

Mourelatos, Evangelos

Working Paper

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GLO Discussion Paper, No. 956

Provided in Cooperation with:

Global Labor Organization (GLO)

Suggested Citation: Mourelatos, Evangelos (2021) : Hiring Discrimination in Labor Markets. An Experimental Study of Mood Regulation, GLO Discussion Paper, No. 956, Global Labor Organization (GLO), Essen

This Version is available at:

<https://hdl.handle.net/10419/243205>

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Hiring Discrimination in Labor Markets. An Experimental Study of Mood Regulation

by Evangelos Mourelatos*

** Department of Economics, Accounting and Finance in Oulu Business School, University of Oulu, Finland*

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 job candidates compared to heterosexuals. Our experimental design allows us to track the complete hiring process and monitor employers' behavior within and without our treatment context, in both online and offline labor market settings. Constructing pairs of curriculum vitae, distinguished, in each case, only by the sexual orientation or the gender of the applicants, led to the observation that females and gay men faced a significantly lower chance of getting hired regardless the labor market context. We also find that female employers propose higher levels of discrimination only for the case of female applicants. Our positive mood manipulation led to a depletion of discrimination levels, with the effects being more robust in the online labor context. Thus, there is substantial experimental evidence to suggest that discrimination based on sexual orientation and gender does exist also in online labor markets. Contributions to the hiring discrimination, mood research, and gig-economy literature are discussed.

JEL-Codes: D91, D87, D53, D23, D01

Keywords: experiment, hiring discrimination, mood, online labor markets, gender, sexual orientation

Introduction

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 tendencies toward mood (Bless et al. 1996; Isen, 1987), economists have just lately tried to embed mood in traditional economic decision-making theories (Rick & Lowewentein, 2008; Kirchsteiger et al. 2006, Sanfey et al. 2003 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. Our findings provide clear evidence that measures of gender and sexual discrimination within hiring decisions are sensitive to subjects' current mood state.

Discrimination exists throughout several aspects of life with many negative consequences (Arrow, 1973). When discrimination occurs in the workplace, there are consequences the company experiences and consequences suffered by the employees. The immediate consequences of job discrimination for a worker or job applicant are obvious: you were not hired or promoted, even when you were qualified, resulting in earning inequalities. The main sources of discrimination are gender, age, race and nowadays sexual orientation individual differences (Becker, 1957; Gardeazabal & Ugidos, 2005; Drydakis, 2009; Akoy et al. 2019 and Drydakis, 2013). Economic literature has been interested in the causes of labor discrimination and their underlying mechanisms, which may result on some form of market failures (Krueger, 1963; Stiglitz, 1973 and Neumark, 2018).

In the United States, there has been a persistent raw difference between the earnings of male and female employees. Moreover, women continue to face lower employment rates than men, with the ratio of female to male labor force participation in 2019 being at approximately 83%.¹ Furthermore, about four-in-ten working women (42%) in the United States say they have faced discrimination on the job because of their gender. They report a broad array of personal experiences, ranging from earning less than male counterparts for doing the same job to being passed over for important assignments, according to a new analysis of Pew Research Center survey data²³. There is similar prima facie evidence of discrimination also in several EU countries⁴ (Williams & Ceci, 2015 and Blau et al. 2017).

In the same direction, it is apparent that sexual minority individuals are also facing unfair treatment in the labor markets⁵. Research studies, have shown lower incomes for

¹ Data: U.S. Bureau of Labor Statistics and <https://data.worldbank.org/indicator>

² Gender discrimination comes in many forms for today's working women, Pew research Center, USA, 2017

³ Women are roughly four times as likely as men to say they have been treated as if they were not competent because of their gender (23% of employed women versus 6% of men), and they are about three times as likely as men to say they have experienced repeated small slights at work because of their gender (16% versus 5%).

⁴ Special Eurobarometer vol. 493.

⁵ On average across these 14 countries, 2.7 percent of adults identified as lesbian, gay, or both (Badgett, et al. 2021).

homosexual workers (Clain & Leppel, 2001, Drydakis 2009;2015 and De Schutter, 2008) and argue that also this aspect of discrimination is the dominating mechanism that explains the variation of 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 to. Sexual orientation discrimination has been part of the workplace in America for decades, and while federal, state and local laws, as well as increased social awareness have improved the situation dramatically, many people who are not heterosexual still face obstacles at work related to being gay, bisexual, asexual, or pansexual. Studies show that anywhere from 15 percent to 43 percent of homosexual people have experienced some form of discrimination and harassment at the workplace. Moreover, a staggering 90 percent of these workers report some form of harassment or mistreatment on the job. These workplace abuses pose a real and immediate threat to the economic security of homosexual workers, resulting in 10 percent to 32 percent less income than similarly qualified heterosexual workers⁶. In the same direction, economists, also 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, by decreasing their access to occupations by 9.6 % (Drydakis, 2021) and job candidates being part of the LGBTQ community, were significantly less likely to be invited for an interview or to be offered a job (Bertrand & Duflo, 2017; Neumark, 2018 and Acquisti & Fong, 2020). Regarding online labor contexts, Coffman et al. 2017, by using a list of experiment tried to find the true rate of non-heterosexuality in an Amazon Mechanical Turk sample. The authors found that rates of non-heterosexual identity implied by the list experiment were 65 percent larger than rates based on direct self-reports. Nevertheless, until now, there is a research gap, on the magnitude of discrimination within online labor contexts and the determinants of requesters' 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. For that reason, this research investigates the relationship between discrimination and hiring in online and offline labor market settings in relation to personal identity, by taking gender differences and sexual orientation into consideration and controlling for demographics, cognitive and personality characteristics (Neumark, 2018).

This study explores a question of interest to economists, behavioral scientists, psychologists, employers, and policy makers: Does “positive mood” make employers

⁶ 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)

more sensitive in hiring decisions? We provide evidence that it does. Before our positive mood induction occur, we found strong evidence of gender and sexual discrimination in both online and offline setting. More particularly, in our experiment, a female participant had, on average, approximately 40% chance to get hired, a gay participant, approximately 37% and a lesbian participant approximately 64 %. After our treatment embedded in the hiring process, the discrimination reduced and the hiring possibilities were increased of about 31% for females, about 35% for gay and just 3.5% for lesbian.

One caveat should be made clear. Although our findings suggest that employers with higher positive mood levels are moderating 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 within an online and offline framework. Our exercise was conducted in Amazon Mechanical Turk (i.e. AMT) which is the leading crowdsourcing platform and the most representative field of investigating issues related to gig economy⁷ (Horton, 2010; Horton et al. 2011; Hara et al. 2018 and Dube et al. 2020). This economy, is consisting of several online labor markets (i.e. OLMs), which have substantially grown in size in recent years (Horton, 2010). According to Horton and Chilton, 2010, OLMs consist of three parts. A requester of a job, the micro task or job and a worker. According to Horton (2010), an online labor market is where, (1) labor is exchange for money, (2) the outcomes of that labor is 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. In general, the use of these OLMs has been increased by around 20% over the last years and the estimated total market size is about \$25 billion with over 48 million registered online workers⁸ (Kassi & Ledhonvirta, 2018 and Kuek et al. 2015). So, OLMs provide an ideal framework along with the traditional (i.e. offline labor markets), framework for studying several economic aspects.

