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Discrimination against Workers with Visible Tattoos: Experimental Evidence from Germany *

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Abstract

We use a correspondence testing approach to study discrimination against applicants with visible tattoos in the German labor market. The method has been widely employed in discrimination literature; however, the majority of papers examine objects of discrimination that are exogenously given (gender, race, ethnicity, etc.). The design of our experiment allows us to study the extent of discrimination against choice-based characteristics. We send fictitious applications to online job postings in the banking sector. Otherwise identical applications differ only in the picture attached: in the treatment group the applicants have a visible tattoo. The extent of discrimination is measured by the difference in callback rates. We find that candidates without visible tattoos have, on average, a 13 percentage point higher callback rate, or an increase in the callback rate of 54%. Following Akerlof and Kranton (2000), our results once more highlight the centrality of identity.

JEL codes: C93, J71

Keywords: Labor market discrimination; field experiment; visible tattoo

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1 Introduction

Correspondence studies have often been used to detect discrimination in labor markets (Neumark, 2016). Most of these studies have focused on characteristics that are exogenously given to the person, such as race, gender, ethnicity, age and etc. (see Bertrand and Duflo (2017) for the most recent review of field experiments studying discrimination in various settings). Some recent papers have examined objects of discrimination that some view as an exogenously given characteristic, but which others see as the choice of the individual; for example, sexual orientation (Gneezy, List and Price, 2012) and wearing a hijab (Weichselbaumer, 2016). So far, little is known about the impact of purely choice-based characteristics on employment opportunities. In this paper we look at how visible tattoos, which are clearly an individual choice, affect employment opportunities.

Studying discrimination against applicants with visible tattoos also provides a novel way to measure the cost people are paying in order to express their identity. People usually choose social groups that they would like to be identified with. In many instances, these choices may not be observable, but some choose to visibly express their group identity. Examples include wearing a hijab (Weichselbaumer, 2016) and tattoos (Akerlof and Kranton, 2000). Logically, there may be two types of people: those who do not realize that visible tattoos may impact their employment opportunities, and those who do know but prioritize group identity. However, their choices may not always be seen as positive by others, particularly in the labor market. HR managers might see visible signs of membership in a particular social group as a hindrance to employment, due to their own or society's distaste for a particular group. They may also think that an individual belonging to a particular social group may be less productive compared to others. Thus, HR managers considering individuals who explicitly express their social group identity, may view those individuals less favorably. So far there is very little rigorous research on the impact of tattoos on labor market outcomes. This paper aims to shed light on the issue by running a natural field experiment to test how having a visible tattoo on an application photo affects employment opportunities.

The research question is also of relevance given that tattoos are becoming increas-

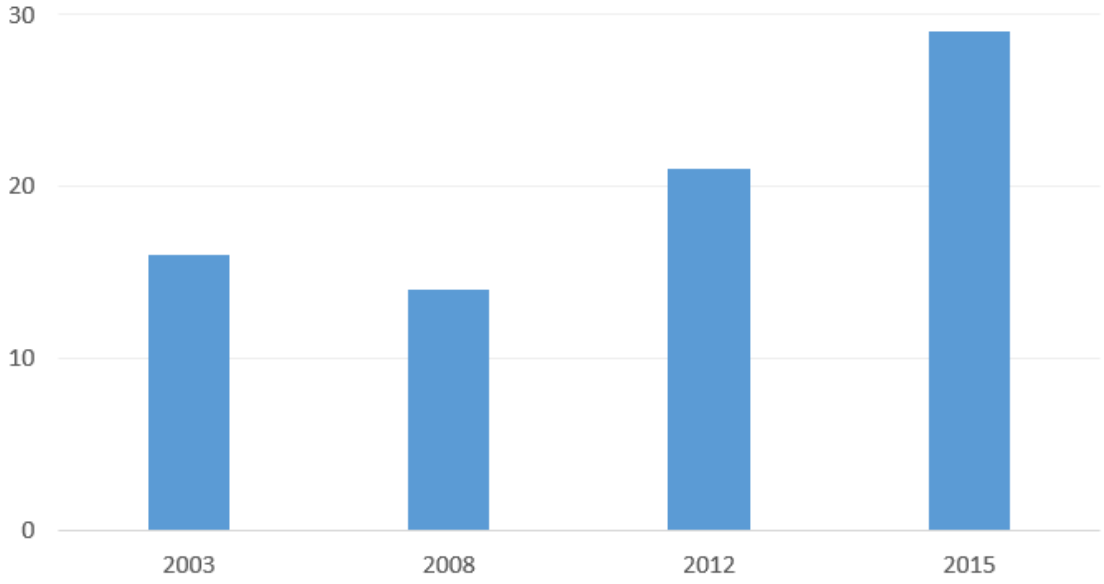

Figure 1: Tattooed individuals in the US (all age groups), %

ingly popular. For example, Figure 1 shows that almost 30% of the US population in 2015 had at least one tattoo, of which 30% are visible.[1]. Aslam and Owen (2013) argue that almost 25 % of the adult population in Europe today have tattoos. Akerlof and Kranton (2000) note that "tattooing, body-piercing, ... all yield physical markers of belonging to more or less explicit social categories and groups" (p. 721). These groups would be different than they used to be, for example 30, or even 20 years ago. Historically, tattoos were associated with sailors, prisoners and gang members (Timming, 2015), who would possibly be less productive in the workplace, especially for white-collar jobs. However, today tattoos are becoming mainstream and they are equally distributed among social groups. Therefore, there is no obvious reason why applicants with visible tattoos should be associated with a less productive workforce and should be given fewer employment opportunities.

In addition to signaling group identity, visible tattoos may also have an effect on applicants' employment chances through their appearance. It is well documented that noncognitive personal attributes affect labor market outcomes, including hiring, firing and promotion. A number of studies have shown negative bias towards less physically at-

[1]Source: The Harris Poll #12, February 2016.

tractive applicants (Hamermesh and Biddle, 1994; Harper, 2000; Weichselbaumer, 2016; Dillingh, Kooreman and Potters, 2016; Katuscak and Kraft, 2013; Ruffle and Shtudiner, 2014). The relationship between appearance and labor market outcomes might exist through the preferences (of HR managers) or an expected correlation between appearance and productivity. Attractiveness can refer to given features of an individual that are hard to change. But, other aspects of one's appearance, such as clothing style, can be changed at almost zero cost. Having a visible tattoo is not cost-less, however, as once acquired, it is hard to change.

