

WE ARE AN EQUAL OPPORTUNITY EMPLOYER

The Use of Diversity Signals in Online Job Advertisements and Its Effect on Application Behaviors

Abstract

To attract talent and build a competitive advantage over competitors in the labor market, organizations may use pro-diversity statements in recruitment messages to portray themselves as being committed to diversity in the workplace. However, the benefits of this practice in terms of increasing the quantity of the applicant pool remain contested. Drawing upon signaling theory and the social identity approach, it is proposed that the presence and frequency of diversity signals in job advertisements are correlated to the application outcome. A sample of 976 job advertisements for software engineer positions in Stockholm was collected on LinkedIn and examined for the use of diversity signals in their content. Results showed that even though diversity signals are underrepresented in job advertisements, they were significantly associated with the number of applicants. The study also illustrated a negative relationship between the use of constraint-diversity content—even when it went together with a pro-diversity statement—and the application behaviors of job seekers. These findings illuminated the role of diversity value description in recruitment materials and provided practical implications for human resource managers.

Keywords: diversity, inclusion, job advertisements, job application, signaling theory, social identity theory, employer branding, digital recruitment, LinkedIn

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Table of Contents

1 Introduction.....	6
1.1 Background.....	6
1.2 Purposes and Research Questions.....	7
1.3 Delimitations.....	8
1.4 Thesis Outline.....	9
2 Literature Review.....	10
2.1 Drivers of Job Choice Decisions.....	10
2.2 Job Advertisements.....	11
2.2.1 Job advertisement and its significance.....	11
2.2.2 Digital recruitment & Online job advertisements.....	12
2.2.3 Employer branding in job advertisements.....	13
2.3 Diversity Value.....	14
2.3.1 The value of diversity in the workplace.....	14
2.3.2 Diversity in recruitment materials.....	15
2.4 Research Gap.....	16
3 Theoretical Framework.....	18
3.1 Signaling Theory.....	18
3.1.1 Signaling's function.....	18
3.1.2 Constructs of signals.....	19
3.1.3 Receiver's perspective.....	20
3.2 Social Identity Approach.....	20
3.3 System of Hypotheses.....	21
3.3.1 Effects of diversity signals.....	22
3.3.2 Effects of frequency of diversity signals.....	23
3.3.3 Effects of mixed diversity signals.....	24
4 Methodology.....	25
4.1 Research Approach.....	25
4.2 Study Setting and Sample.....	26
4.3 Quantifying Diversity Signals.....	27
4.3.1 Digital job advertisement dimensions.....	27
4.3.2 Setting up a dictionary.....	28
4.3.3 Computing and validation.....	30
4.4 Measures.....	30
4.4.1 Dependent variables.....	30

4.4.2 Independent variables.....	31
4.4.3 Control variables.....	31
4.4.4 Regression model.....	32
5 Results and Analysis.....	33
5.1 Description of Sample.....	33
5.2 Hypothesis Testing.....	35
5.3 Heterogeneous Effects.....	38
6 Discussion.....	40
6.1 Current Usage of Diversity Signals.....	40
6.2 Effects of Diversity Messages.....	41
6.3 Heterogeneous Effects Across Seniority Level and Company Size.....	42
6.4 Alternative Mechanisms.....	43
7 Conclusion.....	44
7.1 Theoretical Contributions.....	44
7.2 Managerial Implications.....	44
7.3 Limitations and Suggestions for Future Research.....	45
7.4 Conclusion.....	46
References.....	47
Appendices.....	52
Appendix 1. Diversity language dictionary.....	52
Appendix 2. Robustness Test Models.....	53

We are an Equal Opportunity Employer

“Our ability to reach unity in ***diversity*** will be the beauty
and the test of our civilization.”

Mahatma Gandhi

1 Introduction

The first chapter will provide the background of this thesis which is an interesting phenomenon within the field of talent acquisition—the practice of incorporating pro-diversity statements in online job advertisements. I will then identify my research questions with expected contributions and a brief research outline.

1.1 Background

Racial bias remains a significant problem in workplaces across many countries and poses challenges for minority groups to access labor markets. Experiments suggest that racial minorities are facing discrimination during the hiring process. One of the first attempts to measure hiring discrimination was carried out in the United States in 1990, in which 20 participants—10 black and 10 white men—were allocated to 10 pairs of equal qualifications, matching characteristics, and similar behaviors in interviews. They found out that employers were three times more likely to hire a white candidate than an equally qualified black candidate (Turner et al., 1991). In Sweden, Bursell (2012) showed that Swedish-named applicants received double the number of callbacks compared to foreign-named applicants with equal competencies and merits. More recent studies demonstrated not only that such discrimination has persisted but also that the level of discrimination has not declined over time (Quillian et al., 2017).

However, in recent years, there is a parallel stream of thoughts within the management field that diversity within the workplace has been recognized as a sustainable competitive advantage. The benefits of a diverse workforce include better problem-solving and decision-making, the ability to expand to new markets, and improved product development and competitiveness (Fine, 1996). It is also believed that achieving diversity among employees could attract more talent and strengthen employee-employer relationships (Konrad et al., 2005). But to build a diverse set of employees, companies are facing fierce competition for minority individuals with unique and valuable skills.

In the current “War of Talent” situation when finding fitting employees is “an intensifying competition” (Elving et al., 2013), employers have to redefine their recruitment strategy and recruitment activities to attract talent. Companies are trying to send recruitment messages that emphasize a firm’s diversity-related practices. Corporations today consider diversity and inclusiveness in their workplace as critical corporate values. Pro-diversity statements such as “we believe that diverse, inclusive teams drive performance and innovation, creating greater business value” (Ericsson) and “we strive to provide everyone with an equal opportunity workplace that promotes diversity” (Klarna) can easily be found on employer branding materials such as corporate websites, corporate social media accounts, and job advertisements (also known as job postings, job listings, job announcement).

Furthermore, the digitalization of human resources practices enables employers to use internet-based recruitment tools to expand the reach of their job postings. One such tool is LinkedIn, a multibillion-dollar platform that offers recruiters the ability to filter, search for potential job applicants, and manage job postings. An important advantage of these recruitment

tools is that they are not only fulfilling the need for advertising vacancies but also acting as a social network of professionals that helps companies to build their employer branding.

The combination of these two practices creates an interesting phenomenon in the field of human resources management that companies are “touting” their diversity values in online job advertisements. However, if the increasingly popular tactic actually brings more applicants is still an unanswered question.

1.2 Purposes and Research Questions

Even though it has been proven that the content of a job advertisement plays a significant role in providing relevant information to potential applicants and enabling them to make application decisions (Ganesan et al., 2018), there is little knowledge about the use of diversity language in online job postings and its influence on application behaviors of job seekers. The increasingly popular practice of including diversity messages in addition to essential job information in job advertisements suggests a need to certify the recruitment effectiveness of this activity.

Earlier research focused on organizational attractiveness was mainly lab experiments and not convincing enough to provide empirical investigation on the topic (Lee et al., 2012). A major drawback of those study settings was that they involved the use of surveys and a convenient sample, usually students, which separate study objects from their natural contexts. The dependent variable usually being application intention, instead of application behavior, is not useful to confirm the behavior of job seekers in real life. These disadvantages of previous research urge a new research approach to investigate the effect of diversity messages.

Motivated by these research gaps, this thesis aims to add to the existing literature on diversity value and human resources management by studying the practice of incorporating diversity language in job postings. In order to understand the mechanism of job application behavior in corporation with job advertisement’s language, this study draws on the signaling theory, which suggests that the content of a job advertisement provides signaling of an organization’s values, and social identity theory, which proposes that an individual’s identity is constituted from the identity of the group that person belongs to. The thesis expects to produce a model to understand the correlation between diversity-value signals and the application behavior of potential candidates. Therefore, the purpose of this thesis is to answer the following two research questions

Q1. How employers are signaling Diversity & Inclusiveness values in job advertisements published on online job boards?

Q2. Does this practice associate with the actual application behaviors of job seekers?

The result of this study can have theoretical contributions by identifying categories of diversity-value signals in recruitment advertisements and exploring the interplay of different diversity-value signals on the application behaviors of potential job applicants. The thesis expects to extend the signaling theory beyond pro-diversity language, so called positive signals, such as claims of being an “equal opportunity employer”, and to also cover constraint-diversity language, so called negative signals. The study aims to categorize diversity signals in different aspects of a job

advertisements: not only focusing on corporate statements, but also investigating more subtle diversity cues from job requirements and benefit packages. The introduction of multiple dimensions of diversity language is expected a foundation to explore the interplay of signals, emphasizing the importance of signal consistency.

The thesis also hopes to contribute a novel research approach, utilizing public data sources and text analysis tools to tackle a management question. Thanks to the popularity of online job boards and text processing tools, observational studies can be operated to contribute to the understanding of employer branding practices and their effects. Online job boards such as LinkedIn provide public data to enable observational studies on the topic. Examining online recruitment content with text analysis techniques can classify different categories of corporate descriptions used in job advertisements, thus producing generalizable data (Backhaus, 2004). As the world's largest professional networking platform, LinkedIn is an important setting that reflect the natural context of job seekers. With LinkedIn as the data source, this thesis is able to not only capture job advertisement content and the number of applicants, but also investigate the role of relevant measures, such as work setting (on-site, remote, or hybrid), method of application, and employer popularity.

Additionally, it is expected to have important practical implications for employers. By allowing companies to recognize different ways in which candidates are attracted to the company depending on job advertisement content, and to understand the benefits or drawbacks of diversity language, human resource managers can create methods to improve online recruitment effectiveness.

1.3 Delimitations

To produce a concise and thorough analysis, this thesis is delimited in the selection of the focused diversity category and studied subjects. First, in the organizational literature, the definition of team diversity is split into two categories: (i) bio-demographic diversity that represents member characteristics such as age, gender, race, and nationality, and (ii) task-related diversity that illustrates a variation in individual attributes such as education, expertise, and previous experiences (Horwitz & Horwitz, 2007). This study focuses only on the former one which is bio-demographic diversity, and in specific, nationality diversity.

Second, because diversity can be valued differently in different geographical locations and different industries, it is necessary to scope down the research sample to a specific location and industry. The selection for this thesis is the technology industry in Stockholm due to a shortage of talent (Swedish IT & Telecom Industries, 2020), a situation that can highlight the practice of corporations to attract international talent and its effect.

Third, online job advertisements are published on a few platforms, including employers' own websites, social media, and online job boards. This study's sample is taken from digital job postings published on online job boards, specifically LinkedIn that is the largest professional networking platform and the only platform that publishes the number of applicants in its user interface.

1.4 Thesis Outline

The thesis consists of seven chapters in the following order. First, the Introduction (1) outlines the background of the study and proposes two research questions. Following, a Literature Review (2) summarizes the previous research on the topic of job application behaviors, job advertisements, and diversity value. Combining the available knowledge in the field with signaling theory and social identity theory, the Theoretical Framework (3) chapter presents the mechanism for and predictions of application attraction outcomes based on the use of diversity language in job advertisements. These predictions are streamlined into three main hypotheses for the study. Fourth, I present the Methodology (4) which includes the research approach, the process of quantifying diversity language, and the introduction of variables. After that, the Results and Analysis (5) summarizes the output of regression models with correlations between independent variables and dependent variables, which is used to validate generated hypotheses. The results are further discussed in the Discussion (6) to address potential implications. Finally, the Conclusion (7) presents the contribution of this thesis from theoretical and managerial perspectives, provides limitations, and suggests directions for future research.

2 Literature Review

To lay the foundation for this study, this section will present relevant research on three main topics: (i) the drivers of job choice decisions, (ii) job advertisements and their significance in influencing job choice decisions, and (iii) diversity value in the workplace and in job advertising. Important research gaps will then be identified to guide the research direction of this thesis.

2.1 Drivers of Job Choice Decisions

The decision to apply for a job position often begins with the process of evaluating recruitment materials, including printed and digital advertisements, media messages, and word of mouth. The information an individual obtains from those sources is used to decide whether or not to pursue employment with the company. This is a critical decision that is the first one in a job search process, and that will affect all subsequent decisions and the eventual outcome of a job search process (Gatewood et al., 1993).

Early research on this topic has found the important role of corporate image and recruitment image in initial job choice decisions. Gatewood et al. (1993) provided empirical evidence that corporate image, defined as the image associated with an organization's name and measured by reputation ratings from a Fortune 500 survey and applicant reputation ratings from respondent's survey, was significantly correlated with students' probability of responding to recruitment advertisements. Corporate image can be constituted from personal interactions with a company, such as viewing advertisements, and previous uses of products or services. Recruitment image, which is a specific image of a firm developed by applicants from provided information in recruitment messages, was also significantly correlated with job applicants' intentions to apply. Additionally, the research highlighted that recruitment image has a stronger correlation to intention to pursue job applications ($r = .94, p < .01$) than the corporate image ($r = .90, p < .01$).