But, does potential hiring biases exist in online labor platforms and how they may affect hiring outcomes?

Although, online labor markets give requesters (i.e. organizations or individual employers) the ability to quickly recruit large numbers of workers who are willing to work in micro jobs, 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. But new studied show that biases are alive also in online labor markets. In this context, Gomez-Herrera et al. 2019, revealed a statistically significant

⁷ The term 'gig economy' identifies the establishment of a capital-labor relationship between a worker and a digital platform, that mediates workers' 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).

⁸ Quantitative data drawn by the online labor index.

gender wage gap by exploring over 250,000 online micro jobs involving over 55,824 hiring decisions. Yet, these findings similar to Leung, 2018 paper include heterogeneity across workers' countries. In the same way, Hangartner et al. 2021, in general, within this online recruitment framework, for online gender-dominated jobs, 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. Also, 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' effort to use stereotypical cues to infer subtle interpersonal traits, such as trustworthiness. Unfortunately, until now there is a lack of studies investigating the sexual orientation discrimination in online environments (Williams et al. 2020).

In order 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 of well-developed reputation systems. Thus, online workers get rated for the tasks they accomplish and these ratings become part of their online resumes. Employers can then get a better picture of these freelancers' past performance and make better informed hiring decisions. However, in online labor markets, as well as in most of the online markets in general, reputation scores are very skewed towards high ratings (J-shape distributions) (Kokkodis & Ipeirotis, 2020 and Benson et al. 2020). Thus, Horton, 2017 proposed algorithmically recommending workers to employers in order to substantially increase hiring efficiency⁹. But all the above mentioned hiring solutions, do not take into consideration effects that may have their origin in an employer's stereotyped bias.

In order to investigate this challenge, we used a simplified version of the correspondence test in order to measure requesters'/ employers' discrimination behavioral outcomes in online/offline setting (Jacquemet, & Yannelis, 2012; 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)¹⁰.

The structure of the paper is the following. Section 2 presents the related literature and our hypotheses, section 3 illustrates the experiment and it provides information on the task's attributes, design and the measurement of our outcomes. In Section 4 we present the utilized empirical model and the estimated results (baseline, incentives and personality effects), the robustness checks and the validity. Finally, Section 5 concludes.

⁹ In an experiment conducted in an online labor market, employers with technical job vacancies that received recruiting recommendations had a 20% higher fill rate compared to the control.

¹⁰ This meta-analysis paper includes all the correspondence experiments until now.

Literature Review and Hypotheses

Economists have only recently focused their attention on mood and non-cognitive psychological aspects (Heckman & Kautz, 2012 and Heckman et al. 2019). In case of discrimination firstly, 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 so important to everyday life decisions. For that reason, current mood is a key factor within a human's decision underlying mechanism which may affect positively or negatively their behavior (Schaller & Cialdini, 1988; Fredrickson, 2001 and Baron & Thomley, 1994) as hiring choices may be (Forgas & Fiedler, 1996; 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, have 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 pre-existing 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 one-shot dictator, ultimatum and trust economic game. His research, denoted that good-mood participants have a more altruistic and helpful behavior, during economic decision-making processes. Thus, Shu's 2010 results, confirmed also, that good mood is a vital factor for economic equilibriums.

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 with higher productivity. Last but not least, Reuben & van Winden, 2010, demonstrated that subjects' mood is sensitive to fairness perceptions.

Furthermore, in order to go in depth our investigation on how mood affects hiring discrimination behavior, we draw also our attention on employers'/requesters' personality traits. It has long been postulated that personality and mood states are related (Svackic et al. 1992 and Peirson, & Heuchert, 2001). Thus, Hepburn & Eysenck, 1989, found that mood variability was related to extraversion and to 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 assess personality premiums in various hiring decisions with conscientiousness, followed by emotional stability, being important drivers of recruiters' decisions.

By taking all the above into consideration, in order to address our research challenges, we used a mood-regulated experimental setup as a treatment to discriminated stereotypes (Lambert et al. 1997 and Drouvelis, & Grosskopf, B, 2016) by considering

positive mood induction, as a shift variable within employers' utility function (see Appendix B) and we measured its values with Panas inventory¹¹ longitudinally in a way that provides us with an opportunity to scrutinize the changes in mood within our subjects (Watson et al. 1988).

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

Hypothesis 1: In the first round of the experiment (i.e. pre-treatment), we will find evidence of gender and sexual discrimination, in both online and offline setting.

Hypothesis 2: Female employers, will have a low discriminated hiring profile in cases of a homosexual applicant.

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

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

Design of the Experiment

- Correspondence test

Our experimental approach, was based on the principles of the correspondence test which incorporates a simulation of the communication between employers and job seekers and involves matched pairs of *curricula vitarum* (i.e. CVs) of potential job applicants as a 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. With this way, we were able to conduct tests and investigate the underlying mechanics of online discrimination and by having several individual-specific characteristics constant, we had the opportunity to isolate 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 pairs of testers who are identically, and differ on gender and sexual orientation, so that any systematic difference in treatment within each pair can be attributed only to the effects of the group characteristic (Bertrand et al. 2004).

- Application Structure

¹¹ This is a self-report inventory, consisting of two scales designed to measure PA and NA (i.e. 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.

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

Concerning homosexuality, we followed Adam, 1981, Weichselbaumer, 2003 and Drydakis, 2009 gay labeling, in which the interests/memberships section of the CV included: “*at Sport and Travel clubs / at Gay, Lesbian and Straight Education Network (GLSEN) and Consortium of Higher Education LGBT Resource Professionals organization.*” For the straight half of the applicants, no explicit information on sexual orientation was given. But, in order not to have bias, from a potential misunderstanding of the employer side in relation to the interpretation of the aforementioned label (i.e. volunteer or activism activity), we control for this possibility by adding at the straights’ CVs, also, a volunteerism information in an environmental community (Mason & Palmer, 1996). Moreover, due to the online labor market characteristics in which the experiment took place we did not believe that these activities and the workers’ present duties create a conflict in the hiring process, so the application documents don’t indicate that those activities had ended¹². Lastly, in order to look at the effect of several unobservable characteristics, we embedded items on the CVs in order 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). In the end, 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 but 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.

- *Methodology*

In this study, in order to measure occupational access discrimination for females and gay job seekers and in order to link these hiring choices with employers’ mood status, we created one recruitment process with the attributes of an online labor market and one recruitment procedure with embed a real life condition of an offline labor marketplace.

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 it was set to 0.80\$¹³ (Banfi, & Villena-Roldan, 2019). We choose Amazon Mechanical Turk, because it proves to be the best online labor market which efficient replicates the principles of a real labor market (i.e. offline labor markets) and where buyers contract with individual sellers (Horton, 2010; Horton, 2011 and 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, Crump et al. 2013 and Goodman & Paolacci, 2017). The experiment was programmed using zTree and it was consisting of two rounds with

¹² 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. This is a result of the offline market labor characteristics.

