.

The second mechanism suggests that under conditions of information asymmetry between employers and employees, employers are incentivized to identify and use signals that would indirectly indicate the level of productivity of an individual (Spence, 1973). In the signaling model, a visible, observable feature, such as the presence or the absence of a postsecondary degree, or the prestige associated with this degree, is interpreted as an indicator for a broader non-visible feature, in this case potential productivity. Signaling theory, as introduced in social sciences by Michel Spence (1973), refers to the transfer of information in a market system in the form of signals. In the job market, an employee is perceived as a possible asset identifiable by analyzing observable characteristics and attributes rather than, and instead of testing actual productivity. These characteristics can be alterable or non-alterable. Alterable or changeable characteristics are defined as signals. Non-alterable or unchangeable characteristics are defined as indices. Education is an example of a signal, while sex and race are perceived as indices.

Last, the third mechanism, best explained by social capital theory, entails that individuals obtain jobs based on their social network and the trust they have established with people they know directly or indirectly (Bayer, Ross, & Topa, 2005; Petersen, Saporta, & Seidel, 2000) through practices such as sharing job specific information, occupation specific norms, and job referrals (Montgomery, 1991). As fictitious applications do not know people directly or indirectly, I assume that social capital broadly—and networking effects specifically—are absent from the experiment I conduct.

The disproportionate labor market effects of university prestige can be explained by the three mechanisms above. It may be the case that alumni of prestigious universities have added skills that position them better in the labor market, have benefited from the prestige signal of their degrees, or social have social networks. The field experiment of the labor market I conducted controls for the effects of social capital in the process of applying for jobs, and instead analyzed the effects of signaling in comparison with the role played by human capital. The goal of this endeavor was to observe empirically if, in the employment process, skills and ability prevail in importance over prestige signals, or if prestige signals are used to sort candidates despite or above someone's skills.

The task of choosing a framework that would allow the detection of negative consequences of university prestige is not trivial. University prestige is deeply associated in contemporary discourse with individual merit, achievement, and desert. The attempt to differentiate between fair and unfair effects of university prestige is not only limited by the volatile nature of the concept being studied, but also by the innate skepticism towards the question being asked. To address this critique, I rely conceptually on a definition of merit that is strongly associated with skills and competencies, or human capital. This interpretation of merit rooted in human capital theory is juxtaposed to the use of signals in the labor market, where actual skills are secondary in a selection process. As such, for the purpose of this research, human capital, with all its limitations, does not only serve as a theory to explain the effects of university prestige in the labor market, but also as a criterion to separate between fair and unfair applications of university prestige.

Conclusion

Jost, Pelham and Carvallo (2002) illustrate that minority and disadvantaged groups tend to internalize self-perception of inferiority; this too applies to students of low-status universities. Groups with an inferiority self-perception tend to express out-group favoritism, prefer being associated with members outside of their groups, and thus favor the success of privileged outgroups. Supported by system justification theory, the authors reveal that students from high-status universities reversely manifest in-group favoritism and prefer being associated with members within their group. System justification theory suggests that "people consciously and unconsciously justify and perpetuate existing social arrangements" (p. 587). Thus, individuals are likely to value their merit based on and consistent with the assumptions of merit made by society. McCoy and Major (2007) call this phenomenon meritocratic priming. Meritocratic priming conditions underprivileged individuals to justify inequality in two distinct ways. First, meritocratic priming allows the justification of disadvantages and inequalities underprivileged individuals experience themselves or as part of a group. Second, it serves to justify the advantages received by other groups through the narrative of merit. This adds to the body of evidence suggesting that members of low-status groups are likely to justify group and individual discrimination by engaging in status-justification and are less likely to recognize discrimination patterns.

Historically, the endorsement of formal qualifications as fair selection criteria has advanced the cause of equality by overcoming the use of ascribed characteristics to judge a person (Jackson, 2009). Education—as opposed to class—is viewed as an allocation system that has implications on defining the elite standards and matching individuals within a stratified society (Bourdieu, 1998; Meyer, 1977). Elite allocation is, in fact, one of the functions of

education. However, these views hinder the ability to identify injustice today. They are particularly powerful in legitimizing the allocation of privilege to elites in society, as elites see their position as a reflection of the application of merit as a socially acceptable and desirable criterion of distribution of power and prestige (Warikoo & Fuhr, 2014).

In the current environment, educational credentials are used to prove and verify formal qualifications, but they too are proxies that do not always reflect relevant skills and capacities, and often serve to hide discrimination patterns. Conversely, they might serve to further reinforce views of the world based on intrinsic inequalities. In this light, evidence suggesting increased rates of return to attending prestigious higher education institutions should not be interpreted only as a positively meritocratic manifestation of social forces, but also as a possible source of evidence for discrimination.

The switch from an elite higher education system to an expanded higher education system increased the overall access to higher education (Altbach, Reisberg, & Rumbley, 2009; Trow, 2006). Inconceivable in the past, representatives from lower social classes and traditionally disadvantaged populations have access to social mobility through higher education. However, elites are more likely to attend the universities at the top of the higher education hierarchy (Baker, 2014; Chetty et al., 2017; Warikoo & Fuhr, 2014). Facilitated by stratification, the contrast between prestigious and non-prestigious universities could only be enhanced. If the name of the university someone graduated from carries discriminatory properties, the stratification of today's society cannot be reversed solely through mere access to higher education. A critical discussion about the impact that prestigious higher education institutions have on society is crucial in order to identify mechanisms for fair and equitable social mobility

and in order to consolidate the role that higher education institutions can actively play in advancing equality and social change.

Chapter 2: Literature Review

In this chapter I survey the current academic literature about university prestige, the labor market, and discrimination, as well as the intersections between these phenomena. I have two aims. First, I offer an overview of what is currently known about the leading questions behind this research. Second, I aim to properly define the concepts I use as part of this endeavor and to position this research in relation to relevant academic debates.

To begin, I explore the concept of university prestige in the broader framework of stratification. Here, I conclude that university rankings, with all their limitations serve as the appropriate measure of prestige for the purpose of this research project. Then, I engage with the concept of employability as an important feature of the labor market. Employability received limited attention in the academic literature analyzing the relation between university prestige and the labor market. The chapter continues by highlighting the empirical evidence that illustrates the existent financial and non-financial gaps between graduates of prestigious and less prestigious universities within the academic and the non-academic labor markets. As part of this section I emphasize how these benefits are more likely to be received by male rather than female graduates. Last, I engage critically with the concept of discrimination, make the case that university prestige meets the theoretical criteria to be considered a discriminatory factor, and link human capital theory and signaling theory to merit, in an attempt to best understand what constitutes a fair recruitment process.

Defining University Prestige

The concept of prestige is strictly linked to stratification and hierarchy (Tumin, 1967). Davis and Moore (1945) focus on defining prestige in relation to the functions it plays in society. For them, prestige represents a form of institutionalized inequality and the necessary mechanism

through which rare talents are attracted to functionally important social positions. For Tumin (1967), alongside preference, prestige represents the form taken by evaluation, which in return is a cause of stratification. Prestige leads to deferential and respectful behavior. Henrich and Gil-White (2001) adopt this conception, and further differentiate between dominance and prestige, where prestige is viewed as freely conferred deference, that is a mechanism of renouncing one's own authority and attributing this very authority to a third party. Individuals learn to identify prestigious entities and attempt to copy them. Further, prestige is valuable in so far as it offers power to individuals or institutions that possess it. For power to be exerted, prestige needs to be broadly identified and recognized as such (Tumin, 1967). Stratified systems such as the labor market and higher education are prestige sensitive, where prestige can be both identified and acquired.

The concept of university prestige is highly disputed within the higher education arena. The academic literature on this topic does not contest the impact or presence of prestige in higher education. Instead, it both laments the increased attention and importance given to prestige and it contests various definitions used to define it, most significantly by global academic rankings. Three general approaches are present in the academic literature to define prestige in higher education.

First, several studies including Rothwell, Jewell, and Hardie (2009) and Mihut (2015) shy away from proposing their own definitions of prestige, and engage with definitions given by higher education stakeholders, such as employers and students. Such approaches provide a triangulated version of university prestige that captures input beyond highly quantitative measurements of selectivity or research output, and instead illustrate local variations in the perception of prestige. These endeavors generally illustrate that, in the perception of employers,

a variety of factors give universities their prestigious reputation, most significantly, their ability to provide high quality teaching (Rothwell et al., 2009; Mihut, 2015). While inclusive, such definitional approaches do not meet the standardized and reliability requirements as to be employed in the context of an experimental design.

Several country-focused empirical studies use single measurable indicators to define prestige. These indicators are often labeled as college selectivity (Brewer et al., 1999; Dale & Krueger, 2014; Hoxby, 2009) or college quality (Black & Smith, 2004; Long, 2010). In the US context, college selectivity is often measured using Barron's Index, a stock market index that measures the productivity of publicly listed companies, the average SAT or ACT scores of admitted undergraduate students, or college acceptance rate (Brewer et al., 1999; Dale & Krueger, 2014; Hoxby, 2009; Long, 2010). While these measurements represent to a large extend a reliable indicator for university prestige within the US, in the international context these measurements receive little recognition, as they are not available for use in international comparative exercises. Before higher education rankings became prominent, studies such as Bedeian and Field (1980) used various independent reputation surveys to measure university prestige. Such approaches are unnecessary today, given the abundance of global lists and rankings measuring prestige.

Most often, academic literature pertaining to the field of higher education defines academic prestige by referencing university rankings (Morley & Aynsley, 2007; Tapper & Filippakou, 2009). Global university rankings, the most famous of which are the Times Higher Education Ranking, the Academic Ranking of World Universities, the QS World Universities Ranking, and the US News and World Report Ranking, receive wide attention both within the academic environment and more importantly outside the higher education sphere.

University rankings are highly criticized within the academic literature on methodological (Bougnol & Dulá, 2015; Rauhvargers, 2014; Soh, 2013) and normative grounds (O'Connell, 2013; Tapper & Filippakou, 2009). Pusser and Marginson (2013) identify a high degree of consistency between the indicators used across different rankings. Researchers often discuss several methodological concerns regarding rankings collectively, stating that they offer a unidimensional image of universities and disregard their mission (Daraio, Bonaccorsi, & Simar, 2015; Pusser & Marginson, 2013), favor research intensive fields such as the hard sciences and research intensive universities (Marginson, 2014), neglect the quality of teaching as a relevant indicator (Taylor & Braddock, 2007), favor rich institutions (Hazelkorn, 2014) and institutions located in the English speaking world (Kelm, 2014; Pusser & Marginson, 2013). Alternative ranking initiatives that respond to some of these concerns have been created. A notable example is U-Multirank, an interactive ranking aimed at offering users the ability to gather useful information about universities by customizing both the ranking criteria and their respective weights.

While country relevant indicators have a limited geographical relevance, global rankings cover few universities. With the exception of US News and World Report Ranking, such ranking initiatives only name and categorize universities that are perceived to be at the top of the academic enterprise (Millot, 2015). While rankings might prove to be a good source for identifying very prestigious and somewhat prestigious institutions, they prove unreliable for identifying universities with a low level of prestige. Even with these limitations, rankings are still potentially better measurements of prestige, as no alternative international comparable tools to measure prestige exist.

With all their limitations, global university rankings became influential and have managed to steer public perception, alter institutional behavior (Efimova, 2014; Locke, 2014; Yudkevich, Altbach, & Rumbley, 2015; 2016), influence research behavior (Hazelkorn, 2014; Münch & Schäfer, 2014), and guide national and transnational policy (Erkkilä, 2014; Kehm, 2014). The widespread use and influence of university rankings further serves to justify their relevance and their appropriateness as a proxy for measuring university prestige.

Defining Employability

The demand for higher education institutions to produce employable graduates has risen in recent years, as a result of massification and current employment trends (Cai, 2013, Harvey, 2001). Higher education institutions are compelled to reveal the percentage of graduates that found jobs, and have become more receptive to teaching transferable skills required by the job market. Policymakers around the world pressure higher education institutions to graduate students faster and contribute towards economic development. For many, the ability of higher education institutions to graduate employable students became the quality landmark of an institution.

According to Harvey (2001), employability is the "propensity of students to obtain a job" (p. 98). Employability is a concept typical to the sphere of the labor market and is viewed as an outcome, and not as a process. Often, researchers capture employability by referencing the behavior of actors involved in the labor process: the behavior of applicants successful in obtaining a job or the behavior of employers hiring a person. Concepts such as appointment and recruitment appear more frequently in the academic literature than the term employability. For example, articles discussing the first job of PhD students refer to academic appointments (Bedeian & Field, 1980; Long, Allison & McGinnis, 1979). Rothwell, Jewell, & Hardie (2009)

define three units of analysis at which employability can be studied: (1) the individual level, (2) the workforce level, and (3) employability as a human resource strategy, or the enterprise level. Alternatively, employability is defined as the sum of practices and priorities relevant to employers in the recruitment process (Morley & Aynsley, 2007).

The study of university prestige in relation to the labor market does not particularly focus on the effects of prestige on employability directly, but on wages as another relevant element of the working life of individuals (Black & Smith, 2004; Brewer et al., 1999; Dale & Krueger, 2014; Long, 2010). While how much money an individual obtains is a relevant indicator for the impact of university prestige, answering questions related to the propensity of an individual to obtain a job or not, and the ease with which the job is obtained, represents an important addition to studying the effect of university prestige in the labor market.

The concept of employability may be further operationalized to encompass all stages of the recruitment and selection process, from initial resume screening (Cole, Rubin, Feild, & Giles, 2007; Riley, 2001), to competencies tests (Miao & Gastwirth, 2014), and interviews (Case, 1988; Chamberlain, 2016). This dissertation has only investigated the first stage of the recruitment process, where the screening of CVs occurs, before employers are able to meet the person behind the CV, and where signals have the strongest effects.

Relation Between University Prestige and Employability

Within the academic labor market, evidence suggests that the prestige of the university one graduated from represents a key variable in gaining an academic appointment (Long, 1978; Long, Allison, & McGinnis, 1979; Roberts, Ilardi, & Johnson, 2006). Outside the academic labor market, relevant studies generally focus on understanding both the impact of university prestige on earnings, but also on understanding the employer and employee perceptions on the

importance of prestige in the employment process. At the end of the section I discuss the disproportionate effect of university prestige on wages by sex.

University Prestige and Academic Appointments

Multiple studies show a high degree of correlation between the prestige of the doctoral program one graduated from on one hand, and the prestige of the employment institution on the other hand (Burris, 2004; Long, 1978; Long, Allison, & McGinnis, 1979; Roberts, Ilardi, & Johnson, 2006). Two leading hypotheses aim to explain these results: the hiring network hypothesis—equivalent to social capital theory—and the productivity hypothesis—equivalent to human capital theory. Both hypotheses have been challenged by the academic literature either on normative or empirical grounds.

The hiring network hypothesis is premised on notoriously high inbreeding rates among elite institutions, or the propensity of universities to hire their own graduates (Mihut, de Gayardon, & Rudt, 2017). Variations of social capital theory (Burris, 2004) describe academic departments as a caste system and define prestige in relation to the social networks established between PhD programs, challenging the common view that university reputation is a reflection of research productivity. Burris was able to estimate that 84 percent of the variation in departmental prestige is explained through hiring networks. The authors view the high inbreeding level among prestigious institutions not only determined by prestige, but also to act as a gatekeeper necessary to preserve the high reputation of institutions. In her book analyzing the trajectory of Nobel prize laureates in the sciences, Harriet Zuckerman (1977) discusses the importance of mentorship, of personal relation to previous Nobel winners, and of socialization as key determinants to enter the scientific elite in the United States. The ascribed status of future

scientists, partially connected to their existing access to established elites, further determines differential and prioritized access to key scientific resources, such as laboratories.

In contrast, Crane (1965) suggests that the propensity of graduates of elite or "major" institutions to obtain academic appointments at peer universities is explained by their increased productivity. The author reveals that research productivity for graduates of major universities persists regardless of the status of the employing institution. University prestige highly correlates with research productivity measures, which are relevant to the university enterprise and its mission. Given this fact, the overwhelming body of evidence suggesting a relation between the prestige of the university someone received their PhD from and their post-graduation academic appointment can be to some extent sensible and maybe even desirable. However, in 1979, Long, Allison, and McGinnis (1979) published the results of a study analyzing the career trajectory of 239 male biochemists who received their PhD in 1957, 1958 1962, 1963. Their results reveal that the prestige of the academic appointment destination after graduation has a correlation of .34 with mentor's citations, while the correlation with their own publications is only .14. Long (1978), and Baldi (1995) additionally suggest that the prestige of a PhD department is more relevant than research productivity in obtaining an appointment at a prestigious institution, indicating that academic appointments at prestigious institutions depart from the application of meritocratic criteria. The authors thus suggest that the use of university prestige as a hiring factor for academic appointments is problematic, maintaining that academic appointments should reflect the abilities of the individual hired, and not the reputation of their graduating department. Such critical interpretations of the effects observed are not present in studies investigating the effect of university prestige on earnings.

The Effect of University Prestige on Earnings

Academic literature investigating the relation between university prestige and employment in the labor market overwhelmingly suggests that individuals attending more selective colleges have higher lifetime earnings. Brewer, Eide, and Ehrenber (1999) use longitudinal earning data for the high school class of 1972, 1980, and 1982 in regression analysis investigating the relation between the prestige of the school attended and the wages received by graduates. Their findings suggest a significantly higher rate of return for graduates of elite private institutions in the US than for graduates of middle-rated private institutions. The evidence for an increased rate of return to attending a prestigious public institution is weaker. In addition, the 1980 cohort had a higher rate of return to attending a selective institution than the 1972 cohort. Monks (2000) also researched the heterogeneity in wages among college graduates. His results suggest that students graduating from private universities and research universities earn more money than students graduating from liberal arts colleges and public institutions. Long (2008; 2010) uses a similar methodology as Brewer, Eide, and Ehrenber, and the results illustrate an increased rate of return to attending a more selective higher education institution. Long also suggests that the effects of prestige seem to have increased over time, consistent with trends of stratification.

Adding to the body of evidence suggesting a positive relation between the two variables, Black and Smith (2004; 2006) analyze the relation between college selectivity and wage by using longitudinal earning data. However, they attempt to diversify the methodological approach by using a propensity score matching method (Black & Smith, 2004) and by expanding the operationalized definition of college selectivity to include faculty-student ratio, admission rejection rate, freshman retention rate, mean SAT score, and mean faculty salaries (Black &

Smith, 2006). Hoekstra (2009) focuses on analyzing the effect of attending the flagship state public institution on the wages of graduates. The research reveals that graduating from the flagship state institution yields 20 percent higher earnings for Caucasian male graduates. The study does not include women and minorities in the analysis.

Empirical research overwhelmingly suggests a strong correlation between the prestige of the institution one graduated from and owns wage. However, non-observable characteristics of graduates that could further explain similar outcomes are not fully accounted for. Dale and Krueger (2002; 2014) attempt to resolve this problem by employing a selection-adjusted model labeled as the self-revelation model. This model assumes that students reveal unobservable characteristics to university admission officers, characteristics that are unknown to researchers and cannot be measured through conventional means. If true, by comparing the post-graduation earnings of students that were accepted by selective universities and decided to attend those universities versus those that were accepted but did not attend selective universities, the researchers can infer if existing non-observable characteristics explain salary patterns.

The regression analysis for the student cohorts of 1976 and 1989 at 27 colleges illustrate that patterns of wage discrepancy between graduates of colleges of varying selectivity persist. When the self-revelation model was applied to analyze the same data set, the effects of college selectivity on earning becomes close to zero, which means that there is no statistically significant wage difference between graduates of prestigious institutions and students that were accepted to prestigious institutions, but did not pursue the offer. There is one significant exception to this result: the college selectivity effects persist under the self-revelation model for Black-American and Hispanic students. This study was met with skepticism by the academic community. Hoxby (2009) suggests that the population of students not accepting an offer at a more selective

university is a statistical anomaly, and thus the results of Krueger and Dale should not be considered a strong enough response to the wide array of evidence suggesting the strong impact of university prestige on wages.

Most studies investigating the relation between university selectivity or prestige and the wage of graduates rely on available longitudinal data sets that use simplified quantitative measurements to determine the abilities of individuals. Additionally, they focus almost exclusively on a limited understanding of labor market success indicators, specifically earnings. Dale and Krueger (2002; 2014) are effective in illustrating that hidden unobservable features of individuals may determine the wage gap between graduates. However, their study assumes that those accepted into prestigious universities are, for the most part, better-equipped individuals who are selected based on unobservable features that employers care about, a constant assumption that remains untested and not problematized in the literature studying the effect of university prestige on earnings. It is precisely this assumption that my research proposal addressed by distinguishing between fair and unfair mechanisms that might explain the impact of university prestige in the labor market.

Sex, University Prestige, and Employability

The effects of university prestige on wages vary by sex. While Hoekstra (2009) eliminates women altogether from his sample, Long (2008) suggests that women's earnings benefit less from attending a prestigious institution. The author explains this finding by suggesting that childbirth might have negatively affected the professional prospects of women. Similarly, Black and Smith (2004) find that “attending a high-quality college rather than a low-quality college increases wages by 11 or 12 percent for men and by about 7.5 percent for women” (p. 115). The study conducted by Monks (2000) illustrates a mixed relationship between

gender and the rate of return in earnings for college graduates. While female graduates of specialized institutions earn more than males, the relation reversed for males attending a graduate degree-granting or a research university. Specialized institutions award degrees in a single field (The Carnegie Foundation for the Advancement of Teaching, 2001). The wage gap between males and females described by these studies is consistent with broader wage discrimination patterns between females and males in society (Gander, 2014; Gunderson, 1989).

University Prestige and Employability Beyond Wage

While academic literature exploring the relationship between university prestige and wage is abundant, the effect of prestige on other relevant labor market variables, such as the likelihood to obtain a job, receives less attention. Alternative methodological approaches have been employed in order to explore the relationship between university prestige and labor market related indicators. Interviews or surveys with employers are most frequent.

In a survey evaluating the self-employability perception of 226 UK postgraduate students from diverse backgrounds at business schools, Rothwell, Jewell, and Hardie (2009) learn that students believe university prestige will be a significant factor in their employment process. Morley and Aynsley (2007) use 41 interviews, 3 focus groups, and survey responses from 100 participants to gather information from employers about the criteria relevant in the employment process in the UK. Their findings report that over 25 percent of employers use information about the ranking position of a university an applicant graduated from as part of the employment process, and around 80 percent discussed the relevance of reputation while recruiting. Similarly, in a study conducted by Finch, Hamilton, Baldwin, and Zehner (2013), 30 employers in Canada were interviewed to understand the variables relevant in the employment process. While the study revealed that prestige is the least significant employment variable according to

interviewees, 19 out of 30 respondents spoke about their use of university reputation in making employment decisions. In a comparative study focused on interviewing employers in Romania and Germany, Mihut (2015) reveals that university prestige plays a contributory role in the employment process of graduates. Importantly, these studies emphasize that the prestige of universities is only secondary in importance to skills possessed by individuals applying for jobs.

The assumption that skills are more important than prestige in the employment process was undermined in 2015, when Lauren Rivera's book *Pedigree: How elite students get elite jobs* was published. The book reveals that students who do not attend elite institutions are rarely considered for top law and financial jobs in the US. According to Rivera, employers bypass the traditional recruiting model where all potential employees are invited to submit applications to open hiring calls. Instead, companies conduct recruitment events on the campuses of a few selected elite universities.

Neither students nor employers represent fully reliable sources of information for understanding employment practices. Students are likely to be aware of their sole situations without any ability to provide comparative inferences, and employers are either likely to not be fully aware of the practices they engage in or be disinclined to reveal them (Daniel, 1969).