Employer attractiveness, or organizational attractiveness is a term defined by Cable and Turban as a "competitive advantage for employers" that will enhance their likelihood to attract talent (2001). Highhouse et al. (2003) proposed that the notion of organizational attraction is constructed of three distinct and interrelated components that are company attraction, intentions to pursue employment, and company prestige. In the study, company attraction was measured by items assessing general attitudes towards a company (e.g., "This company is attractive to me as a place for employment", "A job at this company is very appealing to me"). To measure intentions to pursue, respondents were shown five items relating to specific intentions (e.g., "accept a job offer", "recommend to a friend looking for a job", and "go to a job interview"). The perceptions of a company's prestige were assessed by the company's subject to "social influence", such as reputation (e.g., "This is a reputable company to work for"), popularity (e.g., "There are probably many who would like to work at this company", and status (e.g., "I would find this company a prestigious place to work"). The authors pointed out a statistically significant coefficient from company attractiveness to intentions and from prestige to intentions, meaning that both general attitude towards a company and the perception of its social influence are significant predictors of behavioral intentions to pursue employment.

Organizational attractiveness is often associated with the person-organization fit theory (Cable & Judge, 1994; Schneider, 1987) that suggests that “different kinds of organizations attract, select, and retain different kinds of people” (Schneider, 1987). Studying the reasons for and consequences of compatibility between a person and an organization, Cable and Judge (1994; 1996; 1997) argued that person-organization fit occurs when there are similar characteristics between the person and the organization, and with higher levels of person-organization fit comes higher levels of organizational attractiveness. The theory assumes that job seekers, during the job application process, develop their own perception of the degree of fit with employers.

Among different characteristics that affect this person-organization fit perceptions, researchers focus on two types of congruence, which are organizational values and relational demography (Cable & Judge, 1996). Values guide one’s attitudes, judgments, and behaviors, and thus, Schneider suggested that the person-organization fit perception of job seekers was based on the organization’s values (1987). To test the effect of value congruence between job seekers’ perceptions of an organization’s values and their own values on their perceived person-organization fit, Cable & Judge asked respondents to assess recruiting organizations’ cultures and their own values by sorting a set of values into categories from “most characteristic” to “least characteristic”. The study confirmed that the values congruence positively affected perceived person-organization fit, which significantly predicted job seekers’ job choice intentions (1996). In other words, job seekers are attracted to companies that they perceive fit with their own values, needs, and preferences.

There is some indirect evidence that demographic similarity between job seekers and recruiters may affect the perceptions of person-organizational fit (Cable & Judge, 1996). The recruiters’ demographic characteristics such as race and gender may be important in job choice decisions because they act as an organization’s representatives who convey “initial signals” about the organization. However, an empirical finding by Cable & Judge (1996) has contradicted this belief and found that the perception of person-organization fit was not influenced by demographic similarity with recruiters. They argued that in the research’s setting where job seekers and recruiters interacted in 30-minute interviews, their interaction duration may not be long enough to develop outcomes of relational demography. The required setting in which demographic similarity starts to show effects on person-organization fit is, unfortunately, not confirmed in studies.

2.2 Job Advertisements

2.2.1 Job advertisement and its significance

Job advertisements act as the first engagement between potential candidates and employers, and also provide the first source of information about the company and the position (Ganesan et al., 2018). They are directly related to application intention by creating awareness about the employer and sending positive signals about the job and the organization (Martinez, 2000).

Many studies have confirmed the impact of job advertisements as a medium to attract applicants. In Phillips et al.’s (2014) research, they found that the wording in job advertisements has a significant impact on applicants’ attitudes toward the organization. Roberson et al. (2005) conducted an experiment with 171 college-level job seekers and discovered that detailed job postings increase the

perception of an organization's qualities, leading to a greater intention to apply for a job. A survey among 350 companies discovered that the physical features or visual appearance of job advertisements positively correlated with the number of job applicants (Kaplan et al., 1991). More recent research in 2006 also emphasized the importance of catchy words, pictures, and descriptions of development and promotion opportunities in designing job listings (Blackman, 2006).

Ganesan et al. (2018) summarized research on this topic and developed a conceptual model to understand the dimensions of print job advertisements. The dimensions include (i) Job and work characteristics, (ii) Employee portrayal/testimonial, (iii) Corporate/organizational image-building statements, (iv) Organizational culture, (v) Aesthetic appeal, and (vi) Human resource offerings/organizational attributes, such as reward package, salary, and compensation benefits. The authors claim that these dimensions represent both instrumental and symbolic attributes and influence organizational attractiveness and application intention. The effect is moderated by organizational familiarity—the level of awareness of the employer that a job seeker has.

2.2.2 Digital recruitment & Online job advertisements

As digital technology revolutionizes every industry, human resource departments and talent acquisition functions are no exception. In response to the external changes in the business and technology scene, the human resource division needs to prioritize “non-routine and complex”, and “creative and value-added” assignments while becoming smart by adopting smart solutions (Bondarouk et al., 2017). Conventional approaches to human resources are no longer effective and a transition to digital human resources management is necessary with new competencies being required in human resource practitioners, for example, extracting, understanding, and interpreting data (van den Berg et al., 2020).

The digitalization of the recruitment process is a crucial element in the transformation of human resources. According to Lumi (2020), the advancement of technology has revolutionized the recruitment function, with digital recruitment proved to be effective and efficient. Online recruiting allows hiring managers and recruiters to (i) post and advertise job placement in digital spaces including corporate websites, online job boards that aggregate job postings into one platform such as LinkedIn and Indeed, and social media, (ii) provide job applicants with application forms to be filled, (iii) manage the applicant database.

With higher dependence on social media and the internet for searching information, recruiters are utilizing online job advertising as a key tool to attract job seekers (Puncheva-Michelotti et al., 2018). Employers can take advantage of social media platforms like Twitter, Facebook, and LinkedIn to be cost-effective, competitive, targeted, and strategic (Din et al., 2015). First, these social media platforms allow recruiters to expand their reach and attract a wider talent pool with diverse skills and competencies (Doherty, 2010; Faliagka et al., 2012; Puncheva-Michelotti et al., 2018). Second, the digital format of job advertising also allows recruiters to convey more information within a job posting at no extra cost: printed job advertisements usually charge by the amount of space occupied, but digital job boards introduce new monetization models (e.g., pay-per-view, pay-per-post, subscription) (Puncheva-Michelotti et al., 2018). Finally, automated solutions from these platforms reduce recruitment costs and information searching time (Doherty, 2010). Automated screening has proven to perform as well as human recruiters while increasing the

efficiency of the recruitment process, letting recruiters focus on interviewing and investigating the background of top candidates only (Faliagka et al., 2012).

However, Internet recruitment is a fairly new topic in academic research, despite this new channel has grown to be a dominant recruiting method (Backhaus, 2004). Some scholars claimed that investing in job recruitment in newspapers remains the “most commonly used approach” thanks to its large audience and reliability (Ganesan et al., 2018). This statement ignored changes in job searching behavior of new generations such as Millennials and Gen-Z: they search for new job opportunities mostly online and they are unlikely to observe traditional advertising on physical boards or in newspapers (Dalessandro, 2018). Therefore, digital recruiting methods should be on the agenda of future research.

2.2.3 Employer branding in job advertisements

The term “employer branding” was coined by Ambler and Barrow in 1996 as an extended concept derived from marketing principles of branding in the employment situation. The authors defined employer branding as “a package of functional, economic, and psychological benefits”, similar as in customer brands, provided by the employer, supporting the company to improve recruitment, retention, and commitment (Ambler & Barrow, 1996). Backhaus and Tikoo developed the concept further by describing employer branding as an effort of companies to create attractive images that are “different” and “desirable” as employers and promote such images both internally and externally (2004).

The application of employer branding in job advertising involves incorporating dimensions of organizational attractiveness in the advertisement’s language (Hah et al., 2005). Some factors contributing to employer attractiveness defined are opportunities for career advancement and development (Hah et al., 2005), corporate responsibility (Backhaus, 2004), positive, supportive, and innovative working culture (Backhaus, 2004; Hah et al., 2005), attractive compensation and promotional opportunities (Hah et al., 2005). Among them, “social climate” (close and positive relationships with coworkers) and “social responsibility” (contributing to societal benefits) factors in job listings appear to have the highest contribution to potential employees’ estimates of person-organization fit.

It is also essential that these dimensions are not created solely for the purpose of attracting candidates, but rather should be a part of the organization’s identity (Mosly, 2007). There is often a gap between the diverse image built by the organization and the reality, which is referred to as “diversity mixed messaging” (Windscheid et al., 2016). The authors argue that when explicitly a pro-gender diversity statement (e.g., “We value gender diversity”) but showing a uniform all-male board of directors, the employer attractiveness is negatively affected. Based on the behavioral integrity concept which is defined as “the perceived pattern of alignment between an actor’s words and deeds” (Simons, 2002), such mixed messaging creating a disparity between an organization’s words and actions can negatively impact an organization’s integrity (Windscheid et al., 2016). Therefore, if an employer cannot “walk the talk”, employer branding messages can result in negative organizational attractiveness.

Notwithstanding employer branding's benefits, employer branding is not widely integrated into job advertisements (Puncheva-Michelotti et al., 2018). Despite the shift of customer branding from product-oriented to value-oriented, employers have not recognized the opportunity to promote organizational culture and values in job advertisements. By failing to include employer branding in job postings, corporates are not able to differentiate from competitors and miss potential benefits such as increasing organizational attractiveness (Elving et al., 2013). Eventually, without a concrete employer branding strategy and a different employer brand identity, a company is not able to compete for the best candidates (Backhaus, 2004). Elving and his colleagues argued that the fact that companies ignore the advantages of employer branding over traditional recruitment is a consequence of separated business functions (branding, HR, and communications) being unable to integrate and react to changes in the external environment (2013).

2.3 Diversity Value

2.3.1 The value of diversity in the workplace

Diversity in the workplace provides two main values: instrumental and non-instrumental. Firstly, diversity value is primarily an instrument to gain valuable outcomes in productivity, morale, and responsiveness to customers (Shin & Gulati, 2010). Naturally, in a team of different backgrounds, there are likely different expertise, experiences, and perspectives. These unique attributes that members bring to the team are believed to create a positive impact on overall performance. This case is defined as cognitive diversity which can promote creativity, innovation, and problem-solving in heterogeneous teams (Horwitz & Horwitz, 2007).

However, diversity is described as a “double-edged sword” in organizational theory because of conflicting empirical findings on the effects of team diversity on organizational performance. Drawing on the similarity-attraction perspective which argues that individuals tend to select people who are similar to themselves to interact within a group, some researchers pose a counter-argument that homogeneous teams perform better thanks to increasing cohesion. Indeed, research by Horwitz & Horwitz that meta-analyzed 35 articles about team diversity published between 1985 and 2006, covering nearly 2,000 observations, did not observe any relationship between bio-demographic diversity and the quantity and quality of team performance. However, the same study confirmed a significant positive relationship between task-related diversity attributes (i.e., diversity in educational backgrounds, and previous working experiences) and team performance. The authors, therefore, claimed that the benefit of bio-demographic diversity and team performance has been “overstated” (2007).

Notwithstanding the mixed propositions of the impact that diversity in the workplace possesses on group-level performance, scholars are increasingly urging for a higher level of participation of under-represented groups in some segmentations, specifically the technology industry. One concern for unbalanced gender or ethnicity in the IT workforce is the production of biased algorithms. When developing algorithms, data scientists and software engineers can embed their own bias in the computer code, and the training data, design choices, and feature selections, consequently, are unable to represent a population, but rather benefit only the majority group. In

the age of booming artificial intelligence, when more and more decisions are made as a result of algorithms including important processes such as education, criminal justice, and financial lending, inequality at the IT workplace can derive “reinforcing discrimination and widening inequality” in our society (Yarger et al., 2020). The instrumental value of diversity, therefore, in this case of the technology industry, is larger than just the performance of an organization, but the public equality and fairness.

Secondly, diversity can be valued in a non-instrumental way which means diversity is valuable in itself without considering its consequences as in we care about diversity because it reflects justice or equality in our society. By showcasing the diversity within a workplace, an employer wants to be perceived as a progressive organization where there is a “fair opportunity to succeed, regardless of factors such as race or gender” (Shin & Gulati, 2010). The authors argue that diversity images act as a signal to highlight a corporation’s extra efforts to commit to fairness and justice and differentiate them from others that fail to achieve such diversity. This process might bring benefits to the corporation in terms of higher employer attractiveness and gaining customers and business partners.

Consequently, companies have multiple reasons to include diversity value in corporate communications. Under the instrumental approach, attracting talents from minority backgrounds is likely to enrich an organization’s overall diversity in expertise and perspectives, which might help improve business performance. This effect is critical in the technology industry to ensure the delivery of fair and inclusive products to society. Furthermore, there are competition-based drivers under the non-instrumental aspect that corporations have to stay differentiated from their competitors by showcasing the commitment to non-discrimination and equality.

2.3.2 Diversity in recruitment materials

As a result of the mentioned drivers, corporations are including the use of inclusive language in job advertisements. For example, the use of words such as “diverse”, “diversity”, “inclusive”, “inclusion”, and “equity” was categorized as pro-diversity statements (Cole et al., 2022; Kang et al., 2016). Inclusive language also includes statements to commit to fairness in hiring by encouraging everyone to apply (Kang et al., 2016) and emphasizing a desire to sponsor a work visa (Lambert et al., 2019). Another common term being used by companies is the “equal employment opportunity” statement that explicitly describes their commitment to diversity, inclusion, and equality (Avery & McKay, 2006). This practice is proven to increase the perceived organizational image of minority applicants and positively affect organizational attractiveness (Avery & McKay, 2006; Lambert et al., 2019).

