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Is disability more discriminatory in hiring than ethnicity, address or gender? Evidence from a multi-criteria correspondence experiment

Yannick L'HORTY*, Naomie MAHMOUDI**, Pascale PETIT***, François-Charles WOLFF****

Abstract: In this paper, we conduct a multi-criteria correspondence test to assess the extent of discrimination in access to employment against candidates with a hearing disability and compare it to three other potential grounds for discrimination: ethnicity, place of residence and gender. From October 2019 to February 2020, we sent 2,315 applications to 463 job vacancies in the Paris region in France for two occupations, administrative managers and caregiver assistants, in both the private and public sectors. We find that discrimination on the grounds of disability is similar in scope to that found on the grounds of ethnicity in the profession of administrative manager, but discrimination against the disabled candidate is half that experienced by the North African candidate in the profession of caregiver assistant, a role which requires more interaction with public, as in the profession of administrative manager. We do not find any evidence of a difference in callback rates based on place of residence or gender. Finally, we cannot conclude that hiring discrimination is systematically lower in the public sector than in the private sector, nor that being eligible for a public subsidy reduces hiring discrimination against the disabled candidate.

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1. Introduction

Persons with disabilities disproportionately experience poverty (United Nations, 2019), low employment rates (Mussida and Sciulli, 2016), low wages (Gunderson and Lee, 2016), part-time work (Autor and Duggan, 2003; Polidano and Vu, 2015) and job insecurity (Mitra and Kruse, 2016). In order to promote their standing in the labor market, and in particular their access to employment, several public policies have been implemented in many countries, ranging from employment quotas for disabled workers to anti-discrimination initiatives, both policies operating on the demand side of the labor market. Still, the employment rate of persons with disabilities remains lower than that of non-disabled people (United Nations, 2019). In France, the country under consideration in this paper, only 37% of people with a registered disability and 47% of the overall disabled population were employed according to the 2019 French Employment Survey, compared to 66% of the total population aged 15 to 64.

Several factors can explain this gap. The most frequently mentioned hypothesis is a lower average skill level and/or lower productivity for a given skill level. Another hypothesis is that there is hiring discrimination, which corresponds to a difference in treatment between two candidates of equal productivity (Heckman, 1998). The question posed by this paper is whether at least part of the low employment rate of persons with disabilities can be explained by a difference in treatment when they try to access employment, and if so, to what extent. Disability as a potential ground for discrimination is more complex to study than other grounds because: *i*) it varies in nature and intensity; *ii*) it can be temporary or permanent, but also progressive; *iii*) it may be visible or invisible; and *iv*) if invisible, it may or may not be revealed by the person. Another peculiarity lies in the effect of disability on productivity, which may be negative or nil depending on the impairment (type and intensity), the environmental factors (type of job, accommodations in the workplace) and resources (assistive devices to address the consequences of the impairment).

In order to assess discrimination against disabled workers in hiring, we conduct a correspondence test based on the well-known methodology of sending a pair of fictitious applications, similar in all respects except for the characteristic whose effect is being tested, in response to real job ads. We focus on a hearing disability, a very widespread type of disability. The World Health Organization's first World Hearing Report (2021) states that 1.5 billion people in the world have some degree of hearing loss (corresponding to one in five people), and of these, 466 million have a

"disabling hearing loss". In France, according to the Handicap-Santé survey of 2008, about 10 million people had hearing problems that year. These hearing limitations ranged from medium to total for 5.4 million of them with potential repercussions on their daily lives. According to this survey, 1.8% of the total population wore a hearing aid, and a further 3.2% did not wear one but believed they needed one (Haeusler et al., 2014).

Compared to other types of disabilities, persons with hearing disabilities are more likely to be in employment. According to Boman et al. (2015), this could be because hearing disability is often progressive with age and thus does not prevent initial entry into the labor market. Moreover, the impact of hearing impairments on productivity can be limited or null through assistive devices or accommodations. In our correspondence experiment, severe deafness was reported in the cover letter of the fictitious candidate with a disability, as was the wearing of a hearing aid, while it was explicitly indicated that his or her productivity was not altered. We thus measure discrimination in the sense of Heckman (1998). However, our protocol does not allow us to identify the discrimination mechanism, either tastebased (Becker, 1957) or statistical discrimination (Arrow, 1972; Phelps, 1972). Also, we study the effects of public policies in favor of disabled people since we randomly included a mention of an administratively registered disability (Recognition of the Status of Worker with Disability, RSWD) in the application and the existence of financial aid available to the employer.

We chose a multi-criteria protocol to quantify the extent of discrimination experienced by the disabled candidate by comparing it to three other potential discrimination grounds: ethnicity, place of residence and gender (we did not consider intersectional discrimination in this study). These four discrimination criteria were among the 10 most frequently referred to the French Human Rights Defender in 2020, with disability and ethnicity coming in first and second position respectively. The five applications were sent simultaneously in response to the same job ads. The correspondence test method was applied to two occupations, administrative managers and caregiver assistants, both in the private and public sectors. While the public sector is more sheltered from the competitive pressures that moderate discrimination, it is more committed to the principle of equality, even in the organization of recruitment operations. In France, persons with disabilities are underrepresented in skilled jobs such as administrative managers, whether or not they have a registered disability and whether or not the job is in the public or private

sector. Conversely, they are over-represented in low-skilled jobs such as caregiver assistants (Bernardi and Lhommeau, 2020).