Despite the growing popularity of tattoos (Stirn et al., 2006), prejudices related to them still exist in society. As Timming (2015) points out, tattoos are linked to negative stereotypes, including promiscuity, crime, drug usage, decreased honesty, low levels of generosity and intelligence, and gang membership. While some stereotypes might indeed be accurate to some degree ("the Dutch are tall"), many are mostly false ("Florida residents are elderly") (Bordalo, Coffman, Gennaioli and Shleifer, 2016). Bordalo et al. (2016) build a model of stereotypes in which decision makers overweight a group's most distinctive types when making predictions about that group. They show that stereotyping increases the systematic differences made between groups, even when the actual difference is negligible. In our context, when visibly tattooed individuals apply for a job, hiring managers may mistakenly relate them to groups with low expected productivity, resulting in statistical discrimination. In addition to statistical discrimination (Phelps, 1972), tattooed individuals may face taste based discrimination (Becker, 1957).[2]

We do not claim to study the effects of all types of visible tattoos on employment opportunities in a broad range of sectors. Specifically, we examine how a "neutral" visible tattoo affects employment opportunities in the banking industry. Although we find evidence of differential treatment, this does not imply that any type of visible tattoo will have the same effect across industries. Tattoos that elicit positive emotions may even help applicants in some fields such as marketing, sports, or fashion. Therefore, considering a

[2]Having a visible tattoo will potentially have a heterogeneous effect across occupations and demographic groups. In marketing, for example, it might bolster an individual's opportunities as it can be seen as a signal of creativity. On the other hand, in a more "conservative" occupation, such as banking (which is our focus in this paper), it may hinder employment opportunities, as hiring managers might be worried that visible tattoos are not accepted in this occupation because of consumers' perceptions.

broader range of occupations and the type of tattoos will help to generate generalizable results. Our paper attempts to answer two main questions. First, do individuals with visible tattoos face discrimination in the banking labor market? Second, what are the sources of discrimination? To answer these questions we run a natural field experiment in Germany. We design fictitious applications and send them to online job advertisements in the banking sector. Applications include a picture of the candidate and the tattoo is attached in the picture in the treatment group. Callback rates are recorded and analyzed as to whether they differ for candidates with and without visible tattoos. In response to the research questions, we find the following. First, applicants without visible tattoos have on average 54% higher callback rates (with $p - value = 0.0001$). Second, using two channels that provide a positive signal about the personality of the applicant, we fail to find evidence of statistical discrimination. In addition to a lower callback rate, discrimination may have a different form. In particular, we find that employers respond positively to candidates without tattoos significantly faster than to applicants with tattoos. Our data do not suggest that visibly tattooed applicants face coworker or customer taste based discrimination. We control for factors such as the degree of interaction with coworkers and customers. These factors are used to test the model of (coworker and customer) taste based discrimination; however, none of the interactions with a treatment dummy are significant in regression analyses.

As mentioned above, visible tattoos may affect employment opportunities either as an expression of identity or through appearance. The experiment objects were ranked according to their attractiveness (above average, average and below average looking), and the treatment had the same effect on all categories. Therefore, the fact that, in our study, there is a high level of discrimination against applicants with visible tattoos demonstrates that people are willing to pay large costs to signal their identity.[3] Our results, once again, confirm the centrality of identity - points made by Akerlof and Kranton (2000), who introduced identity into economics. They argue that the concept of identity expands analyses and claim that "identity can explain behavior that appears detrimental" (p. 717). Unlike the "standard economic agent", Akerlof and Kranton (2000) incorporate identity (or

[3]Assuming that they are aware of the fact that visible tattoos may have a negative effect on their employment opportunities.

self-image) into the utility function. This extension changes the economic analyses and justifies many unexplained facts. As the authors claim, identity can explain why people behave in ways that may seem maladaptive to others. In the Akerlof and Kranton (2000) model, every social category has prescriptions for behavior to "mimic the ideal" from your group. Deviation from these prescriptions may lead to "punishment" from society. As extreme examples of identity-related behavior, the authors cite tattooing and body piercing as expressions of identity. While the intention behind this behavior may match an ideal within the group, it has an adverse effect outside of the group. As a result, "deviators" might be treated less favorably when interacting with individuals from different groups. One of the most important interactions occurs in the labor market while searching for a job and communicating with coworkers or customers. Therefore, individuals with tattoos may find it difficult to succeed in the labor market.

Only a limited number of studies have reported a correlation between visible tattoos and negative labor market outcomes, particularly, employment. By analyzing panel data on Dutch individuals, Dillingh et al. (2016) argue that visibly tattooed candidates score less favorably, in particular on health items (physical as well as mental), though the relationship in the case of the labor market is relatively weak. Similar conclusions are drawn in work by French, Maclean, Robins, Sayed and Shiferaw (2016), who use two large data sets from the US and Australia. They report that after controlling for personal characteristics, candidates with visible tattoos are treated similarly in the labor market as candidates without them. Overall, both studies mentioned above fail to establish a correlation between tattoos and the labor market outcomes (employment and wages).[4] On the other hand, there is some evidence of a negative relation between tattoos and employment in the sociology literature. Relying on 25 in-depth interviews with managers and tattooed workers, Timming (2015) concludes that there is a negative bias toward candidates with visible tattoos. Brallier, Maguire, Smith and Palm (2011) focus on the restaurant industry and show that 88% of managers are willing to hire applicants without visible tattoos, while only 70% of managers are willing to hire applicants with tattoos. Miller, Nicols and Eure (2009) show that workers without body art prefer not to work alongside colleagues

[4]We should note that these studies consider a broad range of occupations. Finding no correlation might indicate that visible tattoos may not have a homogeneous effect across different occupations.

with visible body art (tattoo(s) and piercing(s)). Swanger (2006) reports that around 90% of hiring managers surveyed in the hospitality industry claim that individuals with tattoos and/or piercings are viewed negatively by managers. Consequently, they are less willing to hire these individuals. We should note that these studies are typically based on small sample size surveys and are mostly descriptive. Therefore, despite the growing popularity of tattoos, there is little rigorous research on how visible tattoos affect employment chances. The paucity of evidence about hiring bias for tattooed workers limits our knowledge about the extent (and the source) of discrimination against them.

Most of the experimental correspondence studies in the field focus on characteristics of the candidate that are given, for example, race/ethnicity (Bertrand and Mullainathan, 2004; Bartos, Bauer, Chytilova and Matejka (2016); Kaas and Manger, 2012), gender (Riach and Rich, 1987, 2006); disability (Riach and Rich, 2002, Gneezy, List and Price, 2012) and attractiveness (Ruffle and Shtudiner, 2014; Katuscak and Kraft, 2013). However, literature relating controllable characteristics to discrimination is scarce. Our study is most closely related to work by Gneezy et al. (2012), Weichselbaumer (2016) and Cohn, Marechal, Schneider and Weber (2017). Among other characteristics, Gneezy et al. (2012) examine discrimination against sexual minorities in the car repair market, while Weichselbaumer (2016) tests labor market discrimination against female ethnic minorities (Muslims) wearing a headscarf in Germany. As Gneezy et al. (2012) note, some individuals perceive sexual orientation as a personal choice, while others think that it is a given characteristic (such as race or age). The authors claim that if the decision maker believes the object of discrimination is a given characteristic, discrimination is taste based. Using several treatment manipulations, Gneezy et al. (2012) find that minority car dealers make significantly higher price offers to a gay couple while Caucasian dealers treat them favorably. Similarly, Weichselbaumer (2016) argues that it is not clear (at least to HR managers in Germany), whether the hijab is a choice made by Muslim women or if they are forced to wear them. The author runs a natural field experiment in Germany and finds that female applicants with a Turkish name and hijab face a high level of discrimination that is mostly motivated by animus.