Researchers have also explored the effect of this practice on minority and majority groups separately. A field experiment conducted at a Fortune 500 company has tested the effectiveness of different diversity messages in recruitment materials and suggested that mentioning pro-diversity messages more than doubled the interest and the likelihood to apply of underrepresented groups. The effect can be gained by merely incorporating a corporate statement (i.e., “we believe that inclusion and diversity are key to our success”, without any concrete facts or statistics on gender or ethnic distribution in the workplace. (Flory et al., 2021).

There are two streams of thoughts on the influence of inclusive language in job advertisements on majority groups. On the one hand, scholars argue that this practice can signal threats to high-status individuals. A hiring simulation with 77 white men showed that when applying to a pro-diversity company, participants expressed concerns about being discriminated against (Dover et al., 2016). They explained that many whites consider pro-diversity an anti-white bias. On the other hand, it is argued that incorporating inclusive language does not affect majority groups. Flory et al. (2021) claimed that pro-diversity messages not only preserved the interest to apply from non-underrepresented ethnicities but also increased applicant quality altogether. Another study of 528 job-seeking MBA and undergraduate students in the United States also concluded that when recruitment messages include a diversity statement (e.g., “aggressively recruits women, minority group members for management positions), organizational attractiveness improved for job seekers from both minority and majority groups (Williamson et al., 2008).

Giving an explanation for inconsistent findings, Gutierrez & Clair (2018) claim that the effect of diversity signals is mediated by personal social dominance orientation. Social dominance orientation is defined as an individual’s attitude towards the social hierarchy or the distribution of power and resources among different social groups. The authors proposed that people with high social dominance orientation who tend to support and justify social hierarchies are threatened by minority-focused diversity signals. Meanwhile, people with low social dominance orientation who tend to advocate for greater equality increase job pursuit intention if shown diversity signals. This is aligned with the person-organization fit and organizational attractiveness theory that job seekers are more likely to draw toward organizations with similar core values, beliefs, ethics, and purpose.

2.4 Research Gap

From the literature review, it is prominent that promoting organizational value, specifically diversity value, is an employer branding practice that companies are increasingly adopting, driven by multiple factors. However, the scope of previous studies did not cover different types of diversity messages but usually associated diversity messages with simple keywords such as “diverse” and “inclusive”. There has not been a systematic categorization of content that communicates diversity and inclusive value in job advertisements. By over-focusing on obvious keywords, scholars may overlook diversity messages that are subtle but still recognized by readers and those messages’ impacts.

Notably, previous research in job choice decisions mainly focused on application intention, meaning the thought to “involve active pursuit of a job” as the outcome (Highhouse et al., 2003). Little empirical evidence has been provided to indicate whether the presence of diversity-value content has an impact on recruitment outcomes of application behavior. Given that the intention-behavior gap is evidently large with approximately only half of intentions getting converted into action (Sheeran & Webb, 2016), a study into application behavior is necessary to finish the puzzle.

Another gap in current research is the format of studied job advertisements. Despite empirical statistics that online job boards are covering 60-70% of opening positions in the labor market and over 80% of jobs for those with higher education (Carnevale et al., 2014), digital recruitment

platforms are not fully investigated in major human resource research. As new technologies emerge in this field, new research should be accomplished to understand the practices of recruiters and the behaviors of job applicants on these new and popular platforms.

Therefore, in order to fill this gap in the literature, this thesis has two objectives: firstly, to understand the current usage of diversity language in digital job advertisements, and from that, to propose a conceptual framework that help improve the classification of the use of diversity-value signals in digital recruitment materials; secondly, to measure the correlation between diversity-value signals usage and application behaviors of job seekers.

3 Theoretical Framework

In order to understand the underlying mechanism of job application behaviors, this section will introduce signaling theory and social identity theory. Connecting the theoretical framework with previous literature, three hypotheses will be generated.

3.1 Signaling Theory

3.1.1 Signaling's function

Signaling theory was first coined by Spence in 1973 to explain how individuals and organizations communicate information to others to convey certain characteristics that cannot be easily observed or verified. He used an example from the labor market to describe signaling effects: because employers have little information about the candidate's quality, educational information in one's resume acts as a means of communication for "unobservable characteristics", such as being consistent and less likely to quit, of job candidates. This is contrasting to the human capital view that considers education as a means for increasing work productivity (Connelly et al., 2011).

Such a situation in which each party gets exposed to different information is called "information asymmetry". There are two types of information where asymmetry possesses significant impact: information about "quality" and information about "intent" (Connelly et al., 2011). In the mentioned example, a candidate's quality is critical for employers to make decisions during the hiring process, therefore education acts as a reliable signal for a candidate's quality and reduces information asymmetries. One's behavioral intentions can also be a concern to another party, which motivates scholars to research the mechanisms of incentives for reducing hazardous intentions (Connelly et al., 2011).

In the context of the recruitment process, signalers are not only candidates, but also employers because potential candidates have little information about the company they are interested in applying to. In order to attract suitable talents, organizations communicate characteristics of the job position, the organization, and the workplace environment to prospective employees through "signals". Signaling theory argues that positive attributes of a company can be conveyed to an external audience through the use of "symbols, messages, or images" (Cole et al., 2022). For example, signaling theory explains that the content of job advertisements, specifically images of minority groups such as blacks and women represented in the workplace, draws expectations of applicants of diversity and inclusion practices (White et al., 2019).

The components of signaling are information and inferences about the information. Two noteworthy aspects of inferences are that inferences are made about "unobservable qualities" and that they depend on signal receivers' belief in the difficulties to imitate (Chang & Chin, 2018). On the first aspect, scholars applied signaling theory in advertising and argued that advertising, as a signal, brings benefits to firms, without providing direct information about product qualities. This is because consumers can deduce unobservable product qualities from observable advertisements (Kihlstrom & Riordan, 1984). On the second aspect, signals are believed to be hard to falsify due to the high cost of deceptively fabricating a signal (Donath, 2007). Because customers can confirm

product qualities after purchasing, they assume that a company will suffer the costs of misleading advertising that prevents it from doing so (Kihlstrom & Riordan, 1984).

3.1.2 Constructs of signals

Even though there is positive and negative information that can be sent from signalers, signaling theory mainly discusses the communication of positive information (Connelly et al., 2011), information that is beneficial for itself. It is logical that a signaler would never convey negative signals that infer harmful information for the signaler.

Nevertheless, negative information can be sent unintentionally as Spence (2002) argued that a wide range of signals can be sent without being aware. For example, communications via a press release are intentional, while signals sent via word-of-mouth or public media are unintentional. A single message can contain intentional and unintentional signals as Highhouse et al. (2007) made a distinction between information an organization intends to convey and information that a potential applicant infers from the cue.

In order to be effective, a signal needs to be observed. *Signal observability* is defined as the extent to which signal receivers can notice signals (Connelly et al., 2011). Studying demographic diversity on companies' boards of directors, Miller and Triana (2009) addressed that the more visible signals are, the more effective they are.

The second requirement of effective signaling is *signal cost*. Costly signals are considered to be more credible and more difficult to be imitated, and thus they can be used to differentiate between high- and low-quality signalers (Mavlanova et al., 2012). If a low-quality signaler attempts to falsify a costly signal, believing that the benefits of a positive signal would outweigh the costs of producing it, the signaler will face a penalty cost for displaying false signals (Connelly et al., 2011). For example, false signals in branding damage the brand's current reputation.

In order to increase signaling effectiveness, the signaler can enhance signal observability by increasing the number of observable signals, the so-called *signal frequency*. By increasing signal frequency, signalers can reduce information asymmetry. Especially, when signalers send signals repetitively to communicate a specific message, the signaling process's effectiveness can be increased (Connelly et al., 2011). In a dynamic environment where signalers and receivers are exposed to changing information constantly, signal frequency has been proven to significantly improve the signaling process (Janney & Folta, 2003).

A second approach to achieving an effective signaling process is ensuring *signal consistency*, defined as the "agreement between multiple signals from one source". When a signaler attempts to increase signal frequency, the issue of conflicting signals arises. Having multiple signals but lacking consistency confuses the audience and constraints communication effectiveness. Furthermore, as a preceding proposition about unintentional signals, signal conflict can happen between intentional signals and unintentional ones, creating confusion and may communicate negative information (Connelly et al., 2011). Therefore, there is a lack of study on the interplay of different signals and the impact they may possess on outcomes.

3.1.3 Receiver's perspective

Signaling effectiveness is also determined partly by the characteristics of the receivers. First, the signals would not be able to be observed when receivers are not looking for signals. For example, a job seeker, when visiting a corporate website, looks for specific information about the working culture and may not look for signals inferring the company's financial stability, therefore, financial signals are not observed. The extent to which receivers "vigilantly scan the environment for signal" is defined as *receiver attention* (Connelly et al., 2011). Researchers suggested that the signaling environment plays an important role in deciding receiver attention, and that receiver attention moderated the effect of signal strength (Gulati & Higgins, 2003). Particularly, within a signaling environment with high information asymmetry and high uncertainty, receivers are more actively looking for signals and thus, are more aware of signals (Higgins & Gulati, 2006).

The characteristics of receivers also determine the way they interpret signals. *Receiver interpretation*, defined as the process of "translating signals into perceived meaning", is different between individuals. For example, when looking for signals of organizational quality in job advertisements, different applicants would have distinct concerns that guide different interpretations of a signal. Potential applicants may also have previous perceptions about an organization's quality as a place to work, a viewpoint that can distort signals and diverge their meaning from the original intention (Connelly et al., 2011).

3.2 Social Identity Approach

The social identity approach that is compiled of social identity theory (Tajfel & Turner, 1979) and self-categorization theory (Turner et al., 1987) demonstrates the potential to explain how applicants favor certain signals over others. Social identity theory offers an explanation for intergroup conflict and discrimination. It suggests that an individual's behavior within groups is partially influenced by how much their group membership becomes a part of their self-concept. In other words, a person's self-concept is constructed by their own personal identity, meaning perceptions of their own abilities and traits, and a social identity that is influenced by their group (e.g., organizational, religious, and political group). Self-categorization theory builds on social identity theory by proposing that social identity can be activated through depersonalization, a psychological process that allows individuals to stereotype themselves into certain groups or categories (Celani & Singh, 2011).

According to the social identity approach, an individual's behavior within groups is influenced not only by their identification with the group but also by the reliance of group membership on their social identity (Celani & Singh, 2011). The principle for this approach is that individuals categorize themselves into social groups as a means to maintain a positive self-identity. This process involves categorizing oneself, categorizing others, and assigning value to different social categories (Goldberg, 2003). Researchers have also observed that when belonging to a low-status group, individuals may try to dissociate from it, especially when the group boundaries are perceived as highly permeable (Ellemers et al., 1993). Therefore, to gain one's positive self-identity, individuals will exhibit favoritism toward a high-status out-group to dissociate from their low-status in-group (Ellemers et al., 1988).

In organizational contexts, the social identity approach helps to explain why and under what circumstances similarity biases impact applicants' reactions to recruitment. Research by Highhouse et al. (2007) highlights that the recruitment process is dependent not solely on the signals sent by an organization but also on the inferences drawn by the applicants. This finding is aligned with the notion regarding receiver interpretation in signaling theory that different individuals interpret a signal in different ways based on their characteristics.

Because individuals aim to maintain positive self-identities, when one's social identity is associated with a low-status group, they may distance themselves from that group by showing favoritism toward high-status out-groups. Goldberg (2003) suggested that applicants who shared racial similarities to other applicants tried to distance themselves from the rest of the pool to display a stronger identification with the recruiter and the organization. This finding is important because it indicates that individuals may consider certain attributes or characteristics, such as race, as a potential source of competition or threat. As a result, people who are perceived as lower-status from the majority group may attempt to dissociate themselves from the minority group to be viewed in a more positive light. For example, when being in a predominantly male group, females tend to dissociate from other females because male characteristics are perceived to be higher-status in the workplace (Ely, 1995).

3.3 System of Hypotheses

The previous chapter has demonstrated a relationship between job advertisements and the perception of person-organization fit, which positively impacts organizational attractiveness and eventually influences job seekers' intention to apply. In the light of signaling theory, an applicant's interest in a company can be explained by the company's recruitment efforts in conveying signals through recruitment activities. Due to the information asymmetry between job applicants (signal receivers) and employers (signalers), the information provided by employers in job advertisements acts as a signal to form an image of the organization and reflect the working conditions (Elving et al., 2013). This process happens at the beginning of a job-search process when information asymmetry is high, meaning that potential applicants have little information about an employer, a situation that increases receiver attention for signals.

