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Access to employment for persons with disabilities

Naomie Mahmoudi

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NAOMIE MAHMOUDI

Access to employment for persons with disabilities

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Thesis advisor: YANNICK L'HORTY

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Naomie Mahmoudi

À Apremont, le 23 avril 2022

À mes parents,

À mes frères,

Et surtout à toi, Lenny.



Summary

By promoting social interaction and economic independence (or quasi-independence), employment is a lever in the fight against the exclusion and poverty to which persons with disabilities are overexposed. However, they remain very far from employment, despite significant public action to stimulate the supply and demand of disabled workers.

The objective of this thesis, composed of three empirical studies, is to analyze some obstacles in the access to employment of persons with disabilities, both on the labor supply and labor demand sides, and to discuss the effectiveness of some financial incentives implemented to overcome them. While the international literature on the subject is growing but still limited, quantitative studies in France remain very few. Similarly, there is little data on disability. We therefore focused on the case of France, using experimental data in addition to national survey data.

The first chapter highlights the existence of discrimination in access to employment because of a visible disability (motor disability). It is particularly pronounced in the private sector, in establishments not subject to the employment quota of disabled workers and against women. The second chapter shows that this discrimination also exists towards persons with invisible disabilities (hearing disabilities), while comparing it to three other potential discrimination criteria (origin, gender and place of residence). These first two chapters provide evidence that the employment quota is insufficient to stimulate labor demand and eliminate such discrimination.

The last chapter focuses on a labor supply side barrier to employment: the potential

inactivity trap created by the receipt of disability benefits (the *Allocation aux Adultes Handicapés*, AAH). We also discuss the effectiveness of a measure to stimulate labor supply: the possibility to cumulate this benefit with a job, so that it should always be financially advantageous to work. We show that despite its design, the AAH reduces the probability of employment for its beneficiaries, with a greater disincentive to employment for women and people declaring a low activity limitation. Moreover, the AAH would also increase part-time employment of women.

Keywords: disability, employment, discrimination, public policy, employment quota, disability benefits

Résumé

En favorisant les interactions sociales et l'indépendance (ou quasi indépendance) économique, l'emploi constitue un levier de lutte contre l'exclusion et la pauvreté auxquelles sont sur-exposées les personnes en situation de handicap. Pourtant, elles demeurent fortement éloignées de l'emploi, et ce malgré l'action publique importante pour stimuler l'offre et la demande de travailleurs handicapés.

L'objectif de cette thèse, composée de trois études empiriques, est d'analyser certains obstacles dans l'accès à l'emploi des personnes en situation de handicap, tant du côté de l'offre que de la demande de travail, et de discuter l'efficacité de certaines incitations financières mises en œuvre pour les surmonter. Si la littérature internationale sur le sujet est croissante mais encore restreinte, les études quantitatives françaises restent très peu nombreuses. De même, il existe peu de données sur le handicap. Nous nous sommes donc intéressés au cas de la France, en utilisant des données expérimentales, en plus de données d'enquêtes nationales.

Le premier chapitre met en évidence l'existence d'une discrimination dans l'accès à l'emploi en raison d'un handicap visible (handicap moteur). Elle est d'autant plus forte dans le secteur privé, dans les établissements non assujettis au quota d'emploi de travailleurs handicapés et à l'égard des femmes. Le second chapitre montre que cette discrimination existe également à l'égard des personnes en situation de handicap invisible (handicap auditif), tout en la comparant à trois autres critères de discrimination potentielle (l'origine, le genre et le lieu de résidence). Ces deux premiers chapitres apportent

des preuves de l'insuffisance du quota d'emploi pour stimuler la demande de travail et empêcher ces discriminations.

Le dernier chapitre s'intéresse à une barrière à l'emploi du côté de l'offre de travail : la trappe à inactivité que pourrait engendrer le bénéfice de prestations d'invalidité (l'Allocation aux Adultes Handicapés, AAH). Nous discutons également l'efficacité d'une mesure visant à stimuler l'offre de travail : la possibilité de cumuler cette prestation avec un emploi, de sorte qu'il devrait être toujours financièrement avantageux de travailler. Nous montrons que malgré son design, l'AAH réduit la probabilité d'emploi de ses bénéficiaires, avec un effet désincitatif à l'emploi plus important pour les femmes et les personnes déclarant une faible limitation d'activité. Par ailleurs, l'AAH augmenterait également l'emploi à temps partiel des femmes.