¹³ The duration of the experiment had a mean of 4 minutes and a standard deviation of 1.2 minutes.

an obligatory break in the middle (Fischbacher, 2007). In the beginning of the experimental sessions and before the online task commenced, subjects had to fulfill a survey questionnaire, which included several questions. The collected information from the survey questionnaire allows us to control for demographic and social economic characteristics. Furthermore, to capture differences in personality among subjects the Big Five Personality questionnaire of 44-item inventory is used, which provides measures for each personality trait i.e., Openness, Conscientiousness, Extraversion, Agreeableness, Neuroticism OCEAN , hereafter¹⁴ (John & Srivastava, 1999 and McCrae & Costa, 1999)¹⁵. In order to explore the relationship between mood and hiring choice in both online and offline conditions we run two experimental sessions with different positive mood stimuli. Moreover, in order to have realism during the experimental framework, we include in our analysis only the participants that had also a requester profile in AMT and they were owning or working in a firm at the real labor market and have 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)¹⁶. Those passing the screening survey were given access to the phase 1 of the experiment (Henle et al. 2021) and detailed instructions were displayed on their screen.

All participants were randomly assigned (using the uniform distribution algorithm) to one of two different groups of each session. The first group, serves as the “the control group” and the second as the “treatment group” in which the mood induction took place. In the first round all participants should read the instructions telling that, “being requester you have as a requested job the fulfillment of several surveys, which worker will you hire in each of the following cases” in the online setting¹⁷, and “being owner or part of a HR department of one firm you have to hire a seller, which candidate will you choose in each of the following cases” in the offline setting. It is not consistent with our research objective the investigation of the link between mood and hiring decision 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 which requires a “typical” middle-skill worker (Autor & Dorn 2009; Autor, 2010 and Green, 2019)¹⁸. Our selected jobs also do not suffer from male/female dominated bias (Drydakis, 2015 and Derous et al. 2017) or invisibility hypothesis (Milgrom, & Oster, 1987)¹⁹.

¹⁴ 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.

¹⁵ 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. Afterwards, the OCEAN factors were constructed through a factor analysis, in order to 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 mean zero and standard deviation of one in all reported specifications (Cubel et al. 2016).

¹⁶ 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.

¹⁷ Although in several OLMs the hiring process is as an open call format, AMT offers a new hiring trend, which gives the opportunity to the requesters to create a pre-selection group of workers that the online job will be posted.

¹⁸ In USA the middle skill job had the 45% of all job openings in the past years (OECD 2019).

¹⁹ 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

During the experimental sessions, all subjects were not aware about the randomization process which led them to a mandatory break in which the “control group” was exposed to a neutral placebo film while the “treatment group” was exposed to a comedy film²⁰. By following Oswald et al. 2015 experimental design, we used as a “placebo” film - a moderately interesting but not intrinsically happy clip²¹ which depicts patterns of colored sticks which 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 (i.e. 2 minutes). On the other hand, we similarly, induce positive mood with a “comedy” film which was consisting of a 2 minute composition of well-known USA comedians²². Due to the online environment of our experiment, we choose to trigger the positive emotions, in order the participants to be focused and have high levels of perceptual flexibility during the experimental process (Tan et al. 2009). Mood (i.e. positive and negative affect) was measured at the beginning of the experiment and at the end with Panas inventory with moment time instructions (Watson et al. 1988)²³.

In the end of the break, participants received a brief reminder of the task and conditions of the experiment ahead and they proceeded to the second phase in which they perform the same hiring choices but with different order²⁴.

Our key dependent variable is the hiring behavior of the requesters/employers before and after the mood induction. We measured hiring behavior as a binary choice (0/1), as a categorical choice (1-4) and as a willingness to hire in a continuous scale (1-100).

Thus the experiment consisted of five stages: welcoming and instructions, questionnaire, hiring choice task, break, the same hiring choice task. Hence, the experimental sessions were designed as a two period-experiments in order to provide us with a baseline measure of hiring behavior and allow us to examine how hiring decisions outcomes change after the mood induction (Cubel et al. 2016). Lastly, the online environment of the experiment, allow 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 the employer-employee interaction.

- *Research Limitation*

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 pre-agreed wage to homosexual workers or female workers in the end of the online job, by rating very low his/her quality due to bias behavior (Bertrand & Mullainathan, 2004 and Petit, 2007). So, it is impossible to test for the employers’ truthfulness and trust until a worker will actually receive his compensation. Moreover, we must raise some concerns

²⁰ The questionnaire results indicate that the clip was generally found to be entertaining and had a direct impact on reported positive mood levels

²¹ The film clip was "Computer Graphic" on James Gross's resources site: http://www-psyched.stanford.edu/~psyphy/movs/computer_graphic.mov.

²² The research team conducted a two-step research 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 USA Comedians and then we took into consideration their metrics in Youtube, Facebook and Instagram.

²³ Participant reported on which degree they were feeling this way right now, that is, at the present moment.

²⁴ We adopted a different order in the second phase in order to minimize possible learning, fatigue or boredom effects.

regarding the quality of data. As it is already known, in OLMs purchasers of labor confront severe adverse selection issues. OLMs consist of a pool of potential workers which hide behind their anonymity and may lack of extrinsic motivation (Chandle & Kapelner, 2013), which many times 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 downwards (Horton & Chilton, 2010 and Paolacci et al. 2010).

All the above, may result in a generalized cautious and bias hiring behavior by the employers/requesters.

The Model

The major objective of the current paper is to link the effect of mood state on employers' hiring decision. For that reason, we describe a behavioral model with a 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:

$$Y_{it} (\text{Hiring}=1) = \alpha + \beta_1 T_i + \beta_2 \text{Post}_i + \beta_3 T_i * \text{Post}_i + \beta_4 D_i + \beta_5 P_i^k + \beta_6 X_i + u_i + e_{it} \quad (1)$$

Where $Y = Y_{i1} - Y_{i0}$, denotes the change in outcome variable before and after the intervention, and reflects the probability of a worker receiving a positive hiring answer, α is a constant, T is a dummy variable indicating the treatment group specific effect ($=1$), Post is the time trend common to control and treatment groups (i.e. a dummy variable indicating pre ($t=0$) and post ($t=1$) treatment), $T * \text{Post}$ is the difference-in-differences term which indicates whether the outcome was observed in the treatment group and it was observed after our intervention ($=1$), or any other case ($=0$). D is a dummy reflecting the discrimination by gender or sexual discrimination which equals one (zero) if the worker was labeled as being homosexual or female (in all other cases), P is a k -vector of the personality of worker i (where $k= 1, \dots, 5$ corresponds to OCEAN²⁶), X_i are individual specific characteristics (i.e. other demographic attributes, cognitive skills and social economic background of the i^{th} worker), u is a vector of individual fixed effects, and e is the idiosyncratic error term.

By having controlled for all characteristics except the sources of potential discrimination in each case (i.e. gender and sexual orientation), across two applicants the latter 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). Moreover $\hat{\beta}_4$ indicates the discrimination

²⁵ Difference-in-difference 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 zero and standard deviation of one.

probability levels. If $\hat{\beta}_4 = 0$, the homosexual and heterosexual applicants and females and males had the same probability of receiving a positive hiring response. If $\hat{\beta}_4 < 0$, the homosexual or female applicant had a lower probability than the respective heterosexual or male of receiving a positive hiring decision, while if $\hat{\beta}_4 > 0$ the opposite applies. For equation 1 we report marginal effects²⁷.