Diversity signaling, as an extension of the signaling theory, refers to the use of job advertisements to provide signals of the employer's diversity quality and intention. Differing from previous research that defined diversity signals as the use of inclusive language—providing positive information (Cole et al., 2022), this thesis aims to broaden the scope to also cover negative diversity signals. Negative information about a corporation's diversity quality and intention can exist in multiple patterns. For example, language requirements in job advertisements were considered a discriminatory practice against candidates with particular backgrounds (Mahboob & Golden, 2013). Based on Lambert et al.'s finding that communicating a company's work visa sponsorship for foreign job seekers conveys positive diversity signals (2019), it is expected that a statement addressing an inability to sponsor a work visa can negatively affect organizational attractiveness. Therefore, diversity signals, in the context of this thesis, include both positive signals—information promoting diversity—and negative signals—information constraining diversity in the workplace.

3.3.1 Effects of diversity signals

The presence of positive diversity signals in job advertisements is anticipated to positively affect the application behaviors of potential candidates from both minority and majority groups. First, by using positive diversity signals, corporations can improve organizational attractiveness within minority groups and eventually attract more applications. The inclusive language used in job advertisements creates a perception that the employer highly values diversity and signals a safe work environment with fewer risks of discrimination. Indeed, Kang et al. found out that job applicants from minority groups were less likely to whiten their resumes—a practice of excluding racial cues in job applications—when applying to companies that explicitly express a commitment to diversity and inclusion than when applying to other companies (2016). The positive language also signals that diversity is one of the organization's values. Value congruence between employers and job seekers is confirmed to positively affect the level of perceived person-organization fit that is able to predict organizational attractiveness and job choice decisions (Cable & Judge, 1996).

The effect of positive diversity signals on the application behaviors of people from majority groups is twofold because an individual's social dominance orientation, which is the attitude towards social hierarchies, moderates the effect of diversity signals (Gutierrez & Clair, 2018). On the one hand, job seekers from majority groups who have low social dominance orientation are likely to support equality and have positive biases towards outgroup members. This segmentation values diversity and inclusion, thus sharing common values with employers who commit to diversity. Positive signals will establish a similar effect to the effect on people from minority groups, which is increasing person-organization fit perception and drawing more applicants.

On the other hand, potential applicants who have high social dominance orientation prefer hierarchical group orientations and tend to be more reserved towards group equality. Research showed that males have higher social dominance orientations (Ely, 1995), and that white males are less supportive of diversity-promoting efforts (Avery & McKay, 2006). For this group, positive diversity signals can be considered a threat that job applicants from minority groups are favored (i.e., high-status) and that people from majority groups can be discriminated against (i.e., low-status). However, in the light of the social identity approach, the boundary between low-status and high-status groups is not settled but individuals from the low-status group aim to distance themselves from their group and show positive biases towards the high-status group (Ely, 1995). In this case, when an employer explicitly expresses a favor towards diversity values, it signals that the company highly praises fairness and justice, a signal that will motivate people with high social dominance orientation to show appreciation for diversity values in order to be observed more positively. The eventual result is an unchanged intention to pursue employment and application behavior from the majority groups (Flory et al., 2021).

Based on the aforementioned arguments, I argue that by incorporating positive diversity signals in job postings, corporations will attract more applicants from minority group and maintain the talent pool quantity from majority groups, which results in more applicants in total. Therefore, the following hypothesis is proposed:

Hypothesis 1a (H1a). *The presence of positive diversity signals in job advertisements is positively associated with application behaviors.*

An opposition effect is anticipated for the presence of negative diversity signals in job advertisements, generating the following hypothesis:

Hypothesis 1b (H1b). The *presence of negative diversity signals* in job advertisements is *negatively* associated with application behaviors.

3.3.2 Effects of frequency of diversity signals

The signaling theory supports that increasing signal frequency will increase signal effectiveness by enhancing signal observability and improving the likelihood of accurate interpretation.

Even though it is argued preceding that signals from a job advertisement are highly observed thanks to high information asymmetry and high intention to look for signals from job seekers, employers still need to compete for attention from potential applicants. Digital job boards are considered a dynamic environment with thousands of new job postings daily and information that is available to both parties is constantly changing. In such a dynamic context, signals need to be sent repetitively to gain observability and reduce information asymmetry (Connelly et al., 2011). Specifically, when multiple signals communicate the same message, the effectiveness of the signaling process will be further increased.

Increasing signal frequency not only enhances signal observability but also reduces the risk of misinterpretation. As mentioned above, receiver interpretation is an important construct to ensure the effectiveness of communication due to distinctive interpretations by individuals. Digital recruitment messages, when being published on digital job boards, are able to reach a vast amount of job seekers. This is, however, tricky for the recruiter to limit the reach to its audience group only and causes risks of misinterpretation by individuals out of its target audience. When repeating a message, because the information is distributed in different ways and different contexts, there is a higher chance of accurate interpretation by receivers, even for individuals that are not familiar with the value of diversity. Thus, by mentioning diversity messages repetitively, employers can emphasize the signal and increase signaling effectiveness.

As proposed by Ganesan et al. (2018), there are different dimensions of a job advertisements, all of which proved to affect potential applicants' attitude toward employers, a decisive factor in job application behavior. The content of job advertisements can be decomposed into multiple attributes which showcase distinctive characteristics, such as job characteristics displaying the instrumental attributes, which refer to the tasks, requirements, and responsibilities, while organizational culture exhibiting symbolic attributes of organization's "personality".

For these reasons, I argue that by repetitively sending positive signals across multiple dimensions in job advertisements, positive messages are more likely to be observed and accurately interpreted, resulting in increased signaling effectiveness measured by application behaviors (the mechanism explained in 3.2.1). Conversely, when sending negative signals across multiple dimensions, the negative effect on application behaviors (as explained in 3.2.1) will be amplified and thus, reduces the number of applications. Therefore, the following hypotheses are proposed:

Hypothesis 2a (H2a). The *presence of positive diversity signals in multiple dimensions* in job advertisements is *positively* associated with application behaviors.

Hypothesis 2b (H2b). The *presence of negative diversity signals in multiple dimensions* in job advertisements is *negatively* associated with application behaviors.

3.3.3 Effects of mixed diversity signals

Even though literature regarding signaling theory seldom explores the effect of negative signals, there is evidence that mixed messages represent misalignment and decrease signal reliability. Signal reliability, or signal credibility, is defined as the combination of a signal's honesty (i.e., the extent to which "the signaler actually has the unobservable quality being signaled") and fit (i.e., the extent to which "the signal is correlated with unobservable quality") (Connelly et al., 2011).

Initially, the presence of mixed positive-negative diversity signals reduces signal honesty. Negative signals are likely unintentional because organizations logically do not actively communicate negative information, but are interpreted as negative by receivers. When having both positive and negative signals, even though unintentionally, signalers may be perceived as attempting to deceive. This is more prevalent when the intentional positive signal is not costly to produce, meaning easy to deceive, such as a corporate statement without any supporting evidence.

Furthermore, a lack of consistency in presenting their own strategy and approach to diversity will introduce penalty costs due to decreasing signal fit. The misalignment between an organization's diversity statements and its actions was called "diversity mixed messages" which negatively impacts the organizational attractiveness (Windscheid et al., 2016). Signal fit is, nonetheless, not obvious to assess from the outside without any insider information regarding the reality within the organization, a situation with high information asymmetry. Because of that, negative cues from job advertisements are highly attended to and, when observed, are interpreted as a lack of integrity. The lower perception of integrity and employer attractiveness is expected to result in low application behavior.

For the reasons above, I argue that when including both positive signals and negative signals within a job advertisement, recruiters will face a penalty cost for false signals in terms of decreasing applicants. Therefore, the following hypothesis is proposed:

Hypothesis 3 (H3). The *presence of mixed positive-negative diversity signals* across multiple dimensions in job advertisements is *negatively* associated with application behaviors.

4 Methodology

This chapter will describe the methodology of the study by presenting the research approach, the study setting and sample, the process of quantifying diversity signals, and measures.

4.1 Research Approach

The study is based on existing research on diversity values, employer branding, and job application, and aims to contribute to further knowledge of these research fields. The thesis begins with gathering existing literature, and then generating hypotheses on the topic. A deductive approach is then suitable to be applied to test the formulated hypotheses. The deductive approach has been criticized for being dependent on predetermined expectations because it is based on hypotheses, a process that limits the information collected and may overlook valuable information. However, it also allows a researcher to determine the necessary information to include in a study and delimit the research scope (Jacobsen, 2002).

The quantitative approach is generally applied in deductive research to test formulated hypotheses. Using a quantitative approach helps improve the generalizability of the results to the entire population (Söderlund, 2010).

Given the purpose of this study that is to provide empirical evidence on how employer branding integrating nationality diversity can affect job seekers' application decisions, I am looking to measure this phenomenon and explain any correlations if available. In order to record job application behaviors in a real-world setting, there are two possible methods: field experiment and observational research.

A field experiment in which study objects are randomly assigned to different treatment groups in their natural contexts is a common approach but has limitations. Field experiments are often considered more appealing than observational studies thanks to their advantages of being able to identify causal effects. With the assistance of website tracking tools, it is possible to create an experiment of different online job advertisements and measure the number of submitted applications for each variant. However, in the context of this study, there are two disadvantages of field experiments which are high cost and ethical issues. First, the process of an experiment in a real-world setting would possibly be longer than the given time to complete this thesis. The process involves the creation of fabricated job advertisements, the process of publishing these advertisements on online platforms, and the waiting period for an adequate volume of applications which can be out of the author's control. Second, field experimental studies are often criticized due to related ethical issues arising from the study settings (Phillips, 2021). Indeed, in these experiments on job advertisements and job application behavior, participants can get direct economic harm in terms of opportunity costs. Participants are invited to apply for a deceptive job position, instead of using the time for more productive tasks, such as applying for an actual job.

Due to the mentioned shortcomings of a field experiment, together with the main objective of this thesis that is not to draw a causal effect, but rather to show correlation, this study was operationalized based on quantitative observational research. The observation resulting from this

study has an objective reality: the mentioned phenomenon exists independently and without regard to observer roles (Bell et al., 2019).

4.2 Study Setting and Sample

In this work, LinkedIn is chosen to be the data source of job advertisements for a few reasons. First, LinkedIn, which was launched in 2003 as a professional network that is mostly used for networking and job searching, is the world's largest professional network with more than 900 million members (LinkedIn, 2023). Second, job advertisements on LinkedIn are fully public, and accessible online to anyone even without an account. The platform also allows internet users to view the exact number of applicants for each position, which is critical to this study. Third, job advertisements on LinkedIn follow a semi-structured form that enables ease of text mining analysis.

The chosen sample was Software Engineer jobs in Stockholm. According to a 2020 report from Swedish IT & Telecom industries, it is forecasted that Sweden will be short of 70,000 employees in the tech sector by 2024, with Software Engineer positions being in "very high demand". The association suggested that in order to solve the deficit, Sweden needs to attract international talent and achieve diversity in the tech sector. Notwithstanding such a high demand for overseas talent, in the same report, companies show low interest in hiring international talent: nearly 30% of respondents found international recruitment to Sweden is not relevant at all to their business (Swedish IT & Telecom Industries, 2020). Given the interesting paradoxical situation between market demand and business practice, the tech sector, and Software Engineer jobs in particular, is therefore selected as the sample for this study.

I collected a sample of job advertisements from LinkedIn during the month of March 2023. Job advertisements on LinkedIn are each assigned a unique ID, which allows me to eliminate duplicate listings from different days of collection. When there are more than 200 applicants for a job advertisement, LinkedIn does not show the specific number of applicants, but only displays "over 200 applicants". Because of this limitation of the platform, job advertisements with over 200 applicants were excluded from the dataset. As a result, a total sample size of 976 unique job listings was collected, and each record contains a job title, job description, job location, seniority level, company name, industry, company followers on LinkedIn, apply method, and the number of days since published. Job location includes 3 categories: on-site, remote, and hybrid. Seniority level is a structured field with the following ranks: Internship, Entry level, Associate, Mid-Senior level, Director, and Executive. There are two methods of applying on LinkedIn: "apply" which redirects job applicants to the company's landing page and "easy apply" which allows applicants to complete the application directly on LinkedIn. There is no personal information of applicants being collected in this study.

4.3 Quantifying Diversity Signals

4.3.1 Digital job advertisement dimensions

Because the generated hypothesis involves the use of diversity signals across job advertisement dimensions, it is needed to have a list of relevant dimensions for online job advertisements on digital job boards. Adapted from Ganesan et al.'s model of printed job advertisements dimension (2018), I outlined the four relevant dimensions to this study in Figure 1.