While there is some ambiguity in the perception of sexual minorities or women

wearing a hijab, frequent job switching is an individual choice. Cohn et al. (2017) examine how frequent job changes affect employment chances. They conduct laboratory, field and survey experiments and find that workers who change jobs frequently have a lower chance of employment compared to more "stable" workers. The possible reason is that more stable workers have (or at least are perceived to have) better non-cognitive skills and therefore more firms are willing to hire them. We should note that if having a visible tattoo is not necessarily correlated to a person being less productive, frequent job changes may have a direct effect on productivity. For example, switching jobs regularly between industries might affect the productivity of the worker negatively through less accumulation of industry specific human capital. Therefore, in the eyes of employers, frequent job changes, particularly between industries, might signal lower productivity, and hence a lower chance of employment. This is confirmed in the study by Cohn et al. (2017). Using a field experiment, they find that having relevant industry experience increases the chance of a callback and almost offsets the negative impact of frequent job changes.

Despite some exceptions as discussed above, there is still limited research relating choice-based characteristics to labor market outcomes. In the case of tattoos, as in the case of frequent job changes, there is no ambiguity; it is clearly a personal choice. This also distinguishes our paper from other correspondence studies in the field that examine discrimination against exogenously given characteristics. To the best of our knowledge, this is the first field experiment that examines discrimination against applicants with visible tattoos in the banking industry, thus complementing the existing literature.

Studying discrimination against tattooed individuals in the labor market could be useful for policymakers as well as for the public. Currently, it is up to a company to ban visible tattoos in the workplace. However, policymakers could publicize (at least, among employers) that tattoos are becoming mainstream, and thus lessen negative stereotypes associated with tattooed workers. This could potentially reduce discrimination. On the other hand, individuals who plan to work in a sector where having a visible tattoo might diminish their employment chances, might reconsider their decision to have a tattoo on a visible part of the body. Alternatively, individuals might view visible tattoos as signaling that they are not willing to work in an environment where tattoos (or expressions of

identity) are not accepted.

The rest of the paper is organized as follows. The next section presents the design of the experiment, including description of applications, the application process and summary statistics of the sample. The results are discussed in Section 3, while Section 4 concludes.

2 Experimental Design

We use a correspondence study to collect data, in line with the literature. The correspondence testing approach, in which fictitious CVs are sent to real job vacancies, was developed by Jowell and Prescott-Clarke (1970). This approach proved successful in examining discrimination in the labor market (Bertrand and Duflo, 2017). The candidates' CVs are identical, except for the variable of interest, for example, ethnicity, gender or sexual orientation. Discrimination is measured by the interview invitation rate of the applicants. While the correspondence testing approach has many advantages over other practices, it also has limitations (Riach and Rich, 2002). An invitation for an interview is not the final outcome of the recruiting process; thus we cannot observe hiring rates or wages offered for the particular candidate. However, Riach and Rich (2002) analyze discrimination at the interview invitation and job offer stages and find that around 90 % of discrimination occurs at the stage of selecting candidates for an interview; thus the callback is a key part of the process. Another drawback of the method lies in the technique itself: as we are limited to the job offers we can respond to with written applications, we might exclude some specific jobs that do not require written applications (especially low-skilled jobs). Despite these limitations, the correspondence testing approach has obvious advantages over other techniques and is widely used by researchers. One advantage is that at a much lower cost, compared to audit studies[5], a researcher can obtain larger sample sizes. Another advantage is that correspondence studies avoid experimenter effects that

[5]In audit studies, two auditors/testers are matched in terms of all relevant observable characteristics except for the object of discrimination. They apply for the job position and are instructed to "behave similarly" during the interview (if they are invited). Discrimination is measured by analyzing differences in success rates (job offers) of applicants in the treatment and control group (Neumark, 2016).

may lead to biased results in audit studies.

The reason we chose Germany for our study is twofold. First, inclusion of a photo in job applications is common in Germany. Another reason is the relatively large size of the labor market. According to the Federal Statistical Office in August 2016, there were 685, 238 vacancy announcements throughout the country.[6] For these reasons, the German labor market has been very popular among scholars examining discrimination against candidates with different characteristics. For example, researchers have been able to document discrimination against ethnic minorities (see, for example, Bartos et al., 2016; Weichselbaumer, 2016; Kaas et al., 2012; Goldberg, Mourinho and Kulke, 1996) and unattractive candidates (Katuscak et al., 2013).

2.1 Applications

Following the standard German labor market practice, each application included a cover letter and a CV with a photo of the candidate. In order to generate sufficient data[7] for the analysis, we needed to have sufficient callback rates. Therefore, we asked HR professionals to create applications in accordance with the German standards.[8] All applicants in our study are the same age (born in 1989). We use German-sounding names and surnames for our applicants to rule out potential discrimination toward minorities, which is well documented in Germany.

As Weichselbaumer (2016) claims, sending more than one application to an employer may bias results, as the method of testing for discrimination is increasingly well known among HR managers in Germany. To avoid this problem we respond to each job advertisement with only one application. Thus, the name and contact details are the same for both tattooed and non-tattooed candidates.[9] As we are sending applications to different firms, we can use exactly the same application for both tattooed and non-tattooed

[6]The number is taken from http://www.statistik-portal.de/Statistik-Portal/en/en_zs02_bund.asp
[7]We conducted power calculations prior to the experiment in order to target sample size.
[8]Sample CVs are available from the author upon request.
[9]Obviously, we use a different first name for male and female candidates.

candidates.[10] We use two channels to test the model of statistical discrimination. In the indirect channel, we include contact details of a non-existing referee in a fraction of applications. If the HR manager wanted to acquire more information regarding the candidate, she could contact the referee via email or phone. To minimize the cost to the employer, the job applicants and referee did not pick up the phone; however, we recorded the missed calls. If an employer contacted the reference person via email, we replied by describing the candidate as reliable, highly consumer oriented and a team player. HR managers might not invest time searching for additional information about the applicant, using just the information available from the application itself, and may not contact the referee at all. For this reason, we use another channel, whereby we indicate on the applications that the applicant is a member of the local alpinist association (Deutsche Alpenverein) which is well known and popular in Germany. We conjecture that being a member of this group is associated with that person being trustworthy, reliable and a team player. If the additional information provided by a referee or by group membership reduces discrimination, the results will be consistent with the model of statistical discrimination.[11] Further, by controlling the degree of interaction with consumers and/or colleagues, our design enables us to test consumer and coworker taste based discrimination (Becker, 1971).

Finally, we chose several candidates for the photo. We ran a survey of undergraduate and graduate students studying in various universities in Prague (Czech Republic) with an initial pool of ten pictures. Based on the survey results, experiment subjects were ranked in the following attractiveness categories: below average looking, average looking and above average looking. From each category we choose one picture of male and female faces, ending up with a total of six pictures.[12] Pictures from different categories are randomly assigned to applications. In the treatment group, we added a tattoo to the picture using computer software. This rules out possible concerns related to the quality of the photo. We chose different tattoos for male and female applicants. The photo of the candidate is on the cover page of the application, to ensure that our signal (having a tattoo)

[10]The only difference is in the photo of the applicant: in the treatment group, candidates have a visible tattoo.

[11]Here we only consider channels of statistical discrimination that relate to the personality of the candidate. There might be other sources of statistical discrimination that we do not consider in this paper.

