



Does Mood affect Sexual and Gender Discrimination in Hiring Choices? Evidence from Online Experiments

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ABSTRACT

We explore whether there is a link between mood and hiring decisions. This research examines how positive mood affects the discrimination faced by homosexual and female job candidates compared to heterosexual and male ones. We randomly assign respondents to one of two mood-inducing videos (positive and neutral), and we allow subjects to make a series of hiring choices prior and immediately after watching the mood-inducing video. Our experiment being conducted in the online labor platform Amazon Mechanical Turk, allows us to track the complete hiring process and monitor employers' behavior within and without our treatment context. Constructing pairs of curriculum vitae, distinguished only by the sexual orientation or the gender of the applicants in each case, leads to the observation that women and gay men faced a significantly lower chance of getting hired. We also find that female employers proposed higher levels of discrimination only in the case of female applicants. Our positive mood manipulation leads to a decrease of discrimination levels. Thus, there is substantial experimental evidence to suggest that discrimination based on sexual orientation and gender also exists in online labor markets. An additional experiment with negative mood manipulation, also, gives evidence for the opposite direction of the effects, contributing to a broader picture of the relationship between mood and discrimination behavior. Contributions to the literature on hiring discrimination, mood research and the online economy are discussed.

1. Introduction

This study investigates a question of interest to economists, behavioral scientists, employers and policymakers: Does mood state affect employers' discrimination behaviour during a recruitment process? Discrimination exists throughout several aspects of life with many negative consequences (Arrow, 1973). When discrimination occurs in the workplace, there are consequences for the company and consequences suffered by the employees. The immediate consequences of job discrimination for a worker or job applicant are obvious: you are not hired or promoted, even when you are qualified, resulting in earning inequalities. The main sources of discrimination among individual differences are gender, age, race and current sexual orientation (Becker, 1957; Gardeazabal & Ugidos, 2005; Drydakis, 2009 and Akoy et al. 2019). The economic literature has been interested in the causes of labor discrimination and their underlying mechanisms, which may result in some form of market failures (Krueger, 1963; Stiglitz, 1973 and Neumark, 2018). Becker, 1993, pointed out that a taste for discrimination among profit-maximizing employers, employees or customers is a

prerequisite for discrimination in the labour market. Given the widely cited prevalence of gender inequality in several societies, it seems likely that women experience discrimination in the labour market.

Mood is pervasive in many social environments and human interactions, characterizing key aspects of our everyday relations and establishing patterns of behavior. While psychologists argue that humans often make different real-life decisions depending on their mood tendencies (Isen, 1987), economists have lately tried to factor mood into traditional economic decision-making theories (Rick & Lowewenstein, 2008; Kirchsteiger et al. 2006 and Dufwenberg et al. 2011). This research uses experimental methods and techniques based on social psychology to shed light on our understanding of the causal link between immediate mood and hiring behavioral outcomes and tries to answer the research question: Does a positive mood in employers reduce discriminatory behavior during the hiring process?

By focusing on gender and sexual discrimination as our main discriminatory factors, our series of online experiments provide strong evidence that positive mood in employers can reduce discriminatory behavior during the hiring process. Positive mood treatment increased

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the probability of female and homosexual candidates being hired, on average by 24% and 21%, respectively, while negative mood drives hiring probabilities in the opposite direction. This result was defined by observing employers hiring decisions. Sending, initially, pairs of curriculum vitae, distinguished only by the sexual orientation or the gender in each case, of the applicant workers, led to the observation that gay men and females, faced a significantly lower chance of receiving an invitation for an online job. Next, by randomly assigning mood treatments to employers in a series of online experiments, we provide evidence that mood plays a key role within employers' hiring behavior mechanism

It is apparent that sexual minorities also face unfair treatment in labor markets¹. Research studies have shown lower incomes for homosexual workers (Drydakis 2009; 2015 and De Schutter, 2008) and argue that this aspect of discrimination is the dominant mechanism that explains the variation in wage inequalities (Black et al. 2007 and Martell, 2019). Sexual orientation discrimination in the workplace occurs when an employee is subjected to negative employment action, harassment, or denial of certain benefits because of their sexual orientation or the sexual orientation of someone they are close to².

Following this direction, economists experimentally revealed that in real labor conditions, monthly unemployment bore a link with occupational access constraints and wage sorting in vacancies offering lower remuneration for gay men and decreasing their access to occupations by 9.6% (Drydakis, 2021), and job candidates who were part of the LGBTQ community were significantly less likely to be invited for an interview or to be offered a job (Ahmed et al., 2013; Baert, 2014; Bertrand & Duflo, 2017; Neumark, 2018 and Acquisti & Fong, 2020). Regarding online labor contexts, Coffman et al. 2017, using a list of experiments, tried to find the true rate of nonheterosexuality in an Amazon Mechanical Turk sample. The authors found that rates of nonheterosexual identity implied by the experiment were 65 percent larger than rates based on direct self-reports. Nevertheless, until now, there has been a research gap on the magnitude of discrimination within online labor contexts and the determinants of employers' underlying mechanism of hiring.

In the United States, an estimated 4.5% of the population—11 million people—identify as LGBT. With a large majority of this population—88%—in the workforce, more employers have pushed for LGBT-centric initiatives. However, wage inequalities are only one of the possible forms that discrimination can take (Tilcsik 2011). Labor legislation, for instance, focuses more frequently on discrimination in hiring and harassment which involves unwelcome conduct of a sexual nature in the workplace. The harasser, as well as the victim, can be a male or female. The harasser can, mainly, be an employer, a supervisor, a supervisor in another area and even though a co-worker. Discrimination behavior and harassment can include job and promotion refusal, being dismissed or having shifts cut down, sexual comments, jokes, sexual gestures, or denial of training opportunities and transfers. This behavior can also include non-sexual conduct that is based on gender and sexual orientation, such as comments about certain types of jobs being "men's or straight's work. Thus, although very little is known about the true extent of discrimination against LGBT people in the workplace, because it is not that obvious in most cases, similarly to gender discrimination, research shows that it is driven by gender identity (Drydakis,

2012b; 2015), and that many actions to increase women inclusion in organizations actually conceal inequality against women, and many problems faced by the LGBTQ originate within frameworks that anti-discrimination policy reinforce (Bowling et al. 2006)³. For that reason, this research investigates the relationship between discrimination and hiring in an online and offline job in relation to personal identity by taking both gender differences and sexual orientation into consideration and controlling for demographics and cognitive and personality characteristics (Neumark, 2018).

However, do potential hiring biases exist in online labor platforms, and if so, how do they affect hiring outcomes?

In line with studies on the conventional market, this paper, firstly, reveals the existence of prejudiced behavior in online labor markets. We observed clear evidence of gender and sexual discrimination in both online and offline job contexts. Specifically, in our experiment, female participants had an average probability of being hired of approximately 40%, while gay participants had an average probability of approximately 37% and lesbian participants had an average probability of approximately 64%.

In general, online labor markets give requesters (i.e., organizations or individual employers) the ability to quickly hire large numbers of workers who are willing to work in micro jobs, but employers face uncertainty during the hiring process because potential online job seekers are anonymous and often self-report their attributes (Benson et al. 2020). For that reason, online hiring is often assumed to reduce biases based on gender, age or race because such information is often not explicitly revealed by job applicants. However, new studies show that biases are also active in online labor markets. In this context, Gomez-Herrera et al. 2019 revealed a statistically significant gender wage gap by exploring over 250,000 online micro jobs involving over 55,824 hiring decisions. These findings are similar to Leung's 2018 paper, which accounts for heterogeneity across workers' countries. In the same way, Hangartner et al. 2021, within this online recruitment framework, found that women experience a penalty of 7% in professions that are dominated by men, and the opposite pattern emerges for men in professions that are dominated by women. Additionally, Chan & Wang 2018, by examining 264,875 online tasks, surprisingly found that employers who are less experienced in online hiring environments tend to favor female applicants. This hiring behavior is a result of online employers' efforts to use stereotypical cues to infer subtle interpersonal traits, such as trustworthiness. Unfortunately, until now, there has been a lack of studies investigating sexual orientation discrimination in online environments (Williams et al. 2020).

To minimize the level of online employers' uncertainty within the hiring procedure, several hiring alternatives were proposed. Kokkodis et al. 2015, 2016 pointed out the need for well-developed reputation-rating systems. Thus, online workers are rated for the tasks they accomplish, and these ratings become part of their online resumes. Employers can then obtain a better picture of these freelancers' past performance and make better informed hiring decisions. However, in online labor markets, as well as in most online markets, in general, reputation scores are skewed toward high ratings (J-shape distributions) (Kokkodis & Ipeirotis, 2020 and Benson et al. 2020). Thus, Horton, 2017 proposed algorithmically recommending workers to employers to substantially increase hiring efficiency. However, all the above-mentioned hiring solutions do not take into consideration effects that may have their origin in an employer's stereotyped bias.

To investigate this challenge, we design a vignette experimental framework by combining a mood regulation mechanism with a simplified version of the correspondence test to measure requesters'/

¹ On average across these 14 countries, 2.7 percent of adults identified as lesbian, gay, or both (Badgett, et al. 2021).

² Eight percent to 17 percent of gay and transgender workers report being passed over for a job or fired because of their sexual orientation or gender identity. Ten percent to 28 percent received a negative performance evaluation or were passed over for a promotion because they were gay or transgender. Seven percent to 41 percent of gay and transgender workers were verbally or physically abused or had their workplace vandalized (National Center for Transgender Equality and the National Gay and Lesbian Task Force Report, see at https://www.thetaskforce.org/downloads/reports/reports/ntds_full.pdf)

³ For example, the gender equality, gender management, and gender mainstreaming approaches overlook most problems faced by people from the LGBTQ community and from women of color, framing their target stakeholders as white, cisgender, and heterosexual.

employers' discriminatory behavioral outcomes for an online/offline job (Flage, 2019 and Cochard et al. 2019). The correspondence test is a form of social experiment in a real-life situation that has the potential to provide statistical data on discriminatory treatments. This method has been broadly used in several field discrimination experiments with well-reported findings on both sexual and gender hiring discrimination (Flage, 2019).

But we must take into account that hiring is a human decision process. During the decision-making process, there are four behavioral factors that may influence the decision outcome. An individual's values, his or her propensity for risk, the potential for dissonance in his or her decision and his or her psychological state (Ajzen, 1996). This study focuses on the last factor by exploring a question of interest to economists, behavioral scientists, psychologists, employers, and policy-makers: Is "mood" a key factor which makes employers more sensitive towards homosexual individuals and females because they consider these hiring choices as risk-sensitive decisions? We provide evidence that this is the case.

After our positive mood treatment was embedded in the hiring process, the rates of discrimination were reduced, and the hiring possibilities increased by approximately 31% for women, approximately 35% for gay men and just 3.5% for lesbians. But hiring particular a homosexual job candidate is considered as a decision under uncertainty which is still a barrier for (openly) gay job candidates in the labor market (Baert, 2018) and a significant relationship has already been demonstrated between the propensity to take risk-sensitive decisions and mainly, negative mood state by previous literature (Yuen & Lee, 2003 and Kassas et al. 2022). For that reason, using, also, a negative stimulus we further give insights into the risk-sensitive decision mechanism of employers by observing an increased discrimination behavior, mainly, for the gay applicant after a negative stimulus treatment (Baert, 2018).

One caveat should be made clear. Although our findings suggest that employers with higher positive mood levels moderate their hiring behavior, we cannot say categorically that we should spend more resources on making employers happier. This study illustrates the existence of a potentially important mechanism.

Nevertheless, to the best of our knowledge, this is one of the first attempts to use experimental data to directly test this abovementioned relationship. Our experiment was conducted in Amazon Mechanical Turk (AMT), which is the leading crowdsourcing platform and the most representative field for investigating issues related to the gig economy⁴ (Horton, 2010; Horton et al. 2011 and Dube et al. 2020). This economy consists of several online labor markets (OLMs), which have substantially grown in size in recent years (Horton, 2010)⁵. In general, the use of these OLMs has increased by approximately 20% over the last few years, and the estimated total market size is approximately \$25 billion, with over 48 million registered online workers⁶ (Kassi & Ledhonnvirta, 2018). Therefore, OLMs provide an ideal framework along with the traditional (i.e., offline labor markets) model for studying several economic aspects.

The structure of the paper is as follows: Section 2 presents the related literature and our hypotheses. Section 3 illustrates the experiment and

provides information on the task's attributes, design and the measurement of our outcomes. In Section 4, we present the utilized empirical model and in Section 6 the estimated results. Section 6 includes the robustness checks and Section 7 the validity. Finally, Section 8 includes the discussion, Section 9 the implications and Section 10 draws conclusions.

