

ONLY YOU CAN PREVENT DISCRIMINATION:  
TESTING THE EFFECTS OF AUTONOMY-PROMOTING ANTI-PREJUDICE MESSAGES

A Thesis  
by  
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## Abstract

### ONLY YOU CAN PREVENT DISCRIMINATION: TESTING THE EFFECTS OF AUTONOMY-PROMOTING ANTI-PREJUDICE MESSAGES

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Previous research has indicated that people’s stereotypes about race, sex, and age can influence their hiring decisions. Companies often implement equal opportunity efforts and antiprejudice messaging to alleviate discrimination in hiring practices. In this study, I evaluated the effect of anti-prejudice messages on gender discrimination in hypothetical hiring decisions. Participants were shown anti-prejudice messaging that were phrased in either a controlling or autonomous manner, or they did not see a message. They then evaluated the suitability of the applicant and made a decision to hire for both a male and female candidate for two stereotypical “masculine” jobs. Similar to previous research, the controlling anti-prejudice message increased discrimination—participants were more likely to hire the man than the woman. However, there was no evidence of discrimination for participants who saw no anti-prejudice message or the autonomy-promoting message. This research provides evidence that the way anti-prejudice messages are framed can negatively impact behavior towards an individual in the context of hiring decisions. Additional research is necessary to understand when messages designed to decrease discrimination might backfire or successfully decreases discriminatory behavior.

*Keywords: discrimination, stereotyping, anti-prejudice messaging, judgment and decision-making*

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## **Only You Can Prevent Discrimination:**

### **Testing the Effects of Autonomy-Promoting Anti-Prejudice Messages**

People often make associations based on stereotypes that are learned through external sources. Stereotypes are generalizations about an individual's characteristics based on their group membership (Aronson et al., 2019) and can occur automatically, with little or no effort (Tversky & Kahneman, 1974). Stereotypes are often negative, but sometimes positive, associations of others based on identifiable or known characteristics, such as race, ethnicity, gender, age, and sexual orientation. These negative associations can be harmful to others by creating unjust attitudes towards a person, which can potentially lead to negative treatment of that individual. It is possible that reducing the influence of stereotyping on decision-making could help alleviate these negative associations. In my study, I examined whether anti-prejudice messages could reduce discrimination.

### **Stereotyping, Prejudice, and Discrimination**

As noted earlier, stereotyping occurs when people make generalizations about an individual based on their group membership. For example, people might generalize that Asian Americans are hardworking or intelligent or that African Americans are athletic or strong, based on their membership in their racial group. Other common stereotypes associate men as strong leaders, or women as kind and nurturing. While these stereotypes do not seem inherently negative, these blanket characterizations can lead to viewing an individual as a category rather than a person. Additionally, it can sometimes lead to negative perceptions of the self when the self does or does not represent those generalizations (Cashin, 2014; Thompson & Kiang, 2010).

Stereotypes of an individual can also create negative attitudes towards people based solely on their group membership, which is known as prejudice (Aronson et al., 2019). These

negative attitudes are often rooted in emotions, which make them hard to combat with logic. For example, a person might stereotype Jewish people as greedy and self-absorbed, which could lead to a prejudice towards Jewish people of hatred and anger. This irrational prejudice is damaging towards the associated group and to the individuals associated with the group.

While some people are more prejudiced than others, it is often the case that both high and low prejudiced people hold negative associations of social groups. For example, Stewart et al. (2003) showed White participants pictures of White, Black, Asian American, and Latin American college students and assessed which characteristics they associated with each racial group. Participants were more likely to associate negative characteristics with other racial groups through a reaction time task. For example, the White participants were more likely to characterize certain traits such as lazy, unintelligent, and criminal with the pictures of a Black person. Importantly, this was found even for people who scored low on the Modern Racism Scale. Stewart et al. (2003) concluded that both high- and low-prejudiced White participants were likely to stereotype Black people with negative characteristics and behaviors.

It is clear that people hold stereotypes and prejudices, but what are the potential consequences of stereotyping and prejudice, and how does it affect real-world behavior? One example of the negative effects is shown through discrimination—the unjustified negative or harmful treatment of an individual based on their membership in a particular group (Aronson et al., 2019). This harmful treatment can be obvious or subtle and can have severe, and sometimes deadly, consequences. For example, American culture often has a prejudice towards overweight people. Research has shown that overweight people are less likely to receive appropriate medical treatment from physicians because of their weight (Miller et al., 2013). This can lead to serious consequences, like in the case of Rebecca Hiles, where her cough was attributed to her weight

for years, until 5 years later a doctor finally took her problems seriously and she was diagnosed with cancer (Aronson et al., 2019). Her entire lung had to be removed because the diagnosis came so late. It was suggested that she was discriminated against by doctors for years because of her weight; her problems were not taken seriously.

Another example of discrimination is shown in the greater amount of unjustified police brutality towards people of color. There is often a stereotype held by White Americans that Black Americans exhibit exceptional strength and athleticism compared to others (Waytz et al., 2014). The combination of these generalizations, along with associations of Black Americans as criminals, are especially problematic and can create a prejudice that Black Americans are dangerous and threatening, especially in high-stress situations, such as police encounters. This can lead to a snap judgment from a White police officer when relying on these prejudice beliefs that results in unfair treatment and sometimes deadly consequences for the victim because of their race (Correll et al., 2014).

### **Development of Stereotypes**

Most of the research on stereotyping, prejudice, and discrimination has been conducted on adults, but research has also found stereotyping in children as well. Stereotypes seem to form very early in development and expand throughout the entire developmental course into adulthood. In a study examining sensitivity to gender stereotypes, Hill and Flom (2007) had 24-month-old children watch a man and a woman perform gender-consistent and gender-inconsistent activities. For example, a woman putting on a necktie was considered a gender-inconsistent activity, but a woman putting on lipstick was considered a gender-consistent activity. The researchers found that toddlers looked longer at the person performing a gender-inconsistent activity compared to the person performing a gender-consistent activity. They



theorized that longer “preference-looking” was due to a desire for new information and learning, meaning that children already have some knowledge of gendered categorizations.

In a related study, 5-, 8-, and 11-year-old children were shown a picture of a toy and were asked to assign the toy to either a girl or a boy (Banse et al., 2010). Children were more likely to assign the stereotypical boy toys (e.g., truck) to the boy and the stereotypical girl toys (e.g., doll) to the girl. According to the authors, children internalize information about the social world through observation, which creates these role-congruent stereotypes. When children consistently see boys playing with trucks and girls playing with dolls, they build a framework of gender-related associations, or stereotypes.

The findings described above highlight that awareness of gender associations occur early in development and that associations can lead to stereotyping (e.g., with which toys boys and girls should play). Additional research has shown that stereotyping can lead to negative evaluations of both the self and others. For example, Guimond and Roussel (2001) found that high school boys and girls perceived men to be better than women at math and science, but women to be better than men at language. Interestingly, these stereotypes carried over to self-perceptions for women, such that the women high school students evaluated themselves as less competent in math and science when these gender stereotypes were made salient. In short, the developmental process of forming stereotypes is important for understanding how deeply rooted these associations are. Developmental research has shown that people are born with the ability to categorize and these categorizations can develop further into stereotypes, which become more salient as we emerge into adulthood. These stereotypes can then influence people’s perceptions of the self and others.

### **Functions of Stereotypes**

Although the literature often focuses on the existence of stereotypes and how they can negatively impact individuals and groups, it is possible that stereotypes serve beneficial functions. Stereotypes can emerge through cognitive and motivational processes (Hilton & von Hippel, 1996). For example, stereotypes can make information processing easier and faster by relying primarily on existing knowledge and overlooking new information (Macrae et al., 1994). People often make assumptions because they are information-seeking, so they will make their best guess about a person to gain some sort of insight into how to interact with and understand them, whether accurate or not. For example, when evaluating a priest's honesty, most people recalled being told that he brought back lost money to the rightful owner (stereotype-consistent information) rather than that he pocketed the found money (stereotype-inconsistent information). This led participants to quicker evaluations of the priest as honest when shown stereotype-consistent information, and slower evaluations of the priest as dishonest when shown stereotype-inconsistent information (Wigboldus et al., 2003). These cognitive shortcuts can have the benefit of helping us quickly assess a situation or person based on previous knowledge. However, relying on previous knowledge can sometimes prevent us from acknowledging new, potentially more relevant, information.