[12]See Appendix A for detailed discussion of the survey.

reached the employers. Within the gender and attractiveness sub-groups of applications, the only difference between the applications in treatment and control group is the photo of the candidate. Therefore, any difference in callback rates should be associated with the tattoo.[13]

2.2 The Application Process and Data Description

We focus on job openings across Germany in the banking sector, for several reasons. First, there is a sufficient number of new openings in this sector. Second, there are both front-office and back-office positions in banks, which enables us to test whether tattooed applicants face customer discrimination (perceived by employers). The banking sector also features variation in firm characteristics. For example, in terms of age, there are firms in our sample less than one-year-old along with very old firms aged 150 and even more. There is also variation in firm size, defined as the number of employees. Further, our sample includes both international and domestic firms.[14] Therefore, because we use between-firm design, we make sure that the firms are similar in terms of those characteristics for tattooed and non-tattooed applicants. Table 1 presents summary statistics of the firms' characteristics as well as job specific requirements.[15] The average age of the firms is 34 years (with s.d.=35.95), and average size is 1298 employers (with s.d.=4489.37). 37% (with s.d.=0.48) of the firms operate internationally while only 14% (with s.d.=0.35) are recruitment agencies recruiting workers on behalf of others. As our aim is to compare the treatment effect across the front and back office positions, 43% (with s.d.=0.49) of our sample had advertisements for the front office. Most of the job postings (87% with s.d.=0.33) were collected in urban areas.[16] Each firm posted on average 17 (with s.d.=78.16) advertisements in a particular job portal. Most of the applications, 81% (with

[13]We should note that our results are context specific, conditional on "neutral tattoos". If the content of the tattoo is specific, for example, army related, the results might be different.

[14]The data on firms' characteristics (age, size, international status, etc.) was collected either directly from their web pages or through social network accounts, such as LinkedIn or Xing.

[15]The third and fourth column of Table 1 shows the means of the firm/job characteristics across the treatment and the control group and the last column shows a p-value of the hypothesis of equal means across different groups. None of the differences is significant, hence we can claim that any differential treatment should be due to the treatment itself. Further, we ensure that regions were also balanced across groups. See Appendix B for a discussion of the randomization check for regions.

[16]We define the area as urban if the population is greater than 100, 000.

s.d.=0.39), were sent via email, while the rest were submitted through the online application system. As mentioned above, firms had a variety of requirements. In particular, teamwork was required by 46% (with s.d.=0.49) of firms, while a neat and friendly appearance was explicitly required in 25% (with s.d.=0.44) of cases. Almost half of the firms (48% (with s.d.=0.49)) required that the candidate should indicate an expected/required salary in the application.

Table 1. Summary statistics.

Firm characteristic	***Mean***	***Obs.***	***Non-Tattooed***	***Tattooed***	***p-value***
Firm size	1298 (4489.37)	782	1268 (5218.41)	1327 (3652.49)	0.85
Firm age	34 (35.95)	782	34 (36.87)	34 (35.07)	0.76
International firm	0.37 (0.48)	782	0.36 (0.48)	0.38 (0.49)	0.58
Number of ads	17 (78.16)	782	16 (75.45)	18 (80.77)	0.62
Requirements:					
teamwork	0.46 (0.49)	610	0.44 (0.49)	0.47 (0.50)	0.39
appearance	0.25 (0.44)	782	0.25 (0.43)	0.26 (0.44)	0.75
expected salary	0.48 (0.49)	782	0.46 (0.49)	0.49 (0.50)	0.55
email vs. online	0.81 (0.39)	782	0.81 (0.39)	0.82 (0.39)	0.51
Front office	0.43 (0.49)	782	0.44 (0.49)	0.42 (0.49)	0.61
Urban	0.87 (0.33)	782	0.86 (0.35)	0.88 (0.32)	0.31
Recruitment agency	0.14 (0.35)	782	0.15 (0.36)	0.14 (0.34)	0.56

Notes: The table shows means of firms' characteristics and their comparison across the treatment (tattooed) and the control (non-tattooed) groups. Standard deviations are in parentheses beneath mean estimates. Column 5 shows p-values of the hypothesis of equal means across groups.

The experiment was conducted in Germany from October 2016 till the end of January 2018.[17] Some keywords were used to search for relevant job advertisements in the most common job portals in Germany.[18] We combined application materials in a single file and responded to the job postings. Some firms also required various certificates (from university and/or previous jobs). However, for objective reasons, it is difficult to create fake certificates. Thus, our applications consisted of a CV with a picture and a cover letter. A number of employers requested certificates by contacting the candidate through email, in order to have a complete application. In those cases, we replied that for organizational reasons it was not possible to send certificates and the candidate would provide them during the interview. Overall, only 5% of employers required certificates and requests did not differ across the treatment and control group.

When employers requested applicants to indicate salary expectations, we identified the regional location of the workplace and indicated average earnings from that region.[19] Factors including friendly appearance and team player requirements were recorded and used in analyses to test models of customer and coworker discrimination. Employers could contact the candidate via mobile phone or email. Phone calls were not answered and instead missed calls were recorded and considered to be positive responses. Some firms sent a positive response directly by email, inviting the candidate to interview. Two days after a positive response through email, firms were notified that the application was withdrawn. If the company rejected the candidate, the observation was considered a negative response. Finally, if the firm did not respond at all, it was considered a rejection, as most of the firms stated in their email confirming receipt of the application, that if the candidate did not hear from them it was an indication that s/he was not shortlisted.

[17] With some interruptions the data collection process lasted 12 months

[18] These words are (in German): bankkaufmann; kundenberater in bank; finanzberater.

[19] Data on the average earnings in each region and sector is available on the web portal of German Federal Statistical Office at: http://www.statistik-portal.de/Statistik-Portal/en/en_inhalt22.asp