2. Literature Review and Hypotheses

Sexual and gender minority populations have made major inroads in labor markets throughout the past century, but remaining gender and sexual differences in pay and employment seem remarkably persistent (Hospido et al. 2022 and Drydakis, 2022). The factors driving these differences in the labor market can be broadly categorized into three forces, which might be interconnected: productivity, preferences and discrimination (Azmat & Petrongolo, 2014). These behaviors are mainly driven by beliefs about how men and women, or heterosexuals and homosexuals are comprising descriptive gender stereotypes⁷ (Heilman, 2012). For that reason, researchers have focused largely on the perspectives supplied by the social sciences in order to explain the continuance of gender and sexual bias in the workplace—including views based in sociology, and psychology. Economists have only recently focused their attention on mood and noncognitive psychological aspects, to examine further, factors that may unquestionably explain a large portion of differences in hiring bias, salary, and other work-related phenomena (Heckman & Kautz, 2012 and Heckman et al. 2019). In the case of discrimination, first, Elmslie & Sedo, 1996 introduced the concept of psychological effects, trying to interpret how discrimination negatively affects human capital characteristics. Hiring is a human interaction, and the ability to successfully interact with other people is important to everyday life decisions. For that reason, a key factor within a human's underlying decision mechanism is current mood, which may positively or negatively affect their behavior (Fredrickson, 2001) in hiring choices (Sechrist et al. 2003). In psychology, mood is an affective state consisting of positive and negative values and can be influenced by an exogenous stimulus or event (Bower, 1981 and Clark et al. 2018). First, Elster, 1998, and then Loewenstein, 2000, demonstrated all the features of mood that might be relevant for economists. Within this context, several studies have linked the impact of induced mood on various behavioral measures of economic and social preferences. Drouvelis, & Grosskopf, 2016, successfully associated subjects' cooperation and sanctioning behavior with their current emotional states and revealed that the average net earnings are lower when subjects are in an angry mood. Fehr-Duda et al. 2011, also in a laboratory experiment, showed that preexisting good mood is significantly associated with decision rules on probability weighting, especially for female participants. In the same direction, Carpa (2004) tested the effect of induced mood on behavior in a one-shot dictator, ultimatum and trust economic game. His research indicated that good-humored participants have more altruistic and helpful behavior during economic decision-making processes. Equally, Shu's 2010 results also confirmed that good mood is a vital factor for economic equilibrium.

Next, Ifcher & Zarghamee, 2011 and Lane, 2017 pointed out that positive affect impacts time preference, where time preference denoted a preference for present over future utility (i.e., in terms of future payments), while Carpa et al. 2010 linked positive mood with willingness-to-pay outcomes and Oswald et al. 2015 and Bellet et al. 2023, with higher productivity. Last but not least, Reuben & van Winden, 2010 demonstrated that mood makes subjects sensitive to fairness

⁴ The term 'gig economy' identifies the establishment of a capital-labor relationship between a worker and a digital platform, that mediates worker supply and consumer or professional demand for the completion of a small task or 'gig' and operates at once as a market intermediary and a 'shadow employer' (Friedman, 2014).

⁵ According to Horton and Chilton, 2010, OLMs consist of three parts. A requester for a job, the micro task or job and a worker. According to Horton (2010), an online labor market is where (1) labor is exchanged for money, (2) the outcomes of that labor are delivered "over a wire" and (3) the allocation of the labor and the money is determined by a collection of requesters and workers operating within a particular price system.

⁶ Quantitative data drawn by the online labor index.

⁷ Stereotypes are generalizations about groups that are applied to individual group members simply because they belong to that group, (e.g. gender stereotypes are generalizations about the attributes of men and women, while sexual stereotypes are generalizations about the attributes of hetero- and homosexuals).

perceptions.

Furthermore, to conduct an in-depth investigation of how mood affects hiring discrimination behavior, we also draw our attention to employers'/requesters' personality traits (Heckman et al. 2019). It has long been postulated that personality and mood states are related (Svavik et al. 1992 and Peirson, & Heuchert, 2001). Thus, Hepburn & Eysenck, 1989 found that mood variability was related to extraversion and neuroticism, with neurotic extraverts having the greatest mood variability and stable introverts having the smallest mood variability, while Baert, & Decuyper, 2014, outlined laboratory results that assessed conscientiousness, followed by emotional stability, as important personality characteristics that directed recruiters' hiring decisions.

By taking all the above into consideration, to address our research challenges, we used a mood-regulated experimental setup measuring the effects on discrimination against stereotypes (Lambert et al. 1997; Drouvelis, & Grosskopf, 2016 and Booth & Leigh, 2010). We considered positive mood induction as a shift variable within employers' utility function (see Appendix B), and we measured its values with the Panas inventory⁸ longitudinally so that we were able to scrutinize the changes in mood within our subjects (Watson et al. 1988 and Manganari et al. 2022). To induce positive mood shocks, we followed Oswald et al.'s 2015 mood regulation design by using a short comedy clip. In our case, we used two experimental phases to be able to observe the real-time mood levels of the participants before and after the comedy movie clip takes place. We asked subjects about their mood on three occasions. The initial measurement was at the very start of the experiment. The second was immediately after the comedy or placebo film. The third time was at the end of the experiment. As in Oswald's study, our treatment effectively increased the positive mood levels of participants in relation to that of viewers of the placebo neutral movie clip.

Hence, to conclude this section, let us summarize the hypotheses that we will take to the data analysis:

Hypothesis 1. In the first phase of the experiment (i.e., pretreatment), we will find evidence of gender and sexual discrimination in both an online and offline job.

Hypothesis 2. We do not expect significant difference in the discriminatory hiring profile by employers' gender, when considering the sexual orientation of the applicant.

Hypothesis 3. We also expect heterogeneous effects of employers' personality on hiring decisions.

Hypothesis 4. In the second phase of the experiment (i.e., post treatment), employers with higher levels of positive mood will have less discriminatory hiring choices.

3. Design of the Experiment

3.1. Correspondence test

Our experimental approach was based on the principles of the correspondence test, which simulates the communication between employers and job seekers and involves matched pairs of curricula vitae (CVs) of job applicants in response to advertised vacancies. In our case, the correspondence test took place in an online labor market between requesters and potential workers by simulating online labor tasks. In this

⁸ This is a self-report inventory, consisting of two scales designed to measure PA and NA (positive and negative affect). Respondents are asked to read 20 words that describe a series of feelings and emotions and then indicate the extent to which they usually feel them, responding on a Likert-type scale ranging from very slightly or not at all (1) to extremely (5). Total scores on each scale (PA and NA) are obtained by adding the scores for each item.

way, we investigated the underlying mechanics of online discrimination, and by keeping constant several individual characteristics, we isolated causal relationships. Following Riach and Rich, 2002, we matched at least two individuals for all relevant attributes other than the one that is expected to lead to hiring discrimination. Hence, we paired the pseudoseekers on age, education, previous experience and marital status. Our main objective was to replicate several test pairs who differ only in gender or sexual orientation so that any systematic difference in treatment can be attributed only to the effects of the isolated characteristic (Bertrand et al. 2004).

3.2. Application Structure

To study gender and sexual discrimination, we obtained several pairs of fake CV templates from a broad internet search for similar CVs and tailored them to the experimental framework (Booth & Leigh, 2010). Hence, in each case, we produced two imaginary workers equal in human-capital attributes and differing either in gender or sexual orientation.

We followed Weichselbaumer, 2003 and Drydakis, 2009 to indicate homosexuality so that the interests/memberships section of the CV included "Membership and Volunteer work in ILGA World - The International Lesbian, Gay, Bisexual, Trans and Intersex Association". For the heterosexual half of the applicants, no explicit information on sexual orientation was given. However, we controlled for bias from potential employer misinterpretation of volunteer or activism activity by adding membership and volunteer information in an environmental community named the "EIA Environmental Information Association" to the heterosexual-identified CVs (Mason & Palmer, 1996) (see Appendix C for further details). Moreover, due to the online labor market setting, we did not believe that these activities and the workers' present duties created any conflict with the hiring process, so the application documents do not indicate that those activities had ended⁹. Last, to look at the effect of several unobservable characteristics, we embedded items on the CVs to signal that the potential job seekers did not fit a number of other stereotypes cited by the literature as reasons for reluctance in hiring homosexual workers (Herek, 1994 and Heckman, 1998). Ultimately, the qualifications and presentation styles of the two fictitious workers of each case were matched as closely as possible so that they were identical in all employment-relevant characteristics except sexual orientation or gender (see Appendix A). Each application was designed to convey the same level and type of previous experience that might make a potential applicant attractive.

3.3. Methodology

In this study, to measure occupational access discrimination for female and homosexual job seekers and to link these hiring choices with employers' mood status, we created one recruitment process with the attributes of an online job and one recruitment procedure that embedded the real-life conditions for an offline job.

The experimental session is conducted in Amazon Mechanical Turk as an open call online task. To avoid self-selection biases, the offered wage is in line with the price policy of Amazon Mechanical Turk and is set to \$0.80¹⁰ (Banfi, & Villena-Roldan, 2019). We choose Amazon Mechanical Turk because it is the online labor market that most efficiently replicates the principles of an offline labor market and where buyers contract with individual sellers (Horton, 2010; Horton, 2011 and

⁹ Drydakis 2009, in a similar field experiment did control for the probability that the volunteer activity might have created a conflict with his present duties, so the application documents indicated that those activities had ended. These results were relevant to the offline market labor characteristics.

¹⁰ The duration of the experiment had a mean of 4 minutes and a standard deviation of 1.2 minutes.

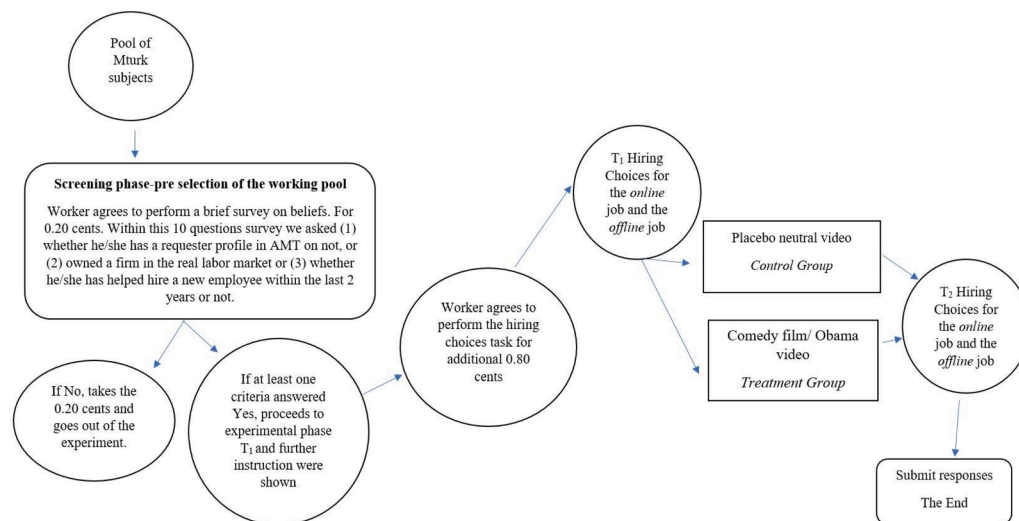


Figure 1. Experimental Design. Notes: In the first phase of our experimental design (T_1), all participants made hiring choices. Afterwards, individuals were randomly assigned to either the control group, which watched a neutral placebo video, or the treatment group, which watched a comedy clip/Obama speech video aimed at positively stimulating their mood. In the second experimental phase (T_2), the same individuals were presented with another set of hiring choices after watching their assigned video.

Horton et al. 2011). Moreover, AMT allows us to easily track malicious participants, either with multiple accounts or multiple participation in the same experiment (Paolacci et al. 2010). The experiment was programmed using zTree and consisted of two phases with an obligatory break in the middle (Fischbacher, 2007). At the beginning of the experimental sessions and before the online task commenced, subjects had to complete a survey questionnaire. The information collected from the questionnaire allows us to control for demographic and socioeconomic characteristics. Furthermore, to capture personality differences among subjects, the 44-item inventory for the big five personality traits is used, which provides measures for openness, conscientiousness, extraversion, agreeableness, and neuroticism (OCEAN, hereafter)¹¹ (John & Srivastava, 1999 and McCrae & Costa, 1999)¹². To explore the relationship between mood and hiring choice in both the online and offline conditions, we run two experimental sessions with different positive mood stimuli. Moreover, to ensure realism during the experiment, we include only the participants who had a requester profile in AMT, who owned or worked in a firm in the real labor market and who helped hire a new employee within the last 2 years (e.g., screened resumes, conducted interviews, provided input into or made the final hiring decision)¹³. Those passing the screening survey are given access to phase 1 of the experiment (Henle et al. 2021), and detailed instructions are displayed on their screen¹⁴.