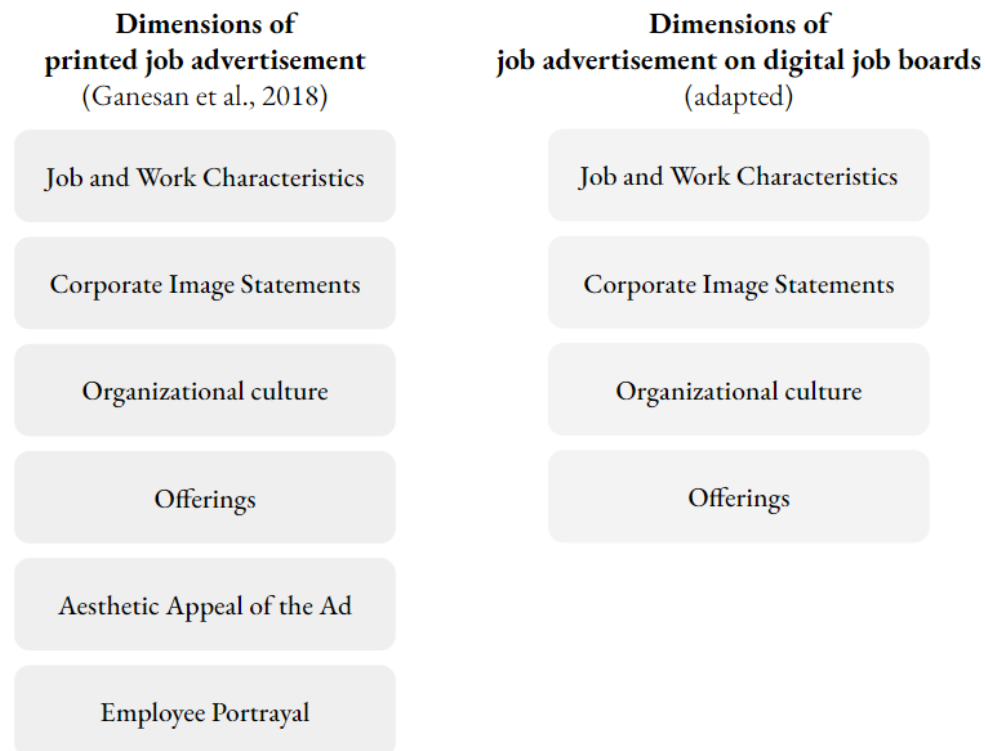


Figure 1: Dimensions of job advertisement

Digital job advertisements share four dimensions with ones in traditional format. First, a description of the job and work characteristics is considered a must-have element that serves the priority function of a job posting: announce the availability of a position and provide the characteristics of that position. This part usually consists of the description of tasks and specific requirements including relevant education, skills, and experiences. Second, corporate statements are used to build a corporate image and identity. The statement can be expressed through mission and vision statements, an introduction about the business, and details about its operation (Ganesan et al., 2018). Third, the organizational culture dimension can be leveraged to provide information about an employer's working environment and social climate. This information, according to person-organization fit theory, can bring advantages to the employer by attracting suitable candidates. And fourth, offerings in terms of both economic benefits such as salary and compensation, and non-monetary offerings such as development opportunities and training can also be integrated into job advertisements.

Due to having different formats and placements, digital job postings do not possess two dimensions as printed ones do. First, the aesthetic appeal of the ad that was important for printed listings is not relevant to job listings on online job boards. Because online job boards such as LinkedIn and Indeed aggregate job listings to a common platform following a structured format, there are no visual distinctions among listings. The use of color, font type, layout, and order of information are all kept under a common template. The aesthetic appeal is thus identical for every listing within a platform. Second, due to the mentioned uniformity, pictures and visual graphics are not allowed on job posting sites. Digital job advertisements found on LinkedIn, for example, are text-based without any pictures. Employee pictures are, therefore, not relevant as a dimension of online job advertisements.

4.3.2 Setting up a dictionary

The goal of this thesis is to conduct an extensive examination of diversity languages across a large sample of job listings. The first task is to create a scalable method for precisely quantifying diversity signals. Traditionally, content analysis is the common approach to analyzing job advertisement content with human experts reading through the content and extracting information. Despite the richness of information extracted from this technique, it is time-consuming and requires much human work (Guo et al., 2016). Given the need to examine a big data set, text mining is a more appropriate approach that can extract relevant information automatically.

Because the formulated hypotheses imply a need to classify records of job advertisements into separate groups (with or without the presence of diversity signals), dictionary-based text analysis is applicable. A computerized-dictionary task is straightforward with 2 steps. First, lists of keywords are assigned into groups that are going to be identified in the text. This step can be done manually by researchers or can take advantage of available dictionaries, such as the Linguistic Inquiry and Word Count (LIWC) dictionary. Second, the computer scans the given text for the presence of those keywords and labels each record accordingly (Guo et al., 2016). This approach is appropriate for efficient text classification tasks, and therefore, has been employed to analyze big social data.

A dictionary for diversity language in job advertisements is unfortunately not available, which requires a manual process to develop a list of relevant keywords (Macanovic, 2022). An important aspect of the process is to ensure that the predetermined list—custom-developed dictionary—can reflect the entire dataset (Guo et al., 2016). A reasonable approach is to read a subset of the text to identify the most covered topics and related words.

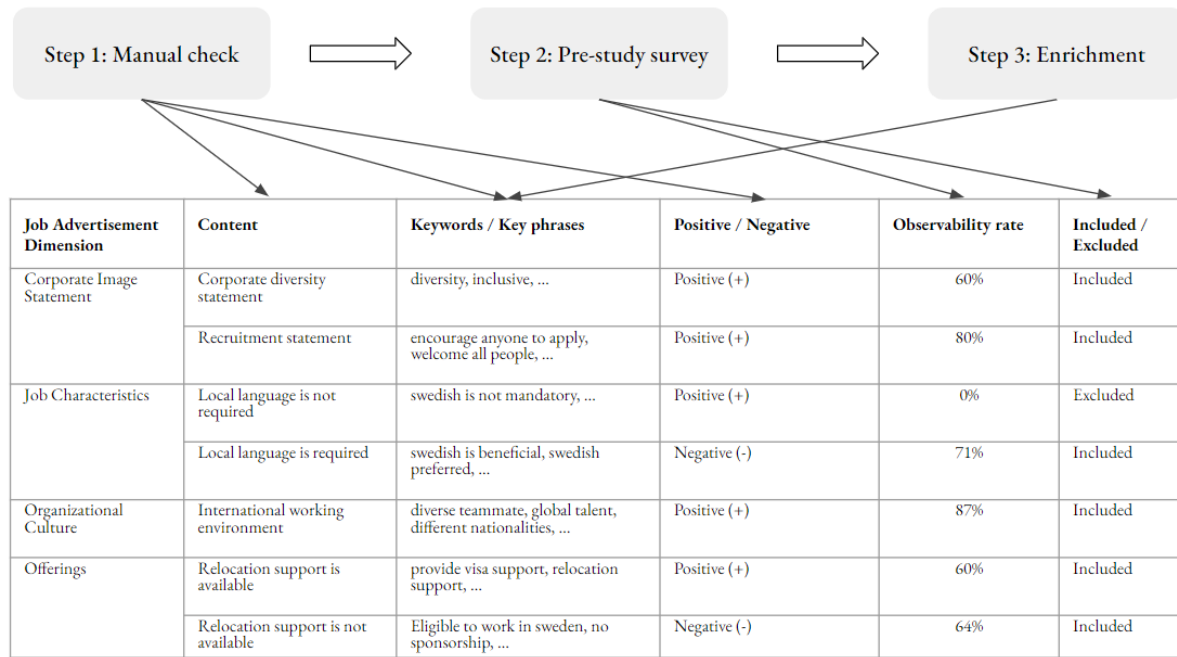


Figure 2: Summary of the dictionary creation process and the output from each step

In this study, I picked a subset of 90 job advertisements (equivalent to 10% of the sample) to manually check for observable diversity signals. The list of keywords and phrases was developed with each item categorized as positive or negative signals. I also tagged the specific dimension for each record. For example, the keyword “equal opportunity” is tagged with a “corporate image statement” dimension and shows a “positive” diversity signal; the phrase “fluency in swedish” is tagged with “job characteristics” dimension and shows a “negative” diversity signal. Details of all keywords and key phrases included in the dictionary are shown in Appendix 1.

In order to ensure the objectivity of the dictionary, a pre-study involving a survey was conducted. Each respondent was shown a random job description from 7 job advertisements that were different from the previous subset. Due to the scope of a pre-study, not all keywords and key phrases were included in this sample of 7 job postings, but all dimensions were covered. This is based on the assumption that some slight variations of diversity-signaling wording will receive similar observability from the audience. Along with the job description, each respondent was asked the two following questions to test whether the respondent perceived diversity signal the same way as the author: “Please fill in all the phrases from the above job advertisements that you think is supporting nationality diversity in the workplace” and “Please fill in all the phrases from the above job advertisements that you think is not supporting nationality diversity in the workplace”.

For the pre-study, a convenience sample of fellow students and colleagues was used. The sample stays relevant for this study because the respondents are likely to be active in the job market. Within them, there is also a mix of local and international, making the results able to represent multiple perspectives of job seekers in Stockholm. They were asked to answer the online questionnaire via social media or group messaging. The survey was sent out between the 25th and 28th of March via an anonymous Qualtrics link without any demographic information collected. In total, 30 respondents completed the survey.

The pre-study result largely aligned with the precedent keyword list. Out of 7 tested content, each of which was being shown to at least 10 respondents, 6 content were observed or recognized by over 50% of respondents, with the accurate categorization of positive or negative signals. Descriptions about the international working environment, for example, were recognized as a diversity signal in 87% of respondents. The only content that was not observed by respondents was a statement that local language is not required, for example, “Swedish is not mandatory”. The author presumed that this phrase can be a positive diversity signal, however, none of the respondents observed it as “supporting nationality diversity in the workplace”. This content was, therefore, excluded from the dictionary due to low observability.

The final step of building this diversity dictionary was to add variants of keywords and key phrases in order to cover as many variants of keywords as possible. For example, “inclusion” in addition to “inclusive”. The complete final dictionary is presented in Appendix 1.

4.3.3 Computing and validation

In order to detect keywords from the dictionary in the job description text, I used the ‘grepl’ function in R. Firstly, text pre-processing was conducted using lemmatization. The lemmatization processes words into their most basic forms, so plural words were transformed into singular words, and verbs were transformed into the present tense version. After that, the ‘grepl’ function is used for pattern matching and returns a numerical value indicating whether a text record matches a specified pattern. For each dimension, value (-1) means the advertisement presents at least one negative diversity signal within that specific dimension, (1) means the advertisement presents at least one positive diversity signal within that specific dimension, and (0) means no diversity signal is detected. This setting assumed that for a specific dimension in a specific job description, there should be only either a positive or negative signal, and no mixed signal should be found within one dimension.

To validate how well the dictionary identifies diversity signals, I conducted a manual check on a random sample of 90 job advertisements (approximately 10% of the total sample). The objective of this validation process is to avoid misclassifications that can happen when keywords are placed in a different context, for example, the “diversity” keyword in the context of “company provides diversity services”. The error rate was low with only three detected false positives (3%) and no false negative was found. Given the highly subjective nature of nationality bias, a perfect algorithm is hard to achieve and the inability to cover every context is acceptable to obtain scalable algorithms. This accuracy rate is indeed acceptable, given that the current accuracy rate of preexisting dictionaries ranges from 87% to 92% (Hardeniya & Borikar, 2016).

4.4 Measures

4.4.1 Dependent variables

Number of applicants. The application behavior is measured by the number of applicants as shown in the LinkedIn interface. Technically, each applicant is accounted for a LinkedIn account, meaning that when an individual submits more than one application to a job position, LinkedIn records

only one applicant. Therefore, the number of applicants that LinkedIn records may be smaller than the actual applications an employer receives. The measure is retained as a continuous variable.

4.4.2 Independent variables

Positive presence and negative presence. The presence of positive or negative diversity signals in job advertisement content was coded as (0) for non-existence and (1) for existence.

Positive frequency and negative frequency. The number of job advertisement dimensions that present a positive or negative diversity signal was retained as a continuous variable ranging from (0) for no signal found to (4) for signals found in all 4 dimensions.

Mixed presence. The presence of mixed diversity signals was coded as (0) for non-existence and (1) for existence.

4.4.3 Control variables

- (a) *Apply method.* There are two possible application methods on LinkedIn: (i) “Apply” which sends job applicants to employers’ landing pages which can be an internal website to submit applications, (ii) “Easy Apply” which enables applicants to fill out an application form and submit applications directly on LinkedIn without being redirected to other websites. The latter method is considered to be quicker because LinkedIn prefills available information from a member’s profile into the application form, which helps save time for job applicants. Because of differences in convenience level, the specific application method is expected to impact the dependent variables.
- (b) *Job location.* There are three types of job locations displayed on LinkedIn: (i) On-site, (ii) Hybrid, and (iii) Remote. Hybrid and remote workplaces are two types of settings that are increasingly popular since the COVID-19 pandemic thanks to their benefits to both employers and employees: more flexibility, cut down labor costs, more employee satisfaction, and better environment experiences (Iqbal et al., 2021). Therefore, job location is expected to influence application decisions and is chosen to be a control variable within this model.
- (c) *Company followers,* representing the number of followers for the employer on LinkedIn. Research indicates that applicants consider an organization’s reputation as a signal during the recruitment process (Turban & Cable, 2003). The study found that organizations with positive reputations tend to receive a large number of applicants compared to organizations with a less favorable reputation. In the context of employer branding, the number of social media followers on LinkedIn is possibly a reflection of a company’s reputation.
- (d) *Word count* of the job description. Because the function of job advertisements is to include and promote positive characteristics of an organization, longer advertisements can convey more positive information (Gatewood et al., 1993). Therefore, the word count was selected as one control variable in this study.
- (e) *Days since published.* Number of days since the job advertisement was published on LinkedIn.