Mots-clés : handicap, emploi, discrimination, politiques publiques, quota d'emploi, prestations d'invalidité

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Glossary

AAH *Allocation aux Adultes Handicapés*. 17, 22, 23, 107–110, 114–125, 128, 129, 131–134, 136–140, 144–147

AGEFIPH *Association de Gestion du Fonds pour l'Insertion Professionnelle des Personnes Handicapées* . 14, 16, 26

CDAPH *Commission des Droits et de l'Autonomie des Personnes Handicapées*. 9, 28, 29, 114, 115

CRPD *Convention on the Rights of Persons with Disabilities*. 6, 15, 16

ESAT *Établissements et Services d'Aide par le Travail*. 9, 17

FIPHEP *Fonds pour l'Insertion des Personnes Handicapées dans la Fonction Publique*. 14, 16, 27

ICF *International Classification of Functioning, Disability and Health*. 4–6

ILO *International Labour Organization*. 27, 120

MDPH *Maison Départementale des Personnes Handicapées*. 17, 28, 29, 114, 115

OECD *Organisation for Economic Co-operation and Development*. 2

RDD *Regression Discontinuity Design*. 122, 124, 132

Glossary

RSWD *Registered Status of Worker with Disability.* 14, 17, 21, 22, 29, 35, 38, 39, 65, 71, 72, 81, 82, 84, 86, 144

WHO *World Health Organization.* 4, 5, 65

General introduction

Context

The ideal of an accessible society, ensuring that persons with disabilities can participate fully in society, is at the heart of disability policies. However, despite the importance of these policies, they face disadvantages in multiple spheres, as education, housing, employment, health care and leisure (WHO & World Bank, 2011; Baradji et al., 2021).

Worldwide, more than one billion people are estimated to have at least one form of disability, which represents about 1 out of 7 individual¹. In France, depending on the definition of disability used, between 2 and 11.5 million persons have a disability². These numbers are constantly increasing, notably due to the aging of the population and the growing importance of chronic diseases. Regarding their socio-demographic characteristics, persons with disabilities are over-represented among the elderly population, women and in developing countries (WHO & World Bank, 2011).

In economic and social terms, they are overexposed to the risk of social exclusion and poverty (United Nations, 2019). This can be explained by the positive link between poverty and disability, highlighted quite recently in the economic literature (Braithwaite

¹World Health Organization. "Disability and health", November 24, 2021 [<https://www.who.int/news-room/fact-sheets/detail/disability-and-health>].

World Bank. "Disability inclusion", April 14, 2022 [<https://www.worldbank.org/en/topic/disability#1>].

²Inspection générale des affaires sociales. "Les liens entre handicap et pauvreté: les difficultés dans l'accès aux droits et aux ressources", novembre 2014.

& Mont, 2009; Barnes & Sheldon, 2010; Grech, 2011; Palmer, 2011; Groce et al., 2011; Mitra et al., 2011; Trani & Loeb, 2012; Brucker et al., 2015), with an exposure to poverty higher for women (Emmett, 2006; Cho et al., 2013; Moodley & Graham, 2015). There is even a "vicious circle of poverty and disability" (Yeo & Moore, 2003). Disability increases the risk of poverty, on the one hand by reducing the chances of accessing education and employment and on the other hand by increasing (disability-related) expenses (Mitra et al., 2009, 2017). At the same time, poverty increases the risk of disability, for example, through malnutrition and the lack of access to health care and education. The Covid-19 pandemic has exacerbated their risk of poverty because they were particularly affected by the consequences of this virus. The need to take this population into account in the implementation of public policies is therefore becoming even more urgent.

In this respect, the *Organisation for Economic Co-operation and Development* (OECD) has stated that disability policy must reconcile two potentially contradictory objectives. Firstly, they should include persons with disabilities in society, by promoting and enabling their participation in economic and social life, including access to sustainable paid employment. At the same time, they should provide them with income security since their disability may deprive them of the ability to earn income from a job (OECD, 2003). Employment policies targeting persons with disabilities and social protection are therefore essential. Furthermore, the 2030 Agenda for Sustainable Development, adopted by all United Nations member States in 2015, recalls in particular the need to improve the political, economic and social inclusion of persons with disabilities to reduce inequality and so end poverty (in particular in insuring decent work for persons with disabilities). Moreover, one of the objectives of the European Commission's Strategy for the rights of persons with disabilities 2021-2030, which follows the previous strategy (2010-2020), is to ensure equal opportunities for persons with disabilities, particularly in employment, and to protect them against all forms of discrimination³.