All participants are randomly assigned (using the uniform distribution algorithm) to one of two different groups for each session. The first group serves as the “control group”, and the second serves as the “treatment group”, in which mood induction took place. In the first phase before our treatment stimulus (T_1 phase hereafter), all

participants for the online job read the instructions, “as a requester, you are hiring for the fulfillment of several surveys; which worker will you hire in each of the following cases”¹⁵ and for the offline job, “as an owner or part of an HR department in one firm you have to hire a seller; which candidate will you choose in each of the following cases”. It is not consistent with our research objective to investigate the link between mood and hiring decisions in relation to several job characteristics. For that reason, we choose the aforementioned job vacancies because in online labor markets, surveys are the most popular type of HITs for USA-based workers (Difallah et al. 2015 and Hara et al. 2018), and in offline labor markets, the sales job is considered to be a middle-skill job that requires a “typical” worker (Autor & Dorn 2009 and Autor, 2010)¹⁶. Our selected jobs also do not suffer from preexisting gender bias (Drydakis, 2015) or the invisibility hypothesis (Milgrom, & Oster, 1987)¹⁷.

During the experimental sessions, no subjects were aware of the randomization process, in which the “control group” was exposed to a neutral placebo film while the “treatment group” was exposed to a comedy film during a mandatory break¹⁸. By following Oswald et al.’s 2015 experimental design, we use as a “placebo” film a moderately interesting but not intrinsically happy clip¹⁹ that depicts patterns of colored sticks that appear and disappear randomly on the screen. The film is considered “neutral” by social psychologists. By setting the process to repeat, it was possible to play this clip for the appropriate length of time (2 minutes). In the experimental group, we induce a positive mood with a “comedy” film consisting of a 2-minute composition of well-known American comedians²⁰. Due to the online environment of our experiment, we choose to trigger positive emotions so that the

¹¹ Openness refers to the tendency to be creative and unconventional; Conscientiousness to the tendency to be organized and disciplined; Extraversion to the tendency to be sociable and active; Agreeableness to the tendency to be trusting and modest; and Neuroticism to the tendency to experience negative emotions.

¹² The Big Five dimensions of personality were estimated on a scale of 1-5, where 1=disagree, 2=slightly disagree, 3=neutral, 4=slightly agree and 5=agree. Afterward, the OCEAN factors were constructed through factor analysis, in order for each trait to be orthogonal to the rest (McCrae & Costa, 1999). To allow for an easier interpretation of our estimates, Big Five scores are standardized to have a mean of zero and standard deviation of one in all reported specifications (Cubel et al. 2016).

¹³ In order not to have self-selection bias, we didn’t mention within our open call that we set as a criterion the abovementioned status of the participants.

¹⁴ At this stage we had only 10 workers that they denied to proceed to phase 1 although they were meeting our experimental pre-criteria.

¹⁵ Although in several OLMs the hiring process is an open-call format, AMT offers a new hiring trend, which gives the opportunity to the requesters to create a preselected group of workers to see the online job.

¹⁶ In USA middle-skill jobs accounted for 45% of all job openings in the past few years (OECD 2019).

¹⁷ The Invisibility Hypothesis holds that the job skills of disadvantaged workers are not easily discovered by potential new employers, but that promotion enhances visibility and alleviates this problem.

¹⁸ The questionnaire results indicate that the clip was generally found to be entertaining and had a direct impact on reported positive mood levels

¹⁹ The film clip was “Computer Graphic” on James Gross’s resources site: http://www-psych.stanford.edu/~psyphy/movs/computer_graphic.mov.

²⁰ The research team conducted a two-step investigation in order to decide which comedians and which videos to embed into the “comedy” film. First, we searched in Google, Quora and Reddit for the best American comedians and then we took into consideration their metrics in YouTube, Facebook and Instagram.

participants will be focused and have high levels of perceptual flexibility during the experimental process (Tan et al. 2009). Mood was measured at the beginning of the experiment, after phase two and at the end with the Panas inventory with moment–time instructions (Watson et al. 1988)²¹.

At the end of the break, participants receive a brief reminder of the task and conditions of the experiment ahead, and they proceed to the second phase in which they perform the same hiring choices but with different orders (T₂ phase hereafter)²².

Thus, a participant, should do three hiring choices for the online job and three hiring choices for the offline job, in each experimental phase. The choices were male vs. female job candidate, gay vs. heterosexual male job candidate and lesbian vs. heterosexual female candidate.

Our key dependent variable is the hiring behavior of the requesters/employers before and after mood induction. We measure hiring behavior as a binary choice (0/1) and as an index.

Thus, the experiment consists of five stages: welcome and instructions, questionnaire, hiring choice task, break, and the same hiring choice task. Hence, the sessions are designed as two-period experiments to provide us with a baseline measure of hiring behavior and allow us to examine how hiring decision outcomes change after mood induction (Cubel et al. 2016). The online environment of the experiment allows us to replicate a work environment as closely as possible by recreating a hierarchy between employer and employee, and we prevent possible emotional connotations due to personal affinity or sympathy, which might easily appear in live interactions and affect employer–employee interactions (see Figure 1).

We also know that it is easy to "hire" when there are no direct payoff implications for the experimental subject, but when payoff is not hypothetical, behavior may differ. To address this issue and for our experiment to produce satisfactory hires, we inform participants in the beginning that at the end of the experiment, we would recommend ten top-rated real workers based on their hiring choices²³. Before the experiment, we launch a survey in Amazon MTurk to collect small amounts of personal information (e.g., gender, sexual orientation, age, zip code). In the survey, we clearly state that we will use this information to recommend workers to potential requesters. By following this practice, we try to create a win–win situation for both requesters and workers conditional to ethical standards²⁴.

3.4. Research Limitations

Our experiment is effective only in investigating discrimination at the initial stage of the hiring process and does not explore possible wage losses and inequalities that might arise later on. For example, an employer/requester might not pay the reported wage to homosexual workers or female workers at the end of the online job by rating his or her quality very low due to biased observations (Bertrand & Mullainathan, 2004 and Petit, 2007). Therefore, it is impossible to test for employer truthfulness and trust until a worker actually receives his or her compensation. Moreover, we must raise some concerns regarding the quality of the data. As is already known, in OLMs, purchasers of labor confront severe adverse selection issues. OLMs consist of a pool of potential workers who hide behind their anonymity and may lack extrinsic motivation (Chandler & Kapelner, 2013), which often may lead to malicious working behavior (Farrell, et al. 2017). In turn, high-quality workers are likely to exit the labor pool, causing wages and labor quality

to spiral downward (Horton & Chilton, 2010 and Paolacci et al. 2010).

Last, the explicit treatment might come off as unnatural to participants, which may raise questions about demand bias. To minimize this issue, we adopted the experimental framework from Cubel et al. 2016 by having an obligatory break within the experiment. Participants were informed in the beginning of the experiment that the task clearly consisted of two phases with a break in the middle. The video break (placebo and comedy film) was introduced as a pop-up ad (Bétrancourt & Bisseret, 1998). This was to avoid the possibility that subjects treated with the comedy clip could guess the nature of the experiment (Oswald et al. 2015).

4. The Model

The major objective of the current paper is to link the effect of mood state on employers' hiring decisions. For that reason, we describe a behavioral model with the most common econometric approach for capturing the effects of discrimination by asking if people who are similar in all observable and economically relevant ways have similar labor market outcomes. The probability of workers receiving a positive hiring answer was estimated according to a logit model²⁵:

$$Y_i(\text{Hiring} = 1) = \alpha + \beta_1 M_i + \beta_2 \text{Post}_i + \beta_3 M_i * \text{Post}_i + \beta_4 L_i + \beta_5 Pk_i + \beta_6 X_i + u_i + e_i \quad (1)$$

where Y is the latent variable reflecting the probability of a fictitious worker receiving a positive hiring answer, α is a constant, M is a dummy variable indicating the treatment group specific effect (mood induction = 1), Post is the time trend common to control and treatment groups (i.e., a dummy variable indicating pre (T₁) and post (T₂) phases), M*Post is the difference-in-differences term which indicates whether the dependent variable was observed in the treatment group after our intervention (=1) or any other case (=0). L refers to the sexual orientation or gender and equals one if the pseudo seeker was labeled as being homosexual or heterosexual, male or female respectively (zero in all other cases). P is a k-vector of the personality of the participant i (where k = 1...5 corresponds to OCEAN²⁶), X_i are participants' specific characteristics (i.e., other demographic attributes, cognitive skills and social economic background of the ith worker), u is a vector of individual fixed effects, and e is the idiosyncratic error term.

By controlling for all characteristics except the sources of potential discrimination (gender and sexual orientation) in each case across two applicants, the sources of bias were not expected to be correlated with the error term in each equation. The estimated coefficient $\hat{\beta}_3$ provides the difference-in-difference estimation of the treatment (positive mood induction). For Equation 1, we report marginal effects²⁷.

Moreover, to estimate linear intermediate effects of mood on hiring decisions, we also used straightforward OLS log regressions by having employers' cumulative discrimination index²⁸ as a dependent variable (Bentolli & Saint-Paul, 1994). Hence, we estimate the following relevant specification:

²⁵ Difference-in-differences is typically used to estimate the effect of a specific intervention or treatment by comparing the changes in outcomes over time between a population that is enrolled in a program (the intervention group) and a population that is not (the control group) (Lechner, 2011 and Puhani, 2012).

²⁶ Openness, Conscientiousness, Extraversion, Agreeableness and Neuroticism, respectively. To allow for an easier interpretation of our estimates, Big Five scores are standardized to have a mean of zero and a standard deviation of one.

²⁷ $\partial \text{prob}(\text{Hiring} = 1) / \partial \text{Di}$

²⁸ Employers' discrimination index is the total sum of their choices (i.e., for both the online and the offline job), on each experimental phase (min value of 0 and max value of 6)

²¹ Participants reported to which degree they were feeling a particular emotion right then.

²² We adopted a different order in the second phase in order to minimize possible learning, fatigue or boredom effects.

²³ Amazon Mechanical Turk offers requesters the opportunity to prehire workers by constructing a hire-pool of worker IDs.

²⁴ The process was completely anonymous.

Table 1

T tests for treatment and control group of participants.

	Start (T ₁) [1]	End (T ₂) [2]	Difference [3]	t [4]
Pooled				
Positive affect	32.265	33.615	1.350**	1.972
Control Group (placebo film)				
Positive affect	32.141	31.044	-1.097	1.058
Treated Group (comedy film)				
Positive affect	32.384	36.060	3.676***	3.796

Source: Dataset with results drawn from the experiment. Author's calculations.

Notes: Difference is [2] – [1]

Statistical significance: *** 1%, ** 5% and * 10%.

Table 2

Descriptive statistics and independent samples t tests.

	Pooled [1]	Control Group [2]	Treatment Group [3]	Difference [3]-[2]	t test t
Demographics					
Female (0/1)	0.559 (179)	0.564	0.554	-0.010	0.165
Age	40.08	39.60	40.53	0.93	0.651
Whites (0/1)	0.735 (236)	0.762	0.713	-0.049	1.002
Social Economic Characteristics					
Tertiary Education (0/1)	0.659 (211)	0.692	0.628	-0.064	1.211
FAS Index	8.538	8.493	8.579	0.086	0.317
High Monthly Income (0/1)	0.515 (165)	0.500	0.530	0.030	0.544
Personality Traits					
Openness	3.708	3.705	3.711	0.006	0.093
Conscientiousness	3.828	3.841	3.817	-0.024	0.283
Extraversion	3.106	3.065	3.145	0.080	0.838
Agreeableness	3.761	3.792	3.730	-0.062	0.726
Neuroticism	2.746	2.673	2.814	0.141	1.289
Mood Indicators					
Positive Affect (T ₁)	32.265	32.141	32.384	0.243	0.235
Negative Affect (T ₁)	18.940	18.378	19.475	1.097	0.923
Prejudices on Sexual Orientation					
Identified as straight (177)	0.553	0.576	0.531	-0.045	0.833
Same possibilities for any orientation (115)	0.359	0.346	0.372	0.026	0.479
Identified as gay (14)	0.044	0.321	0.549	0.228	0.996
Identified as lesbian (14)	0.044	0.449	0.427	-0.022	0.095
Observations	320	157	163		

Source: Author's Calculations. Data drawn from Amazon Mechanical Turk.