Researchers have occasionally investigated the relationship between university prestige and other labor market variables, including job satisfaction (Kim, Kim, Jaquette, & Bastedo, 2014) and occupational status (Brand & Halaby, 2005; Rivera, 2015). These studies have found that while the effects of college selectivity have diminished over time, minority students persist in being less satisfied and that students who graduate from elite institutions are more likely to reach or access jobs with higher occupational status.

Two studies that use field experiments of the labor market include university prestige as an experimental condition. Gaddis (2013) conducted a field experiment of the labor market that analyzed the effects of university selectivity (prestige), sex, and race in the US. Gaddis submitted paired fictitious applications to 1,008 job openings in three metropolitan regions in the US. His result suggests a preference for applicants from prestigious institutions and the presence of race-based discrimination in the labor market. The applications in the high prestige condition (10% callback rate) received an overall callback rate that was 1.6 times higher than applications in the low prestige condition (6.4% callback rate).

Multiple differences persist between Gaddis (2013) and my research. First, he purposefully chooses institutions at the top of the academic hierarchy. The institutions in the high prestige conditions he chooses are Harvard, Stanford, and Duke. I purposefully exclude Harvard and Stanford from this study (see details in Chapter 3). Second, for Gaddis, the sector of the labor market where applications are submitted is not a relevant variable. More importantly, if for Gaddis university selectivity is a measure of human capital, in the context of my study, I use skills match instead of selectivity to operationalize human capital. His findings suggest that while applicants in the high match condition obtain a higher callback rate, Black applicants in the high-prestige condition obtain a callback rate equal to the callback rate for applicants in the low prestige condition.

Michelle Jackson (2009) conducted a field experiment of the labor market in the UK in which she included university prestige as an experimental condition—alongside degree level, class signifiers, and sex. She submitted job applications to 2,560 UK based companies. Her research does not control for skills match with the job opening. The study received an overall small callback rate across all conditions. However, she documents a higher callback rate for her

high-ranked university (2.1% callback rate) than her low-ranked university (0.8% callback rate). Female applicants received a higher callback rate (1.7% callback rate) than male applicants (1.1% callback rate).

Through a diverse set of methodologies, the studies presented in this section offer strong evidence to support that the prestige of the university someone graduated from has significant benefits for the professional lives of individuals but also illustrate how these effects are disproportionately distributed between privileged and less-privileged populations across race, ethnicity, and sex criteria.

Discrimination and University Prestige

In essence, discrimination is the product of scarcity, of the situation when—often by design—only a few can receive what many desire. But in its contemporary understanding, discrimination is mostly associated with the unfair or the unsuited distribution of scarce resources. Moreover, the term has strong legal associations (Lucas, 2009). I choose the language of discrimination for the purpose of this dissertation with full consideration of the normative and negative associations the term carries. To discriminate is intuitively wrong. I understand that by purposefully choosing this language, I set the standard of analysis and justification at a different level than if I were to employ the language of stereotype or prejudice. Discrimination is more than a belief, it represents the outward manifestation of prejudice, with real-world and substantial consequences to the lives of individuals (Allport, 1979; Levesque, 2015; Thornicroft, Rose, Kassam, & Sartorius, 2007).

Within the academic literature, the term discrimination is reserved for judging either the suitability or the fairness of the process or the outcome in distributive and competitive situations. In the tradition of economists, the leading question around discrimination is: what utility, if any,

explains and describes the phenomenon of discrimination (Arrow, 1973; Becker, 2010; Guryan & Charles, 2013). It was Becker (1975; 2010) who first developed an economic theory of discrimination in 1957. With application to the wage gap between employees of different races, his work advanced the theory of taste for discrimination. The theory postulates that employers incur a cost through association with certain groups of individuals and this cost is then subtracted from the wage employers are willing to pay representatives of these groups. The model assumes that differences between wages stem from the social costs these employees might incur for the employer. For Becker (1975; 2010), only the effects of discrimination need to be identified, and not the actual motives that lead to it. Arrow (1973) proposes an alternative theory in the form of statistical discrimination. Arrow suggests that under an asymmetry of information condition, employers use observable features such as sex and race to make inferences about unobservable features such as productivity. Alternatively, employers might use instruments that have less reliability for some groups than others to make costly inferences about worker productivity.

Critics of taste based discrimination and statistical discrimination theories state that both models fail to acknowledge the social processes that lead to discrimination (Kirschenman & Neckerman, 1991; Lucas, 2009). The general critique towards economic models of discrimination is that they theoretically assume that if discrimination is noted at the level of outcomes, then unobservable differences in productivity explain them (Kirschenman & Neckerman, 1991). As such, often economics models fail to acknowledge how taste for discrimination biases the evaluation of potential employees.

Second, in the sociological and psychological tradition, the leading questions around discrimination are: (1) what constitutes a fair process and/or outcome in a distributive situation (Lucas, 2009; Quillian, 2006), and (2) what structural conditions need to exist for discrimination

to occur (Link & Phelan, 2001). This discussion has a significant overlap with inequality (Reskin, 2000) and merit, as merit is generally viewed as an appropriate criterion to favor one over the other at an individual level (Chua, 2011; Jackson, 2009). Under this umbrella, discrimination has a number of prerequisites. First, according to psychologists, discrimination requires the perceived existence of categorizable and distinguishable groups (Allport, 1979; Fiske, 2000). Second, this categorization is translated into in-groups and out-groups based on self-identification (Reskin, 2000). Favoritism towards members of the in-group is usually rooted in a negative set of ideas about the other group and is based on faulty generalizations (Allport, 1979; Link & Phelan, 2001). Often, the relation between groups that leads to discrimination requires the existence of power relations, which in return reinforce cognitive processes that reproduce biases (Reskin, 2000). In this debate, I approach the phenomenon of discrimination from a sociological and psychological perspective but draw on related economic concepts to empirically test its occurrence.

In both traditions, discrimination is frequently defined narrowly and restrictively and refers to the unfair use of personal characteristics such as sex, race, ethnicity, and sexual orientation, or unchangeable indices (Spence, 1973), in making decisions about an individual in a competitive situation (Altonji & Blank 1999; Arrow, 1973; Becker, 2010; Fiske, 2000; Guryan & Charles, 2013; Quillian, 2006; Reskin, 2000; Pager & Shepherd, 2008). For instance, Altonji and Blank (1999) defines labor market discrimination as "a situation in which persons who provide labor market services and who are equally productive in a physical or material sense are treated unequally in a way that is related to an observable characteristic such as race, ethnicity, or gender" (p. 3168). Under this definition, a number or exhaustive criteria are listed to differentiate between fair and unfair selection or distribution processes.

In this dissertation, in contrast to current standards, I give preference to a broad and prescriptive definition of discrimination. Under this framework, I consider the use of hidden and non-necessary criteria to make selections among individuals in competitive situations as a source of discrimination. These non-necessary criteria may go beyond unchangeable indices such as sex, race, ethnicity, and sexual orientation. For example, the requirement to have a driver's license in order to become a university professor may constitute discrimination, but the same requirement would be appropriate for becoming an ambulance driver. Hidden criteria are simply non-explicitly stated as part of the selection or distribution process. An example of a hidden criterion would be the presence of a degree from a certain university, while no public reference is made to such a requirement. This notion of discrimination incorporates problematic behaviors such as sexism, racism, xenophobia, and homophobia—consistent with the current understanding of discrimination—but also includes phenomena such as nepotism and meritocratic priming (McCoy & Major, 2007; Warikoo & Fuhr, 2014). As such, I argue that discrimination constitutes the use of non-necessary and hidden criteria to determine the outcomes of competitive situations.

There are three reasons why I employ a more expansive definition of discrimination. First, in a world of intersectionality (Crenshaw, 1989; 1991), hidden discrimination (Bertrand & Mullainathan, 2004; Daniel, 1968; Riach & Rich, 2002), and where legal and structural barriers between groups have been altered, the effects of discrimination are difficult to identify (Quillian, 2006). This may indeed facilitate a shift towards using alterable characteristics such as prestige signals to filter individuals. Second, in this environment, the reproduction of privilege occurs through newly created legitimate means (Rivera, 2015). Most commonly, merit embodies this newly legitimate form of reproduction (Carson, 2007; Pole, 1993) manifested through institutions such as elite universities (Bourdieu, 1998; Meyer, 1977; Rivera, 2015).

Third, the prerequisites for the emergence of prejudice and discrimination apply to university prestige. As a first condition, the stratification encountered within higher education serves to differentiate between university graduates (Altbach, Reisberg, & Rumbley, 2009; Reimer & Jacob, 2011; Teichler, 2008; Vught, 2008), thus creating separate and distinguishable groups or categories. As a second condition, the new emergent categories translate into in-groups and out-groups, with documented displays of favoritism, in the form of meritocratic priming (McCoy & Major, 2007) and status justification (Warikoo & Fuhr, 2014). Related, but less conclusive, there is a substantial body of evidence that suggests added returns for graduates of prestigious institutions, thus supporting the claim that a visible gap exists between the two groups. It is unclear at this point if favoritism and discrimination rather than a justified reason explain this gap (Dale & Krueger, 2002; 2014). Last, the strong association between merit and elite institutions positions alumni of elite universities at a power differential where university prestige elicits deference and respectful behavior from others (Henrich & Gil-White, 2001; Tumin, 1967). University prestige meets the conditions for the creation and reinforcement of preconceptions and discrimination.

University Prestige: Merit or Discrimination?

Despite these considerations, the view that university prestige might constitute a source of discrimination is not common, as discussed in the introductory section of this dissertation. There I emphasized the strong association between merit and graduates of prestigious universities. I also discuss how this association steered researchers away from considering the gap between graduates of prestigious universities and less prestigious universities as a possible indication for discrimination. Now I add three arguments to further justify why such a consideration is worthwhile.

First, there is an intrinsic skepticism towards accepting that discrimination exists, regardless of its source. This skepticism affects both the ability to advocate for egalitarian proposals and to advance claims that discrimination might occur in society; this skepticism occurs at two levels. First, claims for discrimination are equated with envy. Those who ask for better opportunities and more equality are labeled as envious, temperamentally gloomy, and unwilling to work (Anderson, 1999). Similarly, those who claim bias and discrimination are accused of acting in bad faith (Schraub, 2016). At a second level, individuals themselves are likely to deny that personal discrimination is happening to them (Crosby, 1984). This can happen due to a lack of awareness (Daniel, 1969) or interiorized stereotype (Warikoo & Fuhr, 2014; Sherif, 1936). As such, often legitimate claims of discrimination and inequality are suppressed.

Second, even if the premise that merit should be rewarded by the labor market is accepted, it would be premature to assume that merit is universally associated with prestigious universities. Traditionally, elite universities are criticized on two fronts. First, access for minorities and disenfranchised populations is de facto restricted (Kidder, 2001; Posselt, 2016). Benefits that emerge from university prestige are less likely to be distributed homogeneously between groups in society. Second, elite universities, particularly in the US context, make admission decisions that depart from the rigorous admission criteria usually employed. Legacy admission—where family ties are considered as part of the selection process (Lamb, 1992; Posselt, 2016)—is a well-known practice at elite universities. By some accounts, the odds of being accepted at an elite university are multiplied by a factor of 3.13 as a result of legacy status (Hurwitz, 2011) and benefit white applicants disproportionately (Ladewski, 2010). In addition, there are documented cases where large donations have influenced the admission decisions of less than stellar applicants to elite universities (Golden, 2007). As such, even if generally elite

universities hold high selectivity standards—that may justify added labor market returns—the assumption does not hold true in all cases.

Third, I argue that it is in majority's best interest to grant and receive added rewards based on appropriate and transparent criteria. Fair selection and distribution practices would encourage social mobility and limit resentment between groups.

What Constitutes a Fair Recruitment Process?

The notion of merit is intertwined with the history of equality of opportunity and has been shaped by nation building and industrial imperatives. Merit has become the leading explanation used to justify stratification and inequality in society. In the first chapter of this dissertation, I argued that the notion of merit obstructs the ability to critically engage with the possible negative interpretations of what added monetary and non-monetary benefits for graduates of prestigious universities might mean. My purpose in making this argument is not to entirely reject the usefulness of merit as a construct but to highlight its limitations in promoting equality.

Traditionally, merit is conceptualized as the combination of effort and abilities (Daniels, 1978; McNamee & Miller, 2009; Roemer, 2009). Sen (2000) proposes an instrumental view of merit, where the positive consequences at a societal level are used to judge the appropriateness of rewards. For Sen, merit can only rest within actions—not within individuals—and does not allow for justification of unequal allocations based on intrinsic desert or entitlement. For the purpose of this dissertation, when discussing the relation between employability and universities, I adhere to an instrumental view of merit and borrow the notion of merit insofar as it provides a criterion for what constitutes a fair recruitment process. This notion is strongly tied to the definition of discrimination I employ for the purpose of this research. I define a fair recruitment process as *the*

use of necessary and transparent or explicit selection criteria in a competitive situation. For jobs that require college training, the necessary criteria are most often defined in terms of skills and competencies (Carnevale, Gainer, & Meltzer, 1990; Hendry, 2012; Hodges & Burchell, 2003; Owen, 2001; Stevens, 2005). The job criteria are best made transparent and explicit through job descriptions.

From a conceptual and theoretical perspective, skills and competencies are best captured through the language of human capital theory (Becker, 1975; Mincer, 1974; Schultz, 1959; 1961). Human capital theory suggests that added skills and abilities are rewarded by the labor market. In effect, human capital theory provides a plausible explanation that would serve to explain the labor market gap between graduates of prestigious universities and less prestigious universities. In an attempt to explain the added returns to graduates of elite universities in the labor market process, I contrast the human capital explanation (Becker, 1975; Mincer, 1974; Schultz, 1959; 1961) with the signaling explanation (Spence, 1973). In the human capital model, it is actual skills that facilitate added returns through their direct contribution to productivity. In the signaling model, the added returns are merely produced by an indirect and inferred observable characteristic, such as gender or years of education. In the initial signaling model provided by Spence, it was the presence or the absence of a college degree that was interpreted as a productivity signal. In the context of this research, this is replaced with university prestige. Noteworthy, the signal of university prestige is simply the perceived difference between two college degrees that requires an equal number of years to complete. The use of a signal above the use of actual skills to determine the outcome of a selection process is interpreted as discrimination, as university prestige does not constitute a necessary nor an explicit criterion in the recruitment process.

The research I conducted controls for the presence of yet another commonly accepted factor that contributes in the recruitment process: social capital (Bayer, Ross, & Topa, 2005; Petersen, Saporta, & Seidel, 2000). For the purpose of this dissertation, I assume that fictitious applications do not carry any social capital as fictitious individuals are not part of networks and do not know other individuals personally. As such, this research distinguished between the possible fair ramifications of university prestige in the employment process—in the form of skills required by a given opening—and the unfair use of university prestige as a signal.

Chapter 3: Methodology

The academic literature on the relation between university prestige and the labor market it is lacking on two accounts despite offers compelling evidence to suggest that graduates of prestigious universities have added monetary and social benefits. First, to date, it has not determined the mechanism which best explains the added returns. Researchers have been unable to infer if the added human capital of graduates from prestigious universities, the networks they are associated with, or the prestige signal associated with the degree granting institution explain these empirical results. Second, the current academic literature does not engage critically with the effects observed. As such, the literature does not question if discrimination patterns may explain the gap between graduates of highly prestigious and less prestigious universities and between females and males that receive their undergraduate degrees from prestigious universities.

This study begins to address these limitations by employing a field experiment of the labor market to test if the prestige signal associated with the name of a university matters above someone's skills in the employment process. I submitted fictitious resumes to professional entry level job openings that were attributed to graduates of high-ranked and non-high-ranked universities in the US, the UK, and Australia. The applications either highly matched the job description, as a reflection of human capital, or not. Through this experimental design, I was able to test if prestige matters more than skills in the employment process, or alternatively, if university prestige leads to discrimination.

Research Question

The conceptual research questions of this study were (1) to what extent does the prestige associated with the name of the university someone graduated from affect the employment

prospect of this individual; and more importantly, (2) how does the effect of the prestige associated with the name of a university interact with the level of skills an individual demonstrates in predicting the employment prospect. The operational statistical question of this research was: *Are the effects on the callback rate of applicant match and university prestige, and their interaction, constant across sex, sector, and country?* The operationalized definitions of the constructs of interest are presented later in this chapter.

Research Design

This study investigated the potential discriminatory properties of university prestige in the employment process. I designed and submitted fictitious applications to professional entry-level job openings in two sectors of the labor market: information and communication technology (IT) and accounting. These applications were attributed to non-existent, fictitious individuals. I used a field experiment of the labor market, or a correspondence test (Andriessen, et al., 2012; Bertrand & Mullainathan, 2004; Daniel, 1968; Riach & Rich, 2002; Tal, Moran, Rooth, & Bendick, 2009) in order to differentiate between the use of the university name as a signal and the importance of skills as an expression of human capital by employers. This design gives researchers the possibility to manipulate and vary the experimental variables and to employ random assignment that allows for causal inferences.

Noteworthy, this research did not look at the impact of university prestige and skills in the recruitment process broadly, but specifically at their impact on the first stage—or the screening stage—of the recruitment process. In the labor market, screening acts as a form of gatekeeping that filters individuals out of the employment process simply based on information available on the resume and other basic documents and before the candidates are able to better represent themselves.

Presence or absence of callback in the screening stage of the employment process was the dependent variable of this research design. A callback is an email or phone call response from an employer that either indicates explicitly the fictitious applicant qualified for the next stage of the recruitment process or further interest in the candidate. It was at times difficult to differentiate a callback from an automated message that was sent to all applicants. A broader discussion on how I determined what constitutes a callback is included later in this chapter.

The dependent variable analyzed as part of the study is a categorical variable with two possible outcomes:

(1) Yes: the applicant has passed the first stage of the recruitment process

(2) No: the applicant has not passed the first stage of the recruitment process

Two independent variables were most relevant for my research questions: (1) skills possessed by an applicant (fixed effect), and (2) university prestige (random effect). In order to control for sex bias in hiring, I randomly assigned the sex of the applicant on each job application submitted (random effect). To accomplish this, I randomly assigned female specific and male specific names to the fictitious applications. Applications submitted to job openings belonged to one of the eight match-prestige-sex experimental conditions listed in Table 3.1. Resumes in each of the eight conditions were submitted to job openings in accounting and IT, and in the US, the UK, and Australia.

Table 3.1. Principal conditions of the experimental design

		Prestige of undergraduate/baccalaureate degree			
		High ranked		Non-high ranked	
		Female	Male	Female	Male
Skills of the applicant	High match (Matches job requirements)	% Callback	% Callback	% Callback	% Callback
	Low match (Does not match job requirements)	% Callback	% Callback	% Callback	% Callback

One high match resume and one low match resume were submitted to each eligible job opening. I randomly assigned the prestige condition and the sex of the applicant to each of these resumes. Patterns of prestige based discrimination can be observed if individuals with identical skills but having graduated from universities of varying prestige receive a statistically significant distinct callback rate. The design was also able to provide evidence on whether university prestige compensates for lack of relevant skills in the recruitment process. Similarly, sex based discrimination may be observed if sex is a statistically significant predictor of callbacks.

Random Assignment Design

Random assignment in experimental designs assures that selection bias is not confounded with the constructs of interest by creating groups that are probabilistically similar (Shadish, Cook, & Campbell, 2002). A confounded variable is associated with both the independent and the dependent variable and may lead to misleading conclusions about the relation between the two. Random assignment better ensures that selection bias does not overlap with a hypothetical confounded variable. Random assignment helps ensure that groups across experimental conditions are equally likely to be affected by these additional confounded variables and thus allow measuring the effect of the experimental conditions.

Each application submitted was either in the high match or low match condition and either in the high ranked or non-high ranked condition. In traditional experimental designs, one of these conditions would be attributed to each job opening. I argue that in the case of this research, a random assignment model where one randomly selected resume representing a sole experimental condition would have been submitted to each job opening would have weakened, not strengthened, my design. Typically, in social science, human subjects cannot be assigned to all experimental conditions without risking measurement error. One individual could not take

both the active treatment and the placebo treatment to test the effect of a new drug, as it would be difficult to trace the effect observed to any given experimental condition. In the case of this research, the submission of more than one resume to a job opening did not interfere with the result (or callback) that any independent resume would have received in the same way as it would in the case of human subjects' research.

In the random assignment scenario, each resume associated with one experimental condition has a 1/x chance to be assigned to a job opening, where x is the number of resumes eligible for assignment. In the case of this experiment, at the intersection of each match and prestige condition, each resume has 1/4 chances of being assigned to a given job opening. By assigning more than one resume to a given job opening, the researcher would be able to obtain more information. In the absence of random assignment, resumes representing all experimental conditions may be independently assigned to all job openings, giving the researcher 4 times more information. However, this alternative research design posed one significant challenge for construct validity. Two identical resumes cannot be submitted to job openings without risking the detection of the experiment. You could not submit two applications belonging to a fictitious Ashley Smith, with identical email addresses and internship experience. As such, two equivalent yet different resumes would need to be created for each match condition (high and low). This means that different, yet equivalent demographic information would need to be created, different yet equivalent high ranked and non-high ranked universities need to be selected, and different yet equivalent work experiences need to be drafted. The task of creating equivalent resumes creates additional validity burdens. It would be particularly difficult to draft equivalent yet distinct professional experiences that correspond to an equivalent level of human capital or skill match.

At the intersection of the two scenarios—at one extreme randomly submitting a single resume per job opening and at the other extreme submitting resumes corresponding to each experimental condition to every job opening—there is an alternative. This alternative maximizes the information received from all job openings, while avoiding additional validity threats: one resume from each match condition was submitted to each job opening. To each job application I submitted one high match application and one low match application. In the random assignment process, I blocked on the match of the application condition (fixed effect). The prestige and sex conditions were randomly assigned to each of the two resumes.

This assignment process also served to validate the research instrument by measuring the gap in callbacks between the resumes in the low match and high match conditions. This is because each employer had the opportunity to revise both the high and the low match application. As part of the results to this research, the gap in callbacks between high and low match application cannot be associated with random assignment effects, but the potential preference of employers for one match condition over the other.

I used the website https://www.randomizer.org/ to generate the random assignment used as part of this research. This step was completed prior to the data collection process for a total of 1,201 job openings. After submitting applications to these 1,201 job openings, and in order to compensate for errors in the data collection process, I generated random assignments for an additional 100 job openings. This process mapped ahead of time what resume was assign to each job opening and ensured that a comparable number of resumes corresponding to each experimental condition was submitted.

Sampling Procedure

Selection of Countries for Job Openings

I submitted job applications in the United States, the United Kingdom, and Australia. All fictitious applicants were citizens of the countries where the experiment was conducted and they were graduating from domestic universities. The countries were selected through a criterion purposive sampling (Patton, 1990). They included diverse and growing labor markets, where sufficient job openings were available, where the application process operates in English, and a significant number of job openings was available online.

More importantly, the three countries represent archetypes for the state of higher education stratification. The United States and the United Kingdom have higher education systems with a high degree of stratification. Some of the best-known universities in the world reside here. These countries also host a wide array of higher education institutions. Australia is a higher education system with a sufficient degree of stratification for university prestige to be a measurable concept but with a flatter hierarchy among universities. In essence, higher education in Australia is less stratified than in the United States or in the United Kingdom. While other countries in the world may meet these conditions, time and resource constrains demanded a selection of a subset.

As such, this experimental design does not only offer insights into the effect of university prestige in the labor market, but also into how different degrees of system stratification may contribute towards this effect. By conducting this research in multiple countries, I was able to discuss the effects of higher education stratification beyond one national context and speak more broadly about the effects of higher education stratification.