³It thus contributes to the effectiveness of the European Pillar of Social Rights, which allows the

In addition to providing an income, employment also allows not to feel marginalized and to create and maintain social ties. In the past decades, we have assisted to an improvement in employment opportunities for workers with disabilities, in particular thanks to the development of technical and technological advances that would increase the diversity of jobs offered, work patterns (e.g. the development of e-business and of telework following Covid-19 crisis⁴) and physical skills required. Yet, their employment rate remains low, and their inactivity rate and unemployment rate high. In 2020 in France, only 36% of people registered as having a disability and aged 15 to 64 were employed and 14% unemployed, compared to 65% and 8% respectively for the entire population in this age group⁵.

Disability, a complex concept

Understanding disability is not an easy task. Its apprehension has continuously evolved over time, without arriving at a common and unique definition at the international level. This makes it difficult to understand the concept as a whole, to implement global measures and to make international comparisons.

An evolving and non-harmonized definition

Even though there is no single definition of disability, either between countries⁶ or sometimes even within countries⁷, several models have been developed in order to improve the

European Union to set a framework and objectives in social matters. In particular, the point 17 on the inclusion of persons with disabilities states that "people with disabilities have the right to income support that ensures living in dignity, services that enable them to participate in the labor market and in society, and a work environment adapted to their needs".

⁴However, persons with disabilities are still under-represented in the digital professions, hence the need to train and support them in these jobs (AGEFIPH. "Numérique : emploi et handicap - Les métiers du numérique, des opportunités pour les personnes en situation de handicap", Janvier 2022).

⁵INSEE. "Emploi, chômage, revenus du travail", Insee référence, édition 2021.

⁶However, efforts have been made since 2001 to develop internationally comparable measures of disability based on survey or census data (e.g. with the Washington Group questionnaires (Altman, 2016)).

⁷In some countries, different definitions of disability are used depending on the programs and policies.

understanding of disability and provide a framework for analysis.

Previously, there have been two main influential and contrasted models of disability⁸, differing in the origin of the disability: the medical model and the social model. The medical model considers the individual's health condition (illness, disease, health problem) as the direct cause of the disability, which could have a negative impact on his or her daily life. A medical intervention could then be required to identify the disability and treat, stabilize or improve the health condition. Conversely, the social model sees disability as the result of the social environment. It has gone through several versions but can be summarized as a model according to which disability is the consequence of society's limitations in meeting the needs of persons with disabilities. It would therefore result from barriers created by society, intentionally or unintentionally (e.g. physical barriers and negative attitudes towards them). It then requires changes in the social environment.

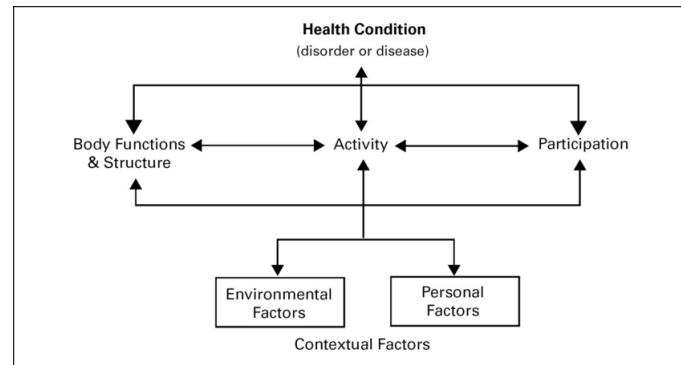
Both models therefore focus on either the individual's health condition or on the environment as the cause of the disability, but do not take into account the interaction between both elements.

The *World Health Organization* (WHO) has taken into account this interaction by creating an international classification of the disability notion: the *International Classification of Functioning, Disability and Health* (ICF). Endorsed in 2001 by the World Health Assembly and approved by the 191 member States of the WHO, this biopsychosocial model provides a standardized language and framework for describing the health status of individuals and thus allows comparisons of data internationally (across countries, times, disciplines and health services). According to this classification, disability is the result of the dynamic interaction between the person's health condition (absence or significant difference in organic functions or anatomical structure), the activities and participation in all aspects of life and the contextual factors (personal and environmental).

⁸Other models were developed, as the Nagi's model (1965) or the Human Development Model of Disability, Health and Wellbeing based on the capability approach (Mitra, 2006, 2018).

Figure 0.1 shows these interactions.

Figure 0.1. The biopsychosocial model of disability



Source: World Health Organization. (2002). "Towards a Common Language for Functioning, Disability and Health : ICF".

The ICF follows the International Classification of Impairments, Disabilities, and Handicaps developed by the WHO in 1980. This first classification focused more on the consequences of disease, whereas the ICF focus more on the components of the health (and thus seems more neutral) and has specified the role of environmental factors in the situation of disability: disability is no longer seen as the result of the person's condition, but as the interaction between the person's condition and the environment. This model, which is global in scope, is now widely used in data collection, national legislation and public policy.