Notes: The parenthesis in Column 1 includes the absolute value of the variable.

$$\begin{aligned}
 \text{Discriminationindex}_i = & \alpha + \beta_1 M_i + \beta_2 \text{Post}_i + \beta_3 M_i * \text{Post}_i + \beta_4 L_i + \beta_5 P_i^k \\
 & + \beta_6 X_i + u_i + e_i
 \end{aligned}
 \quad (2)$$

where, similar to Equation (1), M is a dummy variable indicating the treatment group specific effect (=1), Post is the time trend common to the control and treatment groups (i.e., a dummy variable indicating pre (T₁) and post (T₂) phases, M*Post is the difference-in-differences term which indicates whether the outcome was observed in the treatment group with a positive observation (=1) or any other case (=0), L refers to the sexual orientation or gender and equals one if the pseudo seeker was labeled as being homosexual or heterosexual, male or female respectively (zero in all other cases), P is a k-vector of the personality of participant i (where k = 1....5 corresponds to OCEAN), X_i are participants' specific characteristics (i.e., other demographic attributes, cognitive skills and social economic background of the ith worker), u is a

vector of individual fixed effects, and e is the idiosyncratic error term.

5. Results

5.1. Mood induction

Regarding the induction of the positive mood (i.e., treatment), we collected longitudinal data in a way that provides us with an opportunity to scrutinize the changes in positive mood within our subjects (Erez & Isen, 2002 and Oswald et al. 2015)²⁹. Thus, we measured subjects' positive mood level on three occasions. The initial measurement was at the very start of the experiment. The second was immediately before the comedy or placebo film. The third time was at the end of the experiment. As Table 1 shows, we found statistically significant changes in positive mood in the treated group. Using a two-sided t test, we found that, on average, positive mood increased from 32.384 to 36.060 (p < 0.01). We did not find statistically significant changes between measurements at the starting point and before the film in either case. Hence, our mood manipulation proves to be efficient for the positive side and comes only from our treatment comedy film (Table 1).

5.2. Sample

In this section, we provide the descriptive statistics for the participant-employers (Table 2). Overall, 328 individuals participated in our experimental task. Eight observations were excluded from the analysis due to a particular pattern of sloppy behavior before our experiment took place³⁰. Our sample, on average, was 40 years old, and identified 56% as female and 73.5% as white. Moreover, 66% of the sample had at least a tertiary education, and approximately 51.5% had an above average monthly family income³¹. Additionally, subjects were asked to provide information on the family affluence scale (FAS)³² to have a proxy indicator of their socioeconomic background. FAS, on average, was 8.538, reflecting a middle-high socioeconomic status. With respect to the observed variation in personality traits, we noticed that the mean score for openness is 3.708, suggesting that our sample consisted of individuals with a high tendency toward creativity and active imagination; conscientiousness had a mean of 3.828, signifying high levels of thoroughness; extraversion had a mean of 3.106, exhibiting a satisfactory level of energetic behavior; agreeableness had a mean of 3.761, indicating that our participants seem to be more empathetic and altruistic; and neuroticism had a mean 2.746, suggesting that our sample does not tend to experience negative emotions in general. For each of the aforementioned personality variables, we did not notice a great number of extreme values. Finally, to control for pre-existing homophobia, which might constitute a source of labor market prejudice, we asked them before the experiment (i.e., in this phase, participants were not aware of the core and the design of the experimental framework and the hiring-discrimination procedure that would follow) about their general beliefs on hiring possibilities (Badgett, 2020). Interestingly, 55% responded that heterosexuals should have a higher likelihood of being

²⁹ In a more strictly psychological tradition, research by the late Alice Isen of Cornell University has been important in this area.

³⁰ They chose the same answers in all the Likert scale questions and they completed the whole questionnaire in less than our accepted threshold time.

³¹ Subjects were asked to provide their average monthly income and their current US region of residence. We calculated their relative income position in relation to the average monthly income of their US region of residence.

³² This inventory is fully accepted and used by many studies measuring wealth and has been characterized as a valid, easy-to-answer measure of socioeconomic status (Boyce et al. 2006). This measurement consists of 6 items with a Likert scale and has a summarized value range from 0 to 13. The FAS addresses issues of family car ownership, having their own unshared room, the number of computers at home and the number of times an individual went on holiday in the past 12 months.

Table 3
Candidate Choices per experimental phase

	T ₁ [1]	T ₂ [2]	Difference [3]
Both Jobs			
Female Candidate	0.409	0.715	0.306
Gay Candidate	0.374	0.723	0.349
Lesbian Candidate	0.641	0.674	0.033
Online Job			
Female Candidate	0.409	0.662	0.253
Gay Candidate	0.381	0.721	0.340
Lesbian Candidate	0.647	0.684	0.037
Offline Job			
Female Candidate	0.408	0.768	0.360
Gay Candidate	0.366	0.725	0.359
Lesbian Candidate	0.634	0.663	0.029

Source: Author's Calculations. Data drawn from Amazon Mechanical Turk.

Notes: N= 320

hired, while 36% believed that this kind of discrimination must not exist in hiring decisions.

Table 2 also demonstrates that there are no significant differences in the aforementioned variables between the control and treatment groups.

5.3. Hiring Choices

Table 3 presents the results for occupational access or the choices

made by the employers. Recall that the outcome of our correspondence testing has a similar design as was first set out by McIntosh and Smith (1974), which has since been adopted in similar field experiments across Europe (Riach & Rich, 2002).

Column 1 shows that for both jobs, female and gay applicants face discrimination by having much lower probabilities of being hired. Employers chose female applicants in 41% of cases (with males as the alternative). This percentage is almost the same in both online and offline labor contexts. Regarding homosexual candidates, we observe that gay individuals face discrimination by having an approximately 37% chance of being hired (with heterosexual men as the alternative). This percentage is lower in the case of the offline job. On the other hand, lesbian applicants are chosen in 64% of cases (with heterosexual women as the alternative). These initial findings are in line with Hypothesis H1 and previous research, showing that mainly women and gay men experience earnings penalties, while lesbian women experience earnings premiums (Drydakis, 2021 and Bertrand et al. 2018) (see also Figures 2 and 3).

Interestingly, after our positive mood treatment, the discrimination against female and gay applicants disappears, resulting in higher rates of hiring acceptance. It seems that our treatment affected more employers within the online labor experimental context (i.e., requesters), particularly in the case of having to choose either a female or male applicant (Column 2, Table 3) (see also Figures 4 and 5).

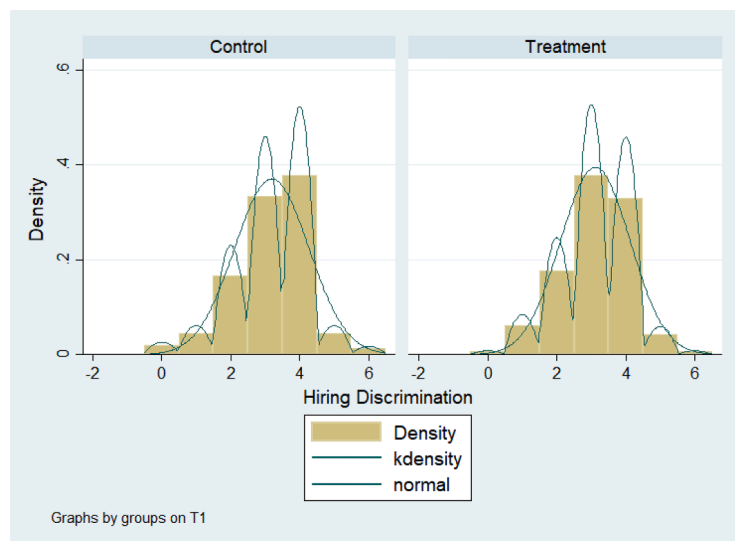


Figure 2. Hiring discrimination on T₁.

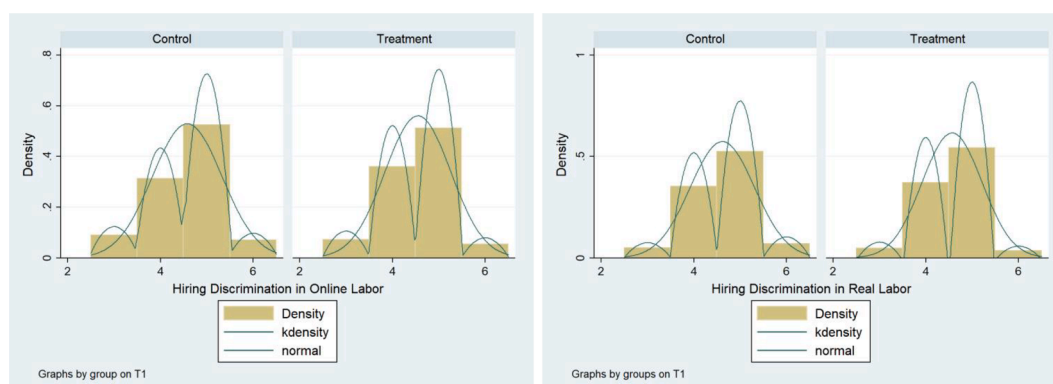
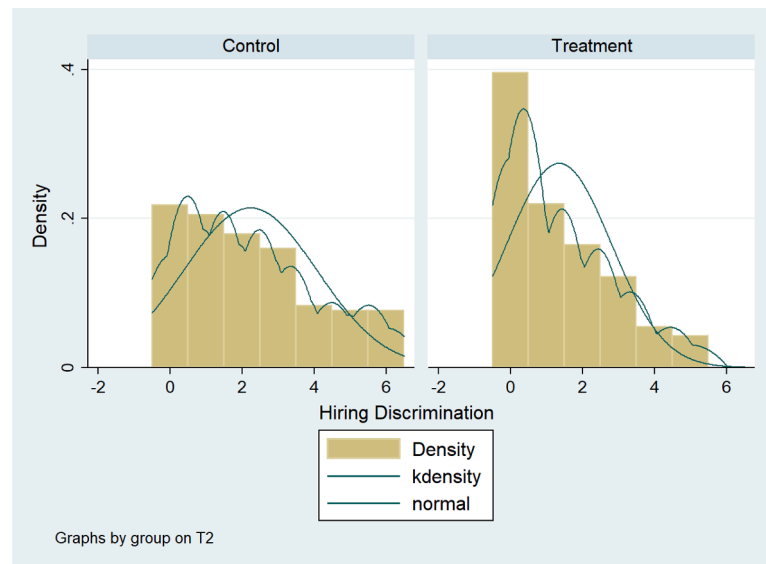
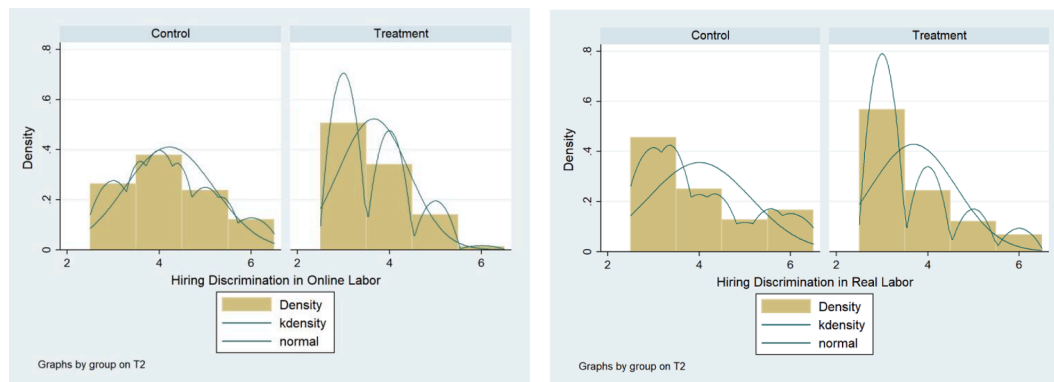


Figure 3. Hiring discrimination on T₁ for the Online and the Offline job.

Figure 4. Hiring discrimination on T_2 .Figure 5. Hiring discrimination on T_2 for the Online and the Offline job.

5.4. Evidence of discrimination in the online labor market

Table 4 presents the key results for employers' hiring choices before the positive treatment stimulus (T_1 phase). All logit regressions control for demographic characteristics (age, ethnicity), cognitive skills (i.e., educational level), socioeconomic background (i.e., FAS index, monthly income), region of residence in the USA and prejudices on sexual orientation. Columns [1] – [3] refer to the online job, while columns [4] – [6] refer to the offline job.