Selection of Degree Level

Job applications were attributed to graduating students from bachelor level degrees. Bachelor degrees were chosen because, in each country, they are the most frequently awarded higher education credential. More individuals are affected by the effect of university prestige at the undergraduate level than at the graduate and post-graduate level. In 2015, 36% of the US population held a baccalaureate degree or higher, while only 9% of the US population held a master's degree or higher (US Department of Education, National Center for Education Statistics, 2016b). Similarly, in 2016 in Australia, while 17% of the population between 15 and 74 years old held a bachelor degree, only 8.3% of the population had a master's degree or higher (Australian Bureau of Statistics, 2016). In the UK, in the academic year 2016/2017, undergraduate first degrees accounted for 55% of all awarded degrees in the country, whereas master's degrees accounted for 22% (Higher Education Statistics Agency, Figure 16).

Given the fluid definition of university prestige, it is harder to trace the number of students at prestigious universities in each of the researched countries. In US national data sources, college selectivity is most often used as a proxy of prestige. The lower the ratio between the number of admitted students and the number of students who applied, the more selective the institution. In the US, in 2017, 0.4% of higher education institutions admitted less than 10% of the number of applicants. Only 1.5% of institutions admit between 10% and 24.9% of applicants. Similarly, only 7.4% of institutions admitted between 25% and 49.9% of applicants (US Department of Education, National Center for Education Statistics, 2017, Table 305.40). Prestigious institutions in the UK and Australia educate a higher fraction of the total post-secondary student body in their respective countries. In the UK, in 2012, 17% of students enrolled in a higher education institution attended a Russell Group member institution, with a bit

less than 2% of students having attended either Oxford or Cambridge (UK Government, 2012). Institutions in the Group of Eight in Australia educate one quarter of higher education students in the country (Group of Eight, n.d.).

As university prestige is likely to be associated with each degree level (Brewer, Eide, & Ehrenber, 1999, Monks, 2000), undergraduate degrees met the operationalized definition of university prestige and in addition have a more extensive level of practical significance.

Selection of Sectors of the Labor Market

I chose to submit applications to entry level jobs as they represent the labor market space where the effect of university prestige is maximized, and less likely to be moderated by the effect of work experience or further education. The choice of sector of the labor market was less straightforward. The labor market is fragmented. Different sectors of the labor market have different norms of hiring and different basic hiring requirements. I use a criterion purposive sample to choose the sectors of the labor market where I submit applications (Patton, 1990). A selected sector of the labor market needs to meet the conditions below:

(1) Have ample job openings at the professional entry level;

(2) Make job openings available online;

(3) Require a college level degree;

(4) Require some degree of specialization;

(5) Have a reasonable degree of standardization in minimum requirements across job openings.

Based on these criteria, the chosen sectors of the labor market where I submit applications were IT and accounting. Both sectors offered ample job openings, year-round, and accept online applications. In addition, both sectors required specialized skills that facilitate the

design of the low and high match resumes. Positions in these fields often required a bachelor degree, with a preference for degrees granted related fields of study.

In the process of selecting sectors of the labor market, I have considered yet had to exclude two sectors: (1) banking and (2) human resource. In banking, most job openings were available in a small number of companies. This concentration of job openings posed logistical challenges to conducting a field experiment of the labor market, as multiple applications would have been reviewed by the same human resources departments, likely with similar results. This would have increased the odds that the experiment would be detected by employers. I have excluded human resources jobs because there are few specialized degrees in this field at the undergraduate level, and no such specialized degree constitutes a requirement for hiring in the field.

Selection of Job Openings

Job openings were selected by conducting frequent job searches on national job portals in the US, the UK, and Australia. The key words included in the Table 3.2. were used to identify appropriate job openings.

Table 3.2. Search words used to identify job openings

Key words accounting	Key words IT
Junior accounting	Junior software developer
Assistant accounting	Entry level software developer
Entry level accounting	Junior computer scientist
Bookkeeper	Graduate software developer
Graduate accounting	-

In the form of a census, applications were submitted to all available entry level job openings in selected fields that met the criteria below:

1. Did not require LinkedIn applications, or applications through other social media platforms;
2. Did not require extensive documentation, such as referees, transcripts, or portfolios;
3. Had been posted less than 30 days prior to the application being submitted;
4. No prior application had been sent to the hiring employer.

As discussed in section on random assignment, to each job opening I submited two distinct applications, one in the high match condition and one in the low match condition. Altogether, 2,400 job applications were submitted to 1,200 job openings, meeting the power analysis requirements to answer the stated research questions.

Power Analysis

The dependent variable of the study was the callback rate received to the applications submitted. There were five categorical independent variables in the study: (1) the prestige signal associated with the name of the university an applicant obtained their degree from (high ranked and non-high ranked), (2) the overall match of the application (high match and low match) (3) sex (female and male), (4) sector of the labor market (IT and accounting), and (5) country of the labor market (Australia, the US, and the UK). No covariate was used for the purpose of this study. The job applications submitted as part of this study belonged to one of the treatment categories listed in the contingency Table 3.3.

Table 3.3. Contingency table for research design

				High ranked	Non-high ranked
High match	Female	Australia	IT	Callback	Callback
			Accounting	Callback	Callback
		UK	IT	Callback	Callback
			Accounting	Callback	Callback
		US	IT	Callback	Callback
			Accounting	Callback	Callback

				High ranked	Non-high ranked
	Male	Australia	IT	Callback	Callback
			Accounting	Callback	Callback
		UK	IT	Callback	Callback
			Accounting	Callback	Callback
		US	IT	Callback	Callback
			Accounting	Callback	Callback
Low match	Female	Australia	IT	Callback	Callback
			Accounting	Callback	Callback
		UK	IT	Callback	Callback
			Accounting	Callback	Callback
		US	IT	Callback	Callback
			Accounting	Callback	Callback
	Male	Australia	IT	Callback	Callback
			Accounting	Callback	Callback
		UK	IT	Callback	Callback
			Accounting	Callback	Callback
		US	IT	Callback	Callback
			Accounting	Callback	Callback

Previous literature detected a small to medium effect associated with various non-alterable indices—such as race, sex, and ethnicity—in the employment process. In the Greek labor market, Drydakis and Vlassis (2010) estimate that the marginal probability to receive a callback is between 12.4% and 37.5% lower for ethnic Albanians than for ethnic Greeks, depending on occupation. Using multilevel regression analysis, Andriessen et al. (2012) estimated that ethnic minorities in Netherlands have between 11% and 20% less chance of being invited for an interview. In what is one of the most significant studies using the method of labor market audit or field experiment of the labor market, Bertrand and Mullainathan (2004), determined that in the US, White men are 50% more likely to receive a callback than Black men.

The outcome variable of this study is a categorical dichotomous variable, that takes the form of 0 and 1. Multiple logistic regression was used to analyze the results of the experiment. I conducted a power analysis using GPower to determine the appropriate sample size to conduct a

multiple logistic regression with categorical predictors. The power analysis for multiple logistic regression required a number of estimates and choices. The power calculation for multiple logistic regression takes into account the relation between the first predictor of the regression model and the outcome variable. This relation is then used to determine two probabilities:

1. $\mathbf{Pr}(\boldsymbol{y = 1 \mid x = 1})\, \boldsymbol{H1}$ what is the probability of a positive result on the outcome variable (y = 1) given that the main predictor variable is positive (x = 1)?
2. $\mathbf{Pr}(\boldsymbol{y = 1 \mid x = 1})\, \boldsymbol{H0}$ what is the probability of a positive result on the outcome variable (y = 1) given that the main predictor variable is negative (x = 0)?

In the context of this research, these probabilities take the following form:

1. $\mathbf{Pr}(\boldsymbol{Callback = 1 \mid Prestige = 1})\, \boldsymbol{H1}$ what is the probability of a positive callback given that the fictitious application signals high-ranked (prestige = 1)?
2. $\mathbf{Pr}(\boldsymbol{Callback = 1 \mid Prestige = 1})\, \boldsymbol{H0}$ what is the probability of a positive callback given that the fictitious application signals low non-high ranked (prestige = 0)?

These probabilities were estimated based on prior academic literature. In previous studies, 1 in 10 fictitious applications received a callback for privileged populations and up to 1 in 15 applications received a callback for non-privileged populations (Bertrand & Mullainathan, 2004). These are some of the lower callback estimates available for comparable studies. As such, for the purpose of the power analysis the values below are used:

1. $\mathbf{Pr}(\boldsymbol{Callback = 1 \mid Prestige = 1})\, \boldsymbol{H1 = 0.1}$
2. $\mathbf{Pr}(\boldsymbol{Callback = 1 \mid Prestige = 1})\, \boldsymbol{H0 = 0.05}$

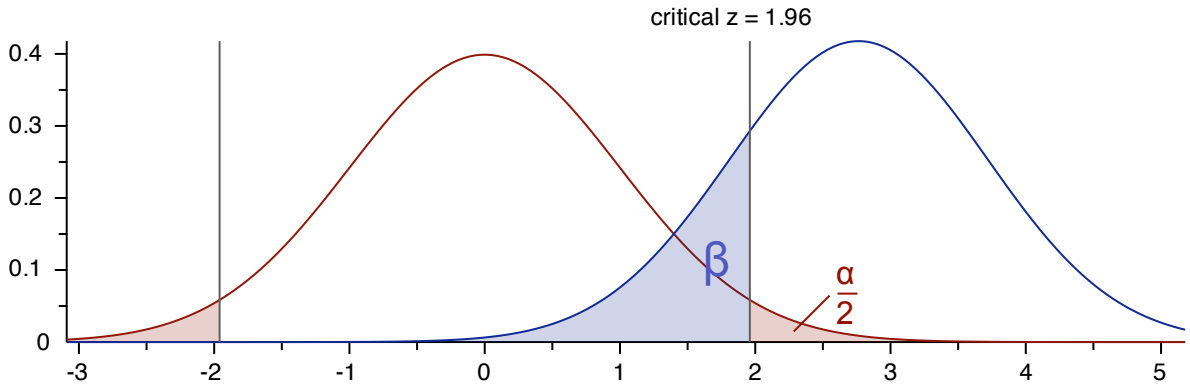
In order to account for the effect of other predictors on the outcome variable, GPower employs the procedure designed by Hsieh, Bloch, and Larsen (1998). This procedure uses a

variance inflated factor (VIP) to estimate the proportion of variance of the outcome variable explained by other predictors or covariates. The VIP value takes the shape of a squared multiple correlation coefficient, noted in GPower as "R^2 other x." For the purpose of this research, I estimated that other predictor variables, in addition to university prestige, have a moderate association (0.5) with the outcome variable, mainly accounted by the match of the applicants in the human capital condition (high or low). As such, the "R^2 of other x" for additional predictor variables is estimated as 0.25 (0.5^2).

Further, an Alpha level of 0.05 and a Beta level of 0.8 were chosen for the purpose of the power analysis. The procedure was conducted for a two-tailed analysis and for a binomial distribution of the predictor variable. Last, as the design of the experiment was balanced, the "X $parm\ \pi$", or the proportion of cases where prestige equals 1 (high ranked university) is equal to 0.5.

The power analysis conducted using the parameters above indicated that I need to apply to 1174 jobs in order to reach the appropriate power to conduct a multiple logistic regression. The central and monocentral distribution that resulted from this analysis is listed in Figure 3.1. The number of applications is comparable with the number of job openings targeted by prior researchers using the method of field experiments of the labor market. For example, Bertrand, M., & Mullainathan (2004) submitted 1300 applications and Andriessen et al. (2012) submitted 1340 applications.

Figure 3.1. Power analysis: Central and noncentral distributions



Noteworthy, in the context of this design, the total number of individual applications submitted was 1174x2, as to each job I submit one high match and one low match application. In addition, in practice, the number of applications submitted will also need to be adjusted according to the number of positive callbacks, as the ratio between the number of events on the outcome variable (positive callbacks) and the number of independent variables included in the model needs to be 10 or larger for the logistic regression analysis to yield reliable statistical results (Concato, Peduzzi, Holford, & Feinstein, 1995; Peduzzi et al., 1996). This means that for each independent variable used for the research, the dataset needs to include 10 or more callbacks. This study employs five independent variables (match, prestige, sex, sector of the labor market, and country). This means that at least 50 callbacks needed to be obtained for the logistic regression models to be statistically significant. This number was exceeded in the data collection process.

Operationalizing University Prestige

Before I elaborate on how I operationalized university prestige, I want to emphasize that throughout this dissertation and subsequent publications I will not reveal the names of the universities selected to represent the high-ranked and non-high ranked conditions as part of this

field experiment of the labor market. By keeping the names of the representative high-ranked and the non-high ranked universities anonymous to readers, I ensure that the integrity of the selected institutions is preserved. More importantly, I ensure that the particular names of the selected institutions will not distract from the prestige condition they are chosen to represent. By openly discussing the methodology used to select these institutions, I attempted to alleviate concerns about how representative the chosen institutions are for each prestige condition.

The higher education systems of the world have varying degrees of stratification (Altbach, Reisberg, & Rumbley, 2009). For the purposes of this experiment, higher education systems with some degree of stratification were needed. Higher education researchers conceive stratification, or vertical differentiation as an implicit feature of a differentiated higher education system (Marginson, 2016). In such a system, universities and other post-secondary tertiary education institutions are arranged in an established hierarchy (Vught, 2008). Prestige, most commonly measured in the form of academic rankings, is the defining feature of stratification (Altbach, et al., 2009). Prestige is the mark of a stratified higher education system. The US, the UK, and Australia represent fitting examples of higher education systems with varied degrees of stratification.

For each country, using a purposive sample (Patton, 1990), I select a typical case of a high prestige or high ranked university and a typical case of a low prestige or non-high ranked university. Five criteria were used to select the typical cases of high and non-high ranked university in each country:

(1) Relative process standardization;

(2) Triangulation;

(3) Avoiding prestigious institutions at the top of the academic hierarchy;

(4) Distinguishing quality from prestige; and

(5) High-ranked and non-high ranked institutions are located in the same city.

First, I ensured relative standardization in the procedure used to select the representative high-ranked and the representative non-high ranked universities across all experimental countries. This criterion ensured the comparability of results across the experimental countries. Given differences among the higher education systems in the US, the UK, and Australia, country level adjustments need to be made. These variations in procedure are discussed later.

Second, across countries, I triangulated among a variety of rankings and other measures of university prestige in order to select typical universities within their prestige condition. While university rankings have become the dominant measure of university prestige, no one ranking is viewed as a definitive measure of prestige. As such, I combined various global and national rankings or alternative measures of prestige in order to ensure a reliable measure of prestigious universities.

Third, I purposefully did not choose universities at the very top of the prestige hierarchy. Various studies have suggested that the differences among universities at the very top of the prestige hierarchy are unique and overcomes the prestige of the universities that immediately follow it (Rivera, 2015). This criterion applies exclusively to the US and the UK. The following institutions are excluded from usage for the purpose of this research: Harvard, Stanford, Yale, Oxford, and Cambridge. In the case of the US, I excluded MIT and Cal Tech due to their high prestige in the technical fields. These institutions are not singular in their ability to capitalize on prestige effects. Many would argue that the prestige effects at these institutions are not typical or representative for understanding higher education stratification, where gaps in prestige are as significant or more significant than the gravitational pool of the highly elite institutions.

I aimed to prove a hard case. I wanted to see how the effects of prestige gaps—outside of the very top and over-researched institutions—look like in the labor market. If prestige effects are disproportionate for these universities, they are likely to be stronger for the institutions at the very top of the prestige hierarchy.

Fourth, this experiment does not aim to measure the difference in perception between prestigious universities and universities that are perceived of low academic quality. I aimed to measure the difference between universities that have good standing, but vary in their prestige. As such, universities that are perceived to be at the lower end of the higher education system are not selected as part of this experiment. This criterion was ensured for all researched countries through the process used to select the non-high ranked institutions.

Fifth, the university in the high ranked and non-high ranked condition needed to be located in the same city, to ensure that the geography of the institution does not affect the results of the experiment. In keeping with the principle of not revealing the name of the universities selected for the high-ranked and non-high ranked condition, the cities where the chosen universities are located will not be revealed as part of this research. For this reason, the location of the professional experiences of fictitious applicants is also anonymized on the versions of the resumes made available in the appendix.

High Ranked Condition

The typical high-ranked universities employed as part of this experiment appear in all relevant iterations of international and national university rankings. This ensures that the high-ranked institutions selected are unquestionably prestigious.

In order to select the typical high prestige university, I combined multiple iterations of globally recognized rankings to identify UK, US, and Australian-based universities that are

consistently listed among the top 100 universities globally. The relevant international rankings considered for this exercise were: (1) the Academic Ranking of World Universities (ARWU), (2) Times Higher Education World University Ranking, and (3) QS World University Ranking.

ARWU is the oldest of the global university rankings, its first edition dating in 2003. For the purpose of this research, the editions of the ARWU between 2011 and 2016 were included in the analysis. The rankings produced by Times Higher Education and QS are more recent. All iterations of these rankings published prior to 2017 were included. The complete list of selected rankings and their selected iterations is available in Table 3.4. Country results are reported in the respective sections below.

Table 3.4. Selected rankings and selected ranking editions

Academic Ranking of World Universities	Times Higher Education World University Rankings	QS World University Rankings
2011	2010-2011	2012-2013
2012	2011-2012	2013-2014
2013	2012-2013	2014-2015
2014	2013-2014	2015-2016
2015	2014-2015	2016-2017
2016	2015-2016	-
-	2016-2017	-

Where appropriate, these results were then compared with reputable national ranking lists to determine the position of each university in their respective national context. In the US, only institutions that were listed among the top 40 in the US World News and World Report National University Ranking were included. For the UK, only globally ranked universities that appear among the top 20 national universities in their respective countries are further considered for the final selection. In Australia, I used the Group of Eight institutions to triangulate international rankings (see section on Australia for a detailed description). The variation in threshold across

national rankings is explained by the difference in the size of the respective higher education systems.

Non-high Ranked Universities

The task of choosing a less prestigious university was more challenging than choosing a prestigious university. The higher education systems in the countries selected vary in size and complexity. As a first step, I identified all universities in Australia, the UK, and the US that have appeared in at least one iteration of the global rankings listed in Table 3.2. Global university rankings include a varying number of universities. If ARWU ranks 500 universities every year, the Times Higher Education Ranking includes over 800 institutions, while the QS ranking includes over 600 institutions. As a second step, where appropriate, these universities were then subtracted from national ranking lists. The representative non-high ranked institutions for each country was selected from among this remaining list. Subjects rankings were consulted to ensure that the universities selected were not listed among the top institutions for the subjects relevant to the selected labor markets. This methodology was slightly altered for the UK and Australia to account for system differences.

United States

The US higher education system is the second largest in the world. It comprises over 4,700 degree granting post-secondary institutions (U.S. Department of Education, National Center for Education Statistics, 2016a). Some of the most prestigious universities in the world are located in the US. Examples include the Ivy League universities, Stanford, Massachusetts Institute of Technology, and the California University System. Using the methodology described above, the representative high-ranked university for the US was chosen from the list of universities at the intersection of global university rankings and national rankings.

Table 3.5. List of US universities listed in top 100 of selected global rankings, in alphabetical order

University name
Boston University
Brown University
California Institute of Technology
Carnegie Mellon University
Columbia University
Cornell University
Duke University
Harvard University
Massachusetts Institute of Technology
New York University
Northwestern University
Princeton University
Stanford University
University of California, Berkeley
University of California, Los Angeles
University of California, San Diego
University of Chicago
University of Illinois at Urbana-Champaign
University of Michigan, Ann Arbor
University of North Carolina at Chapel Hill
University of Pennsylvania
University of Washington, Seattle
Yale University

Twenty-three universities in the US were at the intersection of top 100 universities in all rankings iterations listed in Table 3.5. These universities were then compared with the top 40 institutions listed in the latest edition of the National University Ranking compiled by US News and World Report. This ranking compares US universities exclusively. According to the authors of the National University Ranking, "(s)chools in the National Universities category (...) offer a full range of undergraduate majors, plus master's and doctoral programs. These colleges also are committed to producing groundbreaking research" (US News and World Report, 2016, para. 1). In its latest edition, the National Universities Rankings included 310 US-based universities. At this intersection, the universities among which I have selected the representative high-ranked US

university are listed in Table 3.6. In line with the third criterion for selection, Harvard University, and Stanford University, and Yale University have been excluded from this list.

Table 3.6. List of high-ranked US universities and location, in alphabetical order

University name	Metropolitan area, State
Brown University	Providence, RI
Boston University	Boston, MA
Carnegie Mellon University	Pittsburgh, PA
Columbia University	New York City, NY
Cornell University	Ithaca, NY
Duke University	Durham, NC
New York University	New York City, NY
Northwestern University	Chicago, IL
Princeton University	Princeton, NJ
University of California, Berkeley	Berkeley, CA
University of California, Los Angeles	Los Angeles, CA
University of Chicago	Chicago, IL
University of North Carolina at Chapel Hill	Chapel Hill, NC
University of Michigan, Ann Arbor	Ann Arbor, MI
University of Pennsylvania	Philadelphia, PA

A non-high-ranked university was defined as a US accredited institution that was systematically not listed in global university rankings, but had good overall standing within national ranking lists, as the goal of the experiment was not to measure the difference between nearly failing universities and high ranked institutions. In order to identify the subset of universities from which the non-high ranked university was selected, I aggregated all universities that appeared in at least one iteration of all selected global rankings. There were 244 US universities that appeared at least once among all iterations of the selected rankings.

These universities were then compared with the 2017 edition of the National University Ranking compiled by US News and World Report. For the purpose of this project, one typical non-high ranked US university was chosen from among the subset of universities that resulted from subtracting all globally ranked universities in major global university rankings from the National University Ranking of 2017. The resulting list included 112 distinct universities

(available in Appendix 1). Among these, specialized universities (e.g., technical institutes and single sex institutions) were excluded from selection for the purpose of this experiment. In addition, the US News and World Report Undergraduate Accounting Rankings—as the only subjects ranking relevant for the labor markets selected for this experiment—was consulted to ensure that the selected non-high ranked university does not appear among the top listed institutions. The high-ranked and the non-high-ranked institutions were both located in a major US city.

United Kingdom

The higher education system in the UK is less complex and smaller than the one in the US. According to the UK Government, 163 accredited universities operate in the country (UK Government, 2017). The representative high-ranked university for UK was selected from the intersection of national institutions listed in all iterations of selected global rankings. Table 3.7. illustrates the UK universities at this intersection.

Table 3.7. List of UK universities listed in top 100 of selected global rankings

University name
Imperial College London
King's College London
University College London
University of Bristol
University of Cambridge
University of Edinburgh
University of Manchester
University of Oxford

I then compared these institutions with those among the top 20 of the 2017 *University League Tables*, compiled by *The Complete University* Guide. This ranking compares 127 accredited universities in the UK. The representative high ranked UK university was chosen

from among the institutions at the intersection of global rankings and *The Complete University guide*, listed in Table 3.8.

Table 3.8. List of high-ranked UK universities, in alphabetical order

University name	Metropolitan area
Imperial College London	London
University College London	London
University of Edinburgh	Edinburgh

I initially aimed to subtract all universities listed in selected iterations of global rankings from the universities listed in *The Complete University* guide in order to select a representative non-high ranked university. However, this option yielded too few universities, most of which were positioned at the bottom of the academic hierarchy in the UK. This procedure would not have met the fourth criterion used to select a representative university, by risking to confuse institutional quality with institutional prestige. As a result, I compared the universities that appeared at least once in an iteration of either the ARWU rankings and the QS rankings with the latest iteration of the 2017 ranking of *Best Universities* in the UK, compiled by *Times Higher Education*, a UK based publication. This ranking contains simply all UK universities listed in the *Times Higher Education World University Rankings*, and includes 91 institutions. This procedure resulted in the universities listed in Table 3.9.