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

$$\text{Discrimination index}_{it} = \alpha + \beta_1 T_i + \beta_2 \text{Post}_i + \beta_3 T_i * \text{Post}_i + \beta_4 D_i + \beta_5 P^k_i + \beta_6 X_i + u_i + e_{it} \quad (2)$$

Where, similarly to equation (1), T is a dummy variable indicating the treatment group specific effect (=1), Post is the time trend common to control and treatment groups (i.e. a dummy variable indicating pre (t=0) and post (t=1) treatment), T*Post is the difference-in-differences term which indicates whether the outcome was observed in the treatment group and it was observed after our intervention (=1), or any other case (=0). D is a dummy reflecting the discrimination by gender or sexual discrimination which equals one (zero) if the worker was labeled as being homosexual or female (in all other cases), P is a k-vector of the personality of worker i (where k= 1,...,5 corresponds to OCEAN), X_i are individual 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.

Results

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 of 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 the starting point and before the film measurements of positive mood measurements in neither case.

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

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

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

Hence our mood manipulation proves to be efficient for the positive side and coming only from our treatment comedy-film (Table 1).

---- Please Insert Table 1 about here ----

Sample

In this section, we provide the descriptive statistics for the participant – employers (Table 2). In general, 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, is 40 years old, and 56 % of them were females and 73.5 % whites. Moreover, 66 % of the sample has at least tertiary education and approximately 51.5 % above average monthly family income³¹. Also, subjects were asked to provide information on family affluence scale (i.e. FAS)³², in order to have a proxy indicator of their social economic background. FAS, on average was 8.538 reflecting a middle – high socioeconomic status. In respect to personality, according to the observed variation in personality traits, we notice that the mean score for Openness is 3.708 suggesting that our sample consists of individuals with a high tendency toward creativity and active imagination, for Conscientiousness is 3.828 signifying high levels of thoroughness, for Extraversion is 3.106 exhibiting a satisfactory level of participants’ energetic behavior, for Agreeableness is 3.761 indicating that our participants seem to be more empathetic and altruistic and for Neuroticism is 2.746 suggesting that our sample doesn’t tend to experience in general negative emotions. For all the afore mentioned personality variables we did not notice a great number of extreme values. Last but not least, in order to control for individuals’ negative attitudes towards homosexuals, which might constitute a source of labor market prejudices bias, we asked them before the experiment (i.e. in this phase participants were not aware about the core and the design of the experimental framework and the hiring-discrimination procedure that would follow), about their general beliefs on possibilities and hiring (Badgett, 2020). Interestingly, 55% responded that heterosexuals should have higher possibilities of being hired to a job, while 36% believed that this kind of discrimination must not exist on hiring decisions.

Table 2, also demonstrates that there are no statistical differences between the afore mentioned variables between the control and treatment group.

³⁰ They chose the same answers in all the Likert scale questions and they fulfilled the whole questions 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 being used to many studies measuring wealth and has been characterized as a valid, and easy to answer by individuals, measure of socio-economic status levels (Boyce et al. 2006). This measurement consists of 6 items with a Likert scale form of answering and has a summarized value range from 0 to 13. The FAS is addressing issues of family car ownership, having their own unshared room, the number of computers at home and the times an individual spent on holiday in the past 12 months.

---- Please Insert Table 2 about here ----

Hiring Choices

Table 3 presents the results for access to occupations or the choices being made from the employers. Recall, the outcome of our correspondence testing has a similar design as was first set out by followed McIntosh and Smith (1974), which has since been adopted in similar field experiments across Europe (Riach & Rich, 2002).

Column 1 shows that in both labor markets, female and gay applicants face a discrimination by having much lower probabilities of being hired. Employers chose female applicants at 41 % of cases (i.e. with males being the alternative). This percentage is almost the same in both online and offline labor contexts. Regarding the homosexual candidates, we observe that gay face a discrimination, by having approximately 37% chance to be hired (i.e. with heterosexual men being the alternative). This percentage goes lower especially in the case of the real labor market. On the other hand, lesbian applicants are being chosen at 64% of the cases (i.e. with heterosexual females being the alternative). These initial findings, are in line with our hypothesis 1 and the previous research, showing that mainly, females and gay experience earning penalties, while lesbian women experience earnings premiums (Drydakis, 2021 and Bertrand et al 2018) (see also Figures 1 and 2).

Interestingly, after our positive mood treatment, the discrimination on females 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), and particularly in the case of having to choose either a female or male applicant (Column 2, Table 3) (see also Figures 3 and 4).

---- Please Insert Table 3 about here ----

---- Please Insert Figures 1-4 about here ----

Estimations on T1 period

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

The estimations show that, female employers, have a discriminated hiring behavior only in the case of female employees. More particularly, a female applicant has a lower probability of 26 % (1% level of significance) and 0.3 % (10% level of significance) of being hired in our online and real labor context respectively, when the potential

employer is a woman. Hence, female employers show a low discriminated hiring profile in cases of a homosexual applicant (hypothesis 2).

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 lower, 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 about 14 % in an online labor context, and also a decrease in the probability of hiring a gay job candidate about 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 cases of markets. In all cases, 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 within an online labor context. Finally, we find no evidence that the level of extraversion and conscientiousness of an employers may be correlated with his hiring choice.

Taking advantage of the set-up of our experiment, we also check whether the relationship between mood and hiring choice stands, in case that we measure positive and negative mood as standalone traits. Thus, we do find much evidence of the impact of positive affect trait, varying in magnitude in hiring cases.

---- Please Insert Table 4 about here ----

Difference in Difference on T2 Period

Recall, in T₂ period of our experiment, after our positive mood manipulation took place, we constructed a continuous scale of discrimination for each employer-participant, by calculating this total sum score of choices in each phase³³. For example, an employer that fully discriminated during his hiring choices, has a value of 6. This applies to both periods. This discrimination index had a mean of 3.153 in T₁ and 1.775 on T₂ (i.e. scale 0-6) (Figures 5 and 6).

---- Please Insert Figures 5-6 about here ----

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

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

Concerning the discrimination index, 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, regardless the labor context. The effect of employers' positive mood on discrimination seems to be higher in the case of online labor market. Over time, the discrimination index decreases, in general, approximately 1 point of estimation in case of both markets, 0.4 points of estimation in online labor markets and 0.6 points of estimation in case of real labor market. The difference-in-difference estimator, which is the key parameter that we are interested in estimating, shows that the positive mood treatment, has a significantly negative impact on hiring discrimination, by decreasing the index about 0.8 points of estimation for both markets, 0.53 points of estimation in online labor markets and 0.27 points of estimation in case of real labor market, more than without the positive mood treatment. In column [2], [4], [6], we have also included the personality traits; however, the estimations did not vary; showing the robust and direct effect of positive mood on hiring discrimination behavior.

---- Please Insert Table 5 about here ----

Going deeper to our analysis, Table 6, presents the effects of our treatment, in each case of a hiring choice, within an online and an 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 a female and a gay applicant. More specifically, over time, the probability of hiring a female applicant increases, about 14% and 30% in the online and real labor market respectively. Similarly, over time, the probability of hiring a gay applicant increases, about 25% and 30% in the online and real labor market respectively. The difference-in-difference estimators, reveal that the positive mood treatment, has significantly positive effects on hiring probabilities. In this case, the probability of hiring a female applicant increases about 29% and 22% for online and offline labor markets respectively. In the same direction, the probability of hiring a gay applicant increases about 24% and 18.5% for online and offline labor markets respectively. These results indicate that, overall, positive mood treatment was effective for the diminution of the hiring discrimination that we examined.