Stereotypes can also provide direction and understanding of structure and social roles within society (Eagly, 1995; Fiske, 1993). For example, we make generalizations of people based on attire to help understand their positions in society. In a hospital, we would assume that a person in a white coat is a doctor and the person behind the desk is a receptionist. These generalizations are beneficial to help us understand how to interact with others in context-dependent situations.

Additionally, stereotypes help reduce ambiguity in unfamiliar situations and provide context that help simplify and categorize the complex world around us (McGarty et al., 2002; Tajfel, 1969). People might look at a flight attendant when there is turbulence on a plane to get an idea of the seriousness of the situation. People generalize flight attendants as having more information than they do in that situation. This generalization helps us understand the appropriate response in an ambiguous situation, which reduces our cognitive effort in understanding our environment and social surroundings.

Despite the beneficial functions of stereotyping, it is clear that there are also negative consequences to stereotyping. As noted above, stereotypes can influence perceptions of other people and lead to prejudice and discrimination. One specific context where discrimination has been well documented is discrimination in the workforce.

### **Stereotyping and Discrimination in the Workforce**

Workplace discrimination is a long-standing issue that affects people who are treated differently based on group membership. As noted earlier, this discrimination is built on commonly-held stereotypes. These stereotypes can be found in multiple contexts. For example, White and White (2006) tested whether participants implicitly, or unconsciously, and explicitly, or consciously, associated gender stereotypes with three different occupations. On the explicit test, participants rated an engineer as being more of a masculine occupation and rated an elementary school teacher as being more of a feminine occupation. On the Implicit Association Test (IAT), quicker response speeds represented stereotype-congruent information. Participants responded faster when associating a traditional masculine job with a man and a traditional feminine job with a woman (e.g., engineer with man, elementary school teacher with woman).

These gendered stereotypes in the workforce can sometimes lead to differential treatment (i.e., discrimination). This has been shown in real world data, where women often report more experiences of gender discrimination in the workforce compared to men working in the same positions, such as less pay, respect, support, and promotions (Parker & Funk, 2017). Not only is gender discrimination present through self-report, but there is also experimental evidence for gender discrimination in the workforce. Moss-Racusin et al. (2012) found gender discrimination in hiring decisions among faculty members. In this study, faculty members were given an application for a science lab manager position and asked to rate the applicant on competency, hireability, mentorship, and salary recommendation. The faculty members were sent one of two applications, which were identical except for the name of the applicant. Some participants were given an applicant with a masculine name and others were given an applicant with a feminine name. Moss-Racusin et al. (2012) found that faculty members rated the male applicant as more competent and hireable compared to the female applicant. Additionally, faculty members were more likely to offer mentoring and a higher starting salary for the male applicant compared to the female applicant. Interestingly, faculty members who were women were just as likely to favor the male applicant as compared to faculty members who were men.

In another study examining gender discrimination in the workforce, Glick et al. (1988) had participants evaluate the suitability of applicants for stereotypically “masculine” and “feminine” jobs. Participants read through the résumés of different applicants, who were all given the exact same qualifications, and then rated their hireability for certain jobs. The only difference between the applicants were the names on the résumés, which was either a masculine or a feminine name. Glick et al. (1988) found that participants rated the male applicants as more suitable for the stereotypical masculine jobs compared to the female applicants. Also of interest,

they found that participants rated the female applicants as more suitable for the stereotypically feminine jobs compared to the male applicants. This research provides further evidence that people often categorize others and associate specific professions as being more suitable for certain genders.

Gender discrimination is, of course, not the only form of workplace discrimination. Discrimination in the workforce is also shown in the context of race, ethnicity, age, and disabilities. For example, Ndobu et al. (2018) had participants assess the suitability of a “native-born” and “immigrant” applicant for either an IT job or a security job based on qualifications. In this study, the IT job was considered more suitable for a “native-born” applicant than an “immigrant” applicant, and the security job was considered more suitable for an “immigrant” applicant than a “native-born” applicant. This was based on a pilot-study that evaluated the suitability of certain jobs based on racial stereotyping. Ndobu et al. (2018) found that even when the “non-suitable” applicant was more qualified than the stereotypically “suitable” applicant, participants still rated the stereotypical “suitable” applicant as more favorable for that job. For example, participants rated the “native-born” applicant as more favorable for the IT job, even when the “immigrant” applicant met more of the qualifications for the job.

Overall, this research gives evidence to suggest that people discriminate when evaluating candidates for jobs that are believed to have a preconceived stereotypical “type” of person that should be performing it. This stereotyping in hiring practices can lead to real-world consequences in reducing diversity and equal opportunity in the workforce. While stereotyping is an important factor to consider in discrimination, there might be additional factors that influence prejudice in hiring decisions aside from these general associations. For example, higher importance in certain values, such as elitism, was linked to an increase in hiring White applicants

for a job compared to minority applicants (Reynolds et al., 2021). Additionally, higher importance in values like egalitarianism and resentment were linked to an increase in hiring minority applicants for a job rather than the White applicants (Reynolds et al., 2021). Other factors that have been found to impact gender discrimination in hiring decisions were perceived power of the participant, perceived personal objectivity, and perceived prejudice of the company (Hoover et al., 2019; Uhlmann & Cohen, 2007; Vial et al., 2019). This research suggests that there might be certain values and conditions that impact prejudice during hiring decisions, both positively and negatively.

### **Reducing Discrimination**

Real-world data and research show that discrimination in the workforce is problematic; fortunately, there have been efforts made to reduce this stereotyping and discrimination. As discussed earlier, prejudice can often lead to discrimination, so in order to reduce discrimination, organizations often attempt to address prejudicial attitudes. Some anti-prejudice efforts have shown evidence of a reduction in discrimination, however, there is also research to suggest that some anti-prejudice efforts could possibly have adverse effects.

### ***Interventions that Decrease Prejudice***

Ideally, anti-prejudice interventions would decrease prejudice, which in turn, would decrease discrimination. Some interventions that have been found to be effective in decreasing prejudice provided counter-stereotypical exemplars, used evaluative conditioning methods, provided strategies to override biases, or promoted the autonomy of choice.

**Counter-Stereotypic Exemplar.** This approach to prejudice reduction is grounded in the idea that attitudes linked to the self can impact prejudice. In one study examining the influence of thinking of a counter-stereotypic exemplar on stereotyping, non-Black participants were asked

to put themselves into a story about a White man assaulting them, and then a Black man rescuing them. Participants then took the IAT and were asked to keep the story in mind as they went through this task. Marini et al. (2012) found that after reading the story, participant's anti-Black prejudice was lower compared to the control condition. Another study found a decrease in prejudice compared to the control condition when providing non-Black participants pictures of Black figures labeled as "friends" and pictures of White figures labeled as "enemies" (Lai et al., 2014). These studies suggest that by providing counter-stereotypic exemplars, prejudice can be decreased.

**Evaluative Conditioning Methods.** One way that stereotypes are learned is through conditioning (e.g., repeatedly seeing criminals portrayed as Black men in movies; The Opportunity Agenda, n.d.). Lai et al. (2014) reasoned that conditioning could also be used to reduce stereotypes. In one of their studies, prejudice decreased compared to the control condition when non-Black participants saw pairings of Black faces with positive words and White faces with negative words. In another study, an adapted go/no-go association task (GNAT) was used to test the evaluative conditioning intervention (Lai et al., 2014). Non-Black participants were told to "go" when a Black person was paired with a "good" word and to do nothing if the pairing was anything else (e.g., a White person was paired with a "good" word or a Black person was paired with a "bad" word). Participants racial prejudice decreased after taking the GNAT compared to participants that did not go through the GNAT.