Table 3.9. List of universities in "Best Universities in the UK" 2017, excluding internationally ranked institutions

University name	Metropolitan area
Anglia Ruskin University	Cambridge
Bournemouth University	Poole
De Montfort University	Leicester
Edinburgh Napier University	Edinburgh
Glasgow Caledonian University	Glasgow
Leeds Beckett University	Leeds
Liverpool John Moores University	Liverpool
London South Bank University	London
Royal Veterinary College	London

University name	Metropolitan area
Sheffield Hallam University	Sheffield
Teesside University	Middlesbrough
University of Bedfordshire	Luton
University of Brighton	Brighton
University of Greenwich	London
University of Lincoln	Lincoln
University of Roehampton	London
University of Salford	Manchester
University of the West of England	Bristol
University of the West of Scotland	Paisley
University of Westminster	London

The high-ranked and non-high ranked institutions selected are located in the same major UK city. One of the institutions located in London or Edinburgh has been selected as a non-high ranked institution.

Australia

The Australian higher education system is composed of 43 universities (Australian Government, 2017). However, the system remains differentiated and some of the universities in the country are perceived as prestigious and internationally competitive. There are four Australian universities that appear constantly among the top 100 universities in the world. These institutions are also included in Australia's *Group of Eight*, which brings together the countries' leading universities (Group of Eight, n.d.). One of these institutions, listed in Table 3.10., was chosen as the high ranked prestige university for Australia.

Table 3.10. List of high-ranked Australian universities

University name	Metropolitan area
University of Melbourne	Melbourne
The Australian National University	Canberra
The University of Queensland	Brisbane
University of Sydney	Sydney

In order to select the low ranked university for Australia, a different procedure needed to be designed. This is because 38 out of the 43 universities in the country were listed at least once in relevant iterations of international rankings. Three of the remaining institutions were branch campuses of prestigious universities from abroad.

Noteworthy, Australia does not have a comprehensive national university ranking, as the US and the UK. Instead of excluding all universities listed in the selected global rankings from the list of nationally accredited universities, I selected Australian universities listed in global rankings above the 400 universities threshold. Following this new procedure, the representative low ranked university for Australia will be chosen among the institutions listed in Table 3.11. None of these institutions were listed among Australia's Group of Eight. The high-ranked and non-high ranked Australian institutions are located in one of Australia's major cities.

Table 3.11. List of Australian universities ranked 400 or higher among selected global rankings, listed in alphabetical order

University name	Metropolitan area
Australian Catholic University	Multiple campuses
Bond University	Gold Coast
Central Queensland University	Norman Gardens
Charles Darwin University	Darwin
Charles Sturt University	Bathurst
Curtin University	Multiple campuses
Deakin University	Victoria
Edith Cowan University	Perth
Flinders University	Adelaide
Griffith University	Gold Coast
La Trobe University	Melbourne
Murdoch University	Perth
Queensland University of Technology	Brisbane
RMIT University	Melbourne
Southern Cross University	Lismore
Swinburne University of Technology	Melbourne
University of Canberra	Canberra
University of New England Australia	Armidale
University of Southern Queensland	Toowoomba
University of Tasmania	Hobart
University of Technology, Sydney	Sydney

University name	Metropolitan area
University of the Sunshine Coast	Sunshine Coast
University of Wollongong	Wollongong
Victoria University	Melbourne
Western Sydney University	Sydney

Instrument design

The research instrument employed as part of this research are fictitious resumes. I designed these resumes using the methodology described below, the methodology was also used by Bertrand and Mullainathan (2004).

Content analysis of relevant job openings

First, job descriptions from relevant job openings were centralized into a database for each of the countries where the experiment took place. These job descriptions served as the basis to create an ideal application profile for entry level job openings in IT and in accounting. I conducted this process using content coding and thematic analysis (Auerbach, & Silverstein; Braun & Clarke, 2008). The thematic process resulted in the detailed creation of a list of highly sought characteristics for each labor market targeted. This list of characteristics was used for the next step of the instrument development.

Table 3.12. includes a breakdown of the websites used to retrieve descriptions of entry-level job openings in accounting and IT in the experimental countries and the time interval when the jobs were collected. The principle of data saturation was used to determine how many job descriptions were included in this analysis. Job openings were selected by using the same key word search process employed in the process of identifying the jobs to which applications were submitted.

Table 3.12. Sources of job openings for content analysis and number of openings included for each country and field

Country	Field	Websites	Period of posting job positing	# Openings included
Australia	Accounting	Seek, CareerOne	1/20/2017-2/01/2017	30
	IT	Seek, CareerOne	4/27/2017-9/04/2017	50
United Kingdom	Accounting	CareerJet, Jobsite, Neuvoo, Reed, Monster	8/01/2017-10/10/2017	25
	IT	Indeed, FindApprentiship, Reed, Monster	7/17/2017-10/20/2017	50
United States	Accounting	CareerJet, Indeed, Monster	3/29/2017-4/26/2017	28
	IT	Indeed, Monster	8/01/2017-9/09/2017	50

In each country and in each field, at least 25 distinct job openings were included in the content analysis. In all countries, more IT than accounting job openings were included in the content analysis (50 per country) due to the larger variation in job requirements within the field of IT. In order to conduct the analysis, I listed each job requirement and desirable characteristic of the applicant in an Excel spreadsheet. Then I coded these characteristics in seven emergent themes, listed in Table 3.13. The associated frequency of job requirements and desirable characteristics for each sector of the labor market and each country are also included in this table.

Table 3.13. Overview of frequency of job requirement per identified theme, country, and field

	Australia		**United Kingdom**		**United States**	
Emergent theme	Accounting	IT	Accounting	IT	Accounting	IT
Experience	7 (12%)	27 (7%)	23 (25%)	24 (5%)	24 (12%)	33 (8%)
Relevant degree	2 (4%)	30 (7%)	6 (7%)	37 (8%)	29 (15%)	43 (10%)
Certifications	3 (5%)	8 (2%)	15 (17%)	5 (1%)	3 (2%)	28 (7%)
Technical skills	16 (27%)	188 (45%)	11 (12%)	218 (49%)	43 (22%)	165 (40%)
Communication skills	2 (3%)	33 (8%)	6 (7%)	21 (5%)	19 (10%)	28 (7%)
Other soft skills	27 (46%)	114 (27%)	30 (33%)	125 (28%)	66 (34%)	106 (25%)
Other	2 (3%)	16 (4%)	2 (2%)	14 (3%)	12 (6%)	15 (4%)
Total	59	416	93	444	196	418

By grouping the list of requirements and desired characteristics by themes, I was able to design summary statements that encompassed employer expectation across each theme. These statements, matched across countries, became the criteria for what a high match resume would look like in each sector and country, for each field. Table 3.14. includes the breakdown of criteria for high match accounting resumes and Table 3.15. includes the criteria for the high match IT resumes.

Table 3.14. Criteria for high match resume in accounting

Theme	**Emergent criteria for high match accounting resume across countries**
Experience	1-2 years of experience in a financial service, investment management, or a large corporate or public environment is highly preferred (this includes previous work experience, or college internships)
Relevant degree	Bachelor degree in Accounting, Finance or Business from an accredited university
Certifications	US, Australia: CPA license or working towards a CPA; UK: ACCA/ACA/AAT
Technical skills	Highly skilled in Microsoft Office programs (Excel, Word, PowerPoint, Visio, MS Project). Ledger data; Knowledge of generally accepted accounting principles (GAAP) and generally accepted government auditing standards (GAGAS), OMB A-123 procedures; Xero; MYOB; Quickbooks
Communication skills	Ability to communicate professionally through effective verbal and written skills
Other soft skills and character features	Detail oriented, multitasking, work independently, team-player, deadline oriented, pro-active attitude, good with numbers, ability to prioritize
Other	Eligible to work in the country; For US: GPA of 3.0 or higher

Table 3.15 Criteria for high match resume in information and communication technology

Theme	**Emergent criteria for high match accounting resume across countries**
Experience	1-2 years of experience in a software developer roles (this includes previous work experience, or college internships)

Theme	Emergent criteria for high match accounting resume across countries
Relevant degree	Bachelor degree in computer science from an accredited university
Certifications	(ISC)²; CompTia A+
Technical skills	Windows; .Net; Active directory; Agile; Git/Github; Scrum; C#; Java; JavaScript; SQL; MySQL; AWS; Hibernate; RESTful; HTML5;
Communication skills	Ability to communicate professionally through effective verbal and written skills
Other soft skills and character features	Detail oriented, multitasking, work independently, team-player, deadline oriented, pro-active attitude, good with numbers, ability to prioritize
Other	Eligible to work in the country; For US: GPA of 3.0 or higher

The criteria in Table 3.14. and Table 3.15. are not ideal reflections of the job requirements of entry level jobs in the field of accounting and IT. Criteria were refined to ensure that resume components are believable. For example, I needed to ensure that it was credible for bachelor candidates to possess the credentials required by job openings. Several job openings either required or wanted applicants to possess the Microsoft Certified Solutions Associate (MCSA) certificate. This certificate requires two years of practical experience before taking the exam. Similarly, the CompTia Network+ certification requires nine months of specialized experience and the completion of the CompTia A+ certification.

In addition, particularly for the field of IT, the content analysis of job openings required a wide variety of technical skills, programming languages, and software knowledge. In these cases, I chose to include the technical skills that were most frequently mentioned across job openings.

High match and low match resumes

Second, real resumes from each relevant job sector were collected from various sources including LinkedIn, company employee profiles, university career services websites, and sample resumes available on recruitment websites. Using the list of criteria that resulted as part of the first step, for each labor market sector, the components of these resumes were coded as high match or low match. Aspects of real resumes that could not be determined as either of low or high quality were excluded from the next step of the process. At the end of this process, I obtained a list of examples for sought after features and of non-desired features in each respective industry. I then combined these features into fictitious resumes of high and low match. High match resumes met most job description requirements for each labor market sector and came closer to the ideal candidate for the sector. Conversely, low match resumes did not meet most job description requirements for a sector.

The same low match resume was used for both accounting and IT positions. The low match resume was designed to not match the ideal criteria that emerged as part of the job opening content analysis. However, the low match resume still included a comparable length of experience and a comparable yet misaligned degree.

By creating high match resumes starting from the ideal profile for a selected labor market rooted in actual job openings, the research design partially addresses an additional external validity threat of the experiment: variability of the instrument across job openings. Even within the same field, requirements for entry level jobs vary due to divergent company needs. In order to respond to this, in practice, applicants need to alter their application from one job opening submission to the next. I did not tailor resumes in any way as part of the application process, as this would have represented a validity concern. However, by creating and submitting

applications that are relevant to an ideal type, I ensured a higher likelihood of callbacks across diverse job openings.

Demographic characteristics

All applications were attributed to fictitious applicants holding the nationality of the country where the experiment took place. As part of the application process, this was primarily signaled through answers to questions on working rights. Fictitious names were designed by combining common first and last names among the generation of class of 2018 using the official website of national governments. Email accounts were opened via Google mail, using an available combination of the designated names. Fictitious addresses, were chosen using Google Maps. The addresses were located in the city where the applicants' university was located. Telephone numbers were assured via Skype numbers. I choose phone numbers with the prefix of each country where the experiment took place.

Table 3.16. includes the names, email addresses, and phones used for the fictitious applications. The addresses used as part of the applications are not made available as to not help identify the universities selected for this experiment. As Table 3.16. illustrates, four names and email addresses were created for each country, one for each match condition and each sex condition. I chose to create just enough fictitious accounts to accommodate the validity of the experiment in order to maintain simplicity in the management of the applications and minimize financial costs.

Each match condition and sex condition required the creation of a separate name and email address for two reasons. First, female and male applicants needed to have distinct names that suggested their sex. Second, as sex was randomly and independently assigned for each match condition, the sex of the high match applicant could coincide with the sex of the low

match applicant. In order to avoid compromising the experiment, the female and male applicants in the high match condition needed to have distinct names from female and male applicants in the low match condition.

As only two applications were submitted to each job opening and each country has unique country codes, I only needed two phone numbers per country. One of these numbers was assigned to all low match applications, and the other phone number was assigned to all high match applications within a country.

Table 3.16. Names, email addresses, and phone numbers used for fictitious applicants

Country	Match condition	Sex condition	Name	Email	Telephone
Australia	High match	Female	Ashley Johnson	ashley.m.johnson.mail@gmail.com	(02) 6100 1374
		Male	Daniel Smith	smith.s.d.daniel@gmail.com	(02) 6100 1374
	Low match	Female	Sarah Jones	jones.g.sarah@gmail.com	(02) 6176 1591
		Male	Joshua Jones	jones.joshua.mail@gmail.com	(02) 6176 1591
United Kingdom	High match	Female	Ashley Johnson	ashley.n.johnson.mail@gmail.com	020 7097 1853
		Male	Joshua Smith	smith.joshua.mail@gmail.com	020 7097 1853
	Low match	Female	Sarah Jones	jones.f.sarah@gmail.com	020 3287 7009
		Male	Thomas Jones	jones.thomas.mail@gmail.com	020 3287 7009
United States	High match	Female	Ashley Johnson	ashley.j.johnson.mail@gmail.com	347 809 5513
		Male	Daniel Smith	smith.daniel.jack@gmail.com	347 809 5513
	Low match	Female	Sarah Jones	jones.d.sarah@gmail.com	347 809 6760
		Male	Matthew Jones	jones.matthew.mail@gmail.com	347 809 6760

Instrument Validity

The validity of the research instruments has been tested and improved using semi-structured interviews with experts in recruitment. First, interviewees were asked to describe their experience with recruitment. Second, recruitment experts were asked to independently evaluate the high match IT resume, the high match accounting resume, and the low match resume. For each resume, recruiters were asked the following questions:

1. What are your first impressions?

2. What type of job do you think this resume is targeted at?
3. Do you have any comments on the outline of the resume?
4. Do you have any comments on the contents of the resume?
5. Are there things that are missing from this resume that you are used to seeing on resumes?
6. Do you see any information here that is not typical for an entry level resume?
7. How could this resume be improved?
8. Is this resume believable?
9. Do you have any additional comments on this resume?

Interviewees were recruited using personal networks and a snowballing procedure in all three experimental countries. For Australia and the US, I conducted two rounds of interviews. The first round of interviews was conducted on the resumes that resulted from the instrument construction stage. As data saturation was reached on interviews with recruiting experts, I used feedback from experts to modify and improve the resumes used in each country. Given the rather standardized practices for resume creation and recruitment in all experimental countries and across field, data saturation was reached relatively quicker than in typical qualitative research projects.

Recruiters commented on structure, content, and formatting in similar ways, however not always consistently across countries. For example, Australian recruiters repeatedly mentioned that a one-page resume is not needed in the country and they advised me to split the contents of the Australian resumes on two pages. US recruiters consistently mentioned that I should keep the resume on one page. At times, recruitment feedback differed within a country. I received mixed feedback across countries on whether I should include the GPA of the applicant.

Feedback from recruiters was used to create a check-list with 126 recommendations for improvements to the first draft resumes. The check-list focused on one of the following resume aspects: (1) education (e.g. add specific classes taken; do not use the abbreviation BS for Bachelor of Science); (2) experience (e.g. add company description; use stronger verbs to illustrate experiences); (3) software skills (e.g. consider adding the skills at the top of the resume, above the interpersonal skills); (4) skills summary (e.g. make sure the soft skills included in the section are matched by elements in the resume; add career objective line), and (5) general suggestions (e.g. change template; remove physical address from resume).

Not all suggestions from recruiters were implemented in the revision stage. For example, the suggestion to include hobbies and interests and the suggestion to add a section on spoken languages as part of the resumes were not included in order to not add confounded variables to the research design. Similarly, some suggestions were not included because they were a minority opinion, such as the suggestion to place experience above education on the resume. However, the majority of the suggestions from recruiters were included in the revised versions of the resumes.

These improved versions of the resumes served as the basis of a second round of interviews and revisions. I interviewed one recruitment expert in each experimental country, including the UK. The three interviews conducted in the second validation round provided very few suggestions for improvement. They were also in agreement that the high-match resumes are comparable with the entry level requirements of their respective sectors, that all resumes are believable, and that there is a significant gap in the match level between the low and the high match resumes.

Table 3.17. includes a breakdown of the interviews conducted with experts during each validation round and in all experimental countries. Altogether, 11 interviews were conducted with recruitment experts to validate and improve the research instrument.

Table 3.17. Breakdown of interviewed experts across experimental countries

	United States	**Australia**	**United Kingdom**
1st validation round of interviews	5	3	-
2nd validation round of interviews	1	1	1

Noteworthy, among the interviewed recruiters there were individuals who specialize in IT and accounting recruitment. As such, some of the interviewees were able to not only provide formatting and general content feedback, but also specific feedback on whether the high match resumes indeed met entry level requirements in the field of IT and accounting. The final drafts of the high and low match resumes used in all experimental countries are made available in Appendix 3.

Cover letters were also used as part of this experiment. They were created by a cover letter consultant contracted via the website www.upwork.com. A cover letter and resume expert freelancer was given access to the validated resumes and asked to create three cover letters, one for each core resume. The freelancer was asked to design cover letters that would align with a generic job in fields of accounting and IT. I revised the cover letters and created copies that meet the other experiment conditions of this design. Examples of high match and low match cover letters used for this research are provided in Appendix 4.

Data collection

Data was collected between February 22, 2018 and July 29, 2018. I submitted 2,400 valid job applications to 1,200 job openings, thus marginally exceeding the power analysis threshold. Job openings were retrieved via Indeed.com, a major online job platform. This platform was

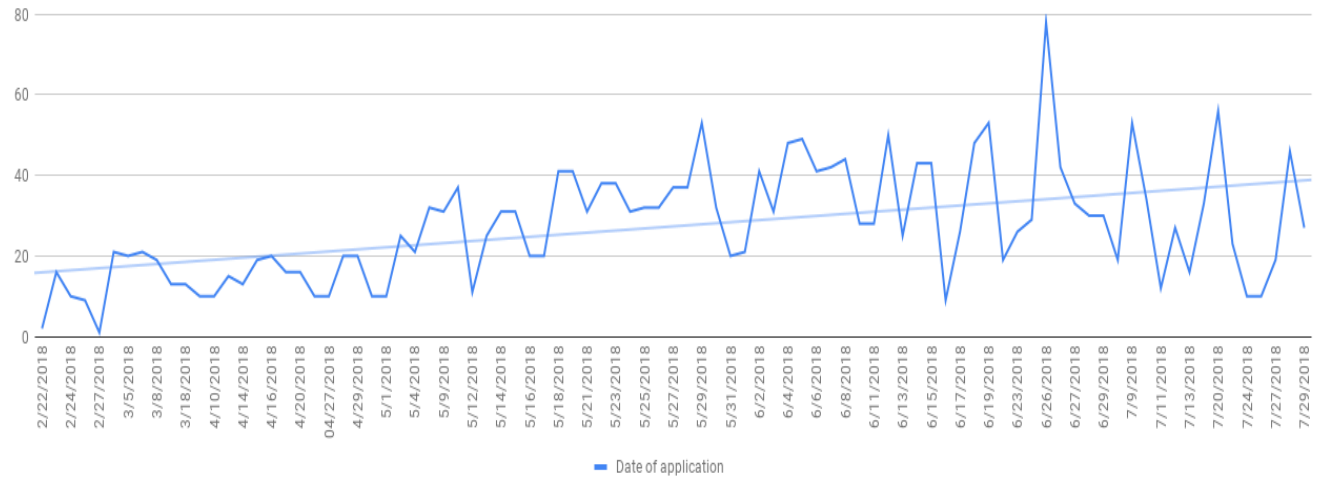
chosen for application submission through trial and error, due to its user-friendly application system, as well as the comprehensive collection to job openings it offered access to. Importantly, the platform facilitated job application submissions without logging into a user account. The ability to submit applications without logging into a different account for each submission streamlined and sped the application process.

As discussed in the random assignment section of this paper, some experimental conditions were randomly assigned. First, as I submitted two resumes to each job opening, I randomly assigned the order in which I would submit the high match and the low match resumes. This random assignment was independently assigned from the random assignment of the prestige and sex conditions and was determined prior to the start of the experiment using the website https://www.randomizer.org. Second, for each job application, I followed the random assignment of the prestige and the match condition.

Data collection over time

The country and field of the labor market conditions were not randomly assigned as part of the data collection process. This choice allowed for better streamlining of the experiment and thus minimized data collection errors. In any given day of data collection, I would apply for jobs in a given country and a given field. As a rule, in any given week I would apply for all new jobs that resulted from using the key search words. On average, I submitted 27.6 job applications per data collection day, with a minimum of one application submitted on 2/27/2018 and a maximum of 78 applications submitted on 6/26/2018.

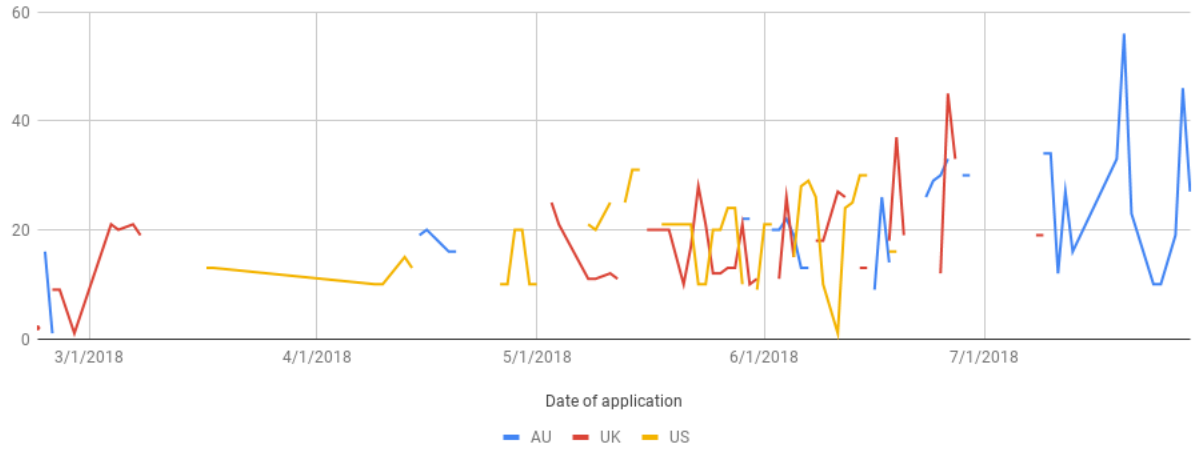
Figure 3.2. Submissions of job applications over time



At the same time, applications in different countries were concentrated in different time intervals of the data collection phase. Overall, applications to the Australian labor market were concentrated towards the end of the data collection process. This was primarily due to the structure of the academic year in the country. In Australia, the academic year generally starts in January. The second semester generally starts in June. This means that applications in the Australian labor market were submitted during the middle of the academic year. This roughly coincides with the period when applications were submitted in the UK and the US labor markets. Figure 3.3. illustrates the distribution of job applications by country.

As each job required the submission of two applications, I submitted the first application in a given day (Day 1), and the second application in the following day (Day 2). Random assignment was used to determine the distribution of high match and low match resumes between Day 1 and Day 2. Overall, 51.4% of Day 1 applications were in the high match condition. This process was designed to minimize the chances that the experiment is discovered by employers and to ensure that the match condition is not confounded with the time when the application was submitted.

Figure 3.3. Submissions of job applications by country



Job application process

During Day 1, I first scanned the job platform for new entry-level jobs in a given field and country. I would then proceed to apply for these jobs in the order of their posting. After submission, I recorded all my applications in a data collection database. This database included the following information:

(1) Match Condition: High match (HM) or Low match (LM)

(2) Job number random assignment: A unique number between 1 and 1228, assigned to each job opening.