Our study contributes to a growing but still small literature on correspondence tests on hiring discrimination based on disability, and in particular based on hearing disability, with only one existing study (Baert, 2016). We also contribute to the slim literature on hiring discrimination that compares multiple discrimination criteria, although this literature does not yet cover disability. To our knowledge, our study is the first to compare hiring discrimination on the grounds of disability to other common discrimination criteria. We find that discrimination in callbacks to job applications in the Paris region on the grounds of hearing disability is similar to that on the grounds of ethnicity for administrative manager positions. However, the penalty against ethnicity is twice that against disability in the profession of caregiver assistant. We also find that discrimination on the grounds of disability is twice as high (and three times higher on the grounds of ethnicity) for caregiver assistant positions than for administrative manager positions. We cannot conclude either that discrimination is systematically lower in the public sector than in the private sector, nor that being eligible for public subsidy in the case of hiring increases a disabled person's chances of obtaining a positive callback.

2. Background

Literature review

In the growing literature on hiring discrimination, the correspondence test has gradually been established as the reference technique for data collection (Bertrand and Duflo, 2017; Neumark, 2018). This approach has made it possible to identify the existence of hiring discrimination on the grounds of the candidate's gender, ethnicity and place of residence. It has also been applied to the disability criterion, but the small number of studies carried out in this area contrasts with the scale of the government initiatives launched to deal with this issue.

In France, only one correspondence test has been applied to disability, especially for motor impairment (Ravaud et al., 1992). In other countries, this method has been used to determine the magnitude of the stigma effect in the labor market of different forms of disability: motor disability (Stone and Wright, 2013; Ameri et al., 2018; Bellemare et al., 2019; Bellemare et al., 2020; Bjørnshagen and Ugreninov, 2021); unspecified physical disability (Capéau et al.,

2012); depression (Baert et al., 2016); obesity (Rooth, 2009; Agerström and Rooth, 2011; Busetta et al., 2020; Campos-Vazquez and Gonzalez, 2020); HIV (Drydakis, 2010); Asperger's syndrome (Ameri et al., 2018); mental disability (Hipes et al., 2016; Bjørnshagen, 2021); and hearing impairment, blindness and autism (Baert, 2016). To our knowledge, only the study of Baert (2016) conducted in Belgium focuses on hearing disability (768 job ads tested). The deaf candidate had a 16.7% lower chance of receiving a broadly positive callback to an application for a job as an IT specialist (comparing to 11.0% lower chance for the blind candidate).

As in these studies, our first objective is to test whether discrimination against an applicant with a hearing disability exists in France, which leads us to test the following hypothesis.

H1. Persons with hearing disabilities are victims of hiring discrimination.

Some studies using correspondence tests have compared hiring discrimination on several grounds other than disability (e.g. Bertrand and Mullainathan, 2004) and others have tested the impacts of different types of disability (Stone and Wright, 2013; Baert, 2016; Ameri et al., 2018). However, no correspondence experiment has compared discrimination on the grounds of disability to other discrimination criteria. Only the meta-analysis by Lippens et al. (2021) provides elements of comparison between disability and other discrimination criteria, including ethnicity, disability and gender. Overall, it finds a level of hiring discrimination due to disability that is at least as important as that on the grounds of ethnicity, but does not find discrimination on the grounds of gender. In France, proof of the absence or of a low level of discrimination on the grounds of living in a priority neighborhood has been found (Challe et al., 2018; Chareyron et al., 2021). For this reason, we expect to find levels of discrimination on the grounds of gender and place of residence.

H2. At a given productivity level, hearing disability and ethnicity should be equal as grounds for discrimination but higher than the discrimination against gender and place of residence.

In the literature, the intensity of discrimination differs across occupations and is particularly linked to the level of customer exposure (Neumark, 2018). In our experiment, we selected two occupations, administrative managers and caregiver assistants, with different relationships with the public. Unlike bureaucratic jobs, caregiving jobs involve a lot of interaction with the public as well as with other caregiver assistants, nurses, doctors, patients, etc. (Folbre and Weisskopf, 1998). Thus, we might expect disability to have different effects in the two occupations, with more discrimination in a profession that has more interaction with the public.

H3. Hearing disability should be more discriminating in occupations that require a high level of interaction with the public.

Several arguments suggest that hiring discrimination may be less important in the public sector than in the private sector. Discrimination is just as illegal in the private sector as in the public sector, but the level of prevention and control of recruitment procedures is higher in the public sector. The pre-eminence of recruitment through competitive examinations in this sector introduces a large number of provisions to formally ensure equality between candidates, although recruitment through competitive examinations represents only a small part of public recruitment. Another argument is that private recruiters are exposed to competitive and market sanctions when they discriminate. According to Becker's model, public recruiters, less exposed to profitability constraints, are then less likely to discriminate. We thus expect to find a lower level of discrimination in the public sector.

H4. Discrimination on the grounds of disability should be lower in the public sector than in the private sector.

Some rare studies have also evaluated the effect of government-funded financial assistance in support of access to employment for persons with disabilities. Those by Deuchert and Kauer (2017) and Baert (2016) show that the mention of wage subsidies by candidates with disabilities is rather ineffective in increasing their callback rate. The study by Bellemare et al. (2019) conducted in Quebec indicates that mentioning eligibility for a government subsidy to cover the costs of adaptation of the workplace and workstation in the cover letter does not increase the callback

rate for the physically disabled applicant. Unlike our study, it focused on motor disability (being in a wheelchair). Being wheelchair-bound could involve significant costs for workstation accommodations incurred by the employer. In our study, the candidate with a disability specifies that he wears hearing aids to mitigate his disability, which implies that he bears the main adaptation costs related to his disability. Because government-funded support aims to improve access to employment for persons with disabilities and hearing disability involves relatively low adaptation costs for the employer, we expect to find a lower level of discrimination when the candidate with a hearing disability is eligible for this support.

H5. An applicant with a hearing disability who is eligible for public subsidy should be less discriminated against than an ineligible applicant with a hearing disability.