The estimations show that female employers have discriminatory hiring behavior only in the case of female employees. More particularly, a female applicant has a 26% (1% level of significance) and 0.3% (10% level of significance) lower probability of being hired in our online and offline jobs, respectively, when the potential employer is a woman. Although, we didn't expect differences on hiring preferences by employers' gender, our results provide evidence that female employers show a low discriminatory hiring profile in cases of a homosexual applicant (Hypothesis H2).

In the regression presented, we have also included the estimates of the effect of employers' personality traits on their hiring choice. The big five personality traits are jointly significant, and the individual scores are largely consistent with our hypothesis. As in the previous literature using survey data and in line with Hypothesis H3, we observe that indeed, several personality characteristics may correlate with the final outcome of an employer's hiring choice. More specifically, more

agreeable employers choose significantly fewer female and gay applicants: an increase of a standard deviation in the level of agreeableness is associated with a decrease in the probability of hiring a female job candidate of approximately 14% in an online job and a decrease in the probability of hiring a gay job candidate of approximately 8.2% and 5.6% in an online and offline labor context, respectively. Surprisingly, we find a positive and significant effect of neuroticism on hiring choices only in the case of a lesbian applicant in both jobs. In all identity categories, the results were statistically significant at the 1% level. Next, the coefficient for openness is significant, negative and of sizeable magnitude only in the case of hiring a female applicant for the online job. Finally, we find no evidence that the level of extraversion and conscientiousness of an employer may be correlated with his or her hiring choice.

Taking advantage of the setup of our experiment, we also check whether the relationship between mood and hiring choice stands when we measure positive and negative mood as standalone traits. Thus, we find considerable evidence of the impact of positive affect, with varying magnitude in different hiring cases.

5.5. Positive stimulus and hiring choices

Recall that in the T_2 phase of our experiment, after our positive mood manipulation took place, we constructed a continuous scale of discrimination for each employer-participant by calculating the total sum of

Table 4
Determinants of choice (Marginal Effects)

	Online Job Female Candidate [1]	Gay Candidate [2]	Lesbian Candidate [3]	Offline Job Female Candidate [4]	Gay Candidate [5]	Lesbian Candidate [6]
Female employer	-0.260*** (0.066)	0.026 (0.061)	-0.018 (0.067)	-0.003* (0.076)	0.027 (0.072)	-0.019 (0.067)
Personality Traits						
Openness	-0.084** (0.036)	0.002 (0.029)	0.010 (0.034)	-0.024 (0.034)	0.038 (0.034)	0.010 (0.034)
Conscientiousness	-0.011 (0.060)	0.025 (0.045)	0.027 (0.048)	-0.031 (0.049)	-0.007 (0.052)	0.027 (0.048)
Extraversion	0.050 (0.038)	-0.011 (0.032)	0.018 (0.036)	0.030 (0.040)	-0.063 (0.038)	0.018 (0.036)
Agreeableness	-0.140*** (0.048)	-0.082** (0.038)	0.034 (0.045)	-0.040 (0.043)	-0.056* (0.046)	0.034 (0.045)
Neuroticism	-0.006 (0.050)	-0.021 (0.041)	0.112*** (0.046)	-0.012 (0.044)	-0.064 (0.052)	0.111*** (0.042)
Mood						
Positive Affect	0.015*** (0.005)	0.006* (0.004)	0.001 (0.004)	0.002 (0.005)	0.004* (0.004)	0.001 (0.004)
Negative Affect	0.010 (0.005)	0.005 (0.004)	-0.003 (0.004)	0.004 (0.005)	-0.002 (0.005)	-0.003 (0.005)
Pseudo R ²	0.303	0.233	0.292	0.327	0.297	0.292
Wald chi2	82.66	48.13	30.14	40.98	37.50	80.14

Source: Author's calculations. Data drawn from Amazon Mechanical Turk.

Notes: The number of participants is N= 320. Dependent variable (0/1), where 1: hiring choice of a woman [1] & [4], a gay man [2] & [5], a lesbian woman [3] & [6]. The specifications control for demographic characteristics (i.e., age, ethnicity), cognitive skills (i.e., educational level), socioeconomic background (i.e., FAS index, Monthly Income), individuals' origins (i.e., regions of the USA), fixed effects and prejudices against sexual orientation. Robust standard errors in parentheses. Statistical Significance: *** p<0.01, ** p<0.05, *p<0.10.

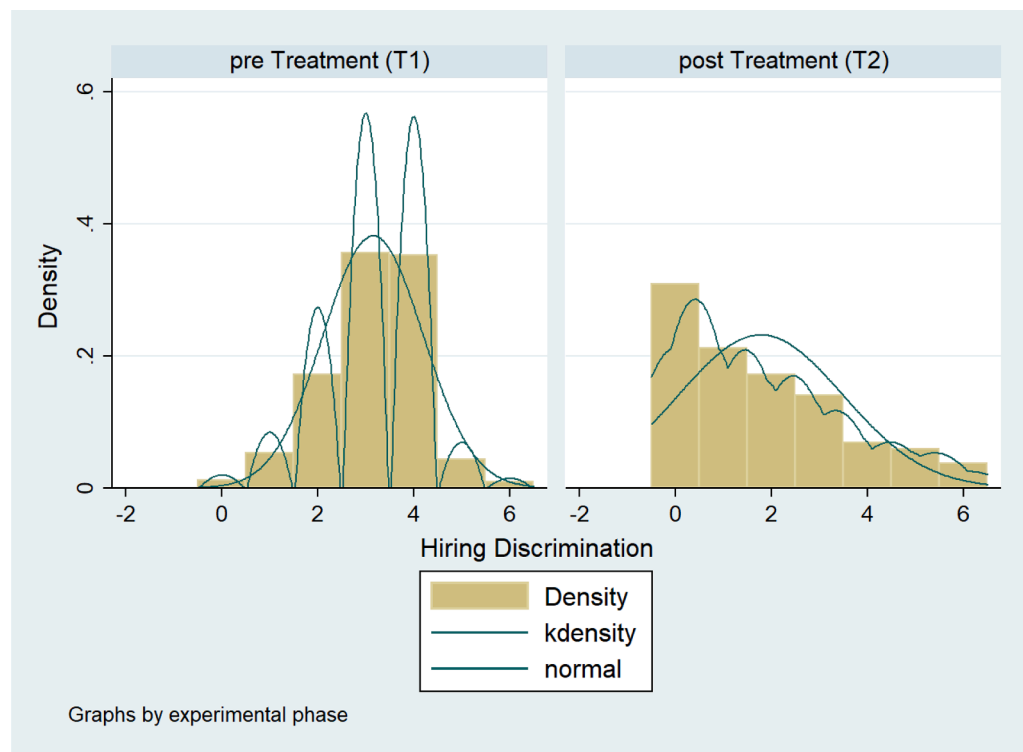


Figure 6. Hiring discrimination before and after positive mood treatment.

choices in each phase³³. For example, an employer that fully discriminated during his or her hiring choices has a value of 6. This applies to both phases. This discrimination index had a mean of 3.153 in T₁ and

1.775 on T₂ (on a scale of 0-6) (Figures 6 and 7).

Estimation results for the DID model (i.e., difference-in-difference) are presented in Table 5 by having the discrimination index (as a continuous scale) as a dependent variable and in Table 6 by having this variable measured as choices (0/1).

Concerning the discrimination index, we observe that the coefficients on time (i.e., phase 2) and the treatment-time interaction term

³³ We constructed this index in order to have also an overall discrimination index for each participant-employer.

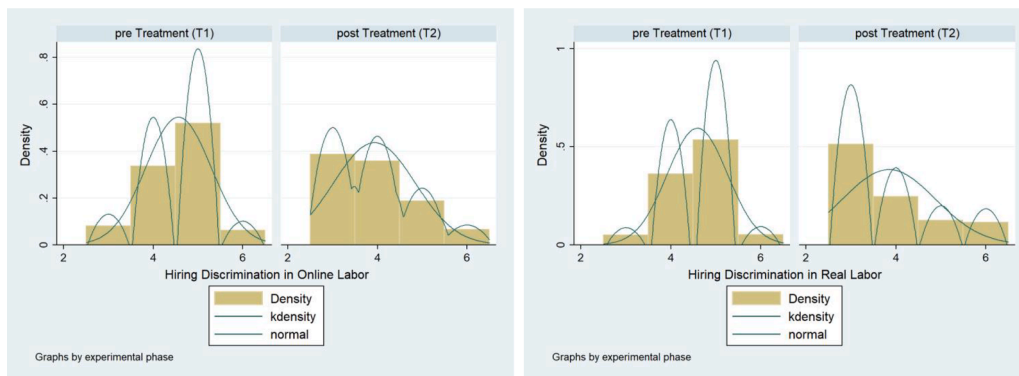


Figure 7. Hiring discrimination before and after positive mood treatment for the Online and the Offline job.

Table 5

Treatment Effects on hiring discrimination behavior

	Both Jobs		Online Job		Offline Job	
	[1]	[2]	[3]	[4]	[5]	[6]
Treated	-0.084 (0.115)	-0.060 (0.117)	-0.027 (0.079)	-0.011 (0.080)	-0.057 (0.076)	-0.049 (0.078)
Phase 2	-0.967*** (0.178)	-0.968*** (0.178)	-0.358*** (0.107)	-0.359*** (0.108)	-0.608*** (0.105)	-0.619*** (0.106)
Treated*Phase 2	-0.800*** (0.230)	-0.801*** (0.231)	-0.531*** (0.137)	-0.531*** (0.138)	-0.249*** (0.139)	-0.264** (0.140)
Personality Traits	No	Yes	No	Yes	No	Yes
Constant	3.107*** (0.444)	3.048*** (0.463)	4.450*** (0.223)	4.431*** (0.237)	4.657*** (0.290)	4.617*** (0.301)
R ²	0.246	0.251	0.199	0.206	0.179	0.182
F-Stat	16.20	12.59	12.80	9.94	10.10	7.63

Source: Author's calculations. Data drawn from Amazon Mechanical Turk.

Notes: The number of observations is N= 640. Dependent variable is discrimination index in continuous scale. The specifications control for demographic characteristics (i.e., sex, age, ethnicity), cognitive skills (i.e., educational level), socioeconomic background (i.e., FAS index, Monthly Income), the change of mood levels, individuals' origins (i.e., regions in the USA), fixed effects and prejudices against sexual orientation. Heteroscedasticity corrected standard errors with clustering at individual level.

Statistical Significance: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Table 6

Treatment Effects on choice (Marginal effects)

	Female Choice		Gay Choice		Lesbian Choice	
	Online Job [1]	Offline Job [2]	Online Job [3]	Offline Job [4]	Online Job [5]	Offline Job [6]
Treated	0.037 (0.058)	0.002 (0.058)	0.036 (0.061)	0.076 (0.061)	-0.016 (0.056)	-0.009 (0.058)
Phase 2	0.141*** (0.058)	0.300*** (0.054)	0.253*** (0.055)	0.299*** (0.054)	-0.014 (0.055)	0.044 (0.058)
Treated*Phase 2	0.293*** (0.072)	0.219*** (0.071)	0.242*** (0.074)	0.185** (0.078)	0.112* (0.070)	-0.023 (0.082)
Personality Traits	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R ²	0.142	0.194	0.148	0.148	0.108	0.188
Wald chi ²	103.34	115.98	105.53	109.36	58.85	61.54

Source: Author's calculations. Data drawn from Amazon Mechanical Turk.

Notes: The number of observations is N= 640. Dependent variable is an employer's choice in each case (0/1). The specifications control for demographic characteristics (i.e., sex, age, ethnicity), cognitive skills (i.e., educational level), socioeconomic background (i.e., FAS index, Monthly Income), the change of mood levels, individuals' origins (i.e., regions of the USA), fixed effects and prejudices against sexual orientation. Logit standard errors in parentheses.

Statistical Significance: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

are statistically significant, with p values less than 0.001, regardless of the labor context. The effect of employers' positive mood on discrimination seems to be higher in the case of the online job. Over time, the discrimination index decreases, in general, by approximately 1 point of estimation in the case of both jobs, 0.4 points of estimation in online job and 0.6 points of estimation in offline job. The difference-in-difference estimator, which is the key parameter, shows that positive mood treatment has a significantly negative impact on hiring discrimination by decreasing the index by approximately 0.8 points of estimation for both jobs, 0.53 points of estimation in online job and 0.27 points of

estimation in offline job more than the control group. In columns [2], [4], and [6], we have also included personality traits; however, the estimations did not vary, showing the robust and direct effect of positive mood on hiring discrimination behavior.