**Autonomy Promoting Anti-Prejudice Messages.** A simple method aimed at reducing prejudice is to have people read a message describing the importance of reducing prejudice and discrimination. These anti-prejudice messages can be framed in many ways. Legault et al. (2011) had non-Black participants read a brochure where anti-prejudice messaging was phrased in an

autonomy promoting way, meaning, participants read that they had freedom of choice in being anti-prejudice and it was entirely up to them to choose equality. It was argued that this approach might be beneficial in reducing prejudice due to self-determination theory where motivation to be anti-prejudice is rooted in the self through autonomous choice (Legault et al., 2011). After reading the brochure, participants' prejudice was measured through the Symbolic Racism 2000 Scale. Participants who had read the autonomy-promoting brochure had lower prejudice scores compared to participants who did not read the brochure. While phrasing anti-prejudice messaging in an autonomy-promoting way decreased prejudice, Legault et al. (2011) also found that when anti-prejudice messaging was phrased in a controlling manner (e.g., "you are expected to be anti-prejudiced") prejudice increased, which is described below.

### ***Interventions that Increase Prejudice***

Ideally anti-prejudice interventions would serve to decrease prejudice, but some research has found that anti-prejudice interventions can have adverse effects.

**Emphasizing Equal Opportunity.** As a potential strategy to reduce prejudiced beliefs, some companies might emphasize the importance of giving all people equal opportunities in terms of getting jobs and being promoted. However, it is possible that emphasizing equal opportunity efforts to hiring managers might not have the desired outcome. Lennartz et al. (2019) examined the impact of emphasizing equal opportunities by having participants make hiring decisions about White and Black candidates. Some participants were asked to read a short statement from the hiring company that emphasized the company's successful implementation of its equal opportunity efforts. Lennartz et al. (2019) found that participants were less likely to hire the Black candidate when given a short statement emphasizing equal opportunity as compared to participants who were not given this statement. They surmised that participants felt less



responsibility to engage in morally productive behavior (i.e., hiring the Black applicant) because of moral licensing—where a person feels less obligated to complete a morally good deed after they have already engaged in a prior good deed (Lennartz et al., 2019). The prior good deed in this study was at the company level, where the company emphasized a history of past success with equal opportunity. The company's previous success creates a greater moral self-image of the participant which results in the participant having an increased moral rationale for immoral behavior (i.e., discrimination).

**Non-Stereotypic Training.** Another method for reducing prejudicial attitudes in the workplace is by having participants go through training programs where stereotypes are unlearned (Kawakami et al., 2005). The goal of the training is for participants to break patterns of stereotypes. For example, the non-stereotypic training might show a picture of either a man or a woman, and then two words next to their pictures. Participants were asked to select the word that was not “culturally associated” with the gender of the picture. In this example, if a picture of a woman was shown along with the words “caring” and “strong,” the participants were supposed to select “strong.” After completing this training, participants were then asked to make a hiring decision for a male and female applicant. Kawakami et al. (2005) found that participants who went through the non-stereotypic training were more likely to hire the male applicant than the female applicant compared to participants who did not go through the training.

**Controlling Anti-Prejudice Messages.** As mentioned above, Legault et al. (2011) found that promoting autonomy in anti-prejudice messaging led to a decrease in racial prejudice relative to no messaging. Among these comparative approaches was an anti-prejudice messaging framed in a less autonomous, more controlling manner. When participants read messaging that phrased anti-prejudice as being “expected of you” and “necessary for society,” prejudice

increased compared to those that received no messaging. The authors proposed that these messages were counterproductive as a mechanism for more pro-Black attitudes because controlled motivation creates resentment toward anti-prejudice pressure (Legault et al., 2011). These results highlight that anti-prejudice messages can be effective at reducing prejudice, but they can also potentially have negative consequences depending on how they are framed.

### **Current Study**

The previous research suggests an interesting dilemma for anti-prejudice interventions and exposes a gap in the literature for anti-prejudice messaging. Some of the interventions above provide evidence to support the idea that anti-prejudice interventions can decrease prejudice. It is important to note, though, that many of the interventions were only successful at decreasing prejudice, not discrimination. This was shown through lack of effects and lack of measurement, respectively, emphasizing the need for more research to understand how these interventions impact discrimination. The distinction between prejudice and discrimination is important because Lai et al. (2014) found that none of the implicit measures (e.g., IAT) correlated with explicit prejudice (e.g., self-reported racial attitudes). So how do we know that these interventions impact behavior? Additionally, some of the interventions that did effect discrimination, or behavior, had adverse effects (Kawakami et al., 2005; Lennartz et al., 2019). That is, going through the intervention led participants to discriminate more, not less. Clearly, more research is needed to identify anti-prejudice interventions that impact behavior in the intended direction.

The current study helps fill this gap by examining the influence of anti-prejudice messages on gender discrimination. Specifically, the current study conceptually replicated and extended the research by Legault et al. (2011), who examined the impact of autonomy-promotion

and controlling anti-prejudice messages on racial prejudice. My study was designed with two goals in mind. First, I tested whether the messages used by Legault et al. can impact gender prejudice (as opposed to racial prejudice in their study). Second, I examined whether the messages influenced people's decisions about a specific individual rather than their attitudes towards a generalized group—as was done in Legault et al.'s study.

In the current study, participants evaluated people applying for a job based on information presented in their résumé. At the beginning of the study, the participants read an autonomy-promoting anti-prejudice message, a controlling anti-prejudice message, or received no message. To test the effect of gender discrimination, all the qualifications for the applicants remained constant except for the name on the application: either a traditionally feminine or masculine name. After reading the job ad and a résumé, the participants indicated how suitable they thought the applicant was for the job and whether they would hire the applicant.

My first hypothesis was that, overall, the decision to hire and suitability scores would be higher for the male applicant than the female applicant. This was based on previous research that has found participants to rate males as more suitable and hireable for stereotypically masculine occupations (Glick et al., 1988; Moss-Racusin et al., 2012; White & White, 2006). Importantly, my second hypothesis was that the difference between hiring decisions and suitability scores for the male applicant and female applicant would vary as a function of the anti-prejudice message that participants receive. Specifically, participants who read the autonomy-promotion anti-prejudice message would be equally likely to hire the man or woman and give similar suitability scores for both applicants (i.e., they would not exhibit discrimination in their decisions). Participants who did not read an anti-prejudice message would be slightly more likely to hire the man and give the man slightly higher suitability scores than the woman. Finally, participants who

read the controlling anti-prejudice message would be much more likely to hire the man and give the man much higher suitability scores than the woman, representing an increase in prejudice and discrimination.

## Method

### Participants

Participants were recruited through Prolific and paid \$1.80 for their participation in the study. Participants were at least 18 years old and currently residing in the United States. A statistical power analysis indicated a sample of at least 219 would be required to have an 80% chance of detecting the predicted interaction.<sup>1</sup> Based on available funding, I collected data from as many participants as possible, ensuring that it was at least above my target sample size. This gave me a total sample size of 452 ( $M_{age} = 33.4$ ,  $SD_{age} = 12.4$ , 49.1% men, 48.5% women, 1.8% non-binary, 0.7% responded that their gender was not listed).

### Design and Procedure

This study was a 3 (message: controlling, autonomous, or no message) X 2 (applicant: male or female) design, with the type of message being a between-subjects factor, and the applicant gender being a within-subjects factor.

Participants were first asked to read a message regarding prejudice in the workforce (see Appendix A). The anti-prejudice messages were adapted from the messages used by Legault et al. (2011). Participants in the controlling condition read anti-prejudice messaging about discrimination that was phrased in a more “controlling” manner. This included messaging such as “you must control prejudice” and “you are responsible for fitting in with antiprejudice norms.”