4.4.4 Regression model

To test a relationship between independent variables and dependent variables, there are three possible regression models. First, the ordinary least squares (OLS) regression model is frequently used in social science which estimated equation “minimizes the sum of the squared residuals” and is able to produce “unbiasedness, consistency, and other important statistical properties relatively easily” (Wooldridge, 2020). In spite of its popularity, the OLS model has a major limitation in that it assumes “normality in the distribution of error terms”. The model, therefore, is not suitable to predict outcomes that are counts of repeatable events because count data tend to have a positive skew, meaning higher values likely record low frequencies (Hutchinson & Holtman, 2005).

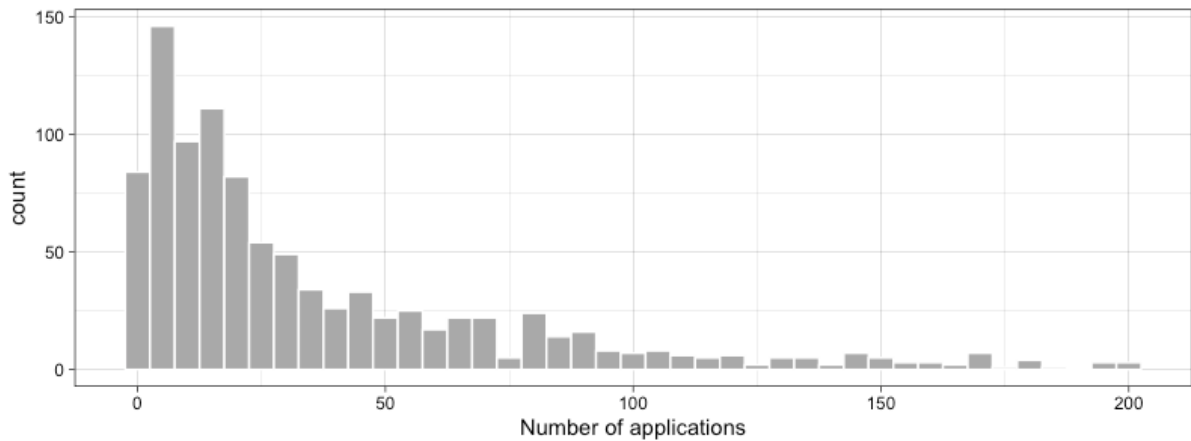


Figure 3: Distribution of dependent variable

For countable outcomes with positive skew as in the dataset collected for this study (Figure 3), Poisson regression and negative binomial regression are considered more appropriate. The distinction between the two models is their assumption of distribution. Poisson regression assumes a Poisson distribution that exhibits equidispersion (i.e., data having the mean that is equal to the variance). When the variance is significantly greater than the mean, overdispersion is present. In such cases, negative binomial regression is more applicable because there is no need to incorporate any corrections to handle overdispersion. (Hutchinson & Holtman, 2005).

Using the function `AER::dispersiontest1` in R, there is evidence of overdispersion ($p\text{-value} < 0.01$). Therefore, negative binomial regression is chosen as the main regression model for this thesis.

¹ An open-sourced function to test the null hypothesis of equidispersion in Poisson GLMs against the alternative of overdispersion and/or underdispersion.

5 Results and Analysis

This chapter will present the results of the study, including (i) a descriptive analysis, and (ii) output from regression models to provide empirical analysis for hypothesis testing.

5.1 Description of Sample

Tables 1 and 2 present the summary statistics for the analytical sample. Positive diversity signals had a higher presence than negative ones, with around 42% of job advertisements including at least one positive signal. Mixed positive-negative diversity signals existed in 4.3% of the sample.

Table 1. Descriptive Statistics (N = 976)

Variable	Mean	SD	Minimum	Maximum
Number of applicants	36.46	40.50	1	199
Positive presence	0.42	0.49	0	1
Negative presence	0.28	0.45	0	1
Positive frequency	0.53	0.70	0	3
Negative frequency	0.28	0.45	0	2
Mixed presence	0.04	0.20	0	1
Total word count	538.72	231.06	48	1673
Days since published	14.79	16.49	0	240
Company followers (in 100,000)	3.50	14.82	0	182.88

Table 2. Correlations

Variable	1	2	3	4	5	6	7	8
1. Number of applicants	-							
2. Positive presence	0.02	-						
3. Negative presence	-0.09	-0.33	-					
4. Positive frequency	0.02	0.90	-0.32	-				
5. Negative frequency	-0.09	-0.32	0.99	-0.31	-			
6. Mixed presence	-0.05	0.24	0.34	0.17	0.36	-		
7. Total word count	-0.08	0.44	-0.04	0.46	-0.03	0.19	-	
8. Days since published	-0.07	-0.14	0.02	-0.13	0.02	-0.07	-0.11	-
9. Company followers	0.06	0.12	-0.00	0.07	0.02	0.17	0.03	-0.05

On average, after 15 days of publishing a job advertisement, the *number of applicants* is 36. Over 75% of job postings in my sample were published within a duration of 30 days. In terms of narrative characteristics, an average job advertisement consisted of 538 words. The correlation coefficients reveal that a job posting's *word count* is positively correlated with *positive presence* and *positive frequency*, which is resonating with the literature that longer job advertisements can convey more positive information.

There was a high correlation between *negative presence* and *negative frequency*. It indicated that job advertisements rarely include more than one negative signal.

Among job advertisements that present positive signals, 75.7% recorded positive signals in one dimension. Positive signals were recorded the most frequently in the Corporate Image Statement dimension (94%), followed by Corporation Culture (30.7%). Negative diversity signals were shown in 27% (270 postings) of recorded job advertisements, mainly from the Job Characteristics dimension with 261 job postings mentioning a requirement of the local language.

Table 3. Prevalence of diversity value signaling

Sample	Sample size	Presence of positive diversity signals (%)	Presence of negative diversity signals (%)	Presence of mixed positive-negative diversity signals (%)
All	976	42.11%	27.67%	4.30%
<i>By Company size</i>				
0-1 employee	1	0%	100%	0.00%
2-10 employees	35	17.14%	37.14%	0.00%
11-50 employees	102	21.57%	33.33%	0.00%
51-200 employees	181	29.28%	23.76%	1.66%
201-500 employees	116	36.21%	22.41%	3.45%
501-1000 employees	89	32.58%	21.35%	5.62%
1001-5000 employees	177	47.46%	31.07%	1.13%
5001-10000 employees	65	69.23%	18.46%	4.62%
10001+ employees	161	68.94%	31.68%	13.66%
<i>By Seniority level</i>				
Entry level	279	35.48%	33.33%	3.58%
Associate	41	41.46%	36.58%	4.88%
Mid-Senior level	377	42.17%	24.40%	4.51%

Table 3 breaks down the prevalence of diversity signals by company and job characteristics. The first panel in Table 3 shows the breakdown by company size. Larger firms were more likely to include positive signals in their job advertisements: less than 30% of job advertisements from companies with fewer than 200 employees indicated a positive signal but over 60% of job listings from companies with over 5,000 employees had at least one positive signal in their job postings. On the opposite trend, smaller companies are more likely to mention negative signals in their job advertisements, however, the distinction of negative signal presence between smaller and larger companies is not as divergent as of positive signals. Companies with over 10,000 employees are exceptional because they belong to the most common groups having positive signals, but also in the more-negative groups. The inconsistency is exemplified by the counting that 13.66% of observations within this largest company size group consisted of a mixed signal, triple the overall rate of the whole sample (4.3%).

The second panel in Table 3 shows the summary by three seniority levels, Entry level, Associate, and Mid-Senior level. It is apparent that job advertisements for more senior level are more likely to indicate a positive signal. Similar to the first panel, the trends for negative signals and mixed signals

are not evident. Noticeably, observations within the Mid-Senior level recorded the most positive signals and the least negative signals, the result reflects a situation that the “War for Talent” for senior talents is more fierce than for entry-level ones.

5.2 Hypothesis Testing

Tables 4 and 5 present the results from negative binomial regression models for the *number of applicants* dependent variable.

Table 4. Negative Binomial Regression Models Predicting Number of Applicants

Variables	Model 1 Control	Model 2 H1a	Model 3 H1b	Model 4 H2a	Model 5 H2b	Model 6 H3
Easy Apply method	0.771*** (0.088)	0.762*** (0.088)	0.769*** (0.088)	0.766*** (0.088)	0.770*** (0.088)	0.786*** (0.088)
On-site location	-0.122* (0.069)	-0.154** (0.070)	-0.144** (0.070)	-0.140** (0.070)	-0.144** (0.070)	-0.119* (0.069)
Remote location	0.347*** (0.127)	0.324** (0.128)	0.288** (0.128)	0.340*** (0.127)	0.288** (0.129)	0.334*** (0.127)
Total word count	0.0001 (0.0001)	-0.00005 (0.0002)	0.0001 (0.0001)	-0.0001 (0.0002)	0.0001 (0.0001)	0.0002 (0.0002)
Company followers	0.005* (0.002)	0.005** (0.002)	0.005** (0.002)	0.005** (0.002)	0.005** (0.002)	0.006*** (0.002)
Days since published	-0.005* (0.002)	-0.005** (0.002)	-0.005** (0.002)	-0.005** (0.002)	-0.005** (0.002)	-0.005*** (0.002)
Positive presence		0.165** (0.076)				
Negative presence			-0.236*** (0.074)			
Positive frequency				0.129** (0.055)		
Negative frequency					-0.233*** (0.073)	
Mixed presence						-0.505*** (0.173)
Constant	3.145*** (0.104)	3.443*** (0.104)	3.493*** (0.107)	3.445*** (0.104)	3.488*** (0.107)	3.387*** (0.104)
Number of observations	976	976	976	976	976	976
Log Likelihood	-4,440	-4,438	-4,435	-4,438	-4,435	-4,437

Notes. Standard errors in parenthesis.

*p < .1, **p < .05, ***p < .01

Model (1) shows the results with only control variables. Among them, several positively predicted the *number of applicants*: having Easy Apply (apply directly via LinkedIn) as the application method, having a remote work location, and having more followers on LinkedIn. In contrast, the two control variables that had negative relationships with the outcome are: having an on-site work location and publishing the job advertisement earlier. Even though this result is contradictory to the assumption that older advertisements have more live time on job platforms and earn more applications, it can be explained that when attracting enough applicants, job advertisements were deleted from the platform, when only less-attractive positions stayed published.

In Model (2) to Model (6), I introduced the independent variables corresponding to the generated hypotheses, with each model testing a hypothesis. The results were consistent with predictions for each hypothesis.

In H1a, it is anticipated that by having at least one positive diversity signal, job advertisements are more likely to attract more talent. Model (2) confirms H1a, indicating that there is a significant relationship between the *positive presence* and the outcome ($\beta = 0.165$, p-value < 0.05).

In H1b, I anticipated the opposite effect from H1a that with the presence of at least one negative diversity signal, the number of applicants is decreased. The effect is observed in Model (3) that *negative presence* significantly produced lower applicants ($\beta = -0.236$, p-value < 0.01).

In H2a, I predicted that when positive diversity signals are used more frequently across dimensions of job advertisements, there are more applicants for the position. Model (4) shows a significant positive relationship ($\beta = 0.129$, p-value < 0.05) between *positive frequency* and the outcome.

In H2b, a negative effect between the presence of negative diversity signals in multiple dimensions in job advertisements and application behaviors was expected. The result from Model (5) confirms that *negative frequency* affects *number of applicants* negatively ($\beta = -0.233$, p-value < 0.01).

In H3, I anticipated that the presence of mixed positive-negative diversity signals across multiple dimensions in job advertisements is negatively associated with application behaviors. In Model (6), I observed that the use of mixed signals in job advertisements is correlated with lower applications significantly ($\beta = -0.505$, p-value < 0.01). The coefficient from this model is also the highest among coefficients between independent variables and dependent variables. This evidence supports H3.

In Table 5 (Model (7) to Model (10)) I combined multiple independent variables to produce full models of the effect. I also added position-type fixed effects in Model (8) and Model (10) to account for any differences cross-sectional because I anticipated that the position type (e.g., full-time, internship, contract) would possess an impact on the outcome. As described above in Table 2, there are two sets of independent variables that are highly correlated, *positive presence-positive frequency* (Pearson's $r=0.90$) and *negative presence-negative frequency* (Pearson's $r=0.99$). Therefore, each model takes one variable from each pair and combines it with *mixed presence* and all control variables.

Model (7) and Model (9) in which fixed effects were not included show a significant relationship between the outcome and *negative presence* ($\beta = -0.156$, p-value < 0.1), and between the outcome

and *negative frequency* ($\beta = -0.148$, p-value < 0.1). The results from these two models further supported H1b and H2b.

Model (8) and Model (10) in which fixed effects were taken into account, both record significant relationships between the outcome of *number of applicants* and independent variables. Specifically, In Model (8), the relationship stays statistically significant for *positive presence* ($\beta = 0.100$, p-value < 0.01), *negative presence* ($\beta = -0.163$, p-value < 0.01), and *mixed presence* ($\beta = -0.279$, p-value < 0.01). In Model (10), a consistent result was produced for *positive frequency* ($\beta = 0.079$, p-value < 0.01), *negative frequency* ($\beta = -0.158$, p-value < 0.01), and *mixed presence* ($\beta = -0.258$, p-value < 0.01). The result confirms all proposed hypotheses and supports the anticipation that the outcome is a function of the employment type.