(3) Country: United States (US), United Kingdom (UK), or Australia (AU)

(4) Prestige condition: High prestige (HP) or Non-high ranked condition (LP)

(5) Sex: Female (F) or Male (M)

(6) Information on whether a cover letter was submitted: Yes or No

(7) Name of the company where the application was submitted

(8) The name of the position to which an application was submitted

(9) Location of job opening

(10) Date of the application (Day, Month, Year)

As part of Day 1, I also decided whether the job was eligible to be included in the experiment. However, at times, during the application process I discovered that the job opening required information too difficult or impossible to provide for the fictitious applications that I designed. This included requests for transcripts, copies of diplomas, and names of referees from current or former job positions. These job openings were a minority among all job openings, yet sometimes they took time to detect. During Day 1 I have also saved the job descriptions of all positions applications were submitted for in pdf format and stored them in a folder for further reference. Appendix 5 includes two samples for a job opening to which I submitted applications, as well as copies of print screens of the job application process. Applications during Day 1 were submitted from Chrome. I would save all web links to job openings in Safari, to facilitate job application submissions during Day 2. Different browsers needed to be used to avoid Indeed.com blocking me from submitting two applications to the same job.

During Day 2, I submitted the second round of applications to the same job openings as Day 1. The completion of the second round of applications generally took substantially less time. I used a VPN to ensure that employer would not detect that the same IP address was used to submit two distinct applications and that the applications were submitted from abroad. Different VPN locations were used for Day 1 and Day 2.

Data collection errors

The experimental design worked as intended. However, I detected data collection errors pertaining to 28 job openings. These errors were due to one of the following reasons, in the order of their frequency: (1) the job was no longer available for applications during Day 2; (2) an application to the respective company was previously submitted; (3) I submitted the a different

resume to the job opening than the one required by random assignment. These errors were generally discovered at the time of the application or immediately after. These 28 cases were excluded from the data analysis process yet not deleted from the database. Additional applications were submitted to compensate for their occurrence.

Evaluating callbacks

The process of evaluating what constitutes a callback was not as straightforward as I initially expected. First, it became apparent that some emails that invite applicants for a skill test were automatic and not the result of screening. These emails were generally received by applicants in the low match and high match conditions and were received immediately after the application was submitted.

For the most part, valid callbacks fell into two categories, First, callbacks would come as brief, often brief notes from HR representatives, such as the examples below:

- "Ashley, when you have 15 mins, pls call the Office to chat w me on our Posting. Thank you (phone number)."
- "Thank you for your interest in our firm. We would like to schedule a phone interview on Wednesday 5/2 between 12.00 to 4.00pm. Let me know what time works for you."
- "Ashley, are you looking to move to Miami?"

Second, callbacks would come as more official and less personalized emails such as the example below:

"Dear **Ashley Johnson**,

You have been invited to complete a phone screening for your application to the **Junior Accountant** role at (name of company). You will need to complete this phone screening by **03:48 PM EDT, Jun 15, 2019**. The process is automatic and should take about 10 minutes.

How does it work?

During this call you will be asked a series of questions. These questions are designed to

help (name of company) learn a little bit more about your background and experience. Your answers will be recorded and passed on to the hiring manager at (name of company).

To initiate the phone screening, please click on the link below.

Start Phone screen

Or, use this link: (link for screening)

After completing the phone screening, the hiring manager will contact you within a few days should they decide to proceed.

What questions will I be asked?

1. Please tell us a little bit about your background and experience.
2. Please tell us why you are interested in this position and how you can make a difference.
3. Please tell us about a past accomplishment that you are especially proud of and why.
4. Please describe a difficult situation you encountered in a previous job and how you resolved it.

Please do not reply to this email. If you have any questions or need assistance, please visit our FAQ page.

Sincerely,

Indeed"

Callbacks were collected throughout the duration of the experiment and for two months following the completion of the experiment. Data was initially collected in google spreadsheet and then imported in SPSS. Variables have been transformed to facilitate data analysis. The original Google spreadsheet dataset, as well as the original SPSS file, alongside the syntax used for analysis can be made available upon request.

Callback errors

Callbacks were collected via email and phone. While the email accounts I created proved to be reliable in recording callbacks from employers, the Skype numbers I used as part of this experiment proved less reliable. This is because many callers did not attempt to leave a message and because many of the voice messages received on these phone numbers could not be heard. In order to minimize loss of callbacks, I completed additional verifications on the call log to my Skype numbers, stored online by Skype for three months at a time.

First, I crosschecked all phone calls to my Skype numbers with the phone numbers listed by employers in their emails to the fictitious applicants. This allowed me to trace callbacks from

employers that both emailed and called the fictions applicants. Second, I performed Google searches of the phone numbers that I was unable to trace via the first method. This allowed me, in some cases, to link phone numbers with companies to which I submitted job openings. Table 3.18. illustrates the proportion of callbacks by phone that remain untraced for each experimental condition.

Table 3.18. Untraced calls to fictitious Skype phone numbers as percentage of total Skype calls

Country	Untraced Skype calls to high match applications (as % of total Skype calls)	Untraced Skype calls to low match applications (as % of total Skype calls)
Australia	38% (17 out of 45)	45% (5 out of 11)
United States	54% (28 out of 51)	82% (23 out of 28)
United Kingdom	30% (21 out of 71)	100% (1 out of 1)

Errors in callback collection are a limitation of this study. It is possible that few valid callbacks from employers have been lost. However, I believe this source of error is unlikely to affect the validity of the results. This is because callback errors likely do not correlate with any of the constructs of interest in this study. In addition, it is unlikely that the distribution of callbacks that originate from phone calls would be distinct than the distribution of callbacks received by email. However, this source of error is likely to lead to an underreporting in the overall callback rates to this experiment.

Noteworthy, the untraced numbers may belong to employers to whom I did not submit applications and who came across the submitted resumes. Similar to unsolicited callbacks received by email, these calls would not be recorded as callbacks for the purpose of this study. Other untraced phone calls could be spam calls.

Data Analysis

All research questions were analyzed using logistic regression. The analysis tested the significance of the independent variables in predicting the variability on the outcome variable.

The independent variables of the study are country, sectors of the labor market, prestige, match, the interaction between match and prestige, and sex. Of particular importance for this study is the interaction between university prestige and the quality of the application condition. The contingency table 3.3. best summarizes all elements of the design. Contingency tables, relative risk ratios, and absolute risk ratios are used to convey the descriptive results of the study.

Absolute risk ratios and relative risk ratios

Absolute risks indicate the probability of an event to occur for a group. It is calculated as a ratio of the number of occurrences within a group divided by the population in the group. Relative risk ratios measure the likelihood of an event happening in one group (experimental group) in comparison to the likelihood of the same event happening in a different group (control group). Risk ratios are traditionally used in experimental research to compare the outcome variation between an experimental and a control group. Risk ratio is calculated by dividing the probability of an outcome to occur in one group (numerator) to the probability of the event occurring in a second group (denominator), or a ratio of two absolute risks. In the context of this research, absolute risk ratios and relative risk ratios were used to understand if callbacks differ between different groups delineated by research variables. A risk ratio that is equal to 1 means indicates no difference in outcomes between the two group. A risk ratio that is smaller than 1 indicates that the denominator group has an increased incidence of the outcome. A risk ratio larger than 1 indicates that the numerator group has an increased incidence of the outcome

Logistic regression

The data analysis procedure utilized for the purpose of this experimental design is logistic regression. Logistic regression is a generalized linear model that allows researchers to model the relationship between multiple categorical or continuous independent variables and a binary or

dichotomous dependent variable. In the case of this experimental design, the outcome variable took the values of Yes = 1 and No = 0, where Yes and No are the presence or the absence of a callback from employers. Both linear regression and logistic regression aim to predict an outcome variable based on a number of independent variables. However, the logistic regression does not employ R^2 to measure the total variability of the outcome variable explained by the model. Instead, the logistic regression model predicts the probabilities and the odds of an event occurring as an effect of the independent variables. This is due to the binomial rather than linear distribution of the outcome variable. During the analysis procedure, the odds of an event occurring are calculated using a transformed linear function of the dependent variable. This transformation is then used to calculate the logit, or the log-odds, thus removing the floor restriction of the odds value. It is the resulting exponential transformation, the logit of the probability of the outcome variable, "rather than the outcome variable itself, that follows a linear model" (Rodriguez, 2007, p. 7). The general model of the logistic regression can be summarized as follows:

$$ln\left(\frac{\hat{p}}{1-\hat{p}}\right) = B_0 + B_1X$$

In the formula above, $\hat{p}$ is the exponent function for the expected probability of the dependent variable = 1, for a given value of the independent variable(s) (Newsom, 2015). The independent variables of the study were, as described earlier: prestige, match, the interaction between match and prestige, country, sector of the labor market, and sex.

Pending a significant result, interactions were introduced one at a time in the logistic regression model to test the overall fit of the model. The significance of various versions of the model was tested using goodness of fit statistics via chi-square using a deviance model. A deviance statistic tests the fit of the actual observed values in comparison with the expected

values. This type of testing does not function as an omnibus test, where all interactions can be added at the same time and removed if not significant due to power limitations. Instead, each new addition to the initial additive model needs to be tested separately (Rodriguez, 2007). The next chapter includes the descriptive and inferential results of the study.

Chapter 4: Results

This chapter introduces the results of the experimental study and provides answers to the research questions asked. First, I introduce the descriptive results of the study by reporting callback rates for all experimental variables, as well as a number of variable interactions. The descriptive results of each variable are reported in distinct sections. In addition, I report on the relative risk ratios between selected groups within the data to offer a more succinct picture of variations within the data. Second, I introduce the inferential results and answer the stated research questions.

Descriptive results

Among 2,400 applications, 276 (11.5%) received callbacks. This callback rate varies across experimental conditions. Throughout this section I report callback rates. Callback rates are the percentage of applications that received a callback for one or more experimental conditions, as specified.

Match condition

Applications in the high match conditions—or the high human capital condition—received a higher callback rate than applications in the low match—or low human capital—condition. Overall, 19.1% of applications in the high match condition received a callback, whereas only 3.9% of applications in the low match condition received callbacks. Some variations can be found within the match condition across other experimental conditions.

High match applications from a high ranked university received a callback of 19.2%, just 0.2 percentage points higher than applications from the non-high ranked condition (19.0%). For high match applications, both male and female applicants received a 19.1% callback rate. Across fields of study, high match applications to accounting jobs received an 18.2% callback rate, and

applications to IT positions received a slightly higher, 20% callback rate. Callback rates across countries for high match applications were more varied, ranging from 15% in Australia, 17.3% in the US, and 25% in the UK. Table 4.1. includes a more detailed breakdown of callbacks by match as it interacts with other experimental conditions.

Table 4.1. Callback rate breakdown by match condition

Experimental condition	**Callback rate high match applications**	**Callback rate low match applications**
Overall	19.1%	3.9%
High-ranked	19.2%	4.8%
Non-high ranked	19.0%	3.0%
Female	19.1%	5.0%
Male	19.1%	2.8%
Accounting	18.2%	4.2%
IT	20.0%	3.7%
United Kingdom	25.0%	6.3%
United States	17.3%	2.8%
Australia	15.0%	2.8%
UK x Accounting	16.1%	5.0%
UK x IT	36.75%	7.5%
US x Accounting	23.0%	4.0%
US x IT	11.5%	1.5%
Australia x Accounting	15.5%	3.5%
Australia x IT	14.5%	2.0%

Variations can be found within sectors of the labor market across countries and sexes. Callback rates in the high match condition vary from 9.1% for high prestige male IT applications in the US to 37.7% for high prestige female IT applications in the UK. This discrepancy is the equivalent of a little less than 1 in 10 applications receiving callbacks versus more than 1 in 3 applications receiving callbacks.

Similar variations can be found across experimental conditions for low match applications. The highest callback rate was received by high ranked IT applications in the UK (10.7%). For several experimental conditions, fictitious applications received no callback. Overall, high ranked applications in the low match condition received a higher callback rate

(4.8%) than non-high ranked applications in the same condition (3.0%). Similarly, female applicants in the low match condition received a higher callback rate (5%) than male applicants (2.8%). Accounting applications in the low match condition received a higher callback rate (4.2%) than IT applications (3.7%). Callback rates for low match applications varied by country, with both the US and Australia registering a callback rate of 2.8%. The callback rate for low match applications in the UK was 6.3%.

Callback rates vary by field of the labor market within the match condition and within countries. High match IT applications in the UK received a callback of 33.8%. IT callbacks in the US were three times lower than in the UK. At the same time, in both Australia and the US, high match applications in accounting received a higher callback rate than applications submitted to IT positions.

High and non-high ranked condition

Overall, 11.9% of applications in the high ranked condition received callbacks, and 11.1% of applications in the non-high ranked condition received callbacks. Table 4.2. provides a detailed overview on the differences in callback rates between high ranked applications and non-high ranked applications by other independent variables.

Callbacks for high and non-high ranked applications were similar across the high match condition, with applications in the high ranked conditions receiving a higher callback rate by 0.2%. The gap between high and non-high ranked applications in the low match condition was somewhat higher. Overall, applications in the low match high ranked condition receive a 1.8% higher callback rate than low match non-high ranked applications.

Applications in the high-ranked condition had a slightly higher callback for both female (0.7% higher) and male (1.1% higher) applicants. Applications in the high ranked condition

received a higher callback rate for the field of IT (2.6% higher). However, the callback rate is reversed for the field of accounting, with non-high ranked applications receiving a slightly higher callback rate (0.8% higher).

If in Australia high ranked and non-high ranked applications received an identical callback rate (8.9%), both in the United Kingdom (1.8% higher) and in the United States (0.3% higher) high ranked applications received a higher callback rate than non-high ranked applications.

Table 4.2. Callback rate breakdown by prestige condition

Experimental condition	Callback rate high ranked applications	Callback rate non-high ranked applications
Overall	11.9%	11.1%
High match applications	19.2%	19.0%
Low match applications	4.8%	3.0%
Female	12.1%	11.4%
Male	11.8%	10.7%
Accounting	10.8%	11.6%
IT	13.1%	10.5%
United Kingdom	16.5%	14.7%
United States	10.2%	9.9%
Australia	8.9%	8.9%

Sex condition

Overall, female applicants received a marginally higher callback (11.7%) than male applicants (11.3%). Table 4.3. includes a breakdown of callback rates by female and male applicants for key research variables. Female and male applications in the high match condition received the same callback rate (19.1%). Females in the low match condition received a higher callback than male applicants (2.2% higher). Female applications receive a marginally higher callback rate across both the high ranked and the non-high ranked conditions. While female applicants to accounting positions received a higher callback rate than male applicants (1.6%

higher), male applicants to IT positions received a higher callback rate than female applicants (0.7% higher). Males received a slightly higher callback rate in the United Kingdom and female applicants received a slightly higher callback rate in the United States and Australia. Notably, female applications in the low match condition in accounting (6.3%) received a higher callback rate than male applications (1.8%). The disproportionate callback rate is stronger for low match female applications in the high ranked condition than the non-high ranked condition.

Table 4.3. Callback rate breakdown by sex condition

Experimental condition	Callback rate female applications	Callback rate male applications
Overall	11.7%	11.3%
High match	19.1%	19.1%
Low match	5.0%	2.8%
High ranked	12.1%	11.8%
Non-high ranked	11.4%	10.7%
Accounting	12.0%	10.4%
IT	11.4%	12.1%
United Kingdom	14.5%	16.7%
United States	11.4%	8.5%
Australia	9.2%	8.6%
High match x Accounting	18.5%	17.9%
High match x IT	19.6%	20.3%
Low match x Accounting	6.3%	1.8%
Low match x IT	3.6%	3.8%
High match x High ranked	18.6%	19.8%
High match x Non-high ranked	19.5%	18.4%
Low match x High ranked	6.3%	3.2%
Low match x Non-high ranked	3.6%	2.4%

Sector of the labor market

While both applications submitted to IT and accounting positions received similar callback rates in the aggregate, significant variations occur across countries. In the United Kingdom, IT applications received almost double the callbacks as applications submitted to accounting jobs. However, in the the United States (7% higher) and Australia (1.2% higher)

accounting applications received a higher callback rate. Table 4.4. breaks down callbacks to accounting and IT jobs by other independent variables.

Table 4.4. Callback rate breakdown by sector of the labor market

Experimental condition	Accounting	IT
Overall	11.2%	11.8%
High match	18.2%	20.0%
Low match	4.2%	3.7%
High ranked	10.8%	13.1%
Non-high ranked	11.6%	10.5%
Female	12.0%	11.4%
Male	10.4%	12.2%
United Kingdom	10.6%	20.6%
United States	13.5%	6.5%
Australia	9.5%	8.3%

Country

Applications submitted to job openings in the UK (15.6%) received a higher callback rate than applications submitted in the US (10%) and Australia (8.9%). Table 4.5. includes the comparison of callback rates across countries by key variables.

Table 4.5. Callback rate breakdown by country

Experimental condition	United Kingdom	United States	Australia
Overall	15.6%	10.0%	8.9%
High match	25.0%	17.3%	15.0%
Low match	6.3%	2.8%	2.8%
High ranked	16.5%	10.2%	8.9%
Non-high ranked	14.7%	9.9%	8.9%
Female	14.5%	11.4%	9.2%
Male	16.7%	8.5%	8.6%
Accounting	10.6%	13.5%	9.5%
IT	20.6%	6.5%	8.3%

This pattern is replicated across both the match and the prestige conditions, with applications to high match applications in the UK receiving a callback rate higher by 7.7% points than similar applications submitted in the US, and 10% higher than high match applications

submitted to Australian job openings. Notably, IT applications submitted to UK job openings received a higher callback rate by 10%.

Overall descriptive results

In table 4.6., I present the counts and callback rates across all experimental conditions.

Table 4.6. Callbacks across experimental conditions

				High ranked		**Non-high ranked**	
				Count	**%**	**Count**	**%**
High match	Female	Australia	IT	5	11.1%	7	14.0%
			Accounting	7	14.9%	10	21.3%
		UK	IT	20	37.7%	13	27.7%
			Accounting	4	10.0%	7	14.6%
		US	IT	7	13.7%	6	12.0%
			Accounting	9	20.5%	15	27.3%
		Total high match female		52	18.6%	*58*	*19.5%*
	Male	Australia	IT	9	16.4%	8	16.0%
			Accounting	9	16.4%	5	9.8%
		UK	IT	19	35.8%	16	33.3%
			Accounting	10	17.5%	11	20.4%
		US	IT	4	9.1%	6	10.9%
			Accounting	10	20.7%	12	21.1%
		Total high match male		*61*	*19.8*	*58*	*18.4%*
	Total high match			***113***	***19.2%***	***116***	***19.0%***
Low match	Female	Australia	IT	1	2.2%	1	1.9%
			Accounting	4	7.5%	1	1.9%
		UK	IT	4	7.8%	2	3.9%
			Accounting	4	6.1%	4	9.3%
		US	IT	3	5.7%	0	0.0%
			Accounting	4	8.3%	3	5.4%
		Total low match female		*20*	*6.3%*	*11*	*3.6%*
	Male	Australia	IT	1	1.9%	1	2.1%
			Accounting	0	0.0%	2	4.5%
		UK	IT	6	10.7%	3	7.0%
			Accounting	2	4.7%	0	0.0%
		US	IT	0	0.0%	0	0.0%
			Accounting	0	0.0%	1	1.7%
		Total low match male		*9*	*3.2%*	*7*	*2.4%*
	Total low match			***29***	***5.5%***	***18***	***3.4%***
Total				**142**	**13.6%**	**134**	**12.44%**

Table 4.7. includes a number of key relative risk ratios. Notably, the risk ratio comparing the probability of a callback for high match applications and low match applications (RR = 4.8) indicates a high discrepancy in callbacks between the two conditions. Similarly, the risk ratio comparing callbacks for low match, high ranked, female applications to male applications in equivalent conditions (RR=3.5) indicate a high discrepancy in callbacks.

Table 4.7. Absolute and relative risk ratios

Numerator	**AR**	**Denominator**	**AR**	**RR**
Formula	o_1/n_1		o_2/n_2	$\frac{o_1/n_1}{o_2/n_2}$
High match	229/1200	Low match	47/1200	4.8
High ranked	142/1189	Non-high ranked	134/1211	1.1
High match accounting	109/599	High match IT	120/601	0.9
Female	141/1203	Male	135/1197	1.0
Low match, high ranked female accounting	20/318	Low match, high ranked, male accounting	5/281	3.5
Low match, high ranked female IT	11/308	Low match, high ranked male IT	11/293	1.0

o_1- number of callbacks for numerator group
n_1- number of applications submitted in numerator group
o_2- number of callbacks for denominator group
n_2- number of applications submitted in denominator group
AR – absolute risk ratio
RR – relative risk ratio

Inferential results

Are the effects on the callback rate of applicant match and university prestige, and their interaction, constant across sex, sector, and country? In order to answer this research question, I used SPSS to run four logistic regression models that look at comparisons across experimental conditions. These generalized logistic models are built using the EMMEANS subcommand in SPSS, which allows the comparison of the interaction between university prestige (non-high ranked and high-ranked randomly assigned conditions) and match of the application (low match

and high match blocked conditions). The logistic regression model results are summarized in Table 4.8.

In Model 1, I aim to understand the effect of prestige, match, their interaction, and sex (female and male) on callbacks. The results suggest that the effect of the match condition is statistically significant in predicting callbacks ($p < .001$). Applications in the high-match condition are more likely to receive a callback than applications in the low match condition. The prestige condition as well as the interaction between university prestige and the match condition are not statistically significant. Similarly, the effect of sex on callbacks is not statistically significant. As such, this experiment detects no sex-based differences in callback rates. The lack of statistical significance for sex is inconsistent with prior findings of field experiments of the labor market.

In Model 2, I test the effect of match, prestige, their interaction, and labor market sector (accounting and IT) on callbacks. The match of the application remains a statistically significant variable ($p < .001$), whereas the prestige of the application ($p = .915$) and the interaction between university prestige and match ($p = .160$) are not statistically significant in predicting callbacks. The labor market sector is not a statistically significant predictor of callbacks ($p = .623$).

Models 3 and 4 test the effect of university prestige, match, and country. For the purpose of these models, dummy variables were created to facilitate comparisons between countries. Model 3 uses the US as a reference country (USvAustralia and USvUK). Model 4 uses the UK as a reference country (UKvAustralia and UKvUS). Model 3 and 4 suggest that prestige ($p = .967$) and the interaction between prestige and match ($p = .178$) are not statistically significant predictors of callbacks. Match remains a statistically significant predictor of callbacks ($p < .001$). USvAustralia is not a statistically significant predictor of callbacks ($p = .422$). However, USvUK

($p = .001$) and UKvAustralia ($p < .001$) are statistically significant predictors of callbacks. This relation is explained by the fact that applications in the UK (15.6%) received a higher callback rate than applications in the US (10%) and Australia (8.9%), as described in Table 4.5.

The analysis above suggests that callback rates are predicted by match and country. Model 1, 2, 3, 4 tested the overall effects of the match condition within each level of the prestige condition. These models indicate that the effect of the match condition is statistically significant (and positive) after controlling for the prestige condition, the interaction between prestige and match, gender, labor market sector, and country ($p < .001$). Across models, the effect of the prestige condition is not statistically significant.

Across Models 1, 2, 3, and 4, the odds ratio of the match condition is between Exp(B) = .213 and Exp(B) = .208, as Table 4.8 illustrates. This suggests that the probability of receiving a callback for an applicant in the high match condition is between 78.7% and 79.2% higher than for an applicant in the low match condition. Altogether, the match of the application explains roughly 11.3% of the variability in callbacks (R^2 Nagelkerke = .113). This estimate resulted from a logistic regression testing the effect of match on callbacks ($\chi 2(1) = 144.810$, $p < .001$).