The French legal setting

In France, quota and anti-discrimination policies coexist and complement each other. The employment quota policy, better known as the obligation to employ disabled workers (hereafter quota), requires employers to have a minimum proportion of workers with disabilities in its workforce. Under the law of July 10, 1987, all establishments, public and private, with 20 or more employees for more than 3 years must hire at least 6% of disabled workers. To qualify under this employment quota, disabled workers must have a registered disability (for instance, hold a disability pension or be registered under the RSWD). In 2008, 16% of people with moderate to total hearing loss had a registered disability according to the Handicap-Santé French survey.

Eligible companies who do not fulfill their obligation must pay an annual financial contribution to an organization that helps the integration, retention and professional development of persons with disabilities. It is calculated based on the number of employees the organization should have hired, multiplied by a coefficient depending on the size of the company. Despite this legislation, the employment quota of 6% of the workforce does not appear to be met. In 2016, the employment rate of disabled people reached 3.8% in the private sector and 5.32% in the public sector. Many companies prefer to pay the penalty rather than hire workers with disabilities.

Since the law of February 11, 2005, all companies, including those not subject to the quota policy, must make reasonable adjustments to the workstation of persons with a registered disability, i.e. to implement "necessary and appropriate" measures to alleviate their difficulties at work, without causing "disproportionate burdens" for the company. Otherwise, it may be considered a discriminatory act. This is assessed on a case-by-case basis. However, only establishments subjected to the employment quota can avail of financial aid (which is not awarded automatically) if they hire a disabled worker, and only after the workstation adaptation has been done.

3. Data collection protocol

The aim of the correspondence test is to determine the existence of discriminatory practices on the grounds of hearing disability in access to a job interview and to compare this to discrimination on the grounds of ethnicity, place of residence and gender. The test was to check for access to job interviews. No candidate was sent to a physical interview and the written applications did not include photographs.

We chose to focus on two professions: administrative managers and caregiver assistants, because they satisfy three criteria. First, they are in sectors that experience labor tightness. Baert et al. (2015) examine the link between ethnic discrimination in the labor market and tightness of the labor market. They do not find discrimination when candidates apply for jobs in a tight labor market. We therefore voluntarily place ourselves in a context that is not conducive to highlighting discrimination. Secondly, these occupations are present in both the public and the private sectors. Thirdly, the large number of job seekers and job ads in these sectors, reduces the risk of detection when several fictitious CVs are sent to the same recruiter.

We systematically sent five fictitious applications in response to each job ad tested. These applications are equivalent in terms of professional and individual characteristics. Specifically, they are comparable in terms of diplomas, career paths and previous professional experience. Applicants have French nationality, are of comparable age (they are between 31 and 33 years old) and have the same family status. They indicate that they have a driving license and their own vehicle. They differ on only one characteristic.

The first fictitious candidate is of the modal sex for the profession tested (male for the administrative manager positions, female for the caregiver assistant positions), has a French-sounding first name and surname and resides

in a neutral neighborhood (reference candidate). The second candidate differs from the reference candidate by the mention of a severe hearing disability in his or her covering letter. The third candidate is distinguished from the reference candidate by his or her first and last names indicating a North African origin. The fourth candidate lives in a disadvantaged neighborhood which corresponds in France to a *"Quartier Prioritaire de la politique de la Ville"*, political district of the city (hereafter priority neighborhood). Finally, the fifth fictitious candidate differs from the reference candidate only by gender. Thus, we sent four male applications and one female application in response to the caregiver assistant ads.

One out of two times, the applicant with a disability mentioned having RSWD in his or her cover letter and also explicitly mentioned it in the CV. In both cases, he or she states being severely deaf for about ten years, so that his or her disability does not suggest to the employer that he or she has problems in communicating, both written and oral. He or she also mentions wearing hearing aids to compensate for the disability and states that his or her productivity is not affected.

We randomly swapped CVs and cover letters between the fictitious candidates throughout the data collection process. Therefore, we randomized their professional experiences and the internship during the second year of their masters (employer, location, date, missions, type of contract and job title), as well as the place where they studied, their hobbies and the style of CV and cover letter. Applications in response to the same job ads were sent as soon as the vacancy was posted on a job website, by email from each candidate's email address on two consecutive days, or by application form or mail (not very often) when the job ad did not give the recruiter's email address. The order of expedition of the applications to the same job ad was also randomized. Finally, as a reminder, the signal of the RSWD in the CV and the cover letter of the disabled candidate was randomized too.

All job ads for administrative managers and caregiver assistants, located in the Paris region, fell within the scope of the study. We included all those brought to our attention between mid-October 2019 and mid-February 2020 and ended the collection of callbacks in the middle of March 2020, just before the first lockdown in France. A dozen websites specialized in the diffusion of job ads were consulted on a daily basis. The composition of the test sample of job ads is presented in Table 1. A response is considered positive when the recruiter invites the candidate to an

interview or asks, for more information about his/her current situation or qualifications. Conversely, the response is considered negative when the recruiter formally rejects the application or does not respond before the end of the test campaign.

4. Results

The pattern of callbacks

In most cases, employers do not respond to the applications they receive, even at the very first stage of contact. The response rate varies depending on the candidate's profile, the occupation and the sector. The response rate for administrative managers both in the private and public sectors is 21.5% for the reference candidate, 17.6% for the candidate with a disability, 16.9% for the North African candidate, 24.9% for the resident living in a priority district and 24.9% for the female (non-modal gender) candidate.

As shown in Table 2, the positive callback ratio, defined as the callback rate of the reference candidate divided by the callback rate of the tested candidate, is significantly higher than one when the application refers to either disability or ethnicity, in the private sector only, and is below one for the candidate from the priority neighborhood (at the 10 percent level). The likelihood that the reference candidate receives a positive callback is around 40% higher than for a candidate with a disability.