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<sup>1</sup> Specifically, using G\*Power (Faul et al., 2007) I conducted the power analysis using the “ANOVA: Repeated measures, within-between interaction” statistical test and an “A priori” type of analysis,  $f = .15$ ,  $\alpha = .05$ ,  $1 - \beta = .80$ , number of groups = 3, number of measurements = 2, correlation among repeated measures = 0, total sample size = 219.

Participants in the autonomous condition read antiprejudice messaging about discrimination that was phrased in a more “autonomous” manner. This included messaging such as “open-mindedness is important for society” and “you are free to choose equality.” Lastly, participants in the “no message” condition receive no messaging before continuing with the study.

After participants read the assigned message, they were asked to evaluate applicants based on their résumés. They were shown job descriptions for two different jobs that are considered stereotypically masculine: a data scientist and a window technician (see Appendix B for job descriptions).<sup>2</sup> The job descriptions were modeled after job postings on Indeed.com. After reading through a job description, participants were shown a résumé of a job application from a man or a woman. All participants were given the same résumés; the only difference was that the name on the résumé was either a masculine (e.g., Samuel) or feminine (e.g., Sarah) name (see Appendix C for résumés). The participant read through the résumé of the applicant and were asked to indicate how suitable the applicant is for the job and whether they would hire the applicant (see below for more details about these questions). Participants completed this procedure twice, once for a male applicant for either the data scientist or the window technician position, and then again for the female applicant for the other job. The gender of the applicant and job were counterbalanced among participants to control for order effects. Additionally, there was a memory check at the end of both résumés to make sure the participant was paying attention to the name of the applicant. Specifically, after viewing each résumé, the participants were asked to identify the applicant’s name from a list of four names. Before conducting the study, it was decided that participants would be excluded if they failed either of the attention checks.

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<sup>2</sup> Data scientist jobs comprise of 65.2% males, 19.7% females, and 15.1% unknown. Window technician jobs comprise of 88.9% males, 6% females, 5.1% unknown (Zippia, 2021a, 2021b)

After reading through the job description and résumé, participants answered three questions about their perceptions of the ability of that applicant to perform successfully at the job. The three measures that were created for this study were:

1. How good of a fit is [applicant's name] for the [specific job] listed in the job description?
2. If [applicant's name] was hired, how well do you think [she/he] would perform at the job described in the job description?
3. If [applicant's name] was hired, how likely is it that [she/he] would excel at the company?

Questions were answered on a scale from 1 (not at all) to 7 (extremely). Upon data review, the Cronbach's alpha for these 3 questions was .95; therefore, the suitability ratings for these questions were averaged to create an overall suitability score.

Next, participants were asked to make a dichotomous choice (yes or no) as to whether they would hire the applicant for the job described:

“If you were making the decisions, would you hire [applicant's name] for the [specific job]?”

After participants made their suitability ratings and hiring decisions for both job descriptions, they completed the neosexism scale (adapted from Tougas et al., 1995). This scale was chosen because it measures explicit prejudice towards women in the workforce (see Appendix D for scale). Upon data review, the Cronbach's alpha for this scale was .90, so answers were combined to create an average neosexism score. Answers on this scale were used as an exploratory measure.

Lastly, participants were asked for their age, gender, and political ideology, and then thanked for their participation.

## Results

As noted earlier, participants were excluded if they failed either of the memory check questions, meaning they did not select the correct name after reviewing the résumé. Out of the 452 participants, 42 (9.3%) incorrectly answered one memory check question and 2 (0.4%) incorrectly answered both memory check questions. Excluding these participants left a final sample of 408 participants. Based on a sensitivity analysis, this sample size gave me an 80% chance of detecting a small effect for my hypotheses.<sup>3</sup>

### Primary Analyses

#### *Average Suitability*

First, I ran a 3 (message: controlling, autonomous, or no message) X 2 (applicant: male or female) repeated measures ANOVA on the average suitability scores. There was not a significant main effect of message,  $F(2, 405) = 1.13, p = .325, \eta_p^2 = .006, 90\% \text{ CI } [0, .020]$ . The main effect of applicant was also not significant,  $F(1, 405) = 3.06, p = .081, \eta_p^2 = .008, 90\% \text{ CI } [0, .028]$ ; there was not a significant difference in suitability ratings of the male applicant ( $M = 3.28, SD = 1.43$ ) compared to the female applicant ( $M = 3.08, SD = 1.48$ ). This was inconsistent with my hypothesis that participants would rate the male applicant as more suitable for the masculine job compared to the female applicant. The message X applicant interaction was also not significant,  $F(2, 405) = 0.97, p = .382, \eta_p^2 = .005, 90\% \text{ CI } [0, .018]$ .<sup>4</sup> Again, this was inconsistent with my

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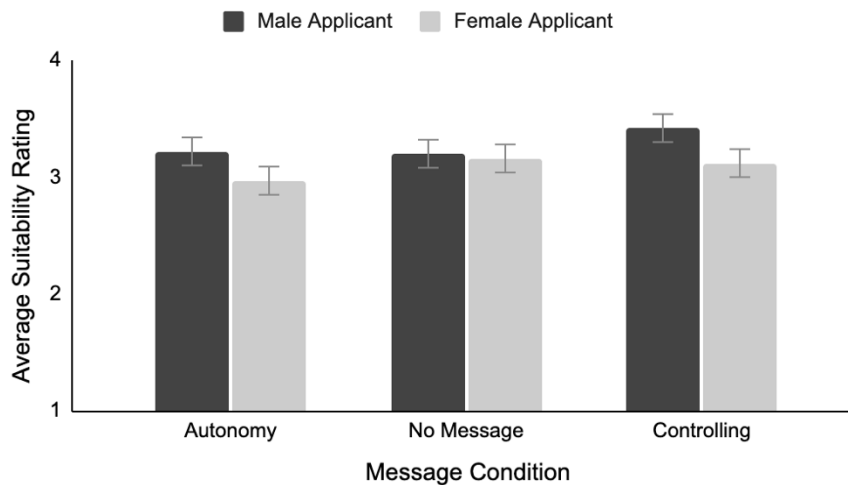
<sup>3</sup> Using G\*Power (Faul et al., 2007) I conducted a sensitivity analysis using the “ANOVA: Repeated measures, within-between interaction,”  $\alpha = .05, 1 - \beta = .80$ , total sample = 408, number of groups = 3, number of measurements = 2, correlation among repeated measures = .12, nonsphericity correction = 1. This analysis revealed I had an 80% chance of detecting an effect of  $f = .10$ .

<sup>4</sup> I also ran a 3 X 2 ANOVA without excluding participants for missing the memory check for applicant suitability. The results remained relatively the same, except there was a main effect of applicant gender, but the effect size was very small,  $F(1, 449) = 4.01, p = .046, \eta_p^2 = .009, 90\% \text{ CI } [.000, .029]$ ; participants were slightly more likely to rate the male applicant as more suitable ( $M = 3.27, SD = 1.43$ ) compared to the female applicant ( $M = 3.09, SD = 1.48$ ).

hypothesis that participants would rate the male and female applicants differently depending on the type of message they received beforehand (see Figure 1).

**Figure 1**

*Average Applicant Suitability Rating Split by Messaging Condition*



*Note.* Average suitability scores were rated on a 1 (“not suitable”) to 7 (“extremely suitable”) response scale. Error bars represent  $\pm 1$  SE.