Table 5. Negative Binomial Regression Models Predicting Number of Applicants with Multiple Independent Variables

Variables	Model 7	Model 8	Model 9	Model 10
Easy Apply method	0.771*** (0.088)	0.815*** (0.042)	0.775*** (0.088)	0.819*** (0.043)
On-site location	-0.152** (0.070)	-0.154*** (0.017)	-0.147** (0.070)	-0.149** (0.017)
Remote location	0.286** (0.129)	0.319*** (0.013)	0.299** (0.128)	0.330** (0.0123)
Total word count	0.0000 (0.0002)	0.00001 (0.00005)	0.0000 (0.0002)	0.00001 (0.00005)
Company followers	0.006** (0.002)	0.005*** (0.0001)	0.006** (0.002)	0.005** (0.0001)
Days since published	-0.005** (0.002)	-0.005*** (0.0003)	-0.005** (0.002)	-0.005** (0.0003)
Positive presence	0.102 (0.085)	0.100*** (0.015)		
Negative presence	-0.156* (0.088)	-0.163*** (0.007)		
Positive frequency			0.086 (0.058)	0.079*** (0.006)
Negative frequency			-0.148* (0.086)	-0.158*** (0.007)
Mixed presence	-0.300 (0.190)	-0.279*** (0.029)	-0.282 (0.185)	-0.258*** (0.025)
Constant	3.464*** (0.109)	3.466*** (0.070)	3.465*** (0.108)	3.465*** (0.108)
Number of observations	976	976	976	976
Employment type FE	Excl.	Incl.	Excl.	Incl.
Log Likelihood	-4,433	-4,433	-4433	-4,433

Notes. Standard errors in parenthesis. Excl., excluded; FE, fixed effect; Incl., included.

*p < .1, **p < .05, ***p < .01

To investigate if the results remain unchanged for alternate specifications, I conducted several robustness checks for the full model (see Appendix 2, Models T1-T4). Model T1 and T2 include

fixed effect (to account for any difference due to the employment type) with alternative regression models (Ordinary least squares, and Poisson). Model T3 shows the results from a negative binomial regression with an industry-fixed effect. Additionally, acknowledging that there may be an effect of company-specific characteristics and that there are more prominent companies in the dataset which have a few ongoing job advertisements, I also rerun the analysis on a smaller subset of job advertisements coming from companies that have one observation in the data sample only (Model T4). The results hold generally consistent for these alterations. In models T3 and T4, the results do not stay statistically significant for all independent variables, indicating that (i) the fixed effect from position type is stronger than the fixed effect from industry and (ii) with a smaller sample in which big companies are likely to be excluded, the variance of outcome is smaller.

The results of hypothesis testing from the main models presented in section 5.2 are summarized in Table 6.

Table 6. Conclusion of hypothesis testing

Hypothesis	Results
H1a. The <i>presence of positive diversity signals</i> in job advertisements is <i>positively</i> associated with application behaviors	Supported
H1b. The <i>presence of negative diversity signals</i> in job advertisements is <i>negatively</i> associated with application behaviors	Supported
H2a. The <i>presence of positive diversity signals in multiple dimensions</i> in job advertisements is <i>positively</i> associated with application behaviors	Supported
H2b. The <i>presence of negative diversity signals in multiple dimensions</i> in job advertisements is <i>negatively</i> associated with application behaviors	Supported
H3. The <i>presence of mixed positive-negative diversity signals</i> across multiple dimensions in job advertisements is <i>negatively</i> associated with application behaviors	Supported

5.3 Heterogeneous Effects

As in the preliminary analysis, there is a distinction between job and company characteristics regarding the use of diversity signals. Therefore, I replicated the regression models by focusing on seniority level (Panel A of Table 7), and company size (Panel B of Table 7) to explore the heterogeneous effects if available.

Table 7. Negative Binomial Regression Models across Seniority Level and Company Size

	<i>Panel A: By seniority level</i>		<i>Panel B: By company size</i>		
	Model 1	Model 2	Model 3	Model 4	Model 5
Variables	Entry level	Mid-Senior	Small	Medium	Large
Easy Apply method	1.581*** (0.390)	0.741*** (0.125)	0.947*** (0.131)	0.898*** (0.213)	0.582*** (0.157)
On-site location	-0.177 (0.130)	-0.273** (0.116)	-0.305** (0.122)	-0.317** (0.139)	-0.100 (0.110)
Remote location	0.707*** (0.221)	0.287 (0.191)	0.547** (0.223)	0.535** (0.272)	-0.157 (0.193)
Total word count	-0.0003 (0.0003)	-0.00002 (0.0003)	0.0005 (0.0003)	0.0007** (0.0003)	-0.0008*** (0.0002)
Company followers	0.020*** (0.005)	-0.005 (0.004)	-0.155** (0.071)	0.030 (0.119)	0.002 (0.002)
Days since published	-0.018*** (0.003)	-0.008 (0.005)	0.005 (0.0003)	-0.017*** (0.005)	0.0006 (0.005)
Positive presence	0.039 (0.158)	0.133 (0.133)	-0.074 (0.146)	-0.075 (0.168)	-0.082 (0.142)
Negative presence	-0.319** (0.157)	-0.123 (0.139)	-0.269** (0.129)	-0.509** (0.193)	-0.244 (0.158)
Mixed presence	0.462 (0.393)	-0.424 (0.287)	1.065* (0.566)	-0.434 (0.388)	-0.132 (0.261)
Constant	3.738*** (0.218)	3.569*** (0.175)	3.099*** (0.175)	3.363*** (0.226)	4.145*** (0.202)
Number of observations	279	377	319	205	403
Log Likelihood	-1,177	-1,761	-1,438	-898	-1,881

Notes. Standard errors in parenthesis.

Small: companies with fewer than 200 employees; Medium: companies with 200-1000 employees; Large: companies with more than 1000 employees.

*p < .1, **p < .05, ***p < .01

In Model (1), when narrowing the focus to job advertisements for entry-level positions, there was a significant relationship recorded between *negative presence* and *number of applicants* ($\beta = -0.319$, p-value < 0.05). However, no significant relationship was found between independent variables and the outcome in job advertisements for the mid-senior level (Model (2)).

Panel B shows that the effect of independent variables on *number of applicants* only manifests in small and medium companies (Models (3) and (4)) and disappears in large companies with over 1,000 employees. There is also a contradicting result from the full model that the presence of mixed positive-negative diversity signals in small companies with less than 200 employees was positively associated with the application outcome.

6 Discussion

In this section, the results presented above will be further discussed to address the two research questions. Alternative mechanisms for the results will also be presented.

6.1 Current Usage of Diversity Signals

The first research question of this thesis was “*How employers are signaling Diversity & Inclusiveness values in job advertisements published on online job boards?*”, which has been empirically explored in the sample of 976 job advertisements for the software engineer positions in Stockholm. The result showed diversity signals are not widely incorporated into recruitment materials as only 42% of the sample has at least a positive signal in the job description. This evidence supported Elving et al’s (2013) claim that companies are ignoring the advantage of employer branding in job advertisements, which can improve job seekers’ first impression of employers.

Notably, the result indicates that corporations are limiting the use of inclusive language and not recognizing the different dimensions within a job advertisement. Diversity and inclusive values in the workplace can be signaled via corporate diversity statements (e.g., “With a holistic approach as an Equal Opportunity Employer, we provide a safe space where all employees feel empowered to succeed.”), descriptions of organizational culture (e.g., “an international work environment”), and a willingness to provide extra support for foreign applicants (e.g., “immigration and relocation support will be provided”). Despite this opportunity to embed multiple positive messages, among job advertisements that incorporate positive diversity signals, three-fourths of them recorded positive signals in solely one dimension, mainly in the Corporate Image Statement dimension. In the whole sample, 83 observations (less than 10%) contain positive signals in more than one dimension, and only 7 job postings employ positive signals in all three possible dimensions. The finding provides a piece of evidence from a large sample of job advertisements for previous research that companies are underutilizing employer branding communication in job advertisements (Puncheva-Michelotti et al., 2018). The below example is extracted from a job advertisement that signals diversity values in multiple dimensions, a practice seldom applied.

“We thrive to foster an inclusive workplace and we do not discriminate on the basis of race, religion, disability, color, national origin, gender, sexual orientation, age, or marital status....We encourage applications from all over the world....We offer relocation support. This support is tailored for each role but always includes visa application, local authority registration, and home-finding service....We are a global company with offices in Stockholm (HQ), New York, London, Paris, Shenzhen and Hong Kong.”

One finding from this study is how divergent corporations’ approaches to signaling diversity in recruitment messages between segmentations are. A pattern was recorded that larger companies are more likely to showcase their diversity value in job advertisements. Remarkably, the majority (over 60%) of companies with more than 5,000 employees sent at least a positive diversity signal in their job postings. This finding aligns with the construct of the signal cost that large companies are more likely to afford the cost of positive signals. In the example above, the company in that job posting is able to afford the cost of creating “an inclusive workplace”, processing applications from “all over

the world”, and relocation support. Large companies are also likely to have an international presence in terms of business operations to be able to claim themselves as “global companies”.

The study’s result also highlighted that when advertising a position at the senior level, employers are more likely to use inclusive language than when advertising a position at the entry-level. Literature within human resource management recognized that middle-level and senior talents are more difficult to attract because they have higher bargaining power (Moroko & Uncles, 2009), implying that the “War of Talent” in this segment is more fierce. The situation can provide an explanation for the detected pattern that companies are more willing to spend extra efforts to build employer branding when in need of senior talents.

By extending the scope of diversity signals to also include negative signals, the thesis confirmed that negative signals exist in recruitment messages in different forms, and they are highly observable by job-seekers, regardless of being sent intentionally or not. Indeed, the pre-study result showed that a requirement for the local language (e.g., “Excellent communication skills (oral and written) in English and Swedish”) and an inability to provide relocation support (e.g., “this job opportunity requires a valid work permit in Sweden, and we don’t offer relocation support”) was perceived as negative diversity signals 71% and 64% of the time respectively. It is also notable that while local language requirement is perceived negatively, a statement that local language is not required was not considered a positive signal. This result indicates that job seekers hold an opinion that the local language should not be required and that English should be the working language by default.

6.2 Effects of Diversity Messages

The second research question that the thesis set out to answer is “*Does the practice of signaling Diversity & Inclusive values in online job advertisements associate with the actual application behaviors of job seekers?*”. The finding confirmed a significant correlation between diversity messages and application behavior. Particularly, the presence of signals, the frequency of signals, and the presence of mixed messages consistently predict the number of applicants.

Aligning with Flory et al. 's finding that the use of inclusive statements in job advertisements raised application rates in underrepresented groups and did not dissuade majority ethnicities, this study affirmed that positive diversity signals produced a higher number of total applicants. An opposition effect is confirmed for negative signals, suggesting that negative signals are correlated to fewer applicants. Signals within job advertisements are considered relatively strong because due to high information asymmetry, job seekers actively look for cues of job and company characteristics (Connelly et al., 2011). Thus, diversity signals serve as a means to reduce information asymmetry, whereas positive signals help build an ethical corporation image and attract talent.

Additionally, the role of signal frequency was also confirmed to be a driver of the application outcome, indicating that the more positive information is communicated, the more effective the recruitment messages are, and vice versa for negative signals. Due to the dynamic environment of an online job board where there are thousands of published job advertisements at the same time, corporations are competing for job seekers’ attention. Therefore, the finding suggested that

employers can improve signaling effectiveness by increasing the amount of positive information to attract attention and prevent positive signals from being missed.

Negative presence and *negative frequency* are the two independent variables that stay significant in all models. The finding represents an important extension of the signaling theory: confirming the observability of negative signals and their negative effect on communication objectives. Moreover, the result provided a piece of empirical evidence that negative signals are stronger predictors of a job application than positive ones. The results showed an alignment with the concept of negative bias that with the same degree of extremeness, negative information tends to influence evaluations more strongly than positive information (Ito et al., 1998).

In this study, the link between diversity mixed messages and application behaviors were also investigated. Similar to Windscheid et al.'s (2016) finding, the result indicates that sending inconsistent diversity messages is associated with fewer applicants. The statistical analysis presented a significant negative effect of mixed signals on applicant attraction outcomes. Thus, this finding not only provided evidence for the notion of penalty costs for sending false signals but also challenged the previous suggestion that simply describing a company's diversity statement can result in higher organization attractiveness and more applicants. It suggested that communicating diversity values should not be an ad-hoc task but rather a strategic plan to ensure consistency between messages and avoid backfire for failing to "walk the talk".

6.3 Heterogeneous Effects Across Seniority Level and Company Size

The thesis not only suggested a potential mechanism underlying application behaviors but also probed the plausibility of heterogeneous effects among segmentations. A key learning is that not every job advertisement gains the same level of influence from diversity signals.