Positive callbacks are much more frequent among caregiver assistants. When both the private and public sectors are pooled, the response rate to the reference candidate is 58.4%. This is higher than the rates for the disabled candidates (50.5%) and the North African candidates (44.1%). The response rates to the candidates living in a priority district and to the non-modal gender candidates (male) are higher (56.9% and 57.4%). Unlike for the administrative managers, discrimination is essentially found in the public sector except for ethnicity where both the private and public sectors are discriminating. In the public sector, the positive callback ratio is 1.267 comparing the reference and disabled candidates and 1.520 comparing the reference and North African candidates. Overall, these results show that there is discrimination against persons with disabilities, which validate hypothesis 1 for the two occupations.

In Figure 1, we show the number of days elapsed before receiving a positive response and report the Kaplan-Meier survival functions for the five candidates. For the administrative manager positions, the survival functions for the North African candidates and those with disabilities are substantially above those of the reference candidates, while those of the candidates living in a disadvantaged area or being of the non-modal gender are below the reference survival function. There are also substantial differences in the survival functions for the caregiver assistant jobs. It takes a maximum of 7 days for 40% of the reference candidates to obtain a response to their application, against 13 days for the candidate with a disability and 19 days for the North African candidate. One month after sending their applications, the survival functions of the five candidates become horizontal in both professions.

In Figure 2, we report the differential in callback rates with respect to the reference candidates along with the corresponding confidence intervals. For the administrative manager position, we observe that the intensity of discrimination is similar for the disabled and North African candidates (p=0.733). Conversely, the negative effect of disability is different from the positive effect of priority neighborhood (p=0.001) and female gender (p=0.002). Differences between tested candidates are observed in the private sector only. For the caregiver assistant position, most discrimination is shown to the North African candidate followed by the disabled candidate. A comparison of the various point estimates shows that the disabled and North African profiles are different at the 10 percent level (p=0.069), but the difference is not significant when the private and public sectors are considered separately. Also, the disabled profile is different from the priority neighborhood and non-modal male profiles, but only for the private sector (p=0.016 and p=0.043). These results seem to partially invalidate hypothesis 2, because for the caregiver assistant positions, discrimination is higher on the grounds of ethnicity than on the grounds of disability.

Econometric analysis of callback

In our experiment, all the candidates' characteristics are similar with one exception (either disability, ethnicity, residence or gender). However, there is still some heterogeneity in the various applications sent to recruiters. Also, there may be some heterogeneity in the various job ads related to employer characteristics. We estimate regression models to account for these confounding factors. We denote by R_{ji} the response sent by employer *j* to candidate *i*

such that $R_{ji} = 1$ when the response is positive and $R_{ji} = 0$ otherwise. We turn to linear probability models to explain the probability of receiving a callback:

$$\Pr(R_{ji} = 1) = \sum_{k} \gamma_k * c_{ki} + \theta * S_{ji} + X_{ji}\beta + \varepsilon_{ji}$$
(1)

where c_{ki} refers to the type of candidate (k = 0 for the reference candidate, k = 1 for disability, k = 2 for North African origin, k = 3 for living in a priority neighborhood, and k = 4 for non-modal gender (i.e a woman applying for an administrative manager job and a man applying for a caregiver assistant job), S_{ji} is a dummy variable equal to one when the job is in the public sector, X_{ji} is a set of control variables, γ_k , θ and β are parameters to be estimated, and ε_{ii} is a residual.

We include two types of explanatory variables in X_{ji} . First, we check that the randomization has no effect on the probability of callback using characteristics related to the experimentation: order of sending, method by which the application was sent, application layout and the month the application was sent. Second, we introduce some characteristics related to the job ads (identified at the time of their publication date on French websites listing job ads): type of job, location of the job, gender of the recruiter, and requirement for immediate availability of the candidate in the job ad. We estimate OLS regressions for the sample of administrative managers and for the sample of caregiver assistants separately. Since there are five applications per job ad, we cluster standard errors at the job ad level. We present our results in Table 3.

We find differences in the candidate profiles between both occupations. When the private and public sectors are pooled, the negative effect of disability is not far from being significant (p=0.108) for administrative managers while that of ethnicity is significant at the 10 percent level (-4.8 points, p=0.057). Among caregiver assistants, the probability of receiving a callback is 7.6 percentage points less for the candidate with a disability than for the reference candidate (p=0.032). This marginal effect is nonetheless half that observed for ethnicity (-14.1 points) and a Wald test shows that both coefficients are different at the 10 percent level (p=0.071). The existence of discrimination based on ethnicity is confirmed by the literature, both from abroad, as shown for instance by the meta-

analyses of Zschirnt and Ruedin (2016) and Lippens et al. (2021), and in France, particularly in the Paris region (Pierné, 2013) and in the accounting field (Duguet et al., 2010; Edo and Jacquemet, 2014).

Moreover, the difference in treatment of disability between the two occupations confirms our third hypothesis. One possible explanation is that the need to hear is perhaps more important in the caregiver assistant occupation, where being able to exchange with patients and staff is essential. Finally, residence and gender have no influence on callback rate in either occupation. Evidence of the absence of hiring discrimination based on these criteria has already been found in the literature abroad (Tunstall et al., 2014, for place of residence; Asali et al., 2018, for gender), but also in France, in the Paris region (Petit, 2007, for gender; Challe et al., 2018, for both criteria in the same occupations tested).

Our results are thus in line with the results of the meta-analysis by Lippens et al. (2021).