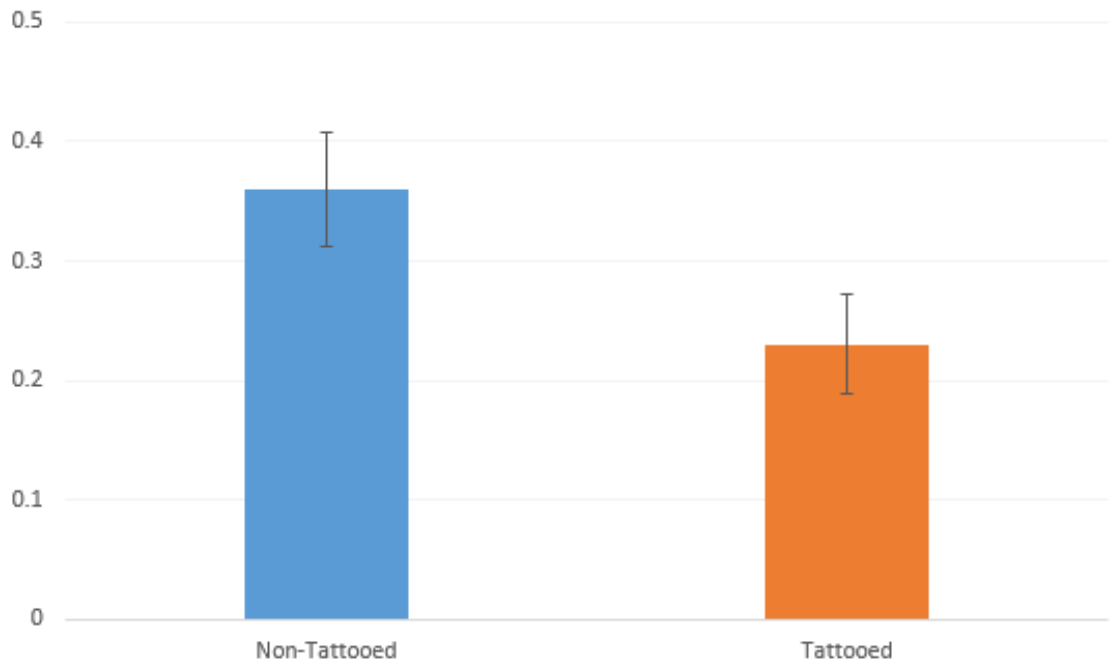

Figure 2: Callback rate across groups, %

3 Results

3.1 Descriptive Summary

We responded to 782 job advertisements. Figure 2 shows the overall callback rate for tattooed and non-tattooed applicants. The difference is 13 percentage points(with $p - value = 0.0001$). This difference translates into an increase in callback rate of about 54% for applicants with no visible tattoos. Thus, we observe a relatively high degree of discrimination against applicants with visible tattoos. The size of the effect in our study is similar to the difference between African-American and White-sounding names reported in Bertrand et al. (2004), which is, one of the largest effects compared to other correspondence studies in the field. Distribution of callbacks across different categories are summarized in Table 2. Column 1 shows the average callback for applicants with no tattoos and column 2 for applicants with tattoos. The percentage point difference in callback rates are shown in column 3, and the ratio of the callback rate in the control and the treatment group is shown in column 4. As Table 2 shows, the overall difference

between callback rates for non-tattooed and tattooed applicants is 13 % and is highly significant, even when adjusted with multiple hypothesis testing (List, Shaikh and Xu, 2016). As Table 2 shows, applicants with no tattoos always receive significantly more callbacks, and the difference ranges from 12 % (the difference for West Germany) to 19 % (for large firms). The only exception is when the position is posted for a rural area: in this case, applicants with no tattoos still have a higher callback rate, 15 %; however, the difference is not statistically significant due to the small number of observations. Our data show that the highest discrimination is observed in large firms (20 % difference, or a reduction of callback rate by nearly 98%).

In addition to lower callback rates, discrimination can take different forms. Table 3 shows the average reaction time (in working days) and the number of callbacks. As the table confirms, overall reaction time is significantly faster for candidates with no tattoos.[20] The effect mainly comes from the positive response, as firms call non-tattooed applicants significantly faster. This could indicate that tattooed candidates are close to the threshold of all applicants. Probably, firms first call candidates above the threshold and if they decline the offer, employers go down the list to choose an alternative. This would delay positive callbacks to applicants with tattoos. Because of the delay in positive response, one might argue that if the experiment were run infinitely, at some point the treatment effect would disappear (the callback rate of applicants with tattoos will "catch up" to the callback rate of applicants without tattoos). Figure 3 reflects Table 3 in the sense that the average number of calls is higher for non-tattooed applicants (blue line) compared to tattooed applicants (red line), and there is a delay in response to tattooed applicants. Further, as Fig. 3 shows, firms stop calling back six weeks after receiving an application. Therefore, even if the experiment were conducted infinitely, the treatment effect would be maintained. In addition to the reaction time, Table 3 and Fig. 3 confirm that employers call back applicants without tattoos more frequently, on average, almost 1.8 times more. Because we do not answer the incoming calls from employers, they call several times in order to reach the applicant. This result indicates that they expend greater effort to reach applicants without tattoos.

[20]Note that we have 156 missing observations for the variable "delay", when firms did not react at all. These observations are treated as rejection later in the regression analyses.

Table 2. Distribution of callback across the treatment (tattooed) and control (non-tattooed) group

	Non-Tattooed	***Tattooed***	***Percentage point Difference***	***Ratio***
	(1)	**(2)**	**(3)**	**(4)**
Overall	0.37 (0.48)	0.24 (0.43)	13***†††	1.54
Male	0.36 (0.48)	0.24 (0.43)	13***††	1.50
Female	0.37 (0.48)	0.24 (0.43)	13**	1.54
Front office	0.40 (0.49)	0.28 (0.45)	13**	1.43
Back office	0.34 (0.47)	0.21 (0.41)	13***††	1.62
West Germany	0.35 (0.48)	0.23 (0.42)	12***†††	1.52
East Germany	0.43 (0.49)	0.28 (0.45)	15*	1.54
Urban	0.36 (0.48)	0.23 (0.42)	13***†††	1.57
Rural	0.41 (0.49)	0.26 (0.44)	15	1.58
Small firm	0.40 (0.49)	0.27 (0.45)	13**	1.48
Medium firm	0.32 (0.47)	0.23 (0.42)	9**	1.39
Big firm	0.40 (0.49)	0.20 (0.40)	19***†	1.98

Notes: The table shows summary statistics of callbacks for our sample of 782 firms. Standard deviations are in parentheses beneath mean estimates. Column 3 shows the percentage difference in callback rates between the treatment (tattooed) and the control (non-tattooed) group. Column 4 reports the ratio of the first column to the second. * $p<0.10$; ** $p<0.05$; ***$p<0.01$; † - significance level with multiple hypothesis testing adjusted (List et al. (2016)).

Table 3: Average reaction time in working days.

Delay in response	***Non-Tattooed***	***Tattooed***	***Difference***
	(1)	**(2)**	**(3)**
All (N=626)	10 (13.25)	12.07 (15.06)	-2.07*
Positive response (N=234)	4.24 (5.16)	5.95 (6.88)	-1.71**
Rejection (N=392)	14.54 (15.70)	14.76 (16.79)	-0.23
Number of callbacks	2.04 (1.66)	1.41 (1.34)	0.63***††

Notes*: The table shows average reaction time in working days and number of callbacks across the control (non-tattooed) and the treatment (tattooed) group. Standard deviations in parentheses. * p<0.1, ** p<0.05, *** p<0.01;* † - significance level with multiple hypothesis testing adjusted.

3.2 Linear Probability Model

In the previous section we showed that applicants with visible tattoos receive fewer callbacks than applicants without tattoos. To estimate the probability of a callback, we estimate the following linear probability model:

$$callback_i = \alpha_0 + \alpha_1 * VisibleTattoo_i$$

where $callback_i = 1$ if applicant *i* gets a callback, and 0 otherwise; $VisibleTattoo_i = 1$ if the tattoo is attached to the picture of the applicant, and 0 otherwise. Column 1 in Table 4 reports results of the simple model. In Column 2 we control for monthly fixed effects. Columns 3-6 expand the model (column 2) to include dummy variables for gender, indicating whether the firm is international, whether the job location is in West Germany (83% of our data is collected from positions in West Germany) and whether it is in an