Table 4.8. Logistic regression table on effect of prestige, match, and their interaction on callbacks, while controlling for sex, sector of the labor market, and country

	Model 1			Model 2			Model 3			Model 4		
	B	SE	Exp(B)	B	SE	Exp(B)	B	SE	Exp(B)	B	SE	Exp(B)
Intercept	-1.489*	.123*	.226*	-1.469*	.125*	.230*	-1.206*	.217*	.299*	-2.280*	.219*	.803*
Match condition	-1.552*	.217*	.212*	-1.545*	.217*	.213*	-1.569*	.218*	.208*	-1.569*	.218*	.208*
Prestige condition	-.018	.147	1.018	-.016	.147	.984	-.006	.148	.994	-.006	.148	.994
Match x Prestige	-.473	.339	.623	-.477	.339	.620	-.558	.340	.572	-.458	.340	.632
Sex	.110	.132	1.116									
Labor market sector				.65	.132	1.915						
USvAustralia							.143	.176	1.153			
USvUK							-.537*	.158*	.584*			
UKvAustralia										.681*	.163*	1.976*
UKvUS										.537*	.158*	1.711*
Deviance	3.567 (3)			2.392 (3)			1.754 (6)			1.754 (6)		

*Significant at $\alpha = .001$ significance level
Model 1: $\chi 2(4) = 149.701$, $p < .001$
Model 2: $\chi 2(4) = 149.250$, $p < .001$
Model 3: $\chi 2(5) = 169.797$, $p < .001$
Model 4: $\chi 2(5) = 169.797$, $p < .001$

Chapter 5: Discussion

Absent of social network effects—when controlling for the sector of the labor market, sex, country, match, and the interaction between prestige and match—university prestige does not predict callbacks. Sex too does not predict callbacks. Instead, skills match of applicant skills and job requirements is a statistically significant predictor of callbacks. Applications in the high match condition are 79% more likely to receive a callback than applications in the low match condition. In this chapter, I discuss the implications of these findings. First, I discuss how these findings align and misalign with prior research. Second, I interpret these findings through the theoretical lens employed as part of this research. Third, I present the limitations of this study. Last, I talk about the implications of my research for practice, policy, and further research.

How this study fits in the broader empirical literature

For the purpose of this section, I focus on better understanding how my findings about university prestige and sex fit in the broader academic literature. I discuss my findings concerning the statistically significant effect of the match, i.e. the human capital condition, in the next section.

The effect of university prestige in the labor market

Current literature documents a wide range of monetary and non-monetary benefits for attendees of prestigious institutions. The effect is particularly strong within the academic labor market. Clauset, Arbesman, and Larremore (2015) suggest that a quarter of universities in the US account for 71 to 86 percent of tenure track faculty in the fields of business, computer science, and history. Social networks linked to one's PhD granting institution as well as academic inbreeding at elite institutions have a strong effect on the academic prospect of graduates. While evidence suggests that some of this effect is explained by the increased productivity of PhD

graduates from more prestigious institutions, productivity alone is not responsible for explaining the gaps detected. Using data from PhDs in biochemistry, Long, Allison, and McGinnis (1979) suggest that academic appointments have a .34 correlation with the applicant's mentor's citations, while the correlation with their own publications is only .14. Conley and Onder (2014) suggest that class rank within a department is a better predictor of post-PhD productivity among economists in the US than the prestige of their graduation institution.

In the broader labor market, evidence suggests that graduates of more prestigious institutions have added monetary returns in the labor market. Black and Smith (2004) find that attending a more prestigious institution results in 11-12 percent higher wages than graduating from a less prestigious institution. While some evidence suggests that students admitted to prestigious institutions would have similar outcomes regardless of attendance (Dale & Krueger, 2002; 2014), multiple benefits emerge from attendance. Rivera (2015) documents that attendees of prestigious institutions have exclusive paths to high-prestige jobs. Gaddis (2013) and Jackson (2009) suggest—without controlling for job description match—that attendees of prestigious institutions receive higher callbacks to job applications.

The results of my dissertation are generally misaligned with prior findings. Contrary to the extant literature, I found no added callbacks for applicants in the high-ranked condition. This is inconsistent with the findings of Gaddis (2013) and Jackson (2009). I hypothesize that three design features may explain these discrepancies. First, both previous studies choose their high-prestige universities from among the very elite. I purposefully excluded these institutions from my research. Second, unlike these two studies, I include skills match as a key variable. It may be the case that skills match erases the effect of university prestige. Third, the skill intensive nature

of IT and accounting may explain the discrepancy in findings. I further elaborate on how the limitations of this study may influence the robustness of my findings later in this chapter.

The effect of sex in the labor market

Two lines of research are relevant for contextualizing the findings of this research that pertain to sex. First, as I discuss in Chapter 2, it is documented that females benefit less from a prestigious university degree than males (Black & Smith, 2004; Long, 2008). At the same time, evidence from previous field experiments which tested the effect of sex in the labor market is mixed. Few studies have found that men receive fewer callbacks than women (Booth & Leigh, 2010; Riach & Rich, 2006). One study found no statistically significant difference in callbacks between fictitious resumes from female and male applicants (Albert, Escot, & Fernández-Cornejo, 2011). In my study, sex is not a statistically significant predictor of callbacks. As such—in the aggregate of my experiment—I found no evidence of sex-based discrimination.

At the descriptive level, in a few conditions, discrepancies in callbacks between female and male applications were documented. Overall, female applicants received a higher callback rate by 0.4% than male applicants. In a few cases, male applicants received a higher callback rate. Most notably, male applicants to IT jobs received a higher callback rate than female applicants by 0.7%. In other conditions, fictitious applications attributed to women applicants received higher callback rates than those attributed to male applicants. Female applicants in the low match condition received a higher callback rate than male applicants in the same condition by 2.2%. Notably, female applicants in the low match condition in accounting received a callback rate higher by 4.5% than male applicants. This preference for female applicants is consistent with the results of previous field experiments of the labor market. Given that female applicants to accounting positions primarily received a higher callback rate in the low match

condition and not in the high match condition, a preference for female applicants in accounting does not fully account for this finding.

It is possible that this discrepancy is in part due to the random assignment of sex to applications. Across all experimental countries, I submitted more fictitious applications that belong to female applicants than male applicants. In the UK, 90 applications attributed to males and 109 applications attributed to women were submitted in the low match condition to accounting positions. Two of the male applications (2.2%) and 8 of the female applications received a callback (7.3%). Similar patterns emerged in the US, where low match accounting applications attributed to female applicants received 3 more callbacks than those attributed to male applicants, but 8 additional applications for female candidates were submitted. While this artifact of random assignment does not fully explain the discrepancy, due to the small number of callbacks at the intersection of conditions, no further inferential analysis can be conducted.

Historically women have been discriminated against in the labor market. Only in recent decades have women started to gain full access to the labor market. In the US, women with advanced degrees have lower unemployment rates that males with advanced degrees (Bureau of Labor Statistics, 2013). Yet women continue to face challenges in gaining promotions (Castilla, 2008; Castilla & Benard, 2010), accessing leadership positions, and are confronted with a gender pay gap. Yet, this study has found no evidence of sex based discrimination at the screening stage. The lack of sex based discrimination against women in this experiment and other similar studies might be explained by the increased attention to gender discrimination in public discourse and the increased receptivity of the labor market to the increasing number of women graduates.

Going back to theory

In my research, I attempted to understand the mechanism through which university prestige makes its mark in the labor market. I aimed to differentiate between the use of social capital, signaling, and human capital. I narrowed the scope of my research to the first stage of the recruitment process. None of my conclusions apply to later and potentially more important labor market outcomes such as hiring, wages, and promotions.

By submitting fictitious applications to job openings, I controlled for social capital effects in my experiment. By submitting high-match and low-match applications to job openings, I was able to test the effect of human capital in the recruitment process. By randomly assigning the name of a high-ranked and a non-high ranked graduating institution to high-match and low-match applications, I tested the effect of university prestige as a signal in the labor market. My results suggest that absent of social capital, university prestige does not predict callbacks. This does not mean that university prestige does not matter in the employment process. It simply means that as part of this research, within its narrow parameters, I found no evidence that university prestige matters. Instead, I found evidence that in skill intensive sectors of the labor market—accounting and IT—match or human capital matters. The intersection between match and prestige is not a statistically significant predictor of callbacks—match is. This result holds while controlling for country, sector of the labor market, and sex.

Human capital theory has deeply permeated the sphere of education and education policy. Employers and policy makers want education institutions to equip students with specific advanced skills that respond to labor market needs. A wide array of new and old education providers offer micro-credentials to better build and demonstrate skills. Yet, the human capital discourse is widely critiqued. The challenge to human capital is part of a broader critique of

neoliberal ideals and norms (Bowles & Gintis, 1975). Neoliberalism is critiqued for its unquestioned focus on economic growth, its ignorance of inequality in all its shapes and forms, and its instrumentalist view of human beings (Robeyns, 2006). Noteworthy, human capital is an extension of the equality of opportunity framework that I myself critique in Chapter 1. It too fails to acknowledge that outcomes—skills or competencies—are a product of social pressures and inequalities.

I did not choose human capital as one of the theories for this study because I endorse it, its assumptions or its hegemonic significance. I choose this theory because it makes sense for this study and because it builds a fairer framework to evaluate labor market outcomes than signaling theory. I elaborated on this argument in Chapter 2. Human capital, as the operationalized manifestation of merit, serves to distinguish between fair and unfair selection and allocation processes. In the labor market, a fair recruitment uses necessary and transparent or explicit selection criteria. The necessary criteria are most often defined in terms of skills and competencies. The selection criteria are made transparent and explicit through job descriptions. In practice, not all criteria listed by employers are fair. For example, most recently, employers have been critiqued for engaging in credential inflation—the tendency to request ever higher levels of education for the same jobs.

Overall, 3.4 percent of applications in the low match condition received callbacks. In one way, the presence of callbacks among low match applications undermines the strength of human capital in explaining the outcomes of this research. One could expect that low match applications would receive no callback if skills match mattered. Several explanations consistent with human capital theory may explain the presence of some callbacks among low match applications. First, it may be the case that those particular jobs required a less than average skill set. Second, it is

possible that the pool of applicants for those particular jobs was weaker to begin with, making employers pay closer attention to the few resumes received. Third, it is possible that the presence of transferable skills and the potential for on-the-job training made low match applicants somewhat appealing to employers. In part, this last explanation would predict that low match applications to accounting positions would receive a higher callback rate (4.2%) than low match applications to IT positions (3.7%) because it is harder to train accountants on the job.

Human capital does not entirely explain callbacks. The logistic regression models used as part of this research suggest that that human capital, or match, explains roughly 11 percent of the variability in the data (R^2 Nagelkerke = .113). Traditionally, R^2 Nagelkerke is not seen as a very reliable way to understand the amount of the variability explained and cannot be interpreted as the equivalent of R^2 in linear regression. As such, some researchers do not interpret R^2 Nagelkerke when discussing the results of logistic regression. It is however quite evident that the majority of applications submitted did not receive a callback. From the perspective of human capital theory, better matching between the application submitted and the job opening may increase callbacks. This would be particularly important for IT jobs, which traditionally include a vast and divergent umbrella of skills. It is also likely that applying for jobs where personal connections may be employed could increase callbacks. This study purposefully excluded networking effects. Other variables that may impact the callback rate are the timing of the application and the geographic proximity to the location of the job opening.

After reviewing the evidence on how college affects students, Pascarella and Terenzini (2005) concluded “our interpretation of the body of evidence across all outcomes is that the net impact of attending (versus not attending) college tends to be substantially more pronounced than any differential impact attributable to attending different kinds of college” (p. 588). This

research confirms their findings. Human capital is one of the mechanisms through which all universities can bring substantial value to graduates and may mitigate the effects of college selectivity.

The findings of my dissertation suggest that—when controlling for social capital or networking effects—human capital rather than signaling is a better predictor of recruitment outcomes for graduates from higher education institutions that differ in their prestige. These findings may or may not be reflective of the mechanisms that explain later disproportionate labor market among graduates from universities with different degrees of prestige or in different professions, as discussed in the next section.

Limitations and alternative interpretations

Research broadly, and social science research particularly, is messy. I chose to conduct a field experiment of the labor market because the method aligned well with my research question. I also chose this method because I was enticed by the prospect of potentially bringing evidence that supports a causal link between variables. However, in the quest of reaching a conclusion that is robust and that illustrates the directionality of a relationship between two variables, this research was necessarily narrow in scope. I only investigated the effect of university prestige in the first stage of the selection process, for students near college completion, as they apply to entry level jobs in only two sectors of the labor market in Australia, the UK, and the US. These applications belong to female and male applicants only. The study does not account for race, intersectional identities, and class. It eludes the small set of most elite institutions in each country. It is possible that this experiment tells us little about how prestige operates in practice. Here I attempt to present some caution about the validity and relevance of this research across real world settings.

How representative is the sample of jobs used for this study?

The results presented in this study may be the product of a non-representative sample of jobs. In most social science research, studying the entire population is not possible. As such, samples need to be drawn. Samples may or may not be representative of the population. In the case of this research, in the form of a census, I submitted applications for all available jobs that met the requirements stated in Chapter 3, within a certain time-frame, and until I met the power analysis requirements of this study. However, the sample of jobs I submitted applications to may be non-representative of the population of job openings. Even if the findings of this study were to be generalized to the population of entry level jobs in accounting and IT, the results may not be representative of job applications and employers beyond these sectors of the labor market and beyond the countries researched. It is impossible to fully conclude if this sample is representative. Further research and replication attempts are needed to validate the results of this research.

Does the prestige of the company matter?

One of the ways in which the jobs I applied for are not fully representative of the labor market is through the indirect exclusion of highly prestigious companies. Often, jobs with renown high-tech companies and consulting firms did not meet the job selection criteria used as part of this research. They generally required multiple documents in the first stage of the recruitment process, including transcripts, references, and essay responses to test questions. In addition, select prominent companies do not advertise their job openings on general job platforms. As suggested by Rivera (2015), elite jobs may represent the area of the labor market where university prestige may matter most. Elite social reproduction may as well occur through

the process of granting students from elite universities preferential access to elite jobs. While the purpose of this research was not to test the effect of university prestige in the elite labor market, indirectly excluding elite jobs represents a limitation of the study.

Non-random distribution of match within the student population

While this research suggests that human capital matters above signaling in skill intensive sectors of the labor market, these results may not be fully representative of how things work in practice. This is because in the broader world, the key independent variable of match may be non-randomly distributed in the population. It may be the case that the distribution of match is not equal at high-ranked and non-high ranked institutions. This can happen through two documented mechanisms.

First, prestigious universities may attract people with more human capital. Some scholars suggest that one of the markers of prestigious universities is in fact their ability to attract students that are already equipped with additional human capital (Harvey & Green, 1993). For example, insofar as higher standardized scores are a mark of human capital, prestigious universities in Australia, UK, and the US attract students with higher standardized tests scores. In Chapter 1, I make the case that meritocratic priming and system justification are more at play in people's imagination than objective differences between individuals at elite and non-elite universities. Not all students at one university are the same, and archetypes of students based on average admission statistics should not be taken as proxy when evaluating the match and potential of any given applicant.

Second, elite universities may equip students with cultural and social capital that increase their match. This process may also shape career ambitions differently for attendees of prestigious universities. Several studies suggest a strong funneling of students at elite universities towards

selective jobs. Students work to polish themselves and better meet the criteria of certain jobs they find desirable (Binder, Davis, & Bloom, 2016). If job tailoring is stronger among students at elite universities, then these students would likely get higher callbacks than students at non-high ranked institutions due to differences in human capital.

How relevant and valid are field experiments of the labor market?

The employment process and the labor market have a number of important outcomes relevant to research and practice. Such outcomes include hiring, promotion, and earnings. Of these, my research only investigates the possible presence of discrimination patterns during the first stage of the selection process (the screening of resumes). The experiment is unable to draw causal inferences about other crucial aspects of the labor market (Bertrand & Mullainathan, 2004). The general response to this critique by proponents of the method of field experiments of the labor market is that information about the first stage of the recruitment process offers valuable data about discrimination patterns. Due to the high control that the researcher has on the conditions of the experiment, such a design can draw causal inferences. These causal inferences are difficult to achieve at any other recruitment stage and with any other aspect of the labor market (Bertrand & Mullainathan, 2004; Daniel, 1968).

The first stage of the selection process functions as a gatekeeper. This is an obstacle that, in practice, many applicants face. The presence of discrimination at this first stage has important consequences in the professional lives of individuals and warrant research, as the pool of candidates for any further employment decision, from hiring to promotion is limited by discrimination at the early stages (Fernandez-Mateo & King, 2011).

How valid and robust are the designed resumes?

Heckman and Siegelman (1993) challenge labor market field experiments on account that they are not double blind. As such, the researches may unconsciously design the instrument as to yield the results desired. Through the validation process—which included 11 interviews with recruiters and human resource experts in the UK, Australia, and the US—I triangulated and improved the research instrument, thus decreasing concerns about bias.

The specific implementation the field experiment of labor market in this particular research poses additional challenges. Previous field experiments of the labor market primarily focus on testing the difference in callback rates between resumes that only vary indices (Spence, 1973) such as race (Bendick, Rodriquez, & Jayaraman, 2010; Bertrand & Mullainathan, 2004, Daniel, 1968) and ethnicity (Widner & Chicoine, 2011). This study attempts to vary signals, or alterable features, between CVs. The task of operationalizing the signal of university prestige and the signal of skills as a reflection of human capital poses reliability and validity concerns, as no prior validated instrument is available for use.

I believe the results of this experiment strongly indicate that the resumes reliably operationalized the match or human capital condition. The callback rates across countries and sectors of the labor market are a good illustration. Most surprisingly, my high match applications to IT positions in the UK labor market attracted a callback rate of 36.75%. To my knowledge, no previous field experiment of the labor market attracted such a high callback rate for any studied condition. If in the UK 1/3 applications to IT positions obtained a callback, callback rates in Australia and the US were substantially lower. In the US, the callback rate obtained by high match applications to IT positions was 11.5%. In Australia, it was 14.5%.

If in the UK, IT applications in the high match condition received a higher callback rate than accounting applications in the same condition, the reverse is true for Australia and the US. Notably, in the US, high match applications to accounting positions received a callback rate more than double than IT positions. This discrepancy in preference between accounting and IT resumes in different countries indicate that country specific variables, rather than construct validity concerns explain the gap in callbacks between IT and accounting positions.

Concerns may still persist about the validity of the operationalization of university prestige. I attempted to operationalize university prestige in a consistent manner across experimental countries. Through my approach, I ensured a significant gap between institutions in the high-ranked condition and institutions in the non-high ranked condition, for each experimental country.

However, I purposefully excluded institutions at the top of the academic hierarchy in the UK and in the US. This is because evidence suggest that highly prestigious institutions have a different gravitas than universities that are close in the academic hierarchy (Rivera, 2015). This approach is however inconsistent with previous approaches to operationalizing prestige in field experiments of the labor market. If my results would have looked different with Harvard and Oxford as my high-ranked institutions, this raises important questions about the relevance of university rankings. Perhaps, being anything else than a top ranked university is not practically meaningful in the labor market (Rivera, 2015).

Prestige may still matter in the job market

Contrary to the results of this research, prestige may still matter in the labor market. Evidence suggests that prestige matters in the hidden labor market and for elite jobs. Prestige may matter in the open labor market at later stages. Prestige may matter in sectors of the labor

market that do not require specialized skills. Prestige may matter in sectors with a mismatch between the number of applicants and the number of openings available—such as academic positions and jobs in fields at risk of automation.

First, there are strong documented instances of some employers seeking graduates of elite universities in the hidden labor market. In the US, graduates of elite institutions already have access to job openings that most graduates from other schools do not. As Rivera (2015) suggests, employers of elite companies reverse the recruitment process: it is employers who reach out to students, and not the other way around. In this manner, employers limit the opportunity of graduates of non-elite institutions to showcase their skills, motivation, and match. Potential applicants from non-high ranked institutions do not even enter the competition. Recruitment portals fully devoted to students and graduates of elite institutions, with exclusive job and internship postings are frequent. One example of such a network is the iNet Internship Network, which describes itself as an internship listing shared by eleven selective universities. These practices are not exclusive to the US context. In my interviews with German employers, they revealed conducting targeted recruitment fairs at select institutions only (Mihut, 2015). In addition to recruitment fairs and reverse recruitment processes, other field experiments of the labor market suggest that more prestigious universities are slightly favored by recruiters.

Second, in this study, I reference research that demonstrate a correlation between various labor market outcomes and university prestige. It is unclear to what extent prestige is a causal factor in these studies. Regardless, it is plausible that prestige signals impact key labor market outcomes at later stages, such as hiring, wages, and promotions.

Third, previous field experiments of the labor market have documented a positive relation between university prestige and callbacks (Gaddis, 2013; Jackson, 2009). These studies have not

focused on skill-intensive sectors of the labor market. They may be better positioned to indicate what the effect of university prestige signaling in less skill-intensive and technical sectors may be.

Fourth, both accounting and IT jobs are in somewhat high demand. In the US, in 2018, unemployment rate for accountants stood at 1.7%, lower than the national average (Robert Half, 2018). In the UK, in 2017, graduates in the field of business and finance[1] and maths and computer science had an employment rate of 90%, compared to 85% in humanities (Office of National Statistics Great Britain, 2017). I hypothesize that the results of this study would look different in sectors of the labor market where the supply of applicants is higher than the demand. It may be the case that a similar dynamic explains the disproportionate preference for PhDs from prestigious universities for tenure track jobs. This dynamic may also lead to degree inflation or the prioritization of graduate-level degrees to undergraduate degrees in the labor market.

If this is the case, the effects of university prestige in the labor market may become further accentuated by automation and Artificial Intelligence (AI). Predictions on the effect of automation and AI on the labor market vary. Generally, it is estimated that the quality of jobs available has and will continue to be impacted (David, 2015). While Western countries have seen a decrease of blue color jobs due to automation and a polarization of the labor market (David & Dorn, 2013), it is suspected that its effects may be extended to professional jobs, including accounting and law. Documented by sociologists, the consolidation of a dual labor market may amplify the effects of prestige (Beck, Horan, & Tolbert, 1980; Reich, Gordon, & Edwards, 1973; Sakamoto & Chen, 1991; Wial, 1991).

[1] Detailed statistics for employment among accounting graduates are not available.

This effect is multiplied by the fact that the labor market may evolve in directions that cannot effectively be predicted. This poses a conundrum for the implications of this research—covered in the next section—as match between the labor market and graduates is much harder to ensure at higher education institutions.

Implications

In this section I discuss the implications of my research for higher education institutions, students and parents, employers, policymakers, and further research. The key takeaway from this study is that a focus on teaching, skill building, and increasing match between applicants and the labor market is beneficial to students when they apply for jobs.

Implications for higher education institutions

Potentially—at institutions of academic quality—a focus on student skill building and increasing human capital may compensate for the limited academic prestige of the institution. This is a particularly important reminder for higher education institutions, as many universities devote extensive resources to consolidating their prestige and advancing in academic rankings (Hazelkorn, 2009; 2014). Higher education institutions need to take their teaching mission—and thus their social mobility mission—seriously.

Given the uncertainty of the labor market under the effect of automation and AI, a focus on teaching cannot solely mean a focus on teaching skills needed in skill intensive sectors of the labor market. Instead, a holistic focus on transferable skills is crucial. In many ways, automation is good news for institutions of higher learning, as the demand for advanced skills is likely to survive an AI revolution. An increased demand for highly skilled workers—may they be more or less specialized—will ensure the relevance of higher education institutions. At the same time,

due to the fluidity of the labor market and due to the need for different skills at different times in people's lives, shorter courses and micro-credentials would become a needed commodity.

Implications for students

Student choice is influenced by prestige. Applications at universities in the US are influenced by changes in national rankings (Bowman & Bastedo, 2009; Griffith & Rask, 2007). This phenomenon is in part based on the belief that the university prestige matters in students' life outcomes—a belief supported by evidence I presented throughout this research. It is also based on deeply rooted uncertainties—such as status anxiety—in a world where traditional identities are fading (de Botton, 2008; Layte, 2011).

The results of my dissertation suggest that—at least in skill intensive sectors of the labor market—learning well is more important than attending a more prestigious university. Students and their parents should consider the match with their institution more broadly than prestige.