France, the country under consideration in this thesis, adopted a definition of disability in accordance with the ICF by highlighting these social and environmental dimensions. According to the law of February 11, 2005 *Pour L'Égalité des Droits et des Chances, la Participation et la Citoyenneté des Personnes Handicapées*⁹, the reference text on the rights of persons with disabilities in this country, "constitutes a disability, as defined in this law, any limitation of activity or restriction of participation in society suffered in his/her environment by a person because of a substantial, lasting or permanent impairment of

⁹For Equal Rights, Opportunities, Participation and Citizenship of Disabled Persons, February 11, 2005.

one or more physical, sensory, mental, cognitive or psychic functions, a multiple disability or a disabling health condition".

The *Convention on the Rights of Persons with Disabilities* (CRPD) of the United Nations, which is the first binding international human rights instrument dealing specifically with disability, defines disability in the line of the ICF as the result of "the interaction between persons with impairments and attitudinal and environmental barriers that hinder their full and effective participation in society on an equal basis with others". The CRPD thus places the environment as a producer of the situation of disability, in the same way as the impairment. It therefore calls on States to take into account both personal and environmental factors in their inclusive public policies on disability. This international human rights treaty was adopted on 13 December 2006 and came into force on 3 May 2008. The European Union and France ratified it in 2010.

In this thesis, we will prefer the use of the expression "persons with disabilities", which is increasingly used in the literature, to that of "disabled people". It has the advantage of highlighting the person's situation and the unsuitable environment that places him or her in a "situation of disability", rather than his or her personal characteristics. This avoids defining the person by his or her disability and seems more neutral.

The heterogeneity of situations

The complexity of the concept of disability lies in the plurality of situations that it covers. There are several types, natures, degrees and temporalities of disability. Moreover, it is not always visible.

First of all, there are 5 main categories of disability which can be cumulated (this is called multiple disability):

- Motor disability: it corresponds to a reduction or loss of motor skills, especially in the upper and/or lower limbs, and resulting in difficulties in moving around and in

performing manual tasks (e.g. amputations, muscular damage resulting in reduced motor skills).

- Sensory disability: it corresponds to a reduction or loss of one or more senses. This includes hearing and visual disabilities (e.g. deafness, blindness).
- Mental disability: it corresponds to impairment of mental and intellectual functions (e.g. autism, Down syndrome).
- Psychic disability: it corresponds to a personality dysfunction resulting in severe, chronic and/or long-lasting disturbances in behavior and/or social adjustment, without impairing intellectual capacities (e.g. bipolar disorder, paranoia).
- Disabling illness: it corresponds to an long-term illness that generates a situation of disability due to its effects on the body (e.g. cancer, multiple sclerosis).

This multidimensional nature of disability makes the assessment of the degree of disability complex. The level of disability (i.e. disability severity) is set by the competent institution involving a multidisciplinary team (doctors, psychologists, social assistants, etc.). It assesses how disabled an individual is from both medical and environmental aspects. It allows to determine, on a case-by-case basis, the level of assistance required in daily life, the eligibility for certain aids - monetary or not (e.g. disability benefits) - and certain statuses (e.g. disabled worker status). To simplify, the degree of a disability is usually classified as mild, moderate or severe.

Disability also has different natures: although its origins are not always known (especially concerning psychological disabilities), it can be present during pregnancy, occur at birth or after birth (e.g. following an accident, trauma, illness, or the aging of the human body).

Moreover, its temporalities differ from one individual to another, since it can be temporary or definitive, and progressing (as neurodegenerative diseases) or stagnant. The

duration of the disability and the possibility of its evolution are generally also integrated into the conditions for granting aid and status.

Disability can be also be visible or invisible. Most of reported disabilities are invisible (mainly disabling illnesses and mental disabilities). In France, 80% of declared disabilities are invisible¹⁰.

This plurality of situations gives rise to different difficulties in several areas, including the labor market, and to different human and material compensations. These difficulties can be accentuated by intersectionalities (depending on gender, for example).

Employment: a source of income and inclusion

Paid employment¹¹ is one of the key levers for fighting exclusion and poverty, by promoting economic independence and social interaction. It is thus an important socialization and financial support (Saunders & Nedelec, 2014). However, having a disability reduces the likelihood of being employed, especially for those with severe form of disabilities (Musida & Sciulli, 2016). Persons with disabilities face difficulties in obtaining and securing employment, but the extent of these difficulties depends on several factors, as the job to be filled¹², the time of occurrence of the disability (Lo & Ville, 2013; Barnay et al., 2015), or the degree and type of disability (Baldwin & Marcus, 2007). Sensory impairments (Amar & Amira, 2003), in particular hearing impairments, and low level of disability (Bouchet, 2019) would be the least penalizing on the labor market. Moreover, men would be less penalized than women in employment (Greve, 2009).