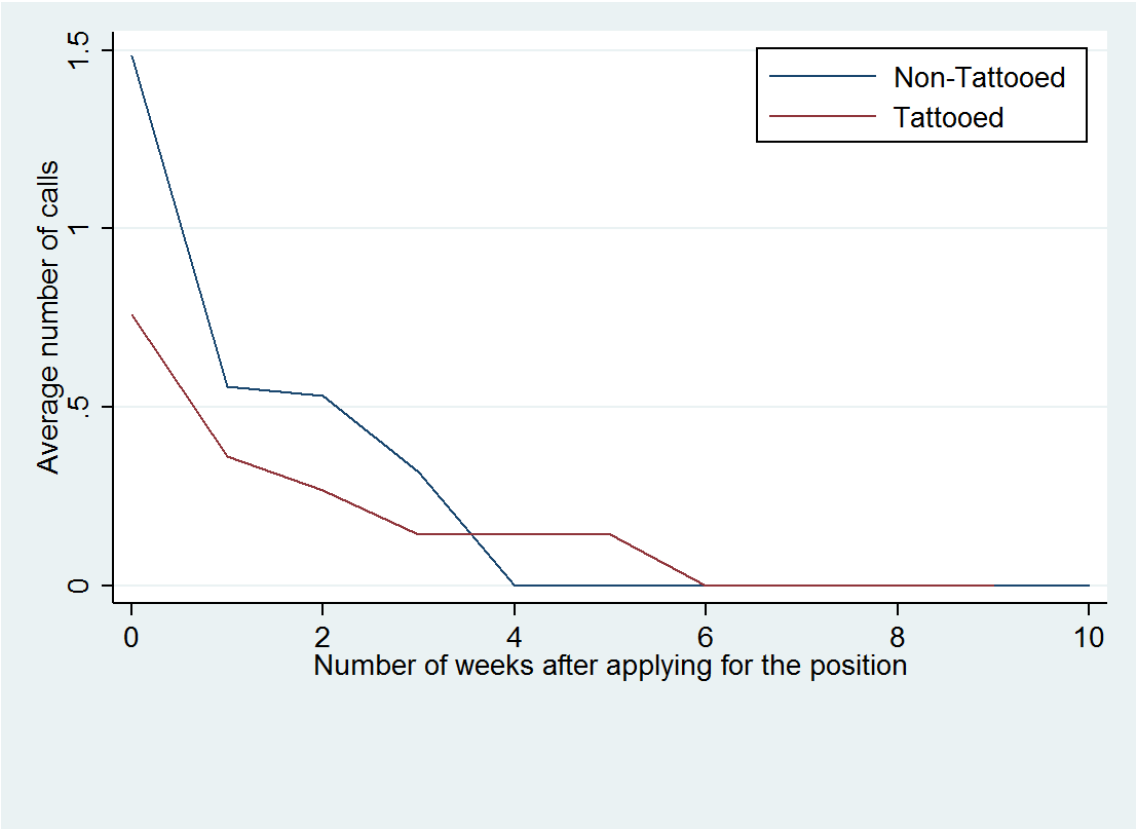

Figure 3: Average callback across time

urban area, and their interaction with the treatment variable (the tattoo status), respectively. In these models, we also control for firms' characteristics including age, size and the number of jobs advertised by the firm. As column 3 shows, having a visible tattoo has the same effect for male and female candidates, as the interaction of the gender dummy with the treatment dummy is statistically insignificant. From column 4, we see that applying to an international firm further decreases the chances of a callback, as the coefficient is negative. However, the interaction is insignificant, meaning that tattooed applicants do not receive different treatment from international firms than applicants without tattoos. As for firms from West Germany and urban areas, we see a similar pattern. Both dummies are negative and their interaction with the treatment dummy is positive; however, none of them are statistically significant.

From Table 4, we conclude that none of the firm characteristics interacted with the treatment dummy have a significant effect on the probability of callbacks. We now consider whether job-specific characteristics have a heterogeneous effect on our appli-

cants. As mentioned above, the job vacancies had different requirements, such as friendly appearance or teamwork skills, and concentrating on the banking sector allows us to examine discrimination in front and back-office positions. These factors enable us to test the model of customer and coworker taste based discrimination. In particular, if we observe that discrimination in applications for the front office positions is greater compared to those for back office positions, we could claim that tattooed applicants face customer taste based discrimination. On the other hand, if in the positions where teamwork is required, we observe a greater level of discrimination compared to those without that particular requirement, we could argue that tattooed applicants suffer from coworker taste based discrimination. As columns 2 and 4 of Table 5 show, we do not find evidence of customer or coworker taste based discrimination. Even though the interaction terms in these columns are positive, they are both statistically insignificant. Column 3 of Table 5 reports that if the position has a requirement for a friendly appearance, it negatively affects the chance of getting a callback, though the effect is similar for applicants from both the treatment and control groups. We should note that after controlling for monthly fixed effects and firm characteristics, the treatment effect is roughly the same and highly significant.

Table 4. Estimates of the Linear Probability Model: firm characteristics.

Callback	**1**	**2**	**3**	**4**	**5**	**6**
Visible tattoo	-0.13***††† (0.03)	-0.13***††† (0.03)	-0.12** (0.05)	-0.11***† (0.04)	-0.16** (0.08)	-0.14 (0.09)
Male			-0.10* (0.05)			
Visible Tattoo X Male			-0.00 (0.06)			
International firm				-0.07 (0.05)		
Visible tattoo X International firm				-0.03 (0.06)		
West Germany					-0.07 (0.06)	
Visible tattoo X West Germany					0.05 (0.09)	
Urban area						-0.03 (0.07)
Visible tattoo X Urban area						0.02 (0.09)
Monthly fixed effects	*N*	*Y*	*Y*	*Y*	*Y*	*Y*
Controls	*N*	*N*	*Y*	*Y*	*Y*	*Y*
Constant	0.37***††† (0.02)	0.45***††† (0.04)	0.64***††† (0.08)	0.53***††† (0.06)	0.59***††† (0.08)	0.54***††† (0.07)
N	782	782	782	782	782	782

Notes: Estimates of the linear probability model. Robust standard errors in parentheses. In columns 2-6 we include monthly fixed effects in the regression. In columns 3-6, where applicable, we control for firm characteristics including age, size, number of job advertisements on that particular page and whether the location of the job is in an urban area. p<0.1, ** p<0.05, *** p<0.01; † - significance level with multiple hypothesis testing adjusted.*

Table 5: Estimates of the Linear Probability Model: job requirements.

Callback	**1**	**2**	**3**	**4**
Visible tattoo	-0.13*** † † † (0.03)	-0.13*** † † (0.04)	-0.15*** † † † (0.04)	-0.13*** (0.05)
Front office		0.05 (0.05)		
Visible tattoo X Front office		0.02 (0.06)		
Appearance requirement			-0.04 (0.05)	
Visible tattoo X Appearance			0.09 (0.07)	
Teamwork requirement				-0.08 (0.05)
Visible tattoo X Teamwork				0.05 (0.07)
Monthly fixed effects	*Y*	*Y*	*Y*	*Y*
Controls	*N*	*Y*	*Y*	*Y*
Constant	0.45*** † † † (0.04)	0.51*** † † † (0.06)	0.54*** † † † (0.06)	0.76*** † † † (0.10)
N	782	782	782	782

*Notes: Estimates of the linear probability model. Robust standard errors in parentheses. We include monthly fixed effects in the regressions. In columns 2-4 we control for firm characteristics including age, size, number of job advertisements on that particular page and whether the location of the job is in an urban area. * p<0.1, ** p<0.05, *** p<0.01; † -significance level with multiple hypothesis testing adjusted.*

Finding no evidence of customer and coworker taste based discrimination, we next examine the model of statistical discrimination. As mentioned above, tattooed individuals are linked to negative stigmas that makes them an "unwanted" group in the workplace. To provide positive signals about the personality of the applicants we used two methods: inclusion of contact details of a reference person in a fraction of applications, and inclusion of membership in the alpinist group in another fraction of applications.[21] Table 6 provides estimates of these two particular channels of statistical discrimination. Column 2 shows that inclusion of the contact details of the reference person decreases the probability of callback by 3%, though the effect is insignificant. On the other hand, the interaction term (of the treatment dummy and the reference signal) increases the probability of callback by 1%; however, the effect is again insignificant. Column 3 in Table 6 shows that having a visible tattoo reduces the probability of callback by 15%. Similar to the reference signal, membership in the alpinists' association further decreases callback probability by 1%, though this is statistically indistinguishable from zero. As the interaction term shows, being a member in the alpinists' association increases the probability of a callback by 8%; however, the coefficient is insignificant.