### ***Decision to Hire***

Next, I ran a 3 (message: controlling, autonomous, or no message) X 2 (applicant: male or female) repeated measures ANOVA on the decision to hire.<sup>5</sup> There was not a significant main effect of message,  $F(2, 405) = 1.32, p = .269, \eta_p^2 = .006, 90\% \text{ CI } [0, .022]$ . The main effect of applicant was also not significant,  $F(1, 405) = 0.17, p = .678, \eta_p^2 = .000, 90\% \text{ CI } [0, .018]$ ; overall, there was not a significant difference in the decision to hire the male applicant ( $M = .25, SD = .43$ ) compared to the female applicant ( $M = .23, SD = .42$ ). This was inconsistent with my

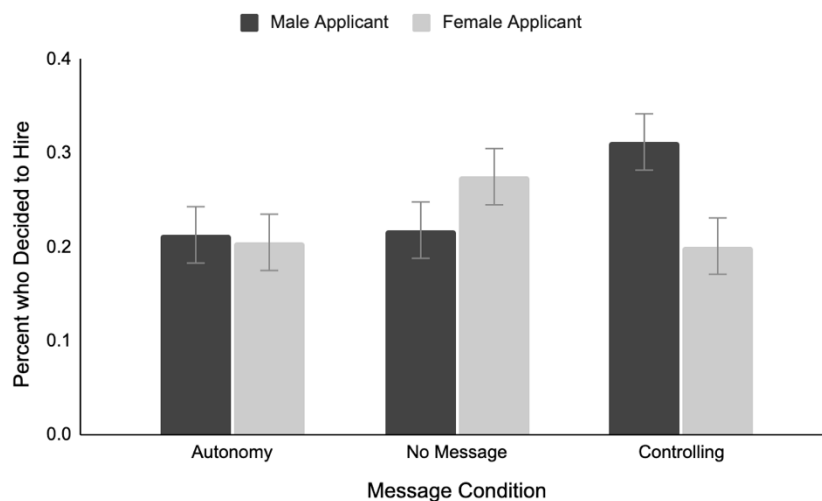
<sup>5</sup> Although decision to hire responses were dichotomous, I used an ANOVA to analyze the data following the recommendations of Lunney (1970). Specifically, my study met the required criteria for using an ANOVA to analyze dichotomous data because the proportion of responses in the smaller response category were not extreme (i.e., less than .20) and the number of degrees of freedom for the within-variance was above 20 (Lunney, 1970).



hypothesis that participants would be more likely to hire the male applicant compared to the female applicant. However, the message X applicant interaction was significant,  $F(2, 405) = 3.11, p = .046, \eta_p^2 = .015, 90\% \text{ CI } [.000, .037]$ .<sup>6</sup> This was consistent with my hypothesis that participants would rate the male and female applicants differently depending on the type of message they received beforehand (see Figure 2).

## Figure 2

*Percent who Decided to Hire Split by Messaging Condition*



*Note.* Error bars represent  $\pm 1$  SE.

Post-hoc analyses revealed that there was a small but significant difference for the decision to hire for participants who received the controlling anti-prejudice message,  $t(133) = 2.09, p = .039, d = .18, 95\% \text{ CI } [.010, .351]$ , where participants were more likely to hire the male applicant ( $M = .32, SD = .47$ ) compared to the female applicant ( $M = .22, SD = .41$ ). This was consistent with my hypothesis that the controlling message would increase discrimination (i.e., participants would be more likely to hire the male applicant than the female applicant). However,

<sup>6</sup> Again, I ran a 3 X 2 ANOVA without exclusions for the decision to hire. The results remained the same, and there was still a significant message X applicant interaction,  $F(2, 449) = 3.12, p = .045, \eta_p^2 = .014, 90\% \text{ CI } [.000, .034]$ .

there was no difference for the decision to hire for participants who received no anti-prejudice message,  $t(132) = 1.45, p = .150, d = .13, 95\% \text{ CI } [-.296, .045]$ . Participants were no more likely to hire the male applicant ( $M = .22, SD = .42$ ) than the female applicant ( $M = .28, SD = .45$ ), meaning there was no discrimination in this condition. This was inconsistent with my hypothesis that there would be a small amount of discrimination among participants who saw no message. Lastly, there was no difference for the decision to hire for participants who received the autonomous anti-prejudice message,  $t(140) = 0.14, p = .887, d = .01, 95\% \text{ CI } [-.153, .177]$ . Again, participants were no more likely to hire the male applicant ( $M = .21, SD = .41$ ) than the female applicant ( $M = .21, SD = .41$ ). Overall, these results partially support my conclusion; the controlling message increased discrimination relative to receiving no message, but the autonomy-promoting message did not decrease discrimination relative to the no message condition.

## **Exploratory Analyses**

### ***Decision to Hire Data Scientist***

As an exploratory analyses, I conducted separate analyses on participants' decision to hire the candidates for each job. I first ran a 3 (message) X 2 (applicant) ANOVA on the decision to hire for just the data scientist position. There was no main effect of applicant gender on the decision to hire for the data scientist position,  $F(1, 420) = 2.36, p = .125, \eta_p^2 = .006, 90\% \text{ CI } [0, .023]$ , meaning participants were no more likely to hire the male applicant than the female applicant for this job. Additionally, there was not a significant message X applicant interaction on the decision to hire for the data scientist position,  $F(2, 420) = 1.27, p = .282, \eta_p^2 = .006, 90\% \text{ CI } [0, .021]$ . This pattern is different from my primary analyses where there was a significant

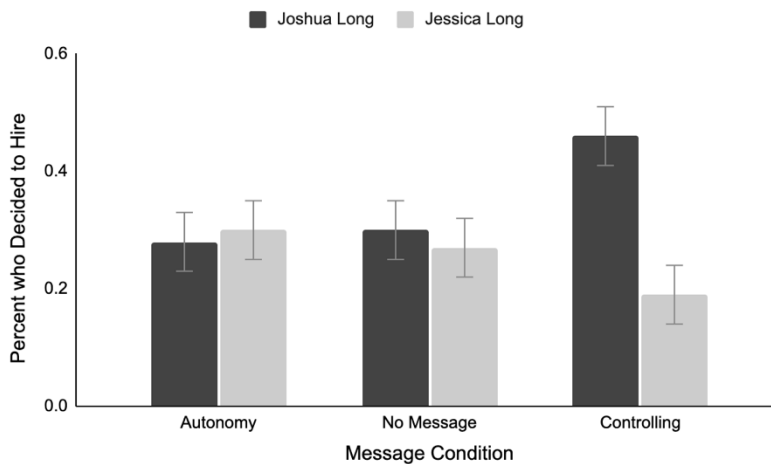
interaction, which suggests that the interaction seen in the primary analysis for decision to hire was not driven by the data scientist position.

### ***Decision to Hire Window Technician***

Next, I ran a 3 (message) X 2 (applicant) ANOVA on the decision to hire for just the window technician position. There was a significant main effect of applicant gender on the decision to hire for the window technician position,  $F(1, 426) = 4.18, p = .042, \eta_p^2 = .010$ , 90% CI [.000, .031], where participants were more likely to hire the male applicant ( $M = .34, SD = .48$ ) than the female applicant ( $M = .25, SD = .44$ ). This was consistent with my hypothesis that there would be gender discrimination regardless of the messaging condition; however, this is different from the primary analyses that found no main effect of applicant gender on the decision to hire. There was also a significant message X applicant interaction on the decision to hire for the window technician position,  $F(2, 426) = 3.86, p = .022, \eta_p^2 = .018$ , 90% CI [.001, .041]. Similar to my primary analyses, participants who saw the controlling anti-prejudice message were significantly more likely to hire the male applicant for the window technician position ( $M = .46, SD = .50$ ) compared to the female applicant ( $M = .19, SD = .40$ ),  $t(138) = 3.42, p < .001, d = .58$ , 95% CI [.232, .922]. This suggests that participants were more likely to discriminate based on gender after receiving the controlling message compared to participants who saw no message. Similar to the primary analyses, there was no discrimination in the autonomous condition, nor the no message condition, meaning participants were equally likely to hire both applicants in both of these conditions (see Figure 3).

**Figure 3**

*Percent who Decided to Hire Split by Messaging Condition for Window Technician Position*



*Note.* Error bars represent  $\pm 1$  SE.