The cost variable weights differently for students in Australia, the UK, and the US. In the UK, most universities in the country charge a similar tuition fee, with a maximum cap of £9,250 per academic year for a domestic undergraduate degree. While other college attendance costs vary across institutions, students in the UK have to think less about cost when choosing their institution. Similarly, in Australia cost varies less between more and less prestigious institutions. In addition, both the UK and Australia have contingency loan agreements for higher education students, where loan repayments are a function of post-graduation income (Shen & Ziderman, 2009).

In the US, cost is a key variable for students deciding to attend college. Student debt has reached $1.5 trillion in 2018, representing the second highest consumer debt sector in the US (Griffin, 2018). The most prestigious institutions in the country are in a position to offer

substantial financial aid to students and college cost is not always a function of prestige. However, students should be open to considering quality above prestige, especially when cost differs dramatically. For students, the cost of attending college need not only be considered in the context of completing a bachelor degree, as students will need to embark on a life-long learning quest. In this quest, university prestige becomes less important.

Implications for employers

Employers have said recurrently that they are primarily looking for skills (Mihut, 2015; Morley & Aynsley, 2007; Rothwell et al., 2009). This research adds to the body of evidence that substantiates the importance of human capital. It seems that employers practice what they preach.

My one note of caution for employers is not a reflection of my results, but a critique of the practice of reverse recruitment. Multiple employers—under the justification of talent seeking—engage in practices that target students from exclusive universities and exclude all others. Because privileged students are more likely to be admitted, attend, and complete elite universities (Kidder, 2001; McKinley & Brayboy, 2004; Posselt, 2016; Roksa, 2011; Tett, 2004), and because public and often large universities are better promoters of social mobility (Chetty et al., 2017), excluding graduates of non-prestigious universities is inequitable and discriminatory. Employers can seek and retain talent in more inclusive ways.

Implications for further research

Higher education research—including this present study—mirrors society at large in its disproportionate focus on elite universities. While it is important for elite universities to integrate a more diverse body of students, selective institutions, regardless of how inclusive they become remain exclusive. If nothing else, elite universities will continue to segregate students across

socially constructed merit lines. They are not and cannot be the solution for social mobility and equality. Instead, more research and resources need to be devoted to understanding how the quality of higher education can be increased across institution types and across degrees of selectivity. Questions such as how students learn better, how post-traditional students can be better served, how degree structures and requirements can meet a more diverse student body are crucial for the mission of higher education.

In light of these observations, it is hard for me to suggest further research into the effects of university prestige in the labor market. At the same time, the results of this study cannot be taken as a definitive conclusion. The mechanisms that explain the added labor market benefits to graduates of prestigious universities later in their careers is still unclear. Further research can focus on investigating the factors that lead to the added returns and attempt to create interventions that aim to better distribute these factors across the population. In addition, a better understanding of the effects of university prestige in the labor market in light of automation is needed.

A line of inquiry that needs further research is how value-added approaches can be improved to measure gains in human capital and skill accumulation during college years. Education researchers have long argued that value added measures rather than outcome measures—especially as measured by standardized tests—are more inclusive and fairer ways to evaluate the impact of education (Barnett, 1992; Hanushek & Rivkin, 2010; Harris, 2011). However—especially at the higher education level—value added approaches remain underdeveloped and controversial. For such approaches to become reliable and accepted practices, they need to be inclusive of the multiple goals of higher education institutions and mindful of the difficulty in measuring key outcomes of higher education.

Last, as discrimination, prejudice, and injustice are becoming covert, evidence for inequity is harder to uncover. This does not mean that inequality does not exist anymore. Instead, it means that research and evidence have shifted reality not always by correcting and redressing inequality, but by making it harder to uncover. The current concepts and tools available to researchers, as well as the narrow frameworks for what is equity—including meritocracy—have been almost stretched to their limits. Novel approaches to understanding what constitutes an equitable society need to be devised. Some of the innovative efforts will come from developing new methods, but most likely, they will derive from new theoretical frameworks.

Implications for policy

Often, when governments measure outcomes they create perverse incentives that undermine the goals of a policy. In higher education, measuring outcomes and linking funding to performance has incentivized universities to become more selective with their student body—a practice that undermines social mobility goals. As such, any measures that governments design to incentivize outcomes need to be researched, piloted, and adjusted as new evidence becomes available. This being said, governments should implement better value-added measures in (higher) education. These measures cannot be as broad and un-nuanced as graduation rates. They need to be tailored to institutional mission, quality of teaching, and the skills obtained by graduates. A focus on institutional quality can ensure that diploma mills do not exploit students and that institutions that do a lot for most people—including community colleges—are supported in their mission.

Quality in education cannot be ensured without funding support. Insofar as education remains a predictor of societal wellbeing across a suite of indicators, governments should not need reminders about the importance of investing in education. However, shrinking public

budgets for higher education institutions have pushed them to allocate less of their resources towards supporting students and more towards financial survival. Public finance of education is crucial for ensuring equity and the quality of teaching.

Conclusion

I conducted a field experiment of the labor market to better understand the effects of university prestige in the labor market. Fictitious applications were submitted to 1,200 entry-level professional job openings in the field of IT and accounting, in the UK, the US, and Australia. One high match and one low match resume were submitted to each job opening. University prestige and sex were randomly assigned to these resumes. This study brought evidence that differentiates between the effect of human capital and the prestige signaling in the labor market. In this study, I argued that using university prestige above relevant skills to make hiring decisions is unfair and a possible source of discrimination in the labor market. Instead, hiring decisions should be based on necessary and transparent criteria. This study provides a framework that may be used to engage critically with the effects of university prestige in the labor market.

Overall, 19.1 percent of the applications in the high skills match condition and 3.9 percent of the applications in the low skills match condition received a callback. The callback rate varied by sector of the labor market and country. The results of the study suggest that university prestige does not predict callbacks. The results bring evidence against the importance of the university prestige signaling hypothesis in the labor market. The skills match of the application—or the human capital displayed by an applicant—was a statistically significant predictor of callbacks. Applications that better matched the requirements of the job opening were 79% more likely to receive a callback. Sex was not a statistically significant predictor of

callbacks either. As such, this study found no evidence of sex-based discrimination in the hiring process.

The findings of this research—while narrow in scope—support the idea that human capital matters in the labor market. This finding re-emphasizes the importance of the teaching mission of universities and should be used as further evidence that learning and skill consolidation are important. Policymakers, students, universities, researchers, and employers can all contribute towards this important goal.

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Appendix 1: List of universities in National University Rankings, excluding internationally ranked institutions

University name	City, State
Adelphi University	Long Island, NY
Alliant International University	San Diego, CA
American International College	Springfield, MA
Andrews University	Berrien Springs, MI
Argosy University	Arlington, VA
Ashland University	Ashland, OH
Auburn University	Auburn, AL
Augusta University	Augusta, GA
Azusa Pacific University	Azusa, CA
Ball State University	Muncie, IN
Barry University	Miami Shores, FL
Biola University	La Mirada, CA
Boise State University	Boise, ID
Bowling Green State University	Bowling Green, OH
California Institute of Integral Studies	San Francisco, CA
California State University at Fresno	Fresno, CA
California State University at Fullerton	Fullerton, CA
Capella University	Minneapolis, MN
Cardinal Stritch University	Milwaukee, WI
Central Michigan University	Mount Pleasant, MI
Clark Atlanta University	Atlanta, GA
Dallas Baptist University	Dallas, TX
DePaul University	Chicago, IL
Duquesne University	Pittsburgh, PA
East Carolina University	Greenville, NC
East Tennessee State University	Johnson City, TN
Eastern Michigan University	Ypsilanti, MI
Edgewood College	Madison, WI
Florida A&M University	Tallahassee, FL
Florida Atlantic University	Boca Raton, FL
Florida Institute of Technology	Melbourne, FL
Florida International University	Washington, DC
Gardner-Webb University	Boiling Springs, NC
Georgia Southern University	Statesboro, GE
Grand Canyon University	Phoenix, AZ
Idaho State University	Pocatello, ID
Illinois State University	Normal, IL
Jackson State University	Jackson, MS
Kennesaw State University	Kennesaw, GA; Marietta, GA
Lamar University	Beaumont, TX
Lesley University	Cambridge, MA

University name	City, State
Liberty University	Lynchburg, VA
Lindenwood University	Saint Charles, MO
Lipscomb University	Nashville, TN
Louisiana Tech University	Ruston, LA
Maryville University of St. Louis	St. Louis, MO
Mercer University	Macon, GA
Middle Tennessee State University	Murfreesboro, TN
Mississippi State University	Starkville, MS
Montclair State University	Montclair, NJ
Morgan State University	Baltimore, MD
National Louis University	Chicago, IL
North Carolina A&T State University	Greensboro, NC
North Carolina State University at Raleigh	Raleigh, NC
Northern Illinois University	DeKalb, IL
Nova Southeastern University	Davie, FL
Pace University	New York City, NY
Pepperdine University	Malibu, CA
Prairie View A&M University	Prairie View, TX
Regent University	Virginia Beach, VA
Robert Morris University	Allegheny County, PA
Seattle Pacific University	Seattle, WA
Seton Hall University	South Orange, NJ
Shenandoah University	Winchester, VA
South Dakota State University	Brooking, SD
Southern Illinois University--Carbondale	Carbondale, IL
Spalding University	Louisville, KY
St. John's University	Queens, NY
Suffolk University	Boston, MA
SUNY College of Environmental Science and Forestry	Syracuse, NY
Tennessee State University	Nashville, TN
Tennessee Technological University	Cookeville, TN
Texas A&M University at Commerce	Commerce, TX
Texas A&M University at Corpus Christi	Corpus Christi, TX
Texas A&M University at Kingsville	Kingsville, TX
Texas Christian University	Fort Worth, TX
Texas Southern University	Houston, TX
Texas State University	San Marcos, TX
Texas Woman's University	Denton, TX
The Catholic University of America	Washington, DC
Trevecca Nazarene University	Nashville, TN
Trident University International	Cypress, CA
Trinity International University	Deerfield, IL
Union Institute and University	Cincinnati, OH
Union University	Jackson, TN

University name	City, State
University of Akron	Akron, OH
University of California--Merced	Merced, CA
University of Dayton	Dayton, OH
University of Hartford	West Hartford, CT
University of La Verne	La Verne, CA
University of Maine	Orono, ME
University of Maryland at Eastern Shore	Princess Anne, MD
University of Memphis	Memphis, TN
University of Missouri at Kansas City	Kansas City, MO
University of Missouri at St. Louis	St. Louis, MO
University of Nevada at Las Vegas	Las Vegas, NV
University of New Orleans	New Orleans, LA
University of North Carolina at Charlotte	Charlotte, NC
University of North Dakota	Grand Forks, ND
University of Northern Colorado	Greeley, CO
University of South Alabama	Mobile, AL
University of St. Thomas	Saint Paul, MN
University of the Cumberlands	Williamsburg, KY
University of West Florida	Pensacola, FL
University of West Georgia	Carrollton, GA
Valdosta State University	Valdosta, GA
Villanova University	Villanova, PA
Walden University	Baltimore, MD
Western Michigan University	Kalamazoo, MI
Wichita State University	Wichita, KS
Widener University	Chester, PA
Wright State University	Dayton, OH

Appendix 2: Instrument validation interview protocol

Part 1: Introduction

Before we begin, I would like to do two things. First, I would like to give you an overview of my dissertation project. Second, I would like to get a better sense of your experience in recruitment.

In my dissertation, I am interested in understanding if employers prioritize the name of the university someone graduated from above their skills in the recruitment process. For this purpose, I will conduct a field experiment of the labor market. This is a study in which applications that meet the variables of interest are submitted to job openings and the researcher measures the discrepancy in callbacks between the different experimental conditions.

In the case of my research, I am interested in three key variables. First, university prestige. I will vary the names of universities on otherwise identical resumes. Second, skill-match. For this purpose, I design two sets of resumes, one that meets the skills required for entry level positions in two fields, and another one that do not quite match the skills required. Third, sex.

I have designed the draft resumes that will be used for this study, and the purpose of today's interview is get some feedback on these. We will be revising three distinct resumes.

Do you have any questions?

Q1: Please describe your experience with recruitment. Have you been involved in any selection processes? If yes, what types of jobs have you conducted recruitment for?

Part 2: Questions on resumes

Q2: I will show you the first resume now.

a. What are your first impressions?
b. What type of job do you think this resume is targeted at?
c. Do you have any comments on the outline of the resume?
d. Do you have any comments on the contents of the resume?
e. Are there things that are missing from this resume that you are used on seeing on resumes?
f. Do you see any information here that is not typical of an entry level resume?
g. How could this resume be improved?
h. Is this resume believable?
i. Do you have any additional comments on this resume?

Q3: I will show you the second resume now.

a. What are your first impressions?
b. What type of job do you think this resume is targeted at?
c. Do you have any comments on the outline of the resume?
d. Do you have any comments on the contents of the resume?
e. Are there things that are missing from this resume that you are used on seeing on resumes?
f. Do you see any information here that is not typical of an entry level resume?
g. How could this resume be improved?
h. Is this resume believable?
i. Do you have any additional comments on this resume?

Q4: I will show you the third resume now.

a. What are your first impressions?
b. What type of job do you think this resume is targeted at?
c. Do you have any comments on the outline of the resume?
d. Do you have any comments on the contents of the resume?
e. Are there things that are missing from this resume that you are used on seeing on resumes?
f. Do you see any information here that is not typical of an entry level resume?
j. This is a low-match resume for both accounting and IT jobs. Do you believe this resume would be at all considered for these type of jobs?
    i. If no: What could I change on this resume to increase its chance at being considered, but not ensure that it remains a low match resume?
k. Is this resume believable?
l. Do you have any additional comments on this resume?

Q4: I have few generic questions left:

a. Is it common to see the telephone number of applicants on the resume?
    i. If yes:
        1. How often would an employer inform the applicant via a call that they qualified for an interview/next stage of the recruitment process?
        2. Would it surprise you to receive a resume that does not have a phone number?
b. How long would it typically take for an employer to inform the applicant that they qualified to the next selection stage?
c. Do you have any advice for me as I embark in this research process?

Appendix 3: Resumes

High match accounting resume, Australia

ASHLEY JOHNSON

Email: ashley.m.johnson.mail@gmail.com, Telephone: (02) 6100 1374

CAREER OBJECTIVE

College student nearing completion seeking to leverage exceptional accounting skills and academic knowledge to gain entry-level accounting position at your firm. Dedicated, competent, and detail-oriented individual with excellent communication skills and the capacity to go beyond what is expected to achieve company goals.

EDUCATIONAL BACKGROUND

(Name of University) **(City)**

Bachelor of Accounting *Expected graduation June 2018*

- Minors in Finance and in Business Law and Professional Ethics
- **Relevant Coursework:** Advanced Management Accounting; Auditing; Public Sector Accounting; Law of Business Entities

PROFESSIONAL EXPERIENCE

(Name of Company) **(City)**

Established for more than 25 years, (Company) is an Australian mid-sized firm of specialist accounting experts and business advisors providing innovative solution and superb services in a range of areas.

Accounting Assistant Intern ***September 2016 – Present***

- Manage accounts payable, prepare journal entries, set up and maintain accounts, process payments, and prepare reports for management
- Manage monthly bank reconciliation of approximately A$100,000
- Ensure all departmental invoices are correctly coded and documented for payment within the period. Cooperate with vendors to ensure all invoices are aid on a timely basis
- Advise 20+ international clients on wide set of tax matters and resolved matters in a quick and effective manner
- Conducted in-person and virtual company tours for prospective clients and retained 10+ clients

(Name of Company) **(City)**

A multinational team with multinational clients, (Company) delivers better business outcomes through technology-enabled solutions

Accounting Intern ***May 2016 - August 2016***

- Entered invoices into accounts payable approval system for routing to project managers
- Collected and compiled client financial data, entered information into QuickBooks or MYOB and assigned appropriate journal accounts for accurate accounting of income, expenses, and contributions
- Conducted ad hoc financial analysis under senior accountant supervision
- Organize files, records, cash, and cash equivalents to comply with policy and procedures
- Give recurring presentations on work progress to 10+ colleagues and supervisors

TECHNICAL SKILLS

- QuickBooks certified
- MYOB, Xero, HandiSoft
- ERP package (Oracle, Dynamics AX)
- Excel, MS Office

High match information and communication technology resume, Australia

DANIEL SMITH

Email: smith.s.d.daniel@gmail.com, Telephone: (02) 6100 1374

CAREER OBJECTIVE

College student nearing completion seeking to leverage exceptional IT skills and academic knowledge to gain entry-level software development position at your firm. Dedicated, competent, and detail-oriented individual with excellent communication skills and the capacity to go beyond what is expected to achieve company goals.

EDUCATIONAL BACKGROUND

(Name of University) **(City)**

Bachelor of Advanced Computing *Expected graduation June 2018*

- Specialization in Systems and Architecture
- **Relevant Coursework:** Introduction to Data Management, Analysis, and Security; Operating Systems Implementation; Structured Programming; Computer Networks

Specialized certifications

- ***CompTia A+*** *May 2017*
- ***ITIL (v3)*** *September 2017*

PROFESSIONAL EXPERIENCE

(Name of Company) **(City)**

(Company) is a multinational company that offers business management software and solutions that help customers thrive in the new application economy by delivering the means to deploy, monitor, and secure their applications and infrastructure.

Software Engineering Intern ***January 2017 – Present***

- Designing and developing automated trading software for backtesting historical trading data in Java platform
- Organising and facilitating Agile and Scrum meetings, which includes Sprint Planning, Daily Scrums or Standups, Sprint Check-In, Sprint Review and Retrospective
- Developing, analysing, and presenting results through workshops to all levels of management in topics ranging from employee selection to employee wellness
- Giving recurrent presentations on work progress to 10+ colleagues and supervisors

Avanade **(City)**

(Company) is a provider of innovative digital and cloud services, business solutions, and design-led experiences for its clients, delivered through the Microsoft ecosystem.

Software Engineering Intern ***May 2016 - August 2016***

- Performed entry level programming, debugging, development and GUI design of Windows Applications via Windows Visual Studio Development Environment
- Architected and designed enterprise applications for policies, claims, general ledger, and agency administration using test-driven development in Ruby on Rails, JQuery, HTML, and CSS
- Created C#.Net Windows Forms application to begin converting the Open Source text to SQL friendly input to get data into a SQL database on a centralized server
- Conducted in person and virtual company tours for prospective clients

SOFTWARE AND PROGRAMMING SKILLS

- Windows, Linux, .Net, Ruby on Rails, Agile, Oracle, Visual Studio, Office, Scrum
- C#, Java, JQuery, Javascript, CSS, HTML, SQL

Low match resume, Australia

Sarah Jones

jones.g.sarah@gmail.com // (02) 6176 1591

Career Objective

Current student nearing completion with extensive teaching and customer service experience seeking entry-level job in the accounting industry. Team player with excellent critical thinking skills and the ability to identify alternative solutions to problems.

Education

(Name of University) **(City)**
Bachelor of Science **2018**

- Majors in Evolution, Ecology, and Organismal Biology and in Statistics
- **Courses:** Advanced Mathematical Statistics; Applied Statistics; Genetics; Foundations of Computing

Professional Experience

Self-employed **(City)**
Mathematics and Biology Tutor **2016 – Present**

- Specialise as an individual tutor by simplifying math and biology concepts while coaching high-school students to think critically and to solve problems
- Improve students' performance on HSC by 10%
- Prepare daily lesson plans for activities
- Help struggling students improve their critical thinking and problem-solving skills
- Cultivate a fun and interesting learning environment which encourages questions and discussions

(Name of Company) **(City)**
Customer Service Officer **2015 – 2016**

- Promoted business development and increased customer loyalty by 6% through demonstrating excellent follow-through with customers and management throughout all phases of the insurance claims process
- Named customer service officer of the month two times
- Processed payments up to A$50,000 as updated systems of record to ensure that account maintenance is current and accurate
- Prepared reports, Power Point presentations, and Excel spreadsheets weekly and monthly for executive management for concise and easy resolution
- Contributed to teams made up of web designers, programmers, and customer service representatives

Software skills

- R, SageMath, MathLab, MEGA, MS Office

High match accounting resume, United Kingdom

JOSHUA SMITH

Email: smith.joshua.mail@gmail.com, Telephone: 020 7097 1853

CAREER OBJECTIVE

College student nearing completion seeking to leverage exceptional accounting skills and academic knowledge to gain entry-level accounting position at your firm. Dedicated, competent, and detail-oriented individual with excellent communication and team-work skills and the capacity to go beyond what is expected to achieve company goals.

EDUCATIONAL BACKGROUND

(Name of University) **(City)**

Bachelor of Science in Statistics, Economics, and Finance *Expected graduation July 2018*

- **Relevant Coursework:** Accounting for Business; Managerial Accounting for Decision Making; Money and Banking; Financial Management

A-Levels

Mathematics (Grade A), Accounting (Grade A), and Business (Grade A)

PROFESSIONAL EXPERIENCE

(Name of Company) **(City)**

Accounting Assistant Intern ***September 2016 – Present***

- Manage accounts payable, prepare journal entries, set up and maintain accounts, process payments, and prepare reports for management
- Manage monthly bank reconciliation of approximately £100,000
- Ensure all departmental invoices are correctly coded and documented for payment within the period. Work with vendors to ensure all invoices are paid on a timely basis
- Advise 20+ international clients on wide set of tax matters and resolved matters in a quick and effective manner
- Conduct in person and virtual company tours for prospective clients and retained 10+ clients

(Name of Company) **(City)**

Accounting Assistant Intern ***May 2016 - August 2016***

- Entered invoices into accounts payable approval system for routing to project managers
- Collected and compiled client financial data, entered information into QuickBooks or MYOB and assigned appropriate journal accounts for accurate accounting of income, expenses, and contributions
- Conducted ad hoc financial analysis under senior accountant supervision
- Ensured all departmental invoices were correctly coded and documented for payment within the period. Cooperated with vendors to ensure all invoices were paid on a timely basis
- Gave recurring presentations on work progress to 10+ colleagues and supervisors

TECHNICAL SKILLS

- QuickBooks certified
- SAP, SQL, IRIS, MYOB, Xero, HandiSoft, ERP package (Oracle, Dynamics AX)
- MS Office

High match information and communication technology resume, United Kingdom

ASHLEY JOHNSON

Email: ashley.n.johnson.mail@gmail.com, Telephone: 020 7097 1853

CAREER OBJECTIVE

College student nearing completion seeking to leverage exceptional IT skills and academic knowledge to gain entry-level software development position at your firm. Dedicated, competent, and detail-oriented individual with excellent communication skills and the capacity to go beyond what is expected to achieve company goals.

EDUCATIONAL BACKGROUND

(Name of University) **(City)**
Bachelor of Science in Computer Science *Expected graduation July 2018*

- **Relevant Coursework:** Logic and Database Theory; Functional Programming; Artificial Intelligence and Neural Computing; Software Engineering

Specialized certifications

- ***CompTia A+*** *May 2017*
- ***ITIL (v3)*** *September 2017*

A-Levels

Mathematics (Grade A), Computer Science (Grade A), and Business (Grade A)

PROFESSIONAL EXPERIENCE

(Name of Company) **(City)**
Software Engineering Intern ***January 2017 – Present***
(Company) is a multinational company that offers business management software and solutions that help customers by delivering the means to deploy, monitor, and secure their applications.

- Designing and developing automated trading software for backtesting historical trading data in Java platform
- Organising and facilitating Agile and Scrum meetings, which includes Sprint Planning, Daily Scrums or Standups, Sprint Check-In, Sprint Review & Retrospective
- Developing, analysing, and presenting results through workshops to all levels of management in topics ranging from employee selection to employee wellness
- Giving recurrent presentations on work progress to 10+ colleagues and supervisors

(Name of Company) **(City)**
Software Engineering Intern ***May 2016 - August 2016***
(Company) is a provider of innovative digital and cloud services, business solutions, and design-led experiences for its clients, delivered through the Microsoft ecosystem.