Figure 4 considers the base group (no additional information), reference signal group, and alpinist membership signal groups separately. The difference in callback rates between applicants with and without tattoos in the base group is 0.19 with the $p-value = 0.0018$; therefore, we can see that without providing any additional information regarding personality, applicants without tattoos are treated less favorably. In the reference signal group, the difference in callback rate is reduced to 0.12 and is still significant at the 5% level ($p - value = 0.02$). On the other hand, in the alpinist membership signal group, the difference is no longer significant. Hence, using our channels we cannot reject the hypothesis that tattooed applicants face taste based discrimination (possibly from HR managers).

[21] Usually, members of the alpinist group, Deutsche Alpenverein, are not risk-taking mountaineers, rather they are nature lovers who go on hiking tours. This should offset the negative stereotypes related to people with tattoos. Hence, we expected that membership would have a greater effect on applicants from the treatment group.

Table 6. Estimates of the linear probability model: channels of statistical discrimination.

Callback	**1**	**2**	**3**
Visible tattoo	-0.12***††† (0.03)	-0.13***†† (0.04)	-0.15***††† (0.04)
Reference signal		-0.03 (0.05)	
Visible tattoo X Reference signal		0.01 (0.07)	
Group membership			-0.01 (0.05)
Visible tattoo X Group membership			0.08 (0.07)
Monthly fixed effects	*Y*	*Y*	*Y*
Controls	*Y*	*Y*	*Y*
Constant	0.54***††† (0.06)	0.54***††† (0.06)	0.55***††† (0.06)
N	782	782	782

Notes: Estimates of the linear probability model. Robust standard errors in parentheses. In all specifications we control for monthly fixed effects and firm characteristics including age, size, number of job advertisements on that particular page and whether the location of the job is in an urban area. p<0.1, ** p<0.05, *** p<0.01; † - significance level with multiple hypothesis testing adjusted.*

Therefore, unless we examine various other sources of statistical discrimination, we cannot present conclusive arguments about the nature of discrimination. However, our preferred interpretation is as follows. When we include the contact details of the reference person we see that the callback differential remains statistically significant. On the other hand, the alpinist group membership signal eliminates the difference. However, as shown in Fig. 4, the callback rate declines for both tattooed and non-tattooed applicants when we include additional information regarding the personality of the candidate. The original purpose for including the additional information was to increase the callback rate for tattooed applicants. Fig. 4 shows that it did not help. Therefore, in line with Gneezy et al. (2012), we claim that the discrimination against applicants with visible tattoos is motivated by animus. Specifically, it seems that HR managers in the banking sector have a distaste for workers with visible tattoos, resulting in differential treatment.[22]

[22]We have analyzed our data using a probit estimation method, however, qualitative results remain unchanged.

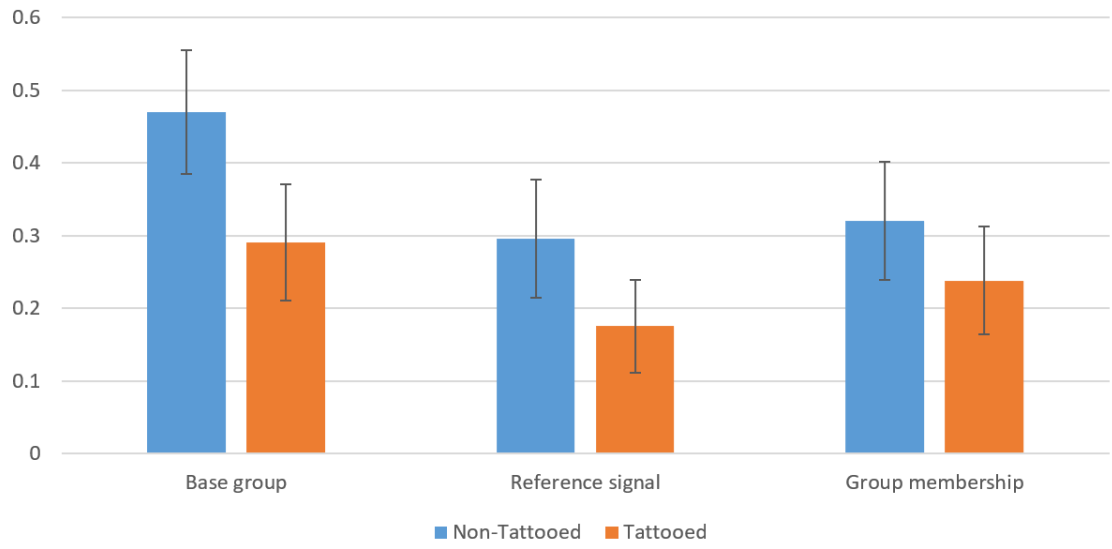

Figure 4: Callback rate across groups: Channels of statistical discrimination

4 Conclusion

In this paper we test whether applicants with visible tattoos are discriminated against in the banking labor market. As Akerlof and Kranton (2000) state, having a tattoo is an explicit signal of belonging to certain social categories.[23] Despite the growing popularity of tattoos, stigma still exists in society towards tattooed individuals. Because of these stereotypes, candidates with visible tattoos may be treated less favorably in the labor market, regardless of qualifications. Being a member of a particular social group does not necessarily predict individuals' productivity; thus, given equivalent qualifications, individuals with and without tattoos should have similar chances of employment. However, Fryer and Jackson (2008) showed that social categorization may lead to discriminatory behavior towards minorities. This paper provides the first experimental evidence to test whether applicants with visible tattoos are discriminated against in the labor market.

To collect data we conducted a natural field experiment in Germany. Our data confirms that applicants without visible tattoos receive 54% more callbacks than those with tattoos. Further, we find that employers react positively significantly faster to candidates without tattoos, and they exert greater effort to contact the applicants (call back

[23]Even though we do not use tattoos that have a clear connection to some specific social groups, tattoos are generally viewed as a hindrance factor in the labor market, at least in some occupations.

almost 2 times more). The design of our experiment allows us to test models of customer and coworker discrimination. However, we find no evidence that tattooed individuals face customer and/or coworker taste based discrimination. Moreover, we use two channels to test whether tattooed applicants suffer from statistical discrimination. Even though we have mixed evidence regarding statistical discrimination, we suggest that the discrimination found in our study might come from animus, particularly from HR managers. This is in line with the argument made by Gneezy et al. (2012), in which the authors argue that when the object of discrimination is perceived as a choice made by the individual, discrimination is taste based. However, we should note that various other sources of statistical discrimination should be tested before arguing that visibly tattooed applicants face taste-based discrimination.