Then, we consider the possibility that the effect of the candidate profile may vary between the private and public sectors in order to test our hypothesis 4. For that purpose, we interact the public sector dummy with the candidate dummies and the other covariates as follows:

$$\Pr(R_{ji}=1) = \sum_{k} \gamma_k * c_{ki} + \sum_{k} \delta_k * c_{ki} * S_{ji} + \theta * S_{ji} + (X_{ji} * S_{ji})\beta + \varepsilon_{ji}$$
(2)

In (2), the coefficients γ_k measure the presence of discrimination for the various candidates in the private sector, while the coefficients δ_k indicates the difference in discrimination between the private and the public sectors. For administrative managers, disability reduces the probability of being contacted in the private sector (-5.5 points, p=0.033), while there is no effect in the public sector. For caregiver assistants, disability plays no role in the private sector, but has a negative influence on the likelihood of callback in the public sector (-14.2 points, p=0.047). We cannot therefore conclude that hiring discrimination is systematically lower in the public sector, which invalidates hypothesis 4.

These mixed outcomes for disability stand in contrast with our findings for ethnicity. For both administrative managers and caregiver assistants, the callback rate to candidates of North African origin is lower than that of the reference candidate in the private sector (-6.8 points and -10.8 points, respectively). Living in a priority neighborhood

decreases the likelihood of a positive answer for caregiver assistants in the public sector (-15.3 points). For the caregiver assistant positions, being a man reduces strongly the probability of receiving a callback in the public sector (-11.5 points).

We have implemented several robustness checks (reported in the online appendix). First, we investigated the determinants of the time elapsed before receiving a callback using Cox proportional-hazard models. When both sectors are merged, the time elapsed before receiving a positive answer is longer for disabled candidates in the caregiver assistant positions and for North African candidates for both occupations (Table A.1). For disabled candidates, the delay between sending the application and being contacted is greater only in the private sector for administrative manager jobs. Second, as our experiment is based on the sending of five applications to each job ad, we were able to account for unobserved heterogeneity using a job-specific heterogeneity term. As there should be no correlation between the applicants' characteristics and the job characteristics, we turn to a random effect linear specification. Taking the private and public sectors together, the probability of receiving a callback is lower for the candidate with a disability in both occupations: -3.8 points for administrative managers and -7.9 points for caregiver assistants (Table A.2).

Signaling a registered disability

The last hypothesis to be tested concerns the effect of public policy. Workers with registered disabilities qualify for the public recruitment aid scheme when applying to establishments with at least 20 employees. Employing a disabled worker helps employers of these companies to comply with their obligation to ensure that 6% of their workforce are workers with disabilities, meaning they do not have to pay the associated fine for non-compliance. Moreover, they can apply for various government financial supports for hiring disabled workers. Here, we focus on jobs advertised by companies whose eligibility for the incentive scheme concerning the employment of workers with disabilities is known. We were able to obtain information on firm size for 441 of the 463 job ads tested. Jobs advertised by companies with 20 or more employees to which people holding the RSWD apply are eligible under the quota scheme. Ineligible job ads are those posted by companies with fewer than 20 employees and/or to which

people without RSWD apply. In our experiment, registration of the disability was mentioned randomly one out of two times in the application of the disabled candidate to job ads.

Table 4 describes the pattern of callback according to firm size and registered disability. In total, we tested 177 job ads that were eligible for the quota and 264 job ads that were not eligible, of which 89 were because the companies tested had fewer than 20 employees. On average, the success rate of the applicants eligible for the quota is 29.7% ((50+15)/219=0.297). The success rate of non-eligible applicants is higher (34.7%, (65+12)/222). The positive callback ratio is significant only among RSWD applicants. At the same time, the probability for the disabled applicant of receiving a callback is higher in eligible companies than in non-eligible companies (34.7% against 22.5%), regardless of the RSWD mention. The gap between both type of companies is thus of 13.2 percentage points for the RSWD candidate and 11.6 percentage points for the non-RSWD candidate.

Companies with more than 20 employees may have an incentive to hire disabled workers in order to avoid paying their financial penalty if they have not met their quota. Large companies also potentially benefit from more resources for possible workplace and workstation adaptations. Regardless of the size of the company, disabled applicants without RSWD are more likely to receive a callback than those with RSWD. The gap in callback rate between both types of disabled candidates is of 4.9 percentage points in companies with more than 20 employees and 6.5 percentage points in companies with less than 20 employees. The opposite result could have been expected, however, since having RSWD allows the 6% quota to be met in eligible companies. One explanation could be that the RSWD signal is an indicator of the seriousness of the disability, potentially implying more adaptation costs for the employer. When hiring disabled workers, employers may prefer to hire workers with a low degree of disability.

In Table 5, we assess whether the RSWD criterion affects the probability of receiving a callback using linear probability models. All covariates are interacted with the RSWD mention: the coefficient associated with disability indicates whether disabled candidates without RSWD have a different probability of callback compared to the reference candidate, while the term crossing disability and RSWD indicates whether disabled candidates with RSWD are treated differently than disabled candidates without RSWD. For administrative managers in the public sector, indicating RSWD has no effect. Conversely, in the private sector, there is a negative correlation between disability and callback for candidates with RSWD, with a marginal effect of -9.7 points (-0.101+0.004=-0.097,

p=0.011). For caregiver assistants, the evidence is more mixed. On the one hand, the disabled candidate with RSWD is less likely to receive a positive answer in the public sector with a marginal effect of -23.0 points (-0.188-0.042=-0.230, p=0.010). On the other hand, the correlation between disability and callback for the candidate without RSWD is negative in the private sector (at the 10 percent level, p=0.060).