### ***Testing for Other Variables***

Next, I ran four separate 3 (message) x 2 (applicant) repeated measures ANCOVAs for the average suitability scores, with each analysis including one demographic variable as a covariate. Overall, there was no significant interaction between the neosexism scale ( $p = .473$ ,  $\eta_p^2 = .004$ ), political ideology ( $p = .769$ ,  $\eta_p^2 = .001$ ), age ( $p = .992$ ,  $\eta_p^2 = .000$ ), or participant gender ( $p = .701$ ,  $\eta_p^2 = .002$ ) with message X applicant interaction for the suitability scores. In other words, the demographic variables did not moderate the influence of the messages on participants' suitability scores for the male and female applicant. However, there was a main effect of age on average suitability ratings ( $p < .001$ ,  $\eta_p^2 = .027$ ); where older participants were less likely to rate the applicant as suitable for the job in general, regardless of the applicant's gender or the message condition.

I also ran four separate 3 (message) x 2 (applicant) repeated measures ANCOVAs for the average decision to hire, with each analysis including one demographic variable as a covariate.

Overall, there was no significant interaction between the neosexism scale ( $p = .686, \eta_p^2 = .002$ ), political ideology ( $p = .982, \eta_p^2 = .000$ ), age ( $p = .804, \eta_p^2 = .001$ ), or participant gender ( $p = .652, \eta_p^2 = .002$ ) with message X applicant interaction for the decision to hire. Again, none of the demographic variables moderated influence of the message on participants' hiring decisions for the male and female applicant. Again, there was a main effect of age on the average decision to hire ( $p < .001, \eta_p^2 = .027$ ); where older participants were less likely to hire the applicant for the job in general, regardless of the applicant's gender or the message condition.

### Discussion

As noted earlier, there were two primary goals of this study. The first was to examine the influence of controlling and autonomy-promoting anti-prejudice messages in a new context and the second was to examine whether the messages can influence people's decisions about a specific individual rather than their attitudes towards a generalized group. Based on previous literature, it appears that the effectiveness of anti-prejudice interventions exposes a disconnect between expectations and reality. Legault et al.'s (2011) studies are prime examples of how intentions might not align with the results. My study followed the methodology used by Legault et al. (2011) and expanded the research to understand how the framing of anti-prejudice messaging impacts gender discrimination in hiring decisions of male and female applicants.

My first hypothesis was that, overall, participants would be more likely to hire the male applicant and rate the male applicant as more suitable for the job than the female applicant. This hypothesis was not supported; overall, participants rated both the male and female applicant as equally suitable and that they would be equally likely to hire the male and female applicant.

My second hypothesis was that there would be different amounts of gender discrimination dependent on the type of messaging participants received. This hypothesis was

partially supported. Interestingly, there was no evidence that the type of message participants received impacted their suitability ratings of the applicant. However, there was evidence that the type of message participants received impacted their decision to hire the applicant. This was arguably more relevant for my study based on my research question regarding how a message designed to limit prejudice impacted discrimination (i.e., the decision to hire the applicant). In the real world, it matters less if someone thinks a candidate is suitable for a job, and more if they chose to actually hire the candidate.

For the decision to hire, participants who received the controlling anti-prejudice message exhibited significant gender discrimination. Specifically, 32% of the participants chose to hire the male applicant while only 22% of the participants chose to hire the female applicant. This is notable because the only difference between the résumés the participants saw was the name (and assumed gender) of the applicant. These results are consistent with the findings by Legault et al. (2011) that the controlling message increased discrimination. Legault et al. (2011) stated that a potential reason that the controlling message increased discrimination is that it produces feelings of resentment which then led to the resistance of anti-prejudice pressure (i.e., leading participants to be more prejudice). Legault et al. (2011) speculated that this “counter-response” is based in reactance theory—people tend to exhibit defiance when their autonomy is threatened through control (Brehm & Brehm, 1981). Other studies have found reactance effects when pressured to hold pro-Black attitudes (Plant & Devine, 2001), when shown over-personalized ads (Brinson et al., 2018), and when threatened with vaccine mandates in response to COVID-19 (Sprengholz et al., 2021). In all these cases, attempting to control the behavior of individuals resulted in an increase of reactance where participants tried to take action against the controlling mechanism

(e.g., increased racial prejudice, increased likelihood of installing ad-blockers, increased avoidance of the COVID-19 vaccine).

I also hypothesized that the autonomous anti-prejudice message would reduce gender discrimination compared to those who received no message. Again, this approach has previously been speculated to be beneficial in reducing prejudice due to self-determination theory, so it was believed that it might also be beneficial in reducing discrimination. There was no evidence of gender discrimination for those who saw the autonomy-promoting message; 21% of the participants chose to hire the male applicant and 21% chose to hire the female applicant. While this was the intended result of the autonomy-promoting message, it would be inaccurate to conclude that the autonomous message decreased gender discrimination. Participants who received no anti-prejudice message also exhibited equal levels of gender discrimination, and, if anything, were slightly more likely to hire the female applicant. Therefore, it cannot be concluded that the autonomous message was effective in reducing discrimination because something cannot be reduced if it was non-existent in the first place.

While it cannot be concluded that the autonomy-promoting message reduced discrimination, the bright side of this study is that participants did not discriminate against the female applicant in the no message condition. This was inconsistent with my hypotheses, but that is not necessarily a bad thing. The fact that there was no gender discrimination in this condition could be due to an overall change in perceptions of the stereotypical gender for these jobs. While there are still statistical discrepancies of gender make-ups for certain jobs (e.g., having predominantly more men than women), it is possible that general perceptions of these jobs are changing. This perception might also be exacerbated considering that most participants in this study (60.3%) identified as at least “somewhat liberal” which is not representative of the entire

population. It has been theorized that liberals tend to be more open-minded, tolerant, and endorse diversity compared to conservatives (Carney et al., 2008). It is possible that the changing societal perceptions and the skewed political ideology of the participants toward liberalism in this study led to the lack of gender discrimination exhibited for participants who saw no anti-prejudice message.

Furthermore, exploratory analyses revealed that the impact of anti-prejudice messaging might be driven exclusively through the window technician position rather than the data scientist position. This could potentially be the case because of the differences in masculinity between the two jobs. Arguably, there is a spectrum of masculinity and femininity on which these jobs lie. That is, the window technician job might be considered more of a “blue-collar” job, while the data scientist job might be perceived as more of a “white-collar” job (Parietti, 2021). This may have impacted participants judgments and decisions. While both jobs are considered to be masculine positions based on their gender make-up (i.e., having predominantly more men than women; Zippia, 2021a, 2021b), it is possible that the window technician position is considered to be more stereotypically masculine because it is a more physically taxing job. While there still is a gender gap in data science, since it is not as physical of a job as a “blue-collar” job, it might not be considered as comparatively masculine. This might be why the effect of the message was only seen for the window technician position.

Another reason why there might be different effects between the data scientist and window technician positions is because participants might be less familiar with data scientists in general. There might be a lack of familiarity with what a data scientist does and the typical person who is working that job. On the other hand, people might be more familiar with what a window technician does and the typical person who is working that job. Again, this lack of



familiarity might have impacted the lack of effect the anti-prejudice messages had for the data scientist position.

Although this study opened a new area of research in understanding the effects of anti-prejudice messaging in hiring decisions, there are some limitations to be addressed. This study was designed to be a first step at looking at the influence of anti-prejudice messages on discriminatory behavior. As such, I did not prioritize external validity, and instead focused on internal validity. Because of this decision, the external validity of this study is questionable considering these hiring decisions were made by Prolific participants about hypothetical jobs. These participants may not have had any experience in hiring practices, so this study cannot necessarily be generalized to represent the actions of actual hiring managers. Also, since the study was conducted online there are no real-world benefits or consequences for any hiring decisions made, which could have affected participants' decision-making. However, the purpose of this research was not to make generalizations of hiring decisions, rather, the hiring decisions were used as the context to measure behavior. The goal of this study was to be a first test as to whether anti-prejudice messages can have downstream consequences (i.e., increasing discrimination) beyond people's attitudes towards a generalized group—as was demonstrated by Legault et al. (2011).