---- Please Insert Table 6 about here ----

Robustness

As a further robustness check of the above mentioned 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 on rational analysis and finally 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 USA citizens our reliance on emotion manipulation was based on the well-known Obama effect (Annau & Kamin, 1961 and Crigler & Just, 2012). According with a growing research literature, a very strong bond between US Presidents and US citizens exists in terms of political, psychological, cultural and economic aspects (Stigler, 1973; Fiorina, 1978 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). Already, several experimentalists have used various features of this “phenomenon” in order 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 in three occasions, similarly to experimental session 1³⁵. As table 7 shows, we found statistically significant changes of 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 the starting point and before the film measurements of positive mood measurements in neither case.

---- Please Insert Table 7 about here ----

In general, 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, is 40 years old, and 57 % of them were females and 73.3 % whites. Moreover, 69 % of the sample has at least tertiary education and approximately 52.4 % above average monthly family income. FAS, on average was 8.608 reflecting again a middle – high socioeconomic status. In respect to personality, according 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.

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

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

Lastly, 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 must have higher hiring probabilities, while 3.54% support the lesbians. No statistically significant differences are observed between these variables for control and treatment group and between the two samples of our experimental tasks.

In order 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 discrimination index. Discrimination index has a mean of 3.276 in T_1 and 2.711 on T_2 (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. difference –in-difference estimator) is negative and statistically significant at 1 level of significance. Our alternative positive mood stimuli-treatment, decreased the discrimination index about 1 point of estimation for both markets, 0.55 points of estimation in online labor markets and 0.42 points of estimation in case of real labor market, more than without the positive mood treatment. In column [2], [4], [6], we again included the personality traits; however, the estimations did not again vary; showing the robust and direct effect of the treatment stimuli on hiring discrimination behavior.

---- Please Insert Table 8 about here ----

Table 9, presents the effects of our treatment, in each case of a 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 about 24% and 19% for online and offline labor markets respectively. In the same direction, the probability of hiring a gay applicant increases about 16% but only in the case of the online labor market. Last but not least, it is noteworthy, that our alternative positive mood manipulation, has also 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 context.

---- Please Insert Table 9 about here ----

Validity

Concerning the validity, and to which extent the findings of our study can be generalized to and 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).

Mechanical Turk is a crowdsourcing web platform that coordinates the supply and the demand of tasks that require human intelligence to complete in a most effective way. AMT is well-suited to take on simple and repetitive microtasks as our experimental sessions were (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 participants' incentives to sufficiently engage with and understand experimental tasks and goals (Horton et al. 2011; Mourelatos et al. 2020). Still, 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 which have revealed that Amazon U.S.-based workers are more likely to be young females with high computer competence (Ipeirotis, 2010) and suggest that the profile of the typical Turker is not a person that participates in online tasks for a living in a developing country (Ross et al. 2009 and Stewart et al. 2015)³⁶. Moreover, the online population of the AMT, remains relatively stable over time and follows the economic circumstances of the real labor USA market (Difallah et al. 2018). Horton et al. 2011 has also shown that, it is possible to replicate, quickly and inexpensively, findings from traditional, physical laboratory experiments in the online laboratory, by replicating several well-known experiments conducted in the context of online labor markets³⁷. Hence, research findings include a satisfactory degree of external validity (i.e. in terms of representativeness and generalizability in relation to the real USA population). However, even if the participants, of our experiments, “look like” population, in terms of observable cognitive and demographic attributes, some degree of self-selection bias, is unavoidable. In line with, the physical laboratory experiments, issues of “who is willing to participate” in an online task, exist, but this matter does not determine the usefulness of such research studies (Falk and Heckman, 2009).

Discussion and Future Directions

We set to give insights to the questions: do hiring decisions being affected by mood? Can positive mood be a key factor of eliminating and preventing workplace discrimination based on gender 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 on the effects of the positive side of mood on gender and sexual discrimination. We used randomized experimental sessions to answer those questions, capturing discrimination both in behaviors of real requesters (i.e. online setting) and real employers (i.e. offline setting). Our results were broadly consistent

³⁶ 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.

³⁷ Edlund et al. 2009, showed that Mechanical Turk workers complete experiments possibly without even knowing that they are in an experiment, minimizing that way concerns of experimenter bias.

across the online and offline experimental setting. They 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 treatment (i.e. the positive mood induction), can consist a key element, of explaining discriminated hiring choices. Unfortunately, our experimental design, does not allow 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 being designed in theoretical and practical level. First of all, must be taken for granted that employers in financial markets respond emotionally to several external or internal changes in the working environment. This emotional change may have an impact on their behavior and decisions as hiring choices are. But, a further investigation must be take place in order to explain more concrete how, in which degree and under which conditions emotional underlying mechanisms play a key role on the financial outcomes (Fenton et al. 20011; Gavriilidis et al. 2016 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 etc.) and their influence on hiring choice (Rusell & Carroll, 1999 and Wilson-Mendenhall et al. 2013).

Concerning the practical implications, our results establish that the relationships between sexual orientation, gender and access constrains are the consequence of discriminated behavior. In our experimental sessions, before the treatment takes place, we found serious evidence of hiring discrimination in both online and offline setting. Although, Heckman, 1998, demonstrated that the correspondence testing does not exclusively identify the extent of taste discrimination (i.e. we might have statistical discrimination or distaste for the minority)³⁸, our constructed applicant profiles allow us to satisfactory substitute a real hiring process in both online and offline working environment and finding behavioral evidence that does not suffer from photo (Rich, 2018 and McFadden, 2020) or beauty bias (Hamermesh & Biddle, 1994). Hence, our findings on mood effects, can be used for the redesigning and upgrading of more efficient and personalized recruitment practices especially in the online labor markets (Williams et al.2020).

Nowadays, although many online labor markets allow workers to hide behind anonymity, and their profiles do not provide much personal information, several tools and strategies exist in order to a requester to find additional information for the workers that will hire. For example, mainly, a Mturk worker's ID is also exist as a customer ID on Amazon, which is a public page which links worker ID to name and preferences Leung, 2018). Crowd Worker's personal data is under investigation, and for that reason many online labor platforms have adopted the profiling of their workers as a monitoring mechanism and as a way of building up the trust and reputation of the hiring procedure

³⁸ Arrow, 1973 and Becker, 1957.

(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 investigate further the negative affect of employers' mood by constructing several manipulation techniques. This will allow us to have a clear picture of the link between mood and hiring behavior. Secondly, we will try to embed also race discrimination in our future research, in order to understand if the mood effects hold also with the presence of racial disparities across several potential job seekers. Last but not least, we will try to replicate our findings within laboratory settings in order 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).

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 mood to hiring decision choices. Our treatments and data allows to track the complete hiring process and the changes in employers' hiring behavior. Our findings have developed several arguments on the how mood interact with behavior in terms of gender discrimination, mainly on OLMs. Moreover, by isolating and experimentally evaluating the taste and statistical discrimination hypotheses that has 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 aspects 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 European Union, serious misconceptions and barriers are encountered by sexual minority individuals in both online and offline labor markets (Badgett et al. 2021).