One such contingency is the seniority level of the advertised job position. This study found signaling effects to be more significant in junior positions than in senior positions. An explanation for this heterogeneous effect is the perception of diversity values across age groups. A recent study that surveyed the social dominance orientation of over 60,000 adults summarized that the mean score of social dominance orientation trended upward across the adult lifespan (Zubielevitch et al., 2023), indicating that older groups of adults are likely to be less supportive of diversity-promoting efforts (Avery & McKay, 2006). As senior talents are likely to be older than job seekers of junior positions, they may show less favor toward diversity values, and thus, their decisions to apply for jobs are less affected by diversity signals. Another explanation is tied to the finding that employers were more likely to include positive diversity signals in recruitment materials for senior positions than entry-level positions. Previous research mainly considered diversity signals as a "separating signal" which acts as a means to differentiate the focal employer from competitors who do not show such similar values (Shin & Gulati, 2010). However, this study suggested that when a signaling tactic is getting adopted more widely, diversity signals are meant to signal similarity, meaning that the employer is also valuing equality and fairness as other companies. Connelly et al. (2011) suggested that failing to achieve diversity values might signal an ignoring of norms. Therefore, positive signals may not improve applicant attraction outcomes, but not including them would signal a lack of commitment to equality and negatively affect the number of applicants.

Company size provides another contingency to the signaling effectiveness. A similar pattern to seniority level was recorded: large companies were more likely to employ positive signals, yet signaling effectiveness disappeared in this segmentation. Accordingly, the aforementioned explanation that when competitors are frequently employing diversity signals, those signals lose their effectiveness can be applied. Indeed, the majority of large companies with more than 5,000 employees were already signaling diversity values in their job advertisements, making it a default practice, rather than a differentiating method. On the other hand, diversity signals, specifically negative ones, still showed a consistent statistically significant relationship with the quantity of applicant pool in small and medium companies. The finding provided evidence to encourage small and medium companies to signal differentiation from competitors in the same segment which did not adopt the practice yet.

Interestingly, a contradicting effect is recorded when narrowing down the focus on small companies that the presence of mixed signals positively correlated to the number of applicants. This is opposite to the findings from the main models that mixed signals predicted fewer applicants, and that the negative effect was a penalty cost for sending inconsistent signals. Even though this result is derived from a smaller subset, the result suggested that the penalty cost is less for smaller companies than for bigger companies. Aligning with Ganesan et al.'s (2018) model that organizational familiarity mediated the effect of job advertisement content on application intention, when a large reputable company communicates negative information regarding diversity values, the influence of such negative information may be stronger than when the same information is sent from a smaller company without any prior familiarity. Therefore, the finding suggested that large companies should be more careful to avoid hurting their reputation.

6.4 Alternative Mechanisms

This analysis so far indicates the plausibility of diversity signaling as a potential mechanism for application behaviors. However, the link between diversity signals in job advertisements and the number of applicants might involve several mechanisms operating in tandem. Considering the job application journey as a consumer purchasing journey, there are likely to be multiple touchpoints between the brand and the individual. For example, a potential applicant can be exposed to information from an employer's corporate websites, social media accounts, and word-of-mouth. A company that makes extra efforts to advertise its diversity and inclusive values is likely to distribute similar messages elsewhere. Previous encounters can build up a corporation image gradually and eventually result in higher application behavior.

Factors from supply-side might be another potential mechanism that had not been probed in this study. For example, job requirements relating to the local language or rights to work in the local country may not be observed as a negative signal, but simply narrow down the number of qualified individuals. In this study, it is assumed that the pool of applicants was similar to all job positions, which was limited to job seekers for software engineer positions in Stockholm. Therefore, any extra requirement, nationality-related or task-related, would shrink the pool of potential talents that qualified for the requirement.

7 Conclusion

The final chapter will discuss the theoretical contributions and managerial implications of the research, followed by a description of the limitations of this study and suggestions for future research.

7.1 Theoretical Contributions

This thesis was grounded in three research gaps, which are (i) a lack of a systematic categorization of content that communicates diversity & inclusive value in job advertisements, (ii) incomplete empirical evidence to support the effect of job advertisement content on job application behaviors, and (iii) missing research into the new format of job advertisements—digital posts on online job boards. Based on these research gaps, the thesis's main theoretical contribution comes from adopting and extending signaling theory and applying a novel methodology to work with digital job advertisements.

Firstly, a categorization of diversity signals in online job advertisements was developed to demonstrate different methods of signaling diversity & inclusive values. The framework consisted of four dimensions: corporate diversity statement, job and work characteristics, offerings, and organizational culture. It was demonstrated that signals can be not only classified in accordance with the proposed dimensions but also labeled as positive and negative measures. By extending diversity signaling to also include negative signals, the thesis confirmed the observability of negative information and the plausible effect on the quantity of the applicant pool. Additionally, this study provided an explanation of the interplay between positive and negative signals and suggested a penalty cost for inconsistent signals. Thus, this study opens up opportunities for further theoretical investigation within signaling theory to explore the relationship between mixed signals and applicant attraction outcomes.

With signaling theory as the main theoretical framework, this thesis also applied the social identity approach to explaining the converging findings about diversity signals' effectiveness. This combination suggested an important role of social identity theory in influencing the perceived level of person-organizational fit and job choice decisions.

Secondly, this thesis proposed a new approach to examining application behaviors by taking advantage of a public database. The methodology enabled the author to collect data on a large scale, categorize diversity signals, and investigate the actual application behaviors of real job seekers for real job advertisements. Thanks to this approach, the thesis was able to fill the research gap of missing empirical evidence to measure application behaviors, instead of application intention. The result opened up possibilities to conduct large-scale research on job advertisement content and its impact.

7.2 Managerial Implications

This study shed light on the importance of job advertisement content, specifically diversity & inclusive description in attracting talent. The study confirmed that during a job application

process, job seekers are not the only ones who necessarily signal their “unobservable” characteristics to be recruited, but employers also should be more active in signaling their positive attributes to attract talents. Managers should consider job advertisements as a possibility to advertise the company’s values to potential applicants, rather than just a post outlining job descriptions and requirements.

Furthermore, managers should expand the scope of diversity dimensions in online job advertisements. In spite of being underrepresented in job advertisements, information about diversity values enhance the pool of applicants. This study showed that companies are not reaching the full potential of this practice and lack a holistic approach. By covering different forms of diversity messages, the positive message can be noticed easily and help improve overall communication effectiveness.

Finally, the study raised awareness of unintended negative signals in job advertisements and suggested managers “walk the talk” to prevent backfire. Some messages that can be sent unintentionally are observed as pieces of negative information by job seekers, creating a negative corporate image and decreasing application behavior. This thesis argued that that companies should be careful to avoid sending negative diversity signals because it is shown to have significant negative correlation with application behavior. There was an observation so-called “the paradox of diversity statements” that companies that present pro-diversity messages in job advertisements were not less likely to engage in racial discrimination during the hiring process than companies that do not display such statements (Kang et al., 2016). This is an alarming happening because without a true intention to commit to diversity, employers cannot gain instrumental and non-instrumental benefits from a diverse workforce.

7.3 Limitations and Suggestions for Future Research

There are a few limitations of this analysis, some of which will hopefully provide suggestions for future research.

A main limitation of this study is the assumption that job seekers make the decision to apply purely based on information from job advertisements. There are undoubtedly many other channels from which job seekers can obtain information regarding the company and the job, including other digital channels (e.g., corporate websites, company rating sites) and offline (e.g., word-of-mouth). I anticipated that information from these channels can be (i) obtained before exposure to job advertisements and already formed a corporation image that influences decisions to apply, or (ii) happened after exposure to job advertisements and changed the decisions to apply. Either way, cross-channel employer branding and cross-channel application journey are likely to affect the job choice decision. Therefore, future research could explore the use of diversity signals in other platforms to draw a complete picture.

Due to the above limitation, and the scope of the dataset, the thesis was not able to draw a causal relationship between independent variables and the dependent variable, but only propose a correlation. Even though this was set at the beginning as the objective of the study, future work might explore the causal relationship by running an experiment to control interferences.

This study was successful in introducing a categorization of diversity signals, and the pre-study also lightly touched on signal observability among dimensions. However, it did not study the divergence of effects among types of signals but only investigated the collective impact of all existing signals. I believe that future research can seek to answer questions of what type of diversity signals gain the most positive effect on recruitment outcomes.

Some other interesting questions that this study did not address and scholars could explore in future research include the following. Will the signaling effect stay consistent in another labor market, where companies do not have to compete fiercely for talent, or where there are more barriers for international job seekers to enter? What is the saturation point of positive signals that increasing signal frequency beyond that point does not gain extra benefit? Besides an increase in the quantity of the applicant pool, what is the effect of diversity signals on the quality of applicants?

7.4 Conclusion

The fundamental motive of this study was derived from an interesting phenomenon observed in job advertisements—the showcase of diversity values of employers. Previous literature in the view has unpacked the “why” of this phenomenon by explaining the benefits of employer branding in recruitment messages to understand the motivation for this practice. This study, however, set out to answer the “how” — how companies are exactly implementing this tactic and how much of benefits employers can gain from this for the applicant attraction process.

Based on the signaling theory and the social identity approach, I argued that by using pro-diversity language and constraint-diversity language, employers signal information to appear more attractive to potential applicants. This information will be used by job seekers to construct perceived person-organization fit and organizational attractiveness, which eventually influence their job application decisions.

The argument was tested by analyzing a sample of 976 job advertisement texts and evidence supportive of the predictions was found. The results showed that the use of diversity signals and the frequency of diversity signals significantly predicted the number of applicants. Additionally, the thesis found a negative relationship between the use of constraint-diversity language, even when being communicated together with a pro-diversity message, and the quantity of the applicant pool. This finding indicated that companies cannot gain full benefits from employer branding in job advertisements by simply saying “We are an Equal Opportunity Employer”, but that they need to “walk the talk” to ensure communication consistency. Otherwise, a penalty cost will be imposed.

Taken together, the findings represent an important extension on the literature on signaling theory: a recognition of negative signals and their effect. This thesis also provided a framework for categorizing diversity-related content in online job advertisements, enabling further research into this under-researched form of recruiting. Finally, I hope that with the implications for human resource managers from this thesis, employers can gain a sustained competitive advantage in this “War of Talent”.

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Appendices

Appendix 1. Diversity language dictionary

Job Advertisement Dimension	Content	Keywords / Key-phrases	Positive/ Negative	Observable rate in pre-study	Note
Corporate Image Statement	Corporate diversity statement	diversity inclusion equal opportunity inclusive	Positive (+)	60%	
	Recruitment statement	encourage anyone to apply welcome people of all welcome all people encourage people from all	Positive (+)	80%	
Job & Work Characteristics	Local language is not required	swedish is not	Positive (+)	0%	excluded from final dictionary
	Local language is required	speak swedish swedish is beneficial/required/mandatory fluent in swedish swedish and english english and swedish swedish preferred nordic language local language	Negative (-)	71%	
Offerings	Relocation support is available	relocation support provide visa support	Positive (+)	60%	
	Relocation support is not available	eligible to work in sweden no sponsorship do not provide relocation sponsorship valid swedish work permits don't offer relocation can't offer relocation	Negative (-)	64%	
Organizational Culture	International work environment	all kinds of backgrounds diverse teammate international work environment people from across the world global talent international work culture international culture from all over the world different nationalities diverse group	Positive (+)	87%	

Appendix 2. Robustness Test Models

Variables	Model T1 OLS	Model T2 Poisson	Model T3 Negative binomial	Model T4 Negative binomial on filtered sample ^a
Easy Apply method	34.178*** (0.478)	0.748*** (0.021)	0.829*** (0.118)	0.508*** (0.158)
On-site location	-4.860*** (0.313)	-0.145*** (0.021)	-0.175* (0.104)	0.183 (0.137)
Remote location	9.751*** (0.652)	0.228*** (0.013)	0.093 (0.148)	0.805*** (0.231)
Total word count	-0.003** (0.001)	-0.0001*** (0.0001)	-0.0003*** (0.0001)	-0.00007 (0.0003)
Company followers	0.091*** (0.002)	0.002*** (0.00008)	0.004* (0.002)	0.007* (0.004)
Days since published	-0.106*** (0.004)	-0.004*** (0.00004)	-0.002 (0.003)	-0.004 (0.003)
Positive presence	3.936*** (0.631)	-0.119*** (0.016)	0.092 (0.107)	-0.024 (0.165)
Negative presence	-5.396*** (0.212)	-0.150*** (0.006)	-0.079 (0.089)	-0.404*** (0.156)
Mixed presence	-6.821*** (0.628)	-0.223*** (0.023)	-0.367** (0.178)	0.069 (0.411)
Constant	34.565*** (2.758)	3.529*** (0.012)	3.570*** (0.070)	3.489*** (0.211)
Number of observations	976	976	927	237
Employment type FE	Incl.	Incl.	Excl.	Excl.
Industry FE	Excl.	Excl.	Incl.	Excl.
Squared Correlation		0.13	0.18	
Adjusted R2	0.12			
Log-Likelihood				1181

Notes. Standard errors in parenthesis. Excl., excluded; FE, fixed effect; Incl., included.

^aThis analysis only includes job advertisements from companies that have only one observation in the data set

*p < .1, **p < .05, ***p < .01