Going deeper into our analysis, Table 6 presents the effects of our treatment on each hiring choice, in both the online and the offline experimental labor context. We observe that the coefficients on time (i.e., phase 2) and the treatment-time interaction term are statistically significant, with p values less than 0.001, in the case of female and gay applicants. More specifically, over time, the probability of hiring a

Table 7

T tests for treatment and control group of participants.

	Start (T ₁) [1]	End (T ₂) [2]	Difference [3]	t [4]
Pooled				
Positive affect	31.961	35.287	3.326***	4.656
Control Group (placebo film)	32.141	31.044	-1.097	1.058
Treated Group (comedy film)	32.384	36.060	3.676***	3.796

Source: Dataset with results drawn from the experiment. Author's calculations.

Notes: Difference is [2] – [1]

Statistical significance: *** 1%, ** 5% and * 10%.

Table 8

Treatment Effects on hiring discrimination behavior for Experiment 2

	Both Jobs [1]	[2]	Online Job [3]	[4]	Offline Job [5]	[6]
Treated	-0.095 (0.125)	-0.052 (0.124)	-0.016 (0.084)	-0.003 (0.083)	-0.072 (0.083)	-0.052 (0.084)
Phase 2	-0.077 (0.187)	-0.078 (0.188)	0.084 (0.114)	0.084 (0.115)	-0.162 (0.104)	-0.163 (0.105)
Treated*Phase 2	-0.966*** (0.261)	-0.967*** (0.263)	-0.549*** (0.152)	-0.549*** (0.153)	-0.417*** (0.152)	-0.417*** (0.153)
Personality Traits	No	Yes	No	Yes	No	Yes
Constant	3.349*** (0.486)	3.627*** (0.501)	4.610*** (0.248)	4.649*** (0.237)	4.925*** (0.315)	4.978*** (0.318)
R ²	0.135	0.153	0.112	0.251	0.119	0.129
F-Stat	8.34	5.75	5.17	4.18	5.83	4.80

Source: Author's calculations. Data drawn from Amazon Mechanical Turk.

Notes: The number of observations is N= 622. Dependent variable is discrimination index in continuous scale. The specifications control for demographic characteristics (i.e., sex, age, ethnicity), cognitive skills (i.e., educational level), socioeconomic background (i.e., FAS index, Monthly Income), the change of mood levels, individuals' origins, (i.e., regions of the USA), fixed effects and prejudices against sexual orientation. Heteroscedasticity corrected standard errors with clustering at individual level.

Statistical Significance: *** p<0.01, ** p<0.05, *p<0.10.

female applicant increases by approximately 14% and 30% in the online and offline job, respectively. Similarly, over time, the probability of hiring a gay applicant increases by approximately 25% and 30% in the online and offline job, respectively. The difference-in-difference estimators reveal that positive mood treatment has significantly positive effects on hiring probabilities. In this case, the probability of hiring a female applicant increases by approximately 29% and 22% for online and offline job, respectively. Similarly, the probability of hiring a gay applicant increases approximately 24% and 18.5% for online and offline job, respectively. These results indicate that, overall, positive mood treatment was effective for the diminution of hiring discrimination that we examined.

6. Robustness

6.1. Alternative positive stimulus and hiring choices

As a further robustness check of the abovementioned link between positive mood and the reduction of discrimination in hiring, we changed the mood manipulation technique by embedding in our following experimental sessions an alternative induction of positive mood. With this experimental strategy, we establish a robust relationship between mood and hiring discrimination. Thus, we made use of emotional response, which is a classic technique to cause a short circuit in rational analysis, to affect the critical sense of the individual. Moreover, appealing to emotions opens the door to the unconscious and makes it easier to implant ideas, desires, fears and doubts, compulsions, or induce behavior (Gross & D'ambrosio, 2004 and Niedenthal et al. 1999). Hence, by taking into consideration that our sample was US citizens, our reliance on emotion manipulation was based on the well-known Obama effect (Crigler & Just, 2012). According to a growing body of research, a

very strong bond between US Presidents and US citizens exists in terms of political, psychological, cultural and economic aspects (Stigler, 1973 and Blinder & Watson, 2016). After Obama was elected, and during his presidency, race-related tensions did not erupt, and in general, several forms of discrimination were restricted. This improvement with respect to race relations and discrimination in the workplace was named the "Obama Effect" (Lopez, 2010 and Onwuachi-Willig & Barnes, 2012). Several experimentalists have used various features of this "phenomenon" to investigate several psychological effects (Aronson et al. 2009; Columb & Plant, 2011 and Marx & Friedman, 2009) and externalities in behavioral economics (Halcoussis et al. 2009 and Ramiah et al. 2015). In our case, we replaced the comedian film of Experiment 1 with a 2-minute film of a composition of Barack Obama's speeches on sexual and

gender discrimination and his passionate defense of equality in employment and hiring practices³⁴.

Again, we measured positive mood longitudinally on three occasions, similar to experimental session 1³⁵. As Table 7 shows, we found statistically significant changes in positive mood in the treated group. Using a two-sided t test, we found that, on average, positive mood increased from 32.384 to 36.060 (p < 0.01). We did not find statistically significant changes in the measurements of positive mood between the starting point and before the film in either case.

Overall, 316 individuals participated in our second experimental task. Five observations were excluded from the analysis due to a particular pattern of sloppy behavior before our experiment took place. Our sample, on average, was 40 years old, with 57% of them female and 73.3% white. Moreover, 69% of the sample had at least a tertiary education, and approximately 52.4% had an above average monthly family income. FAS, on average, was 8.608, again reflecting a middle-high socioeconomic status. With respect to the observed variation in personality traits, we notice that the mean score for openness is 3.703, for conscientiousness is 3.847, for extraversion is 3.037, for agreeableness is 3.837 and for neuroticism is 2.724. Last, 54.66% answered that heterosexuals should have higher possibilities of being hired to a job, while 38% believe that this kind of discrimination must not exist on hiring decisions, 3.86% believe that gay applicants should have higher hiring probabilities, and 3.54% support lesbians. No statistically significant differences were observed between these variables for the control and

³⁴ Onwuachi-Willig, & Barnes, 2012 found that President Obama has had a surprising effect on the enforcement of anti-discrimination laws.

³⁵ To avoid learning bias, we excluded workers having an Amazon ID that was also in our initial experimental settings.

Table 9

Treatment Effects on choice (Marginal effects) for Experiment 2.

	Female Choice		Gay Choice		Lesbian Choice	
	Online Job [1]	Offline Job [2]	Online Job [3]	Offline Job [4]	Online Job [5]	Offline Job [6]
Treated	0.049 (0.060)	-0.041 (0.064)	0.066 (0.062)	0.097 (0.063)	-0.151* (0.064)	-0.061 (0.065)
Phase 2	-0.061 (0.060)	0.166*** (0.062)	0.085 (0.059)	0.112* (0.060)	-0.132* (0.059)	-0.088 (0.063)
Treated*Phase 2	0.239*** (0.081)	0.193** (0.086)	0.160** (0.082)	0.105 (0.085)	0.209*** (0.073)	0.165*** (0.081)
Personality Traits	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R ²	0.135	0.152	0.176	0.178	0.192	0.211
Wald chi ²	64.50	105.50	52.00	57.75	82.15	92.57

Source: Author's calculations. Data drawn from Amazon Mechanical Turk.

Notes: The number of observations is N= 622. Dependent variable is an employer's choice in each case (0/1). The specifications control for demographic characteristics (i.e., sex, age, ethnicity), cognitive skills (i.e., educational level), socioeconomic background (i.e., FAS index, Monthly Income), the change of mood levels, individuals' origins, (i.e., regions of the USA), fixed effects and prejudices against sexual orientation. Logit standard errors in parentheses.

Statistical Significance: *** p<0.01, ** p<0.05, *p<0.10.

treatment groups or between the two samples of our experimental tasks.

To investigate the robustness of the link between positive mood and hiring discrimination, we focus the analysis on the second phase of the experiment. Again, we have a drop in the discrimination index. The discrimination index has a mean of 3.276 in T₁ and 2.711 on T₂ (scale 0-6).

Table 8 and Table 9, include the estimation results for the DID models by having again as a dependent variable the discrimination index (i.e., continuous scale) (regression average treatment effects) and the choices (0/1) (logit marginal effects).

Thus, regarding the discrimination index, we observe that the coefficient of the interaction between the treatment and the time (i.e., the difference-in-difference estimator) is negative and statistically significant at the 1% level of significance. Our alternative positive mood stimulus treatment decreased the discrimination index by approximately 1 point of estimation for both jobs, 0.55 points of estimation for online job and 0.42 points of estimation for offline job beyond the control group. In columns [2], [4], and [6], we again included personality traits; however, the estimations again did not vary, showing the robust and direct effect of the treatment stimuli on hiring discrimination behavior.

Table 9 presents the effects of our treatment per hiring choice within an online and an offline experimental labor context. Interestingly, the difference-in-difference estimators reveal that our alternative mood treatment has significantly positive effects on hiring probabilities. Notably, the probability of hiring a female applicant increases approximately 24% and 19% for online and offline labor jobs, respectively. Similarly, the probability of hiring a gay applicant increases approximately 16% but only in the case of the online job. Last but not least, it is noteworthy that our alternative positive mood manipulation also has effects on the hiring of lesbian applicants by increasing their probability of being hired by 21% and 16.5% within the online and offline labor contexts.

6.2. Negative Stimulus and hiring choices

Having established that positive mood can prevent employers' discrimination behavior in hiring choices, we now focus on going deeper into the underlying mechanism of mood on hiring decision making. Choosing a job candidate is a risk-sensitive decision. So, does mood make employers more or less sensitive in hiring decisions? Previous research has shown that mood influences one's willingness to take a risk-sensitive decision (Kassas et al. 2022). Moreover, hiring a homosexual job candidate is considered as a decision under uncertainty which is still a barrier for (openly) gay job candidates in the labor market (Baert, 2018). A significant relationship has already demonstrated between the

propensity to take risk-sensitive decisions and mainly, negative mood state. More concretely, people in induced negative mood state are more conservative in making risky choices than those were in neutral mood (Yuen & Lee, 2003). For that reason, using, also, the negative mood induction paradigm could help us to gain better insight into the risk-sensitive decision mechanism of employers by observing an increased discrimination behavior, mainly, for the gay applicant after a negative stimulus treatment (Baert, 2018). A laboratory experiment randomly assigning individuals to groups of employers and employees and measuring risk preferences with risk preference elicitation mechanisms (e.g. Eckel-Grossman (EG) and Holt-Laury (HL) tasks) would be ideal in providing a causal answer to this empirical question. However, such experiments are not yet feasible due to the new Covid-19 era³⁶. Therefore, in our case, we followed the same online strategy. Participants were randomly assigned to watch one of two videos inducing either neutral or negative mood. We induce a negative mood with a film consisting of a 2-minute composition of 9/11 events. By taking into consideration the higher complexity of the negative mood state and that we didn't have previous experimental studies using a negative video stimulus to rely on, we firstly, conducted a small Mturk survey with 100 subjects asking what events and situations trigger your intense negative emotions. After screening the results, 55% answered events related to terrorist attacks like the 9/11 attack, while 35% answered events related to the pandemic. We piloted two video clips (e.g., one with 9/11 events and one with Covid-19 events) using another 100 Mturk subjects and we selected the video which were most effective in inducing negative mood³⁷.

Again, during our experiment, we measured negative mood longitudinally on three occasions. As Table 10 shows, we found statistically significant changes in negative mood in the treated group. Using a two-sided t test, we found that, on average, negative mood increased from 20.024 to 23.341 (p < 0.01). We did not find statistically significant changes in the measurements of negative mood between the starting point and before the film in either case.

Overall, 326 individuals participated in our third experimental task with similar demographic characteristics as the two previous

³⁶ Lab experiments in the pandemic moved online or mailed home to university students (Abbey & Hoxley, 2020).

³⁷ T-tests on the difference in Negative Affect Schedule (PANAS) were conducted before and after the video took place.

Table 10

T tests for treatment and control group of participants.

	Start (T ₁) [1]	End (T ₂) [2]	Difference [3]	t [4]
Negative affect	Pooled 21.110	22.712	1.602***	2.966
Negative affect	Control Group (placebo film) 22.209	22.074	-0.135	0.758
Negative affect	Treated Group (pandemic video) 20.024	23.341	3.317***	3.451

Source: Dataset with results drawn from the experiment. Author's calculations.