Next, we consider the influence of being eligible for the quota, defined as having a registered disability and responding to a job ad published by a company with 20 or more employees. Our analysis remains limited due to two reasons. First, we do not know whether the eligible companies have already reached their 6% quota, nor if the number of employees was 20 or more for the last three years. Second, the pattern of firm size is such that almost all job ads in the public sector concern companies with at least 20 employees: only 2 of the 60 ads for administrative managers and 2 of the 62 ads for caregiver assistants were for non-eligible companies. In the private sector, the proportion of non-eligible companies is 36.6% (68/186) for administrative managers but only 12.8% for caregiver assistants (17/133).

Given the limited sample size, we only focus on administrative managers in the private sector. We contrast the situation of four groups of disabled candidates: those with RSWD applying to eligible firms, those with RSWD applying to ineligible firms, those without RSWD applying to eligible firms, and those without RSWD applying to ineligible firms. The marginal effects, along with the confidence intervals, are described in Figure 3. Compared to the reference candidate, only candidates with RSWD applying to eligible firms have a lower probability of callback (-9.4 points, p=0.035). For the other groups, there is no difference between the reference and the disabled candidates and the hypothesis that RSWD has a different effect on eligible and non-eligible companies can be rejected. These results seem to invalidate hypothesis 5, according to which being eligible for public aid improves access to employment for persons with disabilities.

Overall, our results do not allow us to conclude that mention of a registered disability in an application improves access to employment. This surprising outcome is consistent with the results found by Bellemare et al. (2019) in Canada and by Baert (2016) in Belgium. One possible interpretation is that a registered disability may be interpreted by the recruiter as a signal of the seriousness of the disability, implying additional costs that might not be recouped through financial aid or by the reduction of the penalty to be paid if the quota has not been met. In this sense, some

studies have shown that the severity of the disability could reduce the probability of being employed (Berthoud, 2003; Jones, 2011).

5. Concluding comments

In this study, we assess hiring discrimination on the grounds of disability by comparing it to three other grounds for discrimination: ethnicity, location and gender. We chose to focus on hearing impairment as its impact on productivity can be compensated for. It is a very widespread type of disability in France, the country where the research was conducted. We applied the correspondence test method to two occupations in both the private and public sectors: administrative managers and caregiver assistants. Between October 2019 and February 2020, we sent 2315 applications in response to 463 job ads in the Paris region. The outcome under consideration is whether or not a callback was received to these mailings. We reach two main conclusions.

Firstly, we generally do not find differences in treatment by gender or location, whereas we find substantial differences by ethnicity and by hearing disability for both occupations, a finding which is consistent with the existing literature. At the same level of productivity, discrimination on the grounds of disability in terms of callbacks to job applications is high and globally of the same order of magnitude as discrimination based on ethnicity for the administrative manager occupation. In the profession of caregiver assistant, ethnicity is also a criterion for discrimination as the North African candidate has half the chance of success of the disabled candidate.

Second, we cannot conclude that discrimination is systematically lower in the public sector than in the private sector. Neither can we conclude that being eligible for public subsidy increases the success rate of the disabled applicant. It is likely that signaling a registered disability may be perceived by the recruiter as a sign of the severity of the disability. This assumed severity could be associated with a need for workplace accommodation and associated costs which may not be offset by potential financial aid or by the reduction in the financial penalty payable by companies that have not met the 6% quota.

Overall, our results are in line with the literature on hiring discrimination on the grounds of disability, and more specifically with Baert's (2016) study showing discrimination against deaf candidates in Belgium for IT positions. They are also consistent with his study and those of Bellemare et al. (2019), that suggest that mentioning a

government financial aid in an application does not increase the probability of callback for disabled workers. We therefore contribute to the small but growing literature on disability discrimination in hiring and to the literature on the comparison between discrimination criteria.

A few caveats have to be kept in mind when interpreting our results. In particular, the design of our experiment does not allow us to know whether we are assessing statistical discrimination or taste-based discrimination. Our intuition is that discrimination on the grounds of disability would be statistical discrimination for two main reasons. First, hiring the candidate with a disability could potentially involve some costs. Second, the disabled population is on average less productive. Also, our results are limited in scope, which is the case of all studies using the correspondence test methodology. In particular, they would benefit from being supplemented by other studies covering regions other than the Paris region, other periods, other discrimination criteria and/or other occupations. We have also focused here on one particular type of disability, hearing impairment. It would be interesting to assess discrimination in the context of other forms of disability. Finally, we did not investigate the intersectionality between the discrimination grounds studied, knowing that the literature on this point is rather lacking. We leave all these issues for future research.

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| Sector | Administrative | manager | Caregiver assistant | | |
|----------------|-------------------|---------|---------------------|------|--|
| | Number of job ads | % | Number of job ads | % | |
| Private sector | 201 | 77.0 | 138 | 68.3 | |
| Public sector | 60 | 23.0 | 64 | 31.7 | |

Table 1. Composition of the test sample of job ads

Source: Correspondence test DESPERADO 3 (TEPP-CNRS), authors' calculations.