It is also important to note the relatively low hiring decisions overall. For example, in the autonomous condition, participants only hired the applicant about 21% of the time. If hiring decisions were a bit higher overall, then we might see bigger differences between conditions. However, the résumés were purposefully made to be vague and less qualified to allow for gender biases to come into play. By making the applicants more qualified it is possible that ceiling effects might prevent the anti-prejudice messaging from impacting decisions. Further research

could evaluate how anti-prejudice messaging impacts judgments and decisions when applicants are more qualified for the position.

Additionally, it is also possible that the autonomous messaging might need to be adjusted to be less controlling. Some of the language in the autonomous message is arguably a bit controlling, even though it is less so than the controlling message. While this study was designed to test these messages that have already been pre-established by Legault et al. (2011) and shown to effect prejudice, maybe further adaptation is necessary to ensure that the phrasing of the messages are matching the intentions.

Additionally, as addressed earlier, it is important to consider that these jobs lie on a spectrum of masculinity and femininity. I only evaluated this methodology in the context of two stereotypical masculine jobs and it might be the case that other masculine jobs would show different results. Specifically, it would be interesting for a future study to examine the difference between “blue-collar” jobs and “white-collar” jobs that are both stereotypically masculine. Based on my exploratory analyses, I would speculate that the reactance effect from the controlling message would result in significantly greater discrimination for “blue-collar” jobs than for “white-collar” jobs. This follow-up study might help give us a better understanding of the context in which anti-prejudice messaging impacts behavior.

On the other side of the spectrum, since my study only evaluated masculine jobs, it might also be interesting to conduct a follow-up study with stereotypically feminine jobs. Previous research has shown that not only do participants consider men to be more suitable for masculine jobs, but they also consider women to be more suitable for feminine jobs (Glick et al., 1988; White & White, 2006). Based on this research, if a follow-up study was conducted using two stereotypically feminine jobs, I would expect to see a similar pattern of gender discrimination for

the decision to hire, but in the opposite direction. For jobs that are considered stereotypically “hyper-feminine,” such as a nurse or a secretary, I would expect participants who receive a controlling anti-prejudice message to be more likely to hire a female applicant than a male applicant for these jobs. This would expand the literature on the impact of anti-prejudice messaging to the other spectrum of gender discrimination and could provide a deeper understanding of how anti-prejudice messaging impacts decision-making in this context.

In addition to expanding the research of anti-prejudice messages on gender discrimination in hiring decisions, future studies could examine other discriminatory behaviors. As noted earlier, discrimination can take many forms and occurs in a multitude of contexts. Outside of gender, discrimination can occur based on race, sexual orientation, age, religion, and political beliefs. For example, lending discrimination is where loan lenders charge higher interest rates or deny approval for a mortgage on the basis of group membership, where people of color are much more likely to be denied for a mortgage or given higher interest rates (Ceizyk, 2020). Another example of discrimination is in the housing market, where Black homeowners are often given lower appraisals when attempting to sell their home (Badger, 2016). Similar to discrimination in the workforce, laws are set in place to avoid this discrimination, however, it still exists under the radar. Ideally, anti-prejudice interventions could be expanded to situations other than in the workforce to alleviate discrimination in a wide variety of contexts. It would be important to identify when messages can make things worse so backfire effects can be avoided.

Finally, future research could also examine potential individual differences in reactions to anti-prejudice messages. In my study, political orientation did not interact with the influence of the anti-prejudice messages on decisions to hire the applicants. However, it seems quite possible that some people might experience more reactance to anti-prejudice messages than others. Future

studies could include a variety of personality and demographic measures to get a better understanding of who is most effected by reactance. For example, Baumeister et al. (2002) found that people who are high in certain facets of narcissism tend to be more reactive to social and romantic rejection. Therefore, it could be possible that people who are higher in narcissism are more likely to be reactive against controlling anti-prejudice messages, or other anti-prejudice interventions.

In conclusion, few studies exist evaluating the phrasing of anti-prejudice messaging and how that effects decision-making. This research is important because anti-prejudice messaging is a common initiative used by companies in order to promote diversity in hiring practices, but if the phrasing of the messaging matters, then the efforts of these companies might be negated. Overall, based on the current study, it seems like the framing of anti-prejudice messaging does matter. More specifically, when messages were framed in a controlling way, this led participants to exhibit more gender discrimination than when participants received no anti-prejudice message. My study corroborates the findings of Legault et al. (2011) that controlling messaging seems to increase discrimination due to reactance. Overall, though, further research is needed in the area to fully understand the effects of anti-prejudice messaging and how that effects discrimination based on gender. Anti-prejudice interventions should be researched more before being implemented into the real world; although the intention is to alleviate discrimination, it is possible that they might be doing the opposite.

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## Appendix A

### *Anti-Prejudice Messages*

#### **Controlling Message**

##### **Cracking Down on Prejudice in Our Society**

In today's society, you must control prejudice. In other words, being American means having an anti-prejudiced attitude. For instance, Title VII of the Civil Rights Act *prohibits* discrimination in employment based on the grounds of gender identity or sexual orientation. Employers have an obligation to create a 'no prejudice' workplace, and companies face legal liability for workplace prejudice or discrimination. The same standards are being set in the education domain. In fact, a recent government policy initiative by Human Resources and Skills Development requires that educators demand anti-prejudice classrooms. Teachers and students caught displaying sexist attitudes and behavior can face serious consequences, such as termination or expulsion. There are also social perks to controlling sexism - for instance, low prejudiced people tend to be better liked than sexists. The better we are at reducing prejudice, the more we are likely to fit in with today's anti-prejudice norms. Research studies reveal that people with prejudiced attitudes are at risk of being excluded or ostracized. In one recent study, most people reported that their social groups at work and at school disapproved of prejudice and sexism, and people feared being looked down upon if they made prejudiced or sexist remarks. In today's society, we should all be less prejudiced. We should all refrain from negative stereotyping. It is, after all, the politically and socially correct thing to do, and it's something that society demands of us.

#### **Autonomy Promoting Message**

##### **Why it's Important to Reduce Prejudice in Our Society**

As a society, we hold the virtues of tolerance and gender nonprejudice in a very special place - they are important because they increase open-mindedness and social justice. Social justice is the vital ingredient in a free, fair, and peaceful society for all genders. When equality and equity among human beings are achieved, there is less reason for any group or individual to be unhappy. It is also important to be nonprejudiced because it is *so* interesting to interact with and learn about people of other genders and social groups. We live in a wonderful and diverse community. That diversity makes our society great because it brings a wealth of knowledge and experience together. When we let go of gender prejudice, the rich diversity of society is ours to enjoy. Not to mention, being open-minded is a real advantage to our mood and well-being. When there is less gender tension, people are happier and healthier, and better able to do the things they enjoy. You are free to choose to value nonprejudice. Only you can decide to be an egalitarian person. In today's increasingly diverse society, such a personal choice is likely to help you feel connected to yourself and your social world.

## Appendix B

### *Job Descriptions*

#### **Data Scientist Job Description**

##### **Data Scientist**

If data analytics is your passion then the Carolina Research Institute is looking for you to join our team as a Data Scientist.

The Carolina Research Institute is fast paced, research-focused organization uniquely positioned as both an academic research center and clinical research site servicing industry research. Research conducted at the Carolina Research Institute allows physicians to offer the best available options, treatments, and cost savings identified through evidence-based research. Our research findings are repeatedly published worldwide for the betterment of orthopedics.

We are seeking a Data Scientist with Masters level experience and experience in SAS. In this role you would perform analytics to further the company mission of advancing orthopedic research and education, while ensuring quality data and publishable results.