Notes: Difference is [2] – [1]

Statistical significance: *** 1%, ** 5% and * 10%.

Table 11

Determinants of choice (Marginal Effects)

	Online Job Female Candidate [1]	Gay Candidate [2]	Lesbian Candidate [3]	Offline Job Female Candidate [4]	Gay Candidate [5]	Lesbian Candidate [6]
Female employer	-0.103** (0.058)	0.310*** (0.074)	-0.024 (0.084)	-0.091** (0.053)	0.171** (0.085)	-0.019 (0.067)
Personality Traits						
Openness	-0.036* (0.031)	-0.092** (0.039)	-0.038 (0.0340)	-0.026 (0.026)	0.045 (0.043)	-0.038 (0.040)
Conscientiousness	0.114*** (0.039)	0.040 (0.058)	0.031 (0.050)	0.025 (0.037)	0.103** (0.052)	0.030 (0.050)
Extraversion	-0.010 (0.031)	-0.021 (0.038)	0.054 (0.036)	-0.009 (0.028)	-0.111** (0.047)	0.054 (0.036)
Agreeableness	-0.025* (0.031)	-0.123*** (0.048)	-0.054 (0.050)	0.029 (0.036)	-0.031 (0.047)	-0.054 (0.050)
Neuroticism	0.017 (0.037)	-0.019 (0.055)	-0.069* (0.052)	-0.014 (0.038)	-0.017 (0.064)	-0.069 (0.052)
Mood						
Positive Affect	0.008** (0.005)	0.002 (0.004)	0.004 (0.004)	0.010*** (0.003)	0.009* (0.004)	0.004 (0.005)
Negative Affect	-0.005** (0.002)	-0.001 (0.003)	-0.006 (0.004)	-0.004* (0.002)	-0.009** (0.003)	-0.006* (0.003)
Pseudo R ²	0.182	0.222	0.152	0.188	0.227	0.264
Wald chi2	30.87	83.05	55.41	53.23	114.98	55.41

Source: Author's calculations. Data drawn from Amazon Mechanical Turk.

Notes: The number of participants is N=326. Dependent variable (0/1), where 1: hiring choice of a woman [1] & [4], a gay man [2] & [5], a lesbian woman [3] & [6]. The specifications control for demographic characteristics (i.e., age, ethnicity), cognitive skills (i.e., educational level), socioeconomic background (i.e., FAS index, Monthly Income), individuals' origins (i.e., regions of the USA), fixed effects and prejudices against sexual orientation. Robust standard errors in parentheses.

Statistical Significance: *** p<0.01, ** p<0.05, *p<0.10.

experiments³⁸. Three observations were excluded from the analysis due to a particular pattern of sloppy behavior before our experiment took place. No statistically significant differences were observed between demographic variables for the control and treatment groups.

Before our treatment takes place, we confirm again a discrimination behavior on hiring choices by the requesters/employers. Table 11 confirms that females have discriminatory hiring behavior only in the case of female employees. More particularly, a female applicant has a 10.3% (5% level of significance) and 9.1% (5% level of significance) lower probability of being hired in our online and offline job, respectively, when the potential employer is a woman. Again, female employers don't show a discriminatory hiring profile in cases of a homosexual gay applicants (Hypothesis H2).

In the regression presented, we again include the estimates of the effect of employers' personality traits on their hiring choice. As in our previous experiments and in line with Hypothesis H3, we observe that indeed, several personality characteristics correlate with the final

outcome of an employer's hiring choice. For example, more agreeable and "open" employers choose significantly fewer female and gay applicants, while conscientious ones follow the opposite direction.

Going on T₂, after our negative mood treatment took place, we present the estimation results for the DID model in Table 12 by having the discrimination index (as a continuous scale) as a dependent variable and in Table 13 by having this variable measured as a binary choice (0/1).

Concerning the discrimination index, we observe that the difference-in-difference estimator, which is the key parameter, shows that negative mood treatment has a significantly positive impact on hiring discrimination by increasing the index by approximately 0.37 points of estimation for both jobs, 0.23 points of estimation in online job and 0.14

points of estimation in offline job, more than the control group. In columns [2], [4], and [6], we have also included personality traits; however, the estimations did not vary, showing the robust and direct effect of negative mood on hiring discrimination behavior (see Table 12). Going further into our analysis, Table 13 presents the effects of our treatment on each hiring choice, for both the online and the offline job. The difference-in-difference estimators reveal that negative mood treatment has significantly negative effects on hiring probabilities mainly for the gay applicant. The probability of hiring a female applicant decreases by approximately 12% and 7.3% for the online and offline jobs, respectively. Similarly, the probability of hiring a gay applicant decreases by approximately 12.4% and 15.2% for the online and offline job, respectively (at 5% level of significance). We do not find effects regarding the lesbian job candidate.

7. Validity

Concerning the validity and to what extent the findings of our study can be generalized across other hiring situations and stimuli, we have to answer two crucial questions: "Is Amazon Mechanical Turk, a representative online labor market?" (internal validity) and "Are Mechanical Turk worker samples representative of demographics and behaviors in the U.S.?" (external validity).

³⁸ Our sample, on average, was 39 years old, with 55% of them female and 71.7% white. Moreover, 67.48 % of the sample had at least a tertiary education, and approximately 52.7% had an above average monthly family income. FAS, on average, was 8.723. Openness score was 3.653, conscientiousness was 3.886, extraversion was 3.023, agreeableness was 3.843 and neuroticism was 2.659.

Table 12
Treatment Effects on hiring discrimination behavior

	Both jobs		Online job		Offline job	
	[1]	[2]	[3]	[4]	[5]	[6]
Treated	0.159 (0.143)	0.231* (0.142)	0.061 (0.102)	0.116 (0.100)	0.098 (0.096)	0.114 (0.099)
Phase 2	-0.074* (0.038)	-0.074* (0.038)	-0.080*** (0.029)	-0.080** (0.029)	0.006 (0.025)	0.006 (0.025)
Treated*Phase 2	0.366*** (0.067)	0.365*** (0.067)	0.226*** (0.047)	0.226*** (0.047)	0.140*** (0.049)	0.139*** (0.050)
Personality Traits	No	Yes	No	Yes	No	Yes
Constant	3.480*** (0.552)	2.932*** (0.547)	5.245*** (0.395)	4.799*** (0.393)	4.234*** (0.363)	4.133*** (0.401)
R ²	0.112	0.147	0.156	0.188	0.145	0.162
F-Stat	33.48	19.84	13.48	13.72	7.49	8.07

Source: Author's calculations. Data drawn from Amazon Mechanical Turk.

Notes: The number of observations is N= 652. Dependent variable is discrimination index in continuous scale. The specifications control for demographic characteristics (i.e., sex, age, ethnicity), cognitive skills (i.e., educational level), socioeconomic background (i.e., FAS index, Monthly Income), the change of mood levels, individuals' origins (i.e., regions in the USA), fixed effects and prejudices against sexual orientation. Heteroscedasticity corrected standard errors with clustering at individual level.

Statistical Significance: *** p<0.01, ** p<0.05, *p<0.10.

Table 13
Treatment Effects on choice (Marginal effects)

	Female Candidate		Gay Candidate		Lesbian Candidate	
	Online Job [1]	Offline Job [2]	Online Job [3]	Offline Job [4]	Online Job [5]	Offline Job [6]
Treated	-0.075* (0.053)	-0.098** (0.051)	-0.101* (0.054)	-0.040 (0.061)	0.050 (0.061)	-0.057 (0.063)
Phase 2	0.041 (0.048)	0.012 (0.047)	0.013 (0.053)	-0.007 (0.062)	0.029 (0.060)	-0.014 (0.061)
Treated*Phase 2	-0.119* (0.061)	-0.073 (0.063)	-0.124** (0.066)	-0.152** (0.078)	-0.003 (0.083)	0.075 (0.085)
Personality Traits	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R ²	0.096	0.080	0.133	0.101	0.074	0.150
Wald chi ²	55.35	55.53	98.07	90.17	56.30	125.27

Source: Author's calculations. Data drawn from Amazon Mechanical Turk.

Notes: The number of observations is N= 652. Dependent variable is an employer's choice in each case (0/1). The specifications control for demographic characteristics (i.e., sex, age, ethnicity), cognitive skills (i.e., educational level), socioeconomic background (i.e., FAS index, Monthly Income), the change of mood levels, individuals' origins, (i.e., regions of the USA), fixed effects and prejudices against sexual orientation. Logit standard errors in parentheses.

Mechanical Turk is a crowdsourcing web platform that coordinates the supply and demand of tasks that require human intelligence to optimize the completion of jobs. AMT is well suited to take on simple and repetitive microtasks, as in our experimental sessions (Ipeirotis 2010). On the other hand, it is well established that the physical distance of crowdsourcing workers may lead to one of the most common concerns with this recruitment method. The existence of anonymity and the lack of direct observation undermines participant incentives to sufficiently engage with and understand experimental tasks and goals (Horton et al. 2011; Mourelatos et al. 2020). Nevertheless, experimental evidence suggests that Amazon Mechanical Turk respondents are highly experienced, familiar with experimental paradigms and perform experimental tasks significantly better than students in laboratories by ensuring experimental outcomes with high levels of internal validity (Thomas & Clifford, 2017 and Mourelatos & Tzagarakis, 2018).

Concerning the external validity, the experimental sample is in line with many surveys that have revealed that Amazon US-based workers are more likely to be young women with high computer competence (Ipeirotis, 2010) and suggest that the profile of the typical Turker is not a person who participates in online tasks for a living in a developing country (Ross et al. 2009)³⁹. Moreover, the online population of the

AMT remains relatively stable over time and follows the economic circumstances of the real labor market in the US (Difallah et al. 2018). Horton et al. 2011 has also shown that it is possible to quickly and inexpensively replicate findings from traditional physical laboratory experiments in the online laboratory by copying several well-known experiments conducted in the context of online labor markets⁴⁰. Hence, research findings include a satisfactory degree of external validity (i.e., in terms of representativeness and generalizability in relation to the real US population). However, even if the participants of our experiments "look like" the average population in terms of observable cognitive and demographic attributes, some degree of self-selection bias is unavoidable. In line with physical laboratory experiments, issues of "who is willing to participate" in an online task exist, but this matter does not affect the usefulness of such research studies (Falk and Heckman, 2009).

8. Discussion and future directions

We set out to uncover insights into the following questions: are hiring decisions affected by mood? Can positive mood be a key factor in eliminating and preventing workplace discrimination based on gender

³⁹ Paolacci et al. 2010 also showed that Mechanical Turk workers report lower income. The shape of the distribution roughly matches the income distribution in the general U.S. population.

⁴⁰ Edlund et al. 2009 showed that Mechanical Turk workers complete experiments possibly without even knowing that they are in an experiment, minimizing concerns of experimenter bias.

and sexual orientation? Is this psychological aspect a key factor for restricting discrimination during the hiring process in either online or offline labor markets? We focused, mainly, on the effects of a positive boost to mood on gender and sexual discrimination. We used randomized experimental sessions to answer those questions, capturing discrimination both in the behaviors of real requesters (i.e., online job) and real employers (i.e., offline job). Our results were broadly consistent and suggest that while hiring, discrimination exists not only in real labor contexts but also in online labor tasks (Chan & Wang, 2018) based on gender and sexual orientation. Hence, our treatments can constitute a key element in explaining discriminatory hiring choices. Unfortunately, our experimental design does not allow us to estimate whether positive mood has long-term effects on hiring preferences.

These findings provide further evidence of a phenomenon increasingly studied in economics and psychology and highlight the need for more personalized regulatory interventions and policies designed at the theoretical and practical levels. First, it must be taken for granted that employers in financial markets respond emotionally to external or internal changes in the working environment. This emotional change may have an impact on their behavior and decisions in hiring. However, further investigation must be conducted to explain more concretely how, in which degree and under which conditions underlying emotional mechanisms play a key role in financial outcomes (Fenton et al. 2011 and Duxbury et al. 2020). It may be rewarding in future research to attempt to identify additional factors related to the psychological profile of the employer/requester of a job, such as different types of emotions and mood (e.g., anticipatory emotions or anticipated emotions) and their influence on hiring choice (Russell & Carroll, 1999 and Wilson--Mendenhall et al. 2013).