| | l able 2 | | rates by car | | | | | |
|--------------------------------------|----------|----------|--|--|--|---|------------------------------------|---|
| Sample | | (1) Jobs | (2) Neither candidate gets positive callback | (3) Both candidates get positive callback | (4) Only reference candidate gets positive callback | (5) Only tested candidate gets positive callback | (6) Net discriminati on rate | (7) Positive callback ratio (reference vs tested) |
| Reference: Administrative manager | (male) | | | | | | | |
| Reference vs disability | All | 261 | 193 | 34 | 22 | 12 | 0.147* | 1.217* |
| | Private | 201 | 154 | 20 | 19 | 8 | 0.234** | 1.393** |
| | Public | 60 | 39 | 14 | 3 | 4 | -0.048 | 0.944 |
| Reference vs North African | All | 261 | 189 | 28 | 28 | 16 | 0.167* | 1.273* |
| | Private | 201 | 152 | 16 | 23 | 10 | 0.265** | 1.500** |
| | Public | 60 | 37 | 12 | 5 | 6 | -0.043 | 0.944 |
| Reference vs priority neighborhood | All | 261 | 183 | 43 | 13 | 22 | -0.115 | 0.862 |
| | Private | 201 | 144 | 30 | 9 | 18 | -0.158* | 0.813* |
| | Public | 60 | 39 | 13 | 4 | 4 | 0.000 | 1.000 |
| Reference vs female | All | 261 | 182 | 42 | 14 | 23 | -0.114 | 0.862 |
| | Private | 201 | 144 | 27 | 12 | 18 | -0.105 | 0.867 |
| | Public | 60 | 38 | 15 | 2 | 5 | -0.136 | 0.850 |
| Reference: Caregiver assistant (fem. | ale) | | | | | | | |
| Reference vs disability | All | 202 | 68 | 86 | 32 | 16 | 0.119** | 1.157** |
| | Private | 138 | 46 | 60 | 20 | 12 | 0.087 | 1.111 |
| | Public | 64 | 22 | 26 | 12 | 4 | 0.190** | 1.267** |
| Reference vs North African | All | 202 | 66 | 71 | 47 | 18 | 0.213*** | 1.326*** |
| | Private | 138 | 42 | 48 | 32 | 16 | 0.167** | 1.250** |
| | Public | 64 | 24 | 23 | 15 | 2 | 0.325*** | 1.520*** |
| Reference vs priority neighborhood | All | 202 | 66 | 97 | 21 | 18 | 0.022 | 1.026 |
| | Private | 138 | 44 | 72 | 8 | 14 | -0.064 | 0.930 |
| | Public | 64 | 22 | 25 | 13 | 4 | 0.214** | 1.310** |
| Reference vs male | All | 202 | 56 | 88 | 30 | 28 | 0.014 | 1.017 |
| | Private | 138 | 34 | 61 | 19 | 24 | -0.048 | 0.941 |
| | Public | 64 | 22 | 27 | 11 | 4 | 0.167* | 1.226* |

Table 2 Callback rates by candidate and type of job

Source: Correspondence test DESPERADO 3 (TEPP-CNRS), authors' calculations. Note: the net discrimination rate (6) is equal to ((4)-(5))/((3)+(4)+(5)). The positive callback ratio is equal to ((3)+(4))/((3)+(5)). Significance levels are 1% (***), 5% (**) and 10% (*).

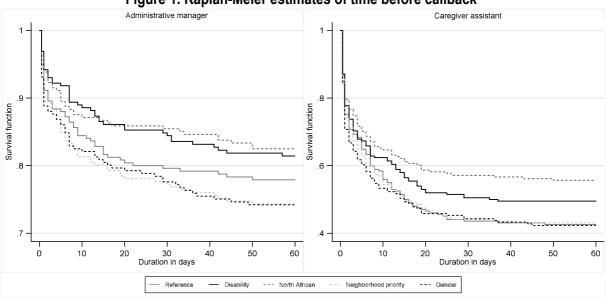


Figure 1. Kaplan-Meier estimates of time before callback

Source: Testing DESPERADO 3 (TEPP-CNRS), authors' calculations.

Note: the non-modal gender is female for administrative managers, male for caregiver assistants.

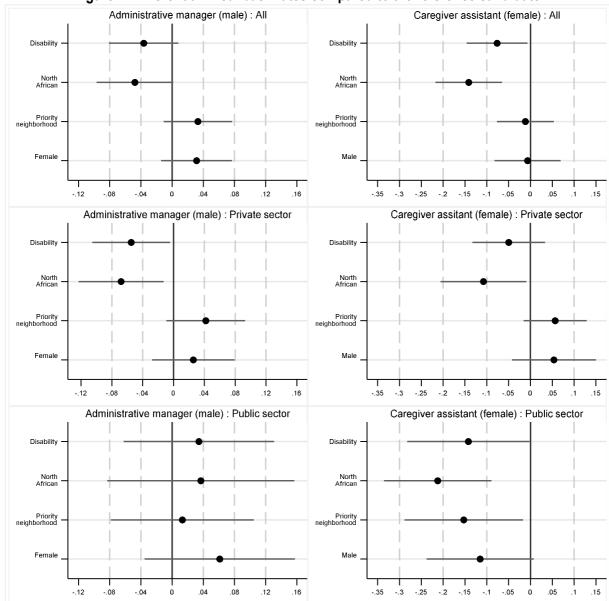


Figure 2. Differential in callback rates compared to the reference candidate

Source: Correspondence test DESPERADO 3 (TEPP-CNRS), authors' calculations

| Variables | (1) Administrative | e manager (male) | (2) Caregiver as | Caregiver assistant (female) | | |
|--|--------------------|------------------|------------------|------------------------------|--|--|
| | coef. | st. error | coef. | st. error | | |
| Pooled estimates | | | | | | |
| Disability | -0.036 | (0.023) | -0.076** | (0.035) | | |
| North African | -0.048* | (0.025) | -0.141*** | (0.039) | | |
| Priority neighborhood | 0.033 | (0.022) | -0.012 | (0.033) | | |
| Female | 0.031 | (0.023) | | () | | |
| Male | | () | -0.007 | (0.038) | | |
| Control variables | YES | | YES | \/ | | |
| Number of observations | 1,305 | | 1,010 | | | |
| R ² | 0.075 | | 0.056 | | | |
| Estimates with public sector interaction | | | | | | |
| Disability | -0.055** | (0.026) | -0.050 | (0.042) | | |
| North African | -0.068** | (0.028) | -0.108** | (0.050) | | |
| Priority neighborhood | 0.042 | (0.026) | 0.057 | (0.037) | | |
| Female | 0.026 | (0.027) | | () | | |
| Male | | () | 0.054 | (0.049) | | |
| Disability x public sector | 0.089* | (0.054) | -0.092 | (0.081) | | |
| North African x public sector | 0.105 | (0.065) | -0.105 | (0.078) | | |
| Priority neighborhood x public sector | -0.029 | (0.052) | -0.210*** | (0.076) | | |
| Female x public sector | 0.035 | (0.054) | | \/ | | |
| Male x public sector | | · · / | -0.169** | (0.078) | | |
| Control variables | YES | | YES | () | | |
| Number of observations | 1,305 | | 1,010 | | | |
| R ² | 0.141 | | 0.110 | | | |

Table 3. Linear probability estimates of callbacks

Source: Correspondence test DESPERADO 3 (TEPP-CNRS), authors' calculations.