Funding:

Additionally, the research is connected to the GenZ-project, a strategic profiling project in human sciences at the University of Oulu. The project is supported by the Academy of Finland (project number 318930) and the University of Oulu.

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Appendix A - Curriculum Vitae Structure

<p>First Name: Randomly assign Last Name: Randomly assign Sex: Male/female Marital Status: Single 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</p> <p><i>Worker profile information:</i> Interests / Memberships: at Sport and Travel clubs / at Gay, Lesbian and Straight Education Network (GLSEN) and Consortium of Higher Education LGBT Resource Professionals organization (homosexual)</p> <p>Or</p> <p>Environmental volunteer (heterosexual)</p>	<p>First Name: Randomly assign Last Name: Randomly assign Sex: Male/female Marital Status: Single Age: 40 Education: College Previous Professional Experience: in sales job from 2010 to 2020</p> <p><i>Curriculum vitae personal information:</i> Interests / Memberships: at Sport and Travel clubs / at Gay, Lesbian and Straight Education Network (GLSEN) and Consortium of Higher Education LGBT Resource Professionals organization (homosexual)</p> <p>Or</p> <p>Environmental volunteer (heterosexual)</p>
<p>Curriculum vitae types in online and offline setting</p>	

Appendix B - Conceptualizing Mood

The modeling structure that we sketch is potentially complementary to neurobiological one of Ashby et al. 1999, where the route from positive affect to increased dopamine is described, but our is framed in the hiring choice theory of taste-based employer discrimination of Becker, 1957 and Banerjee & Mullainathan, 2008³⁹.

In the employer discrimination model, employers may dislike hiring a particular subgroup, such as females and homosexuals. When a female or homosexual 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 discrimination behavior as an internal negative stimulus of brain function being storage in the 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 distribute across different parallel activities. Thus, the 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 attending broadly to the remaining aspects in life. Now, e is the energy the employer devotes to the hiring process, while d is the distractions which result in discrimination. Employer's psychological resources is P . Thus, $P \geq (e + d)$.

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

$$\text{Maximize } u(p, e, s, z) + v(d, s) \quad (1)$$

where p is profits and d reflects a simple form of discriminatory tastes against female of 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 $Eu_{es} - v_{ds}$

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 normalized to unity and assume that u and v functions are concave and differentiable. This will lead to natural forms of interior solutions, and allow the analysis to be generalized.

So, how an exogenous mood perturbation a , can enter employers' objective function?

³⁹ Banerjee and Mullainathan (2008) consider a model where labor intensity depends on outside worries; this generates highly non-linear dynamics between wealth and effort on the job. However, both these abstract from any effect due to positive mood or other emotions.

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

$$u(.) + v(.) + s$$

Hence, the employers would face the positive mood shock as a vertical shift upwards in their utility function. They get the “s” mood shock whether or not 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 out 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

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

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 profits term p by the ratio of the marginal utilities from putting effort on a hiring decision process and having an amount of distraction of which his 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

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

If the marginal utility of an employer memory distractions containing stimuli-discrimination responsive behavior declines quickly enough, then a positive mood shock will successfully raise the employer’s chosen effort on a hiring decision, e^* . With other words, as employer state of mood goes more and more to a positive condition and assuming that (4) holds, that allows him more easily to shift his memory focus by deflecting attention away from discrimination-related internal stimuli and focus to the

hiring procedure without distractions. If condition (4) does not hold, the opposite happens.

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Graphs

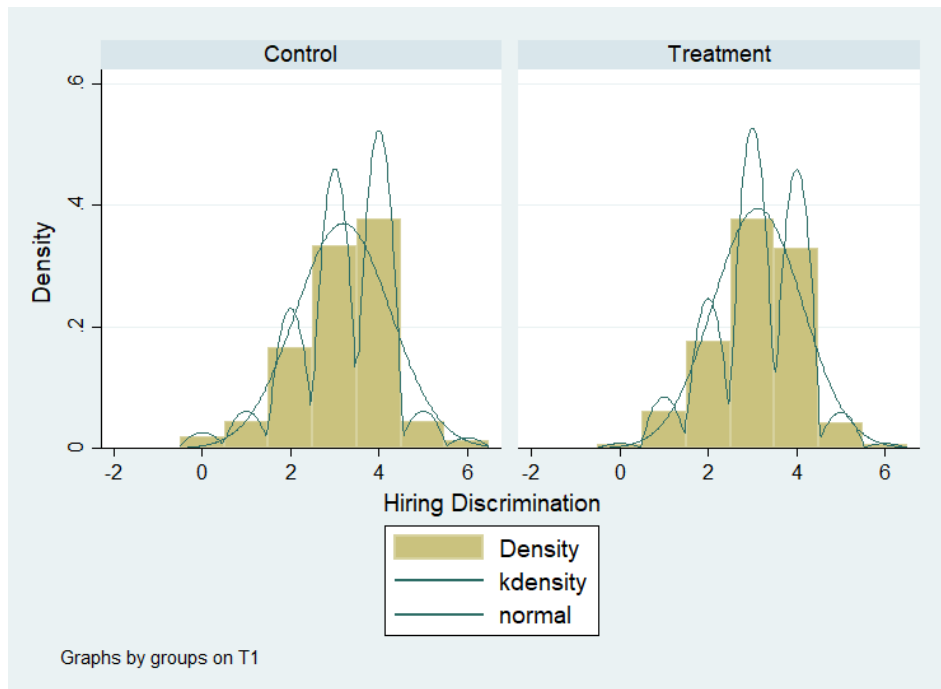


Figure 1. Hiring discrimination on T₁.

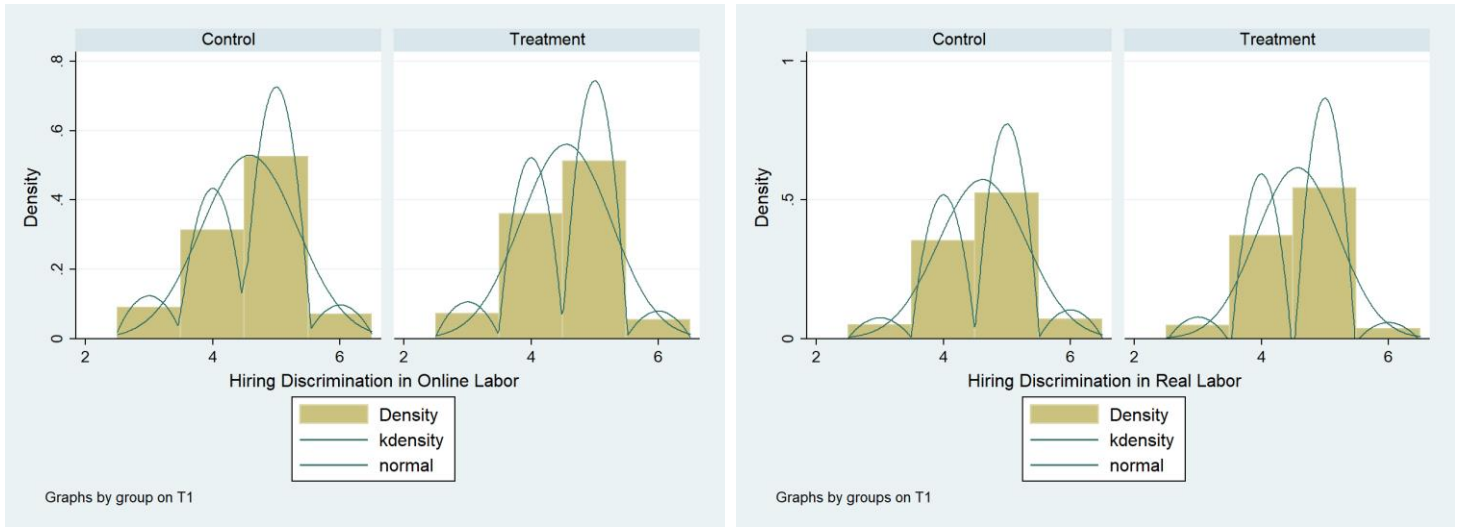


Figure 2. Hiring discrimination on T_1 for Online and Real Labor market.