In the context of models by Akerlof et al. (2000) and Fryer et al. (2008), we find that job applicants are often punished for expressing their identity or belonging to a certain social group. Our results show how important identity is and what consequences job applicants may face when they express it. This might be problematic from the firms' perspective, as they can lose talent as a result of discrimination. Applicants, on the one hand, may suffer from discrimination, as they need more time and resources to find a job. On the other hand, given that applicants have information about discrimination against tattooed individuals, those who want to work in a more "liberal" environment may choose to signal the employer by using tattoos to screen themselves from discriminatory firms. Thus, in addition to its contribution to the literature, the results of this paper may be useful for members of the general public.

Having a tattoo potentially has a heterogeneous effect across sectors. Therefore, in order for the results to have a higher degree of external validity, a broad range of occupations should be considered. There are other possible extensions of the paper. In this paper we use "neutral" tattoos; however, the content of the tattoo may have a different effect. For example, a tattoo that can elicit a positive emotion may not be viewed as negatively as a tattoo that elicits a negative emotion. In addition, the size of the tattoo may have a different effect on employment chances. Thus, more research in this area is needed to find out why/if HR managers "punish" individuals for expressing themselves.

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Appendix A Results of Applicant Attractiveness Survey

In order to rank the experiment participants according to their attractiveness, we conducted a survey. The survey included pictures of the participants and asked subjects to assign them to a category - above average looking (compared to the same age/gender group), average looking and below average looking. The survey was sent to volunteer students of different nationalities studying in various universities in Prague, the Czech Republic. In total we had 35 responses. There were a total of 10 applicant pictures in the survey, 4 female and 6 male. After the survey, we chose a picture of one female and male participant from each category. Table A-1 shows the distribution of attractiveness categories for each of the 6 participants. As we see, there is a consensus about participants' attractiveness among the students surveyed.

We wanted to make sure that our applicants are not rejected because of characteristics other than a visible tattoo, for ethnicity, for example, so we wanted our candidates to have a "German look". Ideally one could use pictures of German people, although in our case it was not feasible, as only one participant is from Germany. For this reason, we needed to make sure that our participants' perceived nationality was similar in the treatment and control group. In the first survey described above, in addition to perceived attractiveness, we asked respondents to state (their perceived) nationality of the person depicted on the pictures.[24]Alongside this survey we created another survey, this time using photos with tattoos, and asked participants to state the perceived nationality of the person in the picture. 26 volunteers completed the survey. Table A-2 shows the top three nationalities indicated by volunteers (with respective percentages). As the table shows, there is no difference in the perceived nationality of applicants with and without tattoos. This ensures that applications in the treatment and control group will not be treated as different nationals, which may complicate the results.

[24]In that survey participants had no tattoo.

Table A-1: *Atractiveness evaluation*

Participant #	Attractiveness Category		
	Above average looking	Average looking	Below average looking
1	0	40	60
2	85.8	8.6	5.6
3	31.4	48.6	20
4	20	62.9	17.1
5	20	31.4	48.6
6	80	14.1	5.9

Notes: Numbers are percentages of votes in the survey.

Table A-2: *Perceived nationality of experiment participants*

Without tattoo	participant #	With tattoo
Top 3 nationalities		Top 3 nationalities
German - 31.4%; Czech - 25.7%; British - 22.3%	1	Czech - 42.3%; German - 26.9%; British - 15.4%
German - 28.6%; American - 28.6%; British - 17.1%	2	German - 34.6%; Czech - 23.1%; British - 23.1%
British - 68.6%; American - 17.1%; German - 5.7%	3	British - 46.2%; German - 26.9%; American - 23.1%
Czech - 25.7%; American - 17.1%; German - 8.6%	4	American - 30.8%; Czech - 23.1%; German - 7.7%
Czech - 31.4%; American - 28.6%; British - 20.0%	5	American - 30.8%; British - 30.8%; Czech - 15.4%
American - 28.6%; British - 25.7%; German - 22.9%	6	American - 34.6%; British - 30.8%; Czech - 23.1%

Appendix B Randomization check

As we sent only one application to one employer, we needed to ensure that firms and jobs were similar in the treatment and control group in terms of all controllable characteristics. In the paper we presented evidence that in terms of a firm's characteristics our sample is balanced. Here we do the same exercise for regions. We test whether regions of the country are similarly represented in the treatment and control group. Table B-1 shows balanced check results for regions. None of the differences are statistically significant, meaning that our randomization ensures the treatment and the control group are similar in terms of controllable characteristics. Thus, we can rule out that any differential treatment of tattooed applicants is related to firm characteristics and/or to region specific factors. Therefore, we argue that any difference in callback rates between the treatment and the control group should be due to the treatment itself.

Table B-1. Randomization check: *Regions*

Region	***Non-Tattooed***	***Tattooed***	***p-value***
	1	2	3
Baden-Württemberg	0.09 (0.29)	0.09 (0.29)	0.89
Bavaria	0.19 (0.39)	0.19 (0.39)	0.84
Berlin	0.10 (0.31)	0.10 (0.30)	0.98
Brandenburg	0.00 (0.05)	0.01 (0.07)	0.58
Bremen	0.02 (0.14)	0.03 (0.16)	0.68
Hamburg	0.08 (0.27)	0.08 (0.28)	0.89
Hesse	0.14 (0.35)	0.14 (0.35)	0.94
Lower Saxony	0.03 (0.18)	0.04 (0.19)	0.63
Mecklenburg-Vorpommern	0.00 (0.05)	0.01 (0.07)	0.58
North Rhine-Westphalia	0.22 (0.41)	0.22 (0.41)	0.90
Rhineland-Palatinate	0.01 (0.10)	0.01 (0.09)	0.67
Saarland	0.00 (0.05)	0.00 (0.05)	0.98
Saxony	0.05 (0.22)	0.04 (0.19)	0.34
Saxony-Anhalt	0.01 (0.07)	0.01 (0.09)	0.43
Schleswig-Holstein	0.03 (0.17)	0.02 (0.15)	0.60
Thuringia	0.01 (0.09)	0.01 (0.09)	0.74
N	385	397	

Notes: The table shows mean comparison of regions across treatment (tattooed) and the control (non-tattooed) group. Standard deviations are in parentheses. Column 3 shows p-values of the hypothesis of equal means across groups.

Appendix C Pictures used in the experiment

Abstrakt

Využíváme korespondenční testování ke studiu diskriminace uchazečů o práci s viditelným tetováním na německém trhu práce. Použitá metoda byla široce využívána v literatuře věnované diskriminaci, nicméně většina článků zkoumá exogenně dané předměty diskriminace (pohlaví, rasa, etnicita atd.). Koncept našeho experimentu umožňuje zkoumat rozsah diskriminace na základě charakteristik, které jsou individuální volbou. Zasíláme fiktivní odpovědi na internetu umístěné pracovní inzeráty v bankovním sektoru. Jinak identické odpovědi se odlišují pouze přiloženou fotkou uchazeče. Uchazeči ve skupině se zkoumanou charakteristikou mají na fotce viditelné tetování. Rozsah diskriminace je měřen rozdílem v četnosti pozitivní reakce (žadatel je kontaktován potenciálním zaměstnavatelem). Zjišťujeme, že kandidáti bez viditelného tetování mají v průměru o 13 procentních bodů vyšší četnost pozitivní reakce, což představuje zvýšení o 54%. V návaznosti na článek Akerlof a Kranton (2000) naše výsledky znovu zdůrazňují význam identity.

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