You would be a good fit for this position if you possess the following qualifications:

- Solid research experience (idea, protocol development, data collection, analysis, conclusion/dissemination)
- Excel in high pressure situations and working with short timeframes
- Experience in taking a research objective and developing research protocol
- Ability to handle an environment with high volume of work and pressing deadlines
- Statistical knowledge/experience in SAS at a Biostatistician level

Other requirements for this role:

- A College degree (BA, BS) required; MA or advanced degree preferred.
- Training in statistics, public health, economics, or related health services field required.
- Previous data analytic experience required, additional experience with machine learning is preferred.
- Should have a combination of appropriate education and experience in statistics to equal 3 years.
- Experience with large research projects and large databases preferred.

#### **Window Technician Job Description**

**Come join the team as our newest window technician!**

NOW HIRING!! If you have experience in construction, we would like to speak with you. Apply today and our hiring manager will follow up! Compensation: \$16-\$21 per hour.

Around here, we're not just glass experts. We're skilled craftsmen. Makers. Doers. Problem solvers. Come join a brand rich in tradition. A place where your hard work is valued above all.

**Specific Responsibilities:**

- Assist installing glass, mirrors, doors, and window hardware in replacement and new installations
- Help ensure the efficient use of materials and maintain adequate stock of vehicle
- Learn how to conduct accurate field measuring and cut flat glass and mirrors according to specified dimensions and patterns.
- Keep company vehicle and equipment properly serviced, clean, and in good working order and condition
- Complete invoices, daily route sheets, and weekly reports as required
- Perform other duties as needed which may include construction and plumbing tasks

**Job Requirements:**

- Prior construction experience preferred
- Ability to measure accurately and perform calculations required for window installation
- No fear of heights on a ladder or lift

## Appendix C

### Résumés

#### Data Scientist

<b>Sarah Thompson</b>	<p><b>Sarah Thompson</b> 787-409-7762 sthomas3@gmail.com</p> <hr/> <p><b>Skills</b> Statistics, Problem Solving, Critical Thinking, Communication, Organization</p> <hr/> <p><b>Experience</b>  <b>Intern / Red Group Analysts</b>                  JUNE 2019 - PRESENT   Cary, NC  <ul style="list-style-type: none"> <li>Organized file system</li> </ul> <b>Teaching Assistant / University of North Carolina, Greensboro</b>                  AUGUST 2015 - MAY 2017   Greensboro, NC  <ul style="list-style-type: none"> <li>Instructed students in writing</li> </ul> <b>Bartender / Greenbriar Brewery</b>                  OCTOBER 2013 - NOVEMBER 2015   Greensboro, NC  <ul style="list-style-type: none"> <li>Memorized restaurants beer stock and accompanying meals</li> </ul> </p> <hr/> <p><b>Education</b>  <b>B.S. Marketing / University of North Carolina, Greensboro</b>                  AUGUST 2013 - MAY 2017   Greensboro, NC</p>
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<b>Samuel Thompson</b>	<p><b>Samuel Thompson</b> 787-409-7762 sthomas3@gmail.com</p> <hr/> <p><b>Skills</b> Statistics, Problem Solving, Critical Thinking, Communication, Organization</p> <hr/> <p><b>Experience</b>  <b>Intern / Red Group Analysts</b>                  JUNE 2019 - PRESENT   Cary, NC  <ul style="list-style-type: none"> <li>Organized online filing system</li> </ul> <b>Teaching Assistant / University of North Carolina, Greensboro</b>                  AUGUST 2015 - MAY 2017   Greensboro, NC  <ul style="list-style-type: none"> <li>Instructed students in writing</li> </ul> <b>Bartender / Greenbriar Brewery</b>                  OCTOBER 2013 - NOVEMBER 2015   Greensboro, NC  <ul style="list-style-type: none"> <li>Memorized restaurants beer stock and accompanying meals</li> </ul> </p> <hr/> <p><b>Education</b>  <b>B.S. Marketing / University of North Carolina, Greensboro</b>                  AUGUST 2013 - MAY 2017   Greensboro, NC</p>
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#### Window Technician

<b>Jessica Long</b>	(555) 496-7090 jlong@gmail.com
<p><b>EXPERIENCE</b></p> <p><b>Gardener— Spring Lake</b>                  JULY 2017 - PRESENT  <ul style="list-style-type: none"> <li>Upkept the landscape and maintained garden</li> </ul> <b>Server— The Inn</b>                  JULY 2016 - JULY 2017  <ul style="list-style-type: none"> <li>Serve customers in a timely manner in a hectic environment</li> </ul> <b>Volunteer Club— North East High School</b>                  OCTOBER 2014 - MAY 2016  <ul style="list-style-type: none"> <li>Volunteered at various local organizations</li> </ul> </p> <p><b>EDUCATION</b></p> <p><b>North East High School</b>                  AUGUST 2012 - MAY 2016</p> <p><b>VOLUNTEER</b></p> <p><b>Habitat for Humanity — Volunteer</b>                  NOVEMBER 2018 - PRESENT</p>	<p><b>SKILLS</b></p> <p>Hard-working                  Communication                  Leadership                  Loyal</p>

<b>Joshua Long</b>	(555) 496-7090 jlong@gmail.com
<p><b>EXPERIENCE</b></p> <p><b>Gardener— Spring Lake</b>                  JULY 2017 - PRESENT  <ul style="list-style-type: none"> <li>Upkept the landscape and maintained garden</li> </ul> <b>Server— The Inn</b>                  JULY 2016 - JULY 2017  <ul style="list-style-type: none"> <li>Serve customers in a timely manner in a hectic environment</li> </ul> <b>Volunteer Club— North East High School</b>                  OCTOBER 2014 - MAY 2016  <ul style="list-style-type: none"> <li>Volunteered at various local organizations</li> </ul> </p> <p><b>EDUCATION</b></p> <p><b>North East High School</b>                  AUGUST 2012 - MAY 2016</p> <p><b>VOLUNTEER</b></p> <p><b>Habitat for Humanity — Volunteer</b>                  NOVEMBER 2018 - PRESENT</p>	<p><b>SKILLS</b></p> <p>Hard-working                  Communication                  Leadership                  Loyal</p>

**Appendix D***Neosexism Scale (adapted from Tougas et al., 1995)*

1. Discrimination against women in the workforce is no longer a problem in the United States.
2. I consider the present employment system to be unfair to women.
3. Women shouldn't push themselves where they are not wanted.
4. Women will make more progress by being patient and not pushing too hard for change.
5. It is difficult to work for a female boss.
6. Women's requests in terms of equality between the sexes are simply exaggerated.
7. Over the past few years, women have gotten more from the government than they deserve.
8. Universities are wrong to admit women in costly programs such as medicine, when in fact, a large number will leave their jobs after a few years to raise their children.
9. In order not to appear sexist, many men are inclined to overcompensate women.
10. Due to social pressures, firms frequently have to hire underqualified women.
11. In a fair employment system, men and women would be considered equal.

*Note.* These questions were answered on a 1 (strongly disagree) to 7 (strongly agree) response scale.



## **Vita**

Kailey E. Plowman was born in Greensboro, North Carolina in July 1998. She was raised in Apex, North Carolina by her father, Michael Plowman, and stepmother, Mary Jane Plowman. She graduated from Apex High School in May 2016 and then moved on to complete her undergraduate degree at Appalachian State University. In May 2020 she received a Bachelor of Sciences degree in Psychology with a Human Services concentration. In the fall of 2020, she began a Master of Arts degree in Experimental Psychology under the mentorship of Dr. Andrew Smith. Her M.A. is expected to be awarded in May 2022. During her graduate career, Kailey managed a research lab, attended national conferences, received several research grants, and worked at the university as a Research and Data Analysis Consultant. She hopes to continue helping other researchers with their personal projects while also continuing her own research goals into her future career.

In June 2022, Kailey will start a position as a Senior Associate Market Researcher at the Gerson Lehrman Group. She will be working remotely while living in Hickory, North Carolina with her partner, Alex, and her two fur-babies, Hank and Stumpy.