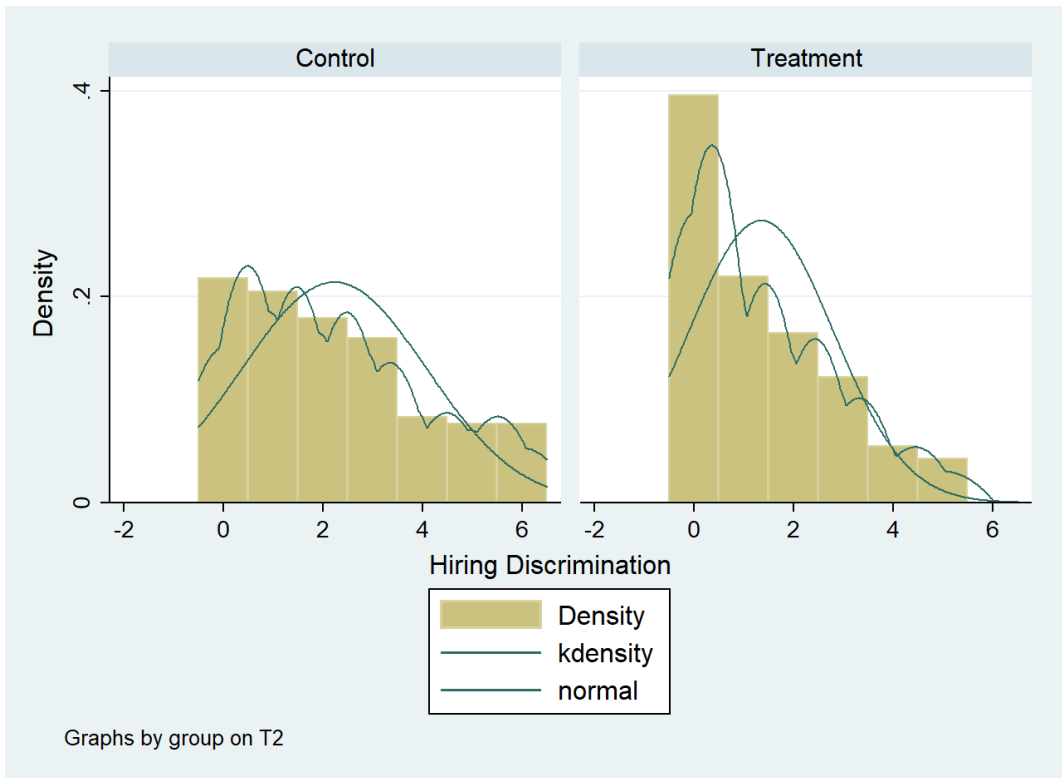


Figure 3. Hiring discrimination on T₂.

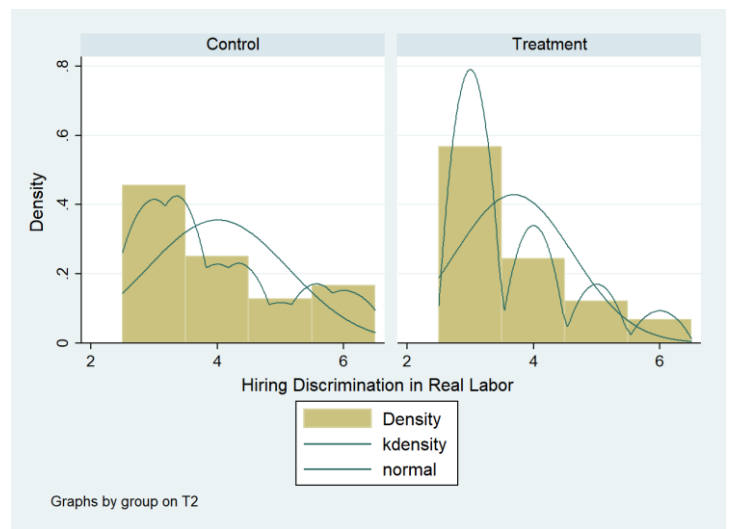
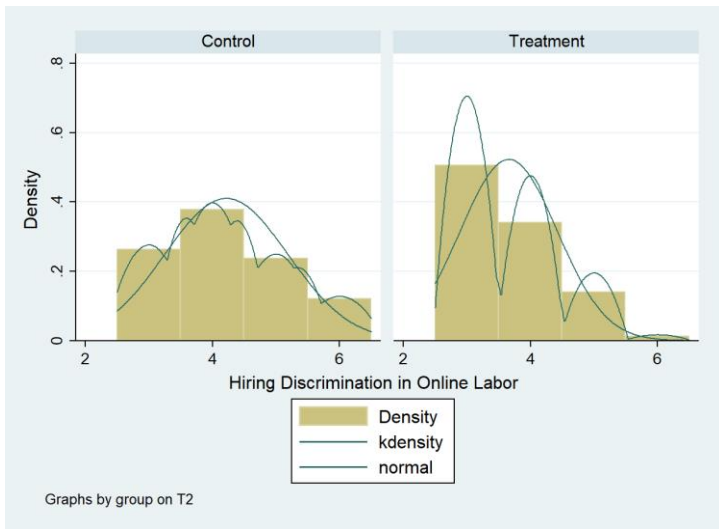


Figure 4. Hiring discrimination on T_2 for Online and Real Labor market.