Our results establish that the relationships between sexual orientation, gender and access constraints are the consequence of discriminatory behavior. In our experimental sessions, before the treatment takes place, we found serious evidence of hiring discrimination in both the online and offline job. However, Heckman, 1998 demonstrated that correspondence testing does not exclusively identify the extent of taste discrimination (i.e., the sample might have statistical discrimination or a distaste for the minority)⁴¹. Our constructed applicant profiles allow us to satisfactorily substitute a real hiring process in both online and offline working environments and find behavioral evidence that does not suffer from photo (Rich, 2018 and McFadden, 2020) or beauty bias (Hamer-mesh & Biddle, 1994). Hence, our findings on mood effects can be used for the redesign and upgrading of more efficient and personalized recruitment practices, especially in online labor markets (Williams et al. 2020).

Currently, although many online labor markets allow workers to hide behind anonymity and their profiles do not provide much personal information, several tools and strategies are available to a requester to find additional information for the workers they will hire. For example, an MTurk worker's ID mainly exists as a customer ID on Amazon, which is a public page that links worker ID to name and preferences (Leung, 2018). Crowd workers' personal data are under investigation, and for that reason, many online labor platforms have begun profiling their workers as a monitoring mechanism and to build up the trust in and reputation of the hiring procedure (Kassi & Lehdonvirta, 2018; Kokkodis & Ipeirotis, 2016; Kokkodis et al. 2015 and Williams et al. 2020).

This research suggests various directions for future investigation. Our aim is to extend this study in three dimensions. First, we plan to further investigate the positive and negative effect of employers' mood by constructing several manipulation techniques within a laboratory setting and try to link the effects with individuals' risk preferences. This will allow us to have a clear picture of the link between mood and hiring behavior. Second, we will try to embed racial discrimination in our future research to understand whether the mood effects also hold in the

presence of racial disparities across several potential job seekers. Last but not least, we will try to replicate our findings within laboratory settings to control also for the bias coming from the participants' anonymity or degree of familiarity with several experimental paradigms (Arechar et al. 2018; Paolacci et al. 2010 and Rand, 2011).

9. Implications

In this section, we discuss what can be extrapolated from our findings and then turn to policy implications for the real world. Recall, we already know that, mood is linked to cognitive flexibility (Isen, 2008), reciprocity (Kirchsteiger et al. 2006), work effort and productivity (Oswald et al. 2015), loss aversion (Isen et al. 1988), time preferences (Ifcher & Zarghamee, 2011) and risk (Kassas et al. 2022). Initially, we conduct a random- assignment experiment to investigate whether positive affect impacts hiring choices. Our results indicate that positive mood state significantly reduces employers/requesters' hiring discrimination behavior against homosexuals and female candidates. Trying to understand in depth, what drives this effect, we, next, investigated the opposite direction of the effect by randomly exposing individuals to a negative mood stimulus. Subjects who watch a negative mood-inducing video were more risk-sensitive during the hiring process resulting in higher discrimination against homosexuals and female job applicants, in comparison to those who watch a neutral mood-inducing video.

Our results show that psych emotional data may be useful in experimental economics and economic psychology research in pinpointing particular points in time when individuals experience visible changes in their emotional states. In addition, our research shows that unfavorable hiring outcomes of homosexual and female job candidates can be tackled by lowering the perceived risk related to hiring these candidates. Therefore, policy makers might consider awareness campaigns that highlight success stories of (openly) homosexuals in the workplace. Because prejudices are formed at an early age, it might be a good idea to integrate such campaigns into education.

Lastly, although a noticeable increase in social science research focusing on gay men and lesbians has occurred over the last decade the existing literature on sexual orientation has ignored several psychological factors influencing employers' and employees' behavior. Our results highlight the complexity of discrimination by focusing on mood but also prove that a history of discrimination could not be turned around overnight. Despite measures to encourage openness and discourage discrimination in the European Union, serious misconceptions and barriers are encountered by sexual minority individuals and females in the job market.

10. Conclusions

The psychological field of mood science, originally slow to develop, is undergoing a revolutionary phase that has already begun to impact several theories of decision-making (Keltner & Lerner 2010, Loewenstein et al. 2001, Loewenstein & Lerner 2003). In our study, we tried experimentally to link employers' positive moods to hiring decision choices. Our treatments and data allow us to track the complete hiring process and the changes in employers' hiring behavior. Our findings have developed several arguments on how mood interacts with behavior in terms of gender discrimination, mainly in OLMs. Moreover, by isolating and experimentally evaluating the taste and statistical discrimination hypotheses that have been proposed to explain some of the disadvantages that homosexual applicants/workers experience in both online and offline labor markets, we also investigate in depth the aspect of sexual orientation within the hiring process, and we add some additional notes to the noticeable and growing research in social science focusing on gay men and lesbians. Despite measures to encourage openness and discourage discrimination in the USA and the European Union, serious misconceptions and barriers are encountered by sexual minorities in both online and offline labor markets (Badgett et al. 2021).

⁴¹ Arrow, 1973 and Becker, 1957.

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References

Mourelatos et al., 2022, Weichselbaumer, 2015, Williams and Ceci,

2015, Ipeirotis, 2010, Kokkodis et al., 2015, February

Declaration of Competing Interests

None

Data availability

Data will be made available on request.

Appendix A - Curriculum Vitae Structure – Short Versions

First Name: Randomly assign Last Name: Randomly assign Sex: Male/Female Marital Status: Single Country: USA Age: 40 Education: College Previous Professional Experience: 80% success rate in previous task completion activity and at least 50 approved survey tasks previously in Amazon Mechanical Turk <i>Worker profile information:</i> Interests/Memberships: Membership and Volunteer work in ILGA World - The International Lesbian, Gay, Bisexual, Trans and Intersex Association (homosexual candidate) Or EIA Environmental Information Association" (heterosexual candidate)	First Name: Randomly assign Last Name: Randomly assign Sex: Male/Female Marital Status: Single Country: USA Age: 40 Education: College Previous Professional Experience: in sales job from 2010 to 2020 <i>Curriculum vitae personal information:</i> Interests/Memberships: Membership and Volunteer work in ILGA World - The International Lesbian, Gay, Bisexual, Trans and Intersex Association (homosexual candidate) Or EIA Environmental Information Association" (heterosexual candidate)
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Curriculum vitae types for the online and the offline job

Appendix B - Conceptualizing Mood

The modeling structure that we sketch is potentially complementary to the neurobiological one of Ashby et al. 1999, where the route from positive affect to increased dopamine is described, but ours is framed in the hiring choice theory of taste-based employer discrimination suggested by Becker, 1957 and Banerjee & Mullainathan, 2008⁴².

In the employer discrimination model, employers may dislike hiring a particular subgroup, such as female and homosexual individuals. When a female or homosexual individual is hired, an employer considers the cost to be both the wage and the disutility from hiring the worker with the aforementioned characteristics. We think discriminatory behavior is an internal negative stimulus of brain function that is stored in memory as a form of distraction when an individual is invited to make a choice (Romo & Salinas, 2003; Beaman et al. 2013 and Kaspar et al. 2015).

In general, individuals have a finite amount of energy, which must be distributed across different parallel activities. Thus, utility consists of two different sources: U, which in our case is the employer’s utility from profits and the effort put into the hiring process, and v is the utility from broadly attending to the remaining aspects in life. Now, e is the energy the employer devotes to the hiring process, while d is the distractions that result in discrimination. Employer psychological resources are P. Thus, $P \geq (e + d)$.

Moreover, we consider an initial positive affect shock A, which we assume to be an argument of the utility function proposed by Isen et al. 1978 and Kimball and Willis, 2006. For the sake of clarity, we assume separability between the two kinds of utility going to the employer. Hence, we suppose that each employer has utility maximizing behavior.

Maximize $u(p, e, s, z) + v(d, s)$ (1a) where p is profits and d reflects a simple form of discriminatory taste against female or homosexual workers. The comparative-static result of particular interest here is the response of profits, given by effort on choice e, to a rise in the initial positive mood shock, s.

Formally, it is determined in a standard way. The sign of de^*/ds takes the sign of the cross partial of the maximand, so that $Sign\ de^*/da$ takes the sign of $E_{es} - v_{ds}$

Without any restrictions, this sign could be either positive or negative. A positive mood induction could increase or decrease the amount of effort put into the hiring choice by an employer. Let P be normalized to unity and assume that the u and v functions are concave and differentiable. This will lead to natural forms of interior solutions and allow the analysis to be generalized.

Therefore, how can an exogenous mood perturbation enter employers’ objective function?

Following Oswald et al. 2015, we embodied it in two different ways. If we think of the exogenous positive mood in relation to choice with the additive model having as a maximand

$u(\cdot) + v(\cdot) + s$

⁴² Banerjee and Mullainathan (2008) consider a model where labor intensity depends on outside worries; this generates highly nonlinear dynamics between wealth and effort on the job. However, both these abstract from any effect due to positive mood or other emotions.

then employers face positive mood shock as a vertical shift upward in their utility function. They get the “s” mood shock whether they subsequently make hiring choices or instead worry about other things and have distractions. This special case corresponds to the view that positive mood and utility functions coincide, so an exogenous positive mood shock adds, in a sense, to the initial “utility” level. In this case, the optimal effort on hiring choices e^* is independent of mood induction treatment.

On the other hand, a more feasible alternative form of the utility function has this positive mood treatment operating within a concave structure. More concretely, the employer’s maximization problem becomes

$$\text{Maximize } u(pe + s) + v(1 - e + s) \quad (2a)$$

which is the assumption that the treatment shock “s” is a shift variable inside the utility function itself, rather than an additive part of that function. By calculating the first-order condition, we have

$$u'(pe + s)p - v'(1 - e + s) = 0 \quad (3)$$

In this case, the optimal level of energy devoted to hiring decisions, e^* , does depend on the level of the induced positive mood treatment. The sign of de^*/ds takes the sign of $u''(pe + s)p - v''(1 - e + s)$, with the first element being negative and the second one positive.

By the first-order condition, we can replace the profit term p by the ratio of the marginal utilities from putting effort into a hiring decision process and having an amount of distraction of which his or her discrimination behavior may have its origins. After substitution, the sign of the comparative static response of effort on a hiring decision, e , with respect to the size of the positive mood shock, s , is greater than or equal to zero as

$$\frac{u'(\cdot)}{u'(\cdot)} - \frac{v'(\cdot)}{v'(\cdot)} \geq 0 \quad (4)$$

If the marginal utility of an employer’s remembered distractions containing stimuli-reactive discriminatory behavior declines quickly enough, then a positive mood shock will successfully raise the employer’s chosen effort on a hiring decision, e^* . In other words, as the employer’s state of mood goes increasingly to a positive condition and assuming that (4) holds, that allows him or her to more easily shift his or her memory focus by deflecting attention away from discrimination-related internal stimuli and focusing on the hiring procedure without distractions. If condition (4) does not hold, the opposite happens.

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Appendix C

Our study tries to examine discrimination against homosexuals and female online job candidates. By searching previous papers, we found only one paper by Drydakis, 2009 investigating homosexual discrimination through correspondence test. Our paper relies on the way Drydakis signals homosexuality in CVs (a gay applicant’s sexual orientation was labeled through a reference in his curriculum vitae to voluntary work at a homosexual community organization) while heterosexuals signal includes volunteerism in an environmental community in case that activism might have biased the selection process. Moreover, in order to identify what volunteering activities, the heterosexual candidates will link to, we conducted one survey⁴³

Appendix C1 Survey results

Volunteerism	Association Score
Social volunteer work (community development)	1.10
Environmental volunteering	1.05
Animal care volunteering	2.43
Collect and distribute foods, clothing, or goods	1.65
Tutor, teaching or mentoring	1.54

Source: Author’s calculations. Data drawn from Amazon Mechanical Turk.

Notes: The number of observations is $N = 97$. The question was phrased as follows: «On a scale from 1 to 10 how do these volunteerism activities, play a role in a hiring choice of a potential job candidate? » Coding ranges from 1 (very important) to 10 (not important).

⁴³ Bureau of Labor Statistics, U.S. Department of Labor, The Economics Daily, Most frequent volunteer activities: fundraising, tutoring, teaching at <https://www.bls.gov/opub/ted/2009/jan/wk4/art01.htm> (visited September 26, 2022).

and one proxy experiment with MTurkers (N=97 and N=104 respectively) asking, firstly, volunteering preferences and then a pool of requesters ought to choose heterosexual candidates varying in volunteerism based on the top answered survey results (Appendix C1). Furthermore, the results didn't reveal statistically significant differences in hiring choices. Paired T-tests were conducted between workers selected without and with activities in environmental volunteering ($p = 0.18$) and without and with activities in social volunteering work for community development ($p = 0.21$). By taking all the above into consideration, we proceed in the main experiment, with *volunteerism in an environmental community*, for our main heterosexual pseudo seeker job candidate.

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