Note: estimates from OLS regressions with standard errors clustered at the job ad level. Significance levels are 1% (***), 5% (**) and 10% (*). Control variables include the immediate availability of the candidate; the location of the job (*département*); the gender of recruiter; the order of sending; the method by which applications are sent (by email or by post); the application layout; the presence of spelling errors in the application email and the month the application was sent.

Table 4. Callbacks of the candidate with a disability based on the eligibility of the structure and the registered disability status

| Sample | Jobs | Neither | Both | Only | Only | Net | Positive |
|--------------------------------------|------|-----------|------------|-----------|-----------|-------------|------------|
| | | candidate | candidates | reference | tested | discriminat | callback |
| | | gets | get | candidate | candidate | ion rate | ratio |
| | | positive | positive | gets | gets | | (reference |
| | | callback | callback | positive | positive | | vs tested) |
| | | | | callback | callback | | |
| Firms with less than 20 employees | | | | | | | |
| Reference vs disability with RSWD | 42 | 27 | 4 | 7 | 4 | 0.200 | 1.375 |
| Reference vs disability without RSWD | 47 | 33 | 10 | 2 | 2 | 0.000 | 1.000 |
| Firms with 20 employees and more | | | | | | | |
| Reference vs disability with RSWD | 177 | 97 | 46 | 23 | 11 | 0.150 | 1.211** |
| Reference vs disability without RSWD | 175 | 92 | 55 | 18 | 10 | 0.096 | 1.123 |
| All firms | | | | | | | |
| Reference vs disability with RSWD | 219 | 124 | 50 | 30 | 15 | 0.158 | 1.231** |
| Reference vs disability without RSWD | 222 | 125 | 65 | 20 | 12 | 0.082 | 1.104 |

Source: Correspondence test DESPERADO 3 (TEPP-CNRS), authors' calculations.

Note: Significance levels are 1% (***), 5% (**) and 10% (*).

| Variables | Administrative manager (male) | | | | Caregiver assistant (female) | | | |
|---------------------------|-------------------------------|-------------|----------|--------------|------------------------------|-------------|-----------|-----------|
| | (1A) Public | (1A) Public | | (1B) Private | | (2A) Public | | Э |
| | coef. | st. error | coef. | st. error | coef. | st. error | coef. | st. error |
| RSWD mention | -0.271 | (0.376) | 0.386** | (0.175) | 0.594 | (0.542) | 0.316 | (0.330) |
| Disability | -0.027 | (0.058) | 0.004 | (0.034) | -0.042 | (0.121) | -0.097* | (0.051) |
| Disability x RSWD mention | 0.125 | (0.095) | -0.101** | (0.050) | -0.188 | (0.146) | 0.095 | (0.086) |
| North African | -0.053 | (0.081) | -0.005 | (0.038) | -0.168* | (0.090) | -0.193*** | (0.066) |
| Priority neighborhood | -0.048 | (0.065) | 0.088** | (0.039) | -0.129 | (0.107) | 0.056 | (0.047) |
| Female | 0.022 | (0.054) | 0.058 | (0.041) | | () | | () |
| Male | | () | | () | -0.194*** | (0.072) | 0.031 | (0.069) |
| Control variables | YES | | | | YES | () | | () |
| Number of observations | 300 | | 1,005 | | 320 | | 690 | |
| R² | 0.412 | | 0.101 | | 0.312 | | 0.153 | |

Table 5. Linear probability estimates of callbacks based on registered disability

Source: Correspondence test DESPERADO 3 (TEPP-CNRS), authors' calculations.

Note: estimates from OLS regressions with standard errors clustered at the job offer level. Significance levels are 1% (***), 5% (**) and 10% (*). Control variables include the immediate availability of the candidate; the location of the job (*département*); the gender of recruiter; the order of sending; the method by which applications are sent (by email or by post); the application layout; the presence of spelling errors in the application email and the month when the application was sent.

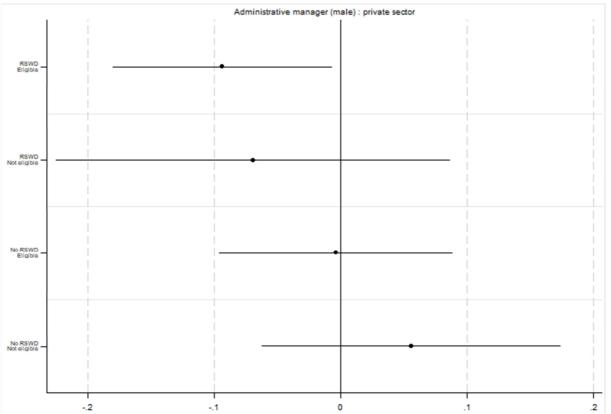


Figure 3. Differential in callback rates based on the eligibility of the company and the registered disability status

Source: Correspondence test DESPERADO 3 (TEPP-CNRS), authors' calculations