- Performed entry level programming, debugging, development and GUI design of Windows Applications via Windows Visual Studio Development Environment
- Architected and designed enterprise applications for policies, claims, general ledger, and agency administration using test-driven development in Ruby on Rails, JQuery, HTML, and CSS
- Created C#.Net Windows Forms application to begin converting the Open Source text to SQL friendly input to get data into a SQL database on a centralized server
- Conducted in person and virtual company tours for prospective clients

SOFTWARE AND PROGRAMMING SKILLS

- Windows, Linux, .Net, Ruby on Rails, Agile, Oracle, Visual Studio, Office, Scrum
- C#, Java, JQuery, Javascript, CSS, HTML, SQL

Low match resume, United Kingdom

Sarah Jones

jones.f.sarah@gmail.com // 020 3287 7009

Career Objective

Current student nearing completion with extensive teaching and customer service experience seeking entry-level job in the accounting industry. Team player with excellent critical thinking skills and the ability to identify alternative solutions to problems.

Education

(Name of University) **Expected completion July 2018**

Bachelor of Science in Biological Sciences

- **Courses**: Quantitative Biology; Introductory Statistical Methods and Computing; Money and Banking

A-Levels

Design and Technology (Grade A), Mathematics (Grade A), and Government and Politics (Grade A)

Professional Experience

Mathematics and Biology Tutor, (City) **January 2017 – Present**

- Specialise as an individual tutor by simplifying math and biology concepts while coaching high-school students to think critically and to solve problems
- Improve students' performance on A-levels by 10%
- Prepare daily lesson plans for activities
- Help struggling students improve their critical thinking and problem-solving skills
- Cultivate a fun and interesting learning environment which encourages questions and discussions

(Name of Company, City) **January 2015 – January 2016**

Leading claims management and loss adjustment business in the UK

Part-Time Customer Service Officer

- Promoted business development and increased customer loyalty by 6% through demonstrating excellent follow-through with customers and management throughout all phases of the insurance claims process
- Named customer service officer of the month two times
- Processed payments up to £50,000 and updated systems of record to ensure that account maintenance is current and accurate
- Prepared reports, Power Point presentations, and Excel spreadsheets weekly and monthly for executive management for concise and easy resolution
- Contributed to teams made up of web designers, programmers, and customer service representatives

Software skills

- R, SageMath, MathLab, MEGA, CAINE, MS Office

High match accounting resume, United States

ASHLEY JOHNSON

Email: ashley.j.johnson.mail@gmail.com, Telephone: 347 809 5513

CAREER OBJECTIVE

College student nearing completion seeking to leverage exceptional accounting skills and academic knowledge to gain entry-level accounting position at your firm. Dedicated, competent, and detail-oriented individual with excellent communication and team-work skills and the capacity to go beyond what is expected to achieve company goals.

EDUCATIONAL BACKGROUND

(Name of university) **(City)**

Bachelor of Science in Business *Class of 2018*

Concentration in Accounting, GPA 3.56

- **Relevant Coursework:** Taxation: Individual and Business Income; Auditing; International Reporting and Analysis; Forensic Accounting and Financial Statement Fraud

PROFESSIONAL EXPERIENCE

(Name of company) **(City)**

One of the largest independent public accounting and advisory service firms in the nation, with offices in major business markets throughout the U.S. and abroad

Accounting Assistant Intern ***January 2017 – Present***

- Manage accounts payable, prepare journal entries, set up and maintain accounts, process payments, and prepare reports for management
- Manage monthly bank reconciliation of approximately $100,000
- Assist in the preparation of State and Federal taxes, for individuals, businesses, and small-sized corporations utilizing forms 1040, 1041, 1120, 1120S, 1065
- Advise 20+ international clients on wide set of tax matters and resolved matters in a quick and effective manner
- Conduct in-person and virtual company tours for prospective clients and retained 10+ clients

Name of company **(City)**

Established in (year), the company offers services in the field of accounting, tax, management advisory, and financial services

Accounting Intern ***May 2016 - September 2016***

- Entered invoices into accounts payable approval system for routing to project managers
- Collected and compiled client financial data, entered information into QuickBooks or MYOB and assigned appropriate journal accounts for accurate accounting of income and expenses
- Conducted ad hoc financial analysis under senior accountant supervision
- Ensured all departmental invoices were correctly coded and documented for payment within the period. Cooperated with vendors to ensure all invoices were paid on a timely basis
- Gave recurring presentations on work progress to 10+ colleagues and supervisors

TECHNICAL SKILLS

- QuickBooks certified, MYOB, Xero, HandiSoft, ERP package (Oracle, Dynamics AX), SAP, SQL, Excel, MS Office

High match information and communication technology resume, United State

DANIEL SMITH

Email: smith.daniel.jack@gmail.com, Telephone: 347 809 5513

CAREER OBJECTIVE

College student nearing completion seeking to leverage exceptional IT skills and academic knowledge to gain entry-level software development position at your firm. Dedicated, competent, and detail-oriented individual with excellent communication skills and the capacity to go beyond what is expected to achieve company goals.

EDUCATIONAL BACKGROUND

(Name of University) **(City)**
Bachelor of Science in Information Systems Management *Class of 2018*

- GPA 3.56
- **Relevant Coursework:** Introduction to Cloud Computing; HTML Programming; Javascript Programming; Design and Programming for the Web; Database Administration; Information Security Management

Specialized certifications

- ***CompTia A+*** *May 2017*
- ***ITIL (v3)*** *September 2017*

PROFESSIONAL EXPERIENCE

(Name of Company) **(City)**
Software Engineering Intern ***January 2017 – Present***

- Design and develop automated trading software for backtesting historical trading data in Java platform
- Organize and facilitate Agile and Scrum meetings, which includes Sprint Planning, Daily Scrums or Standups, Sprint Check-In, Sprint Review and Retrospective
- Develop, analyze, and present results through workshops to all levels of management on topics ranging from employee selection to employee wellness
- Give recurring presentations on work progress to 10+ colleagues and supervisors

(Name of Company) **(City)**
Software Engineering Intern ***May 2016 - August 2016***

- Performed entry level programming, debugging, development and GUI design of Windows Applications via Windows Visual Studio Development Environment
- Architected and designed enterprise applications for policies, claims, general ledger, and agency administration using test-driven development in Ruby on Rails, JQuery, HTML, and CSS
- Created C#.Net Windows Forms application to begin converting the Open Source text to SQL friendly input to get data into a SQL database on a centralized server
- Conducted in person and virtual company tours for prospective clients

SOFTWARE AND PROGRAMMING SKILLS

- Windows, Linux, iOS, .Net, Ruby on Rails, Agile, Oracle, Visual Studio, Microsoft Office, Scrum
- C#, Java, C++, JQuery, Javascript, CSS, HTML, SQL

Low match resume, United States

Matthew Jones

jones.matthew.mail@gmail.com // 347 809 6760

Career Objective

Current student nearing completion with extensive teaching and customer service experience seeking entry-level job in the accounting industry. Team player with excellent critical thinking skills and the ability to identify alternative solutions to problems.

Education

(Name of University) **(City)**
Bachelor of Science in Biology **2018**
Major in Biology; Minor in Digital Forensics *GPA: 3.5*

- **Courses**: Calculus, Biological Applications; Bio-Statistics; Introduction to Information Security; Fundamental of Accounting

Professional Experience

Self-employed **(City)**
Mathematics and Biology Tutor **2016 – Present**

- Specialize as an individual tutor by simplifying math and biology concepts while coaching high school students to think critically and to solve problems
- Improve students' performance on SAT by 10%
- Prepare daily lesson plans for activities
- Help struggling students improve their critical thinking and problem-solving skills
- Cultivate a fun and interesting learning environment which encourages questions and discussions

(Name of Company) **(City)**
Customer Service Officer **2015 – 2016**

- Promoted business development and increased customer loyalty by 6% through demonstrating excellent follow-through with customers and management throughout all phases of the insurance claims process
- Named customer service officer of the month two times
- Processed payments up to $50,000 and updated systems of record to ensure that account maintenance is current and accurate
- Prepared reports, Power Point presentations, and Excel spreadsheets weekly and monthly for executive management for concise and easy resolution
- Contributed to teams made up of web designers, programmers, and customer service representatives

Software skills

- R, SageMath, MathLab, MEGA, CAINE, MS Office

Appendix 4: Cover letters

High match accounting cover letter sample

ASHLEY JOHNSON

Email: ashley.j.johnson.mail@gmail.com, Telephone: 347 809 5513

COVER LETTER

Dear Hiring Manager,

I wish to apply for the role of **(JOB)**, currently being advertised at (**COMPANY where application is submitted).** I am passionate and committed to strengthening my skills for professional accounting. I firmly believe the knowledge and skills built up during my studies, hands-on experience, and internships make me an ideal candidate for the position. During my studies and internships, I worked closely with peers, gained a fundamental understanding of accounting principles, and I am confident my passion and enthusiasm for this industry will shine in this letter and my enclosed resume.

I have proven my ability to efficiently perform duties such as preparing tax returns, payroll procedures, and completing financial and other related statements. I have gained knowledge and experience using software programs such as MYOB. As an assistant accounting intern at (name of company) of (city), one of the largest independent public accounting and advisory services, I gained valuable experience in managing accounts payable, preparing and delivering journal entries, setting up and maintaining accounts, processing payments, and preparing reports for management. In addition to handling monthly bank reconciliation of around $100,000, I supported the the preparation of State and Federal taxes for individuals, businesses, and small-sized corporations—utilizing forms 1040, 1041, 1120, 1120S, 1065. In addition, I have highlighted some of my key strengths below:

- Exceptional organizational and prioritization skills and can successfully complete multiple challenges in a time constricted environment
- I understand the importance of training and development and ensure success through my own progressive development
- I am proficient using multiple platforms and software programs including Microsoft Word, Excel, and Power Point, and multiple accounting platforms and programs

I am willing and able to make a strong commitment to (**COMPANY where application is submitted**) and to the services that your team offers. I am very interested in joining your organization and would look forward to an interview at your earliest convenience. Thank you for your time and effort in considering my application.

Yours Sincerely

Ashley Johnson
Resume Attached

High match information and communication technology cover letter sample

ASHLEY JOHNSON

Email: ashley.j.johnson.mail@gmail.com, Telephone: 347 809 5513

COVER LETTER

Dear Hiring Manager,

I wish to apply for the role of **(JOB)** position, currently being advertised at (**COMPANY where application is submitted).** I am passionate and committed to strengthening my skills for professional software development. I am adept at performed entry level programming, debugging, developing, software engineering, as well as the GUI design of Windows Applications via Windows Visual Studio Development Environment. I am now confident at designing and implementing data storage and software solutions, as well as resolving development issues. I am currently looking to utilize extensive knowledge and secure an entry level position into the industry.

I thrive in fast-paced environments and I have proven my ability to efficiently perform cross-functional duties without losing focus. I consistently ensure requests and standards are fully met. I relate well to people from different walks of life and enjoy diversity. In addition, I have highlighted some of my key strengths below:

- As a Bachelor of Science in Information Systems Management, I developed my transferable skill set and learned computer fundamentals
- During my software engineering internship, I learned how to organize and facilitate Agile and Scrum meetings—this included Sprint Planning, Daily Scrums or Standups, Sprint Check-In, Sprint Review, and Retrospective
- Skilled at developing, analyzing, and presenting findings and results through workshops to all levels of management on topics ranging from employee selection to employee wellness
- I can successfully complete multiple challenges while maintaining focus in time constricted high-pressure environments

I believe the role at (**COMPANY where application is submitted**) will allow me the opportunity to further elaborate on my inherent talent in the field whilst in support of the company's goals. I am willing and able to make a commitment and make a strong contribution to the services that your team offers. I am very interested in joining your organization and would look forward to an interview at your earliest convenience.

Thank you for your time and effort in considering my application.

Yours Sincerely,

Ashley Johnson
Resume Attached

Low match cover letter sample

Sarah Jones
jones.d.sarah@gmail.com // 347 809 6760

To Whom It May Concern:

I am submitting an application to **(JOB)** position at (**COMPANY where application is submitted).** Please find enclosed my resume for your consideration. As you can see from my attached resume, while I have limited hands-on experience in the software development, my strong transferable skill set align to your job specifications, and I wish to pursue my passion for software development. As a self-employed Mathematics Tutor, I utilize and showcase a strong aptitude for numbers, sound communication, approachable interpersonal qualities, and deliver high-quality lessons to students. I am confident I will become a valuable asset to your company.

I thrive in fast-paced environments and I have proven my ability to efficiently perform cross-functional duties without losing focus. I consistently ensure requests and standards are fully met. I relate well to people from different walks of life and enjoy diversity. In addition, I have highlighted some of my key strengths below:

- I possess exemplary organizational and time management skills with extensive experience in providing customer service, quality teaching, and support with minimal to no supervision
- I can successfully complete multiple challenges while maintaining focus in time constricted high-pressure environments
- I have the ability to build strong relationships with new customers and to strengthen relationships with existing ones
- I maintain a high level of customer service to new and existing customers

I believe the role at (**Company where application is submitted**) will allow me the opportunity to further elaborate on my inherent talent in the field whilst in support of the company's goals. I am able to make a commitment and a strong contribution to the services that your team offers. I am very interested in joining your organization and would look forward to an interview at your earliest convenience.

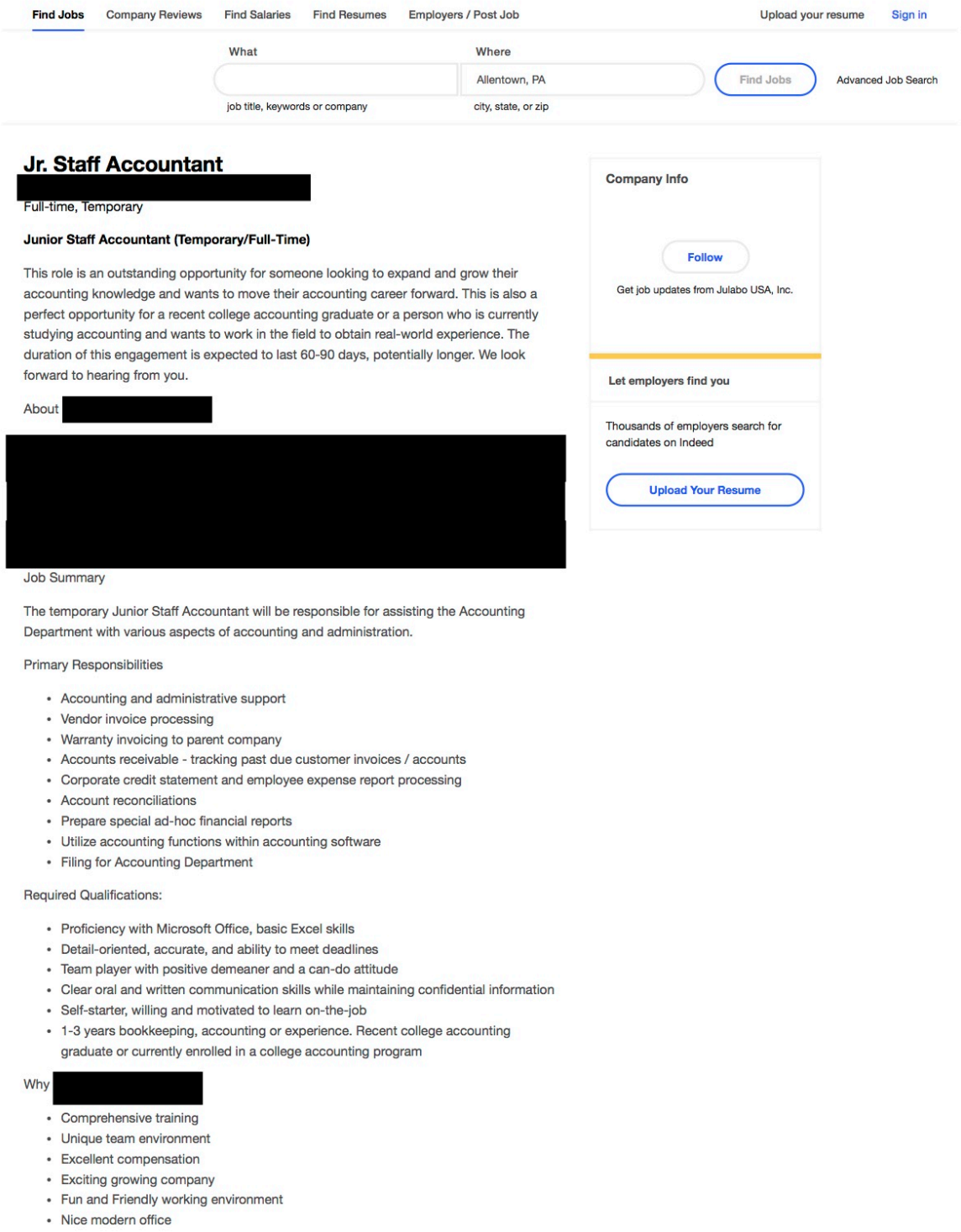
Thank you for considering my application.

Regards,

Sarah Jones

Appendix 5: Sample job openings

Sample job opening accounting



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Jr. Staff Accountant

[redacted]

Full-time, Temporary

Junior Staff Accountant (Temporary/Full-Time)

This role is an outstanding opportunity for someone looking to expand and grow their accounting knowledge and wants to move their accounting career forward. This is also a perfect opportunity for a recent college accounting graduate or a person who is currently studying accounting and wants to work in the field to obtain real-world experience. The duration of this engagement is expected to last 60-90 days, potentially longer. We look forward to hearing from you.

About [redacted]

[redacted]

Job Summary

The temporary Junior Staff Accountant will be responsible for assisting the Accounting Department with various aspects of accounting and administration.

Primary Responsibilities

- Accounting and administrative support
- Vendor invoice processing
- Warranty invoicing to parent company
- Accounts receivable - tracking past due customer invoices / accounts
- Corporate credit statement and employee expense report processing
- Account reconciliations
- Prepare special ad-hoc financial reports
- Utilize accounting functions within accounting software
- Filing for Accounting Department

Required Qualifications:

- Proficiency with Microsoft Office, basic Excel skills
- Detail-oriented, accurate, and ability to meet deadlines
- Team player with positive demeaner and a can-do attitude
- Clear oral and written communication skills while maintaining confidential information
- Self-starter, willing and motivated to learn on-the-job
- 1-3 years bookkeeping, accounting or experience. Recent college accounting graduate or currently enrolled in a college accounting program

Why [redacted]

- Comprehensive training
- Unique team environment
- Excellent compensation
- Exciting growing company
- Fun and Friendly working environment
- Nice modern office

Company Info

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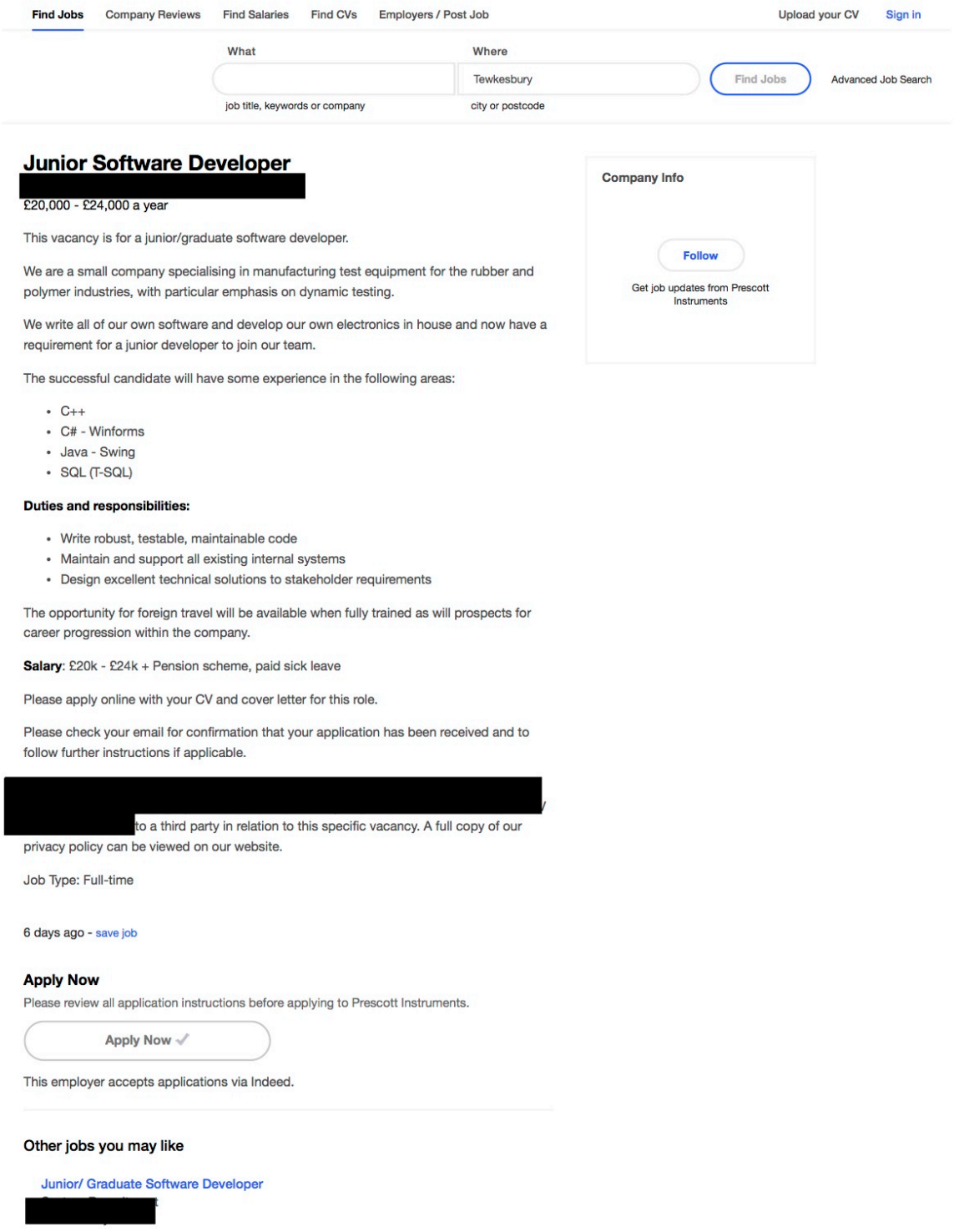
Sample job opening information and communication technology



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Where: Tewkesbury (city or postcode)

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Junior Software Developer

[redacted]

£20,000 - £24,000 a year

This vacancy is for a junior/graduate software developer.

We are a small company specialising in manufacturing test equipment for the rubber and polymer industries, with particular emphasis on dynamic testing.

We write all of our own software and develop our own electronics in house and now have a requirement for a junior developer to join our team.

The successful candidate will have some experience in the following areas:

- C++
- C# - Winforms
- Java - Swing
- SQL (T-SQL)

Duties and responsibilities:

- Write robust, testable, maintainable code
- Maintain and support all existing internal systems
- Design excellent technical solutions to stakeholder requirements

The opportunity for foreign travel will be available when fully trained as will prospects for career progression within the company.

Salary: £20k - £24k + Pension scheme, paid sick leave

Please apply online with your CV and cover letter for this role.

Please check your email for confirmation that your application has been received and to follow further instructions if applicable.

[redacted] to a third party in relation to this specific vacancy. A full copy of our privacy policy can be viewed on our website.

Job Type: Full-time

6 days ago - save job

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Please review all application instructions before applying to Prescott Instruments.

Apply Now

This employer accepts applications via Indeed.

Other jobs you may like

Junior/ Graduate Software Developer

[redacted]

Company Info

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