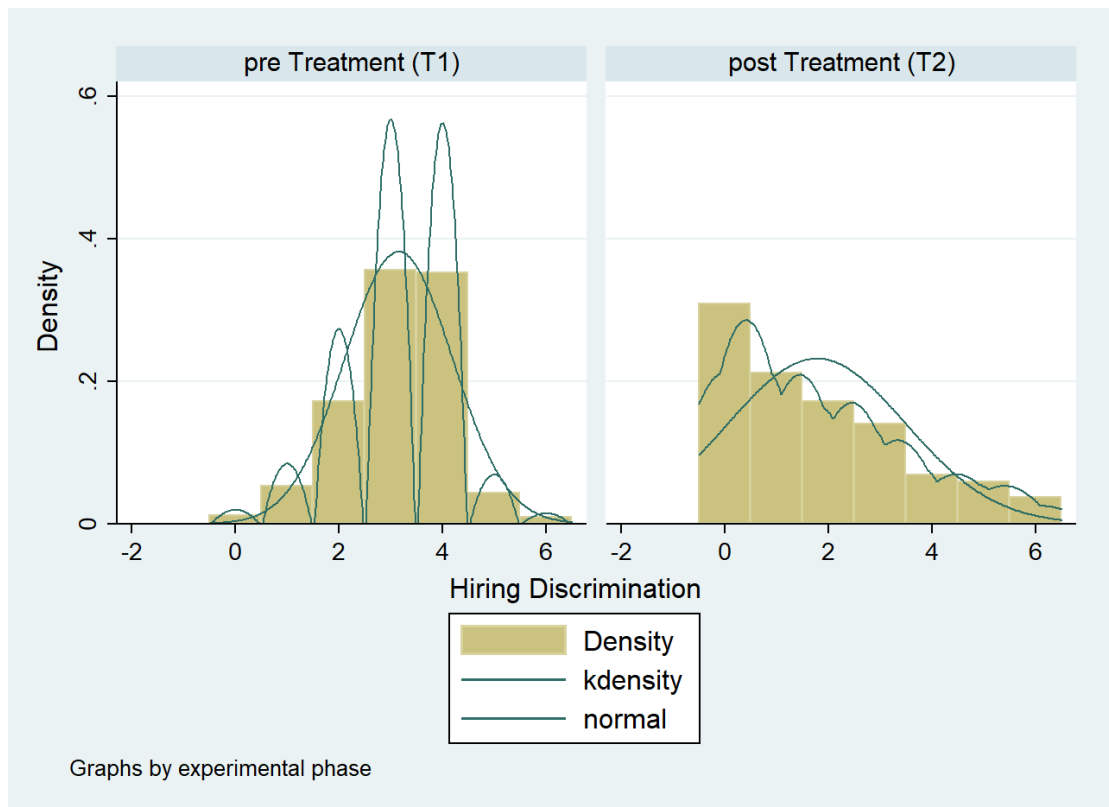


Figure 5. Hiring discrimination before and after positive mood treatment.

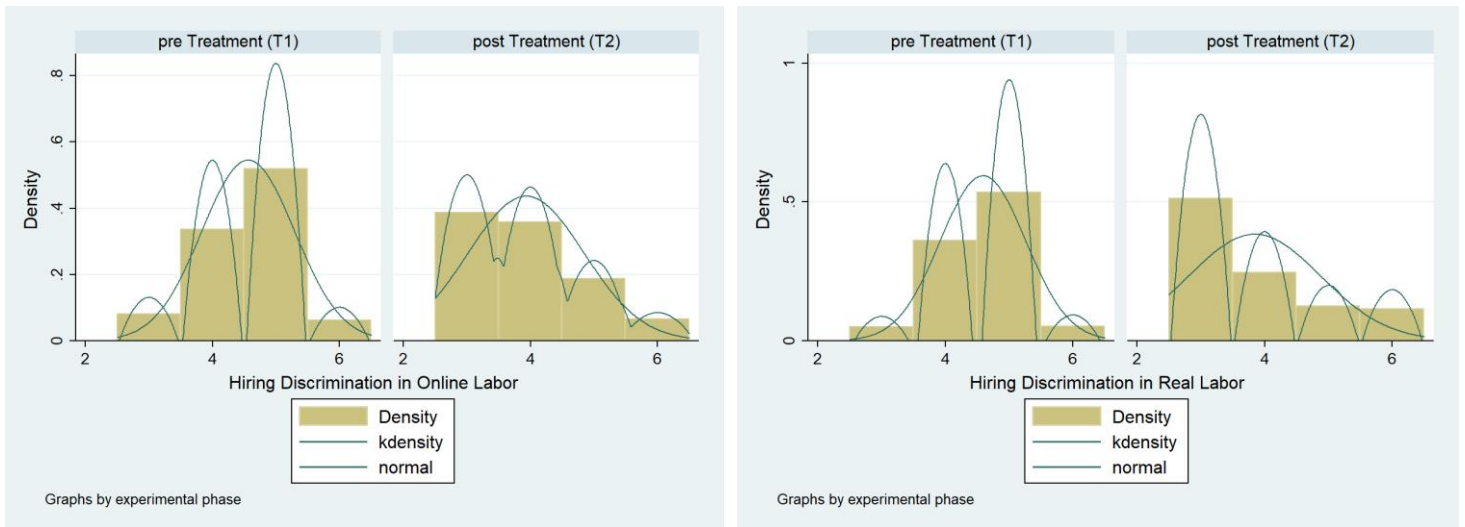


Figure 6. Hiring discrimination before and after positive mood treatment for Online and Real Labor market.

Tables

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	0.553 (177)	0.576	0.531	-0.045	0.833
Same possibilities for straight and homosexuals	0.359(115)	0.346	0.372	0.026	0.479
Identified as gay	0.044 (14)	0.321	0.549	0.228	0.996
Identified as lesbian	0.044 (14)	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.

Table 3. Candidate Choices per experimental phase

	T ₁ [1]	T ₂ [2]	Difference [3]
Both Labor Markets			
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 Labor Market			
Female Candidate	0.409	0.662	0.253
Gay Candidate	0.381	0.721	0.340
Lesbian Candidate	0.647	0.684	0.037
Real Labor Market			
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

Table 4. Determinants of choice (Marginal Effects)

	Online Labor Market			Real Labor Market		
	Female [1]	Gay [2]	Lesbian [3]	Female [4]	Gay [5]	Lesbian [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 female [1] & [4], of gay [2] & [5], of lesbian [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 USA fixed effects and prejudices on sexual orientation. Robust standard errors in parentheses.

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

Table 5. Treatment Effects on hiring discrimination behavior

	Both Labor Markets		Online Labor Market		Real Labor Market	
	[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)	-0.609*** (0.106)
Treated*Phase 2	-0.800*** (0.230)	-0.801*** (0.231)	-0.531*** (0.137)	-0.531*** (0.138)	-0.269*** (0.139)	-0.269** (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. The specifications control for demographic characteristics (i.e. female, 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 USA fixed effects and prejudices on sexual orientation. Heteroscedasticity corrected standard errors with clustering at participant 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 Labor [1]	Real Labor [2]	Online Labor [3]	Real Labor [4]	Online Labor [5]	Real Labor [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. The specifications control for demographic characteristics (i.e. female, 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 USA fixed effects and prejudices on sexual orientation. Logit standard errors in parentheses.

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

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)			
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 8. Treatment Effects on hiring discrimination behavior for experiment 2

	Both Labor Markets		Online Labor Market		Real Labor Market	
	[1]	[2]	[3]	[4]	[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. The specifications control for demographic characteristics (i.e. female, 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 USA fixed effects and prejudices on sexual orientation. Heteroscedasticity corrected standard errors with clustering at participant level.

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

Table 9. Treatment Effects on choice (Marginal effects) for experiment 2.

	Female Choice		Gay Choice		Lesbian Choice	
	Online	Real	Online	Real	Online	Real
	Labor	Labor	Labor	Labor	Labor	Labor
	[1]	[2]	[3]	[4]	[5]	[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. The specifications control for demographic characteristics (i.e. female, 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 USA fixed effects and prejudices on sexual orientation. Logit standard errors in parentheses.

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