When considering the population with disabilities, however, it is important to keep in

¹⁰CAF. "80 % des handicaps sont invisibles : le saviez-vous ?", 23 Juillet 2018 [<https://www.caf.fr/allocataires/vies-de-famille/vivre-avec-un-handicap/vos-droits/80-des-handicaps-sont-invisibles-le-saviez-vous>].

¹¹For the sake of brevity, we will refer to employment in this thesis as paid employment.

¹²For example, the productivity of a wheelchair user in jobs such as accounting or programming should not be affected by his or her disability, which is not the case in jobs such as builder or driver.

mind that not everyone has the capacity to work. This justifies the intervention of the State to provide them with the necessary resources to meet their needs, notably through disability benefits. However, the primary goal remains to foster financial independence and social interaction through employment, without reducing those who cannot work to poverty. Incentive mechanisms in disability benefits can thus be implemented to encourage their transition to employment when their capacity to work is not totally impaired (mainly for those with a low level of disability). The challenge of these minimum social benefits is not to create an inactivity trap for those who could work, even partially. Moreover, although social benefits can provide a safety net, they are often insufficient. In France, the poverty rate of the disabled population, although varying according to the type of limitation, is almost twice as high as for the general population¹³.

For those who have the ability to work, we can distinguish two work environments: disabled workers can integrate the "mainstream" or the "sheltered" work environment. The *Commission des Droits et de l'Autonomie des Personnes Handicapées* (CDAPH) decides which work environment will be more adapted for each individual with a disability according to his/her work capacity. In employment, as in all other areas (education, housing, transport, etc.), the objective of public policies is to promote in priority the accessibility and inclusion in the "mainstream environment" according to the Law of February 11, 2005. The "mainstream" work environment corresponds to the "classic" labor market. It includes private employers (such as companies and associations) and public employers (including the civil service). The "sheltered" work environment refers to establishments and services providing assistance through work (*Établissements et Services d'Aide par le Travail* (ESAT)). These establishments are medico-social establishments offering productive activities to adults with disabilities with a work capacity of less than one-third of that of non-disabled workers. These workers, mostly persons with mental

¹³Drees. "Le niveau de vie des personnes handicapées : des différences marquées selon les limitations", *Études et Résultats*, n°1003, 2017.

disability, are considered users of medical and social establishments and services, not employees. Approved by the regional health agency, these establishments are generally managed by associations and financed by public funds.

Although employment is the privileged place to promote social integration and economic independence, access to and retention in employment is hampered, which has made necessary the implementation of a set of public policies.

Barriers to employment

The employment difficulties that persons with disabilities encounter are diverse and plural, although their intensity varies according to each individual. In addition to those related to the environment (as the lack of accessibility of public space, housing, transportation and of information and communication means), these barriers can also arise from both the labor demand and the labor supply. In a non-exhaustive way, we present the main ones.

On the labor supply side

First of all, the health condition can limit the work capacity of persons with disabilities (Schur, 2003). The allocation of minimum resources to them, as disability benefits, is therefore justified, but it can constitute another barrier to employment by creating an inactivity trap.

Their low average level of education¹⁴ (OECD, 2003), in addition to their lower average productive capacities than the general population, can also negatively impact their access to employment. Besides, some low-skilled jobs are more likely to generate and/or increase disability (e.g. prevalence of work-related accidents and illnesses in blue-collar jobs). Moreover, they could wish to work but decide not to look for a job if they anticipate

¹⁴Which can be explained by the onset of disability before adulthood and by the education system that is still not very inclusive.

that they will not find a job due to various barriers to access to employment (discouraged workers).

Finally, the labor supply may be hindered by the additional work in daily life related to disability. Having a disability can increase the time spent on daily living tasks and medico-social appointments, which would reduce the time available to seek employment and work (Revillard, 2019).

However, the low employment rate of persons with disabilities is not only due to barriers on the labor supply side. Labor demand can also be a source of barriers to employment.

On the labor demand side

Discrimination and the lack of adaptation of the work environment are the main obstacles to the employment of persons with disabilities on the labor demand side. Since the lack of accommodation in employment (workstation, schedules, etc.) can be considered as a discriminatory act, we will focus here only on discrimination.

In the labor market, discrimination is defined by Heckman (1998) as the different treatment by a company (in terms of access to employment, salary, promotion, etc.) between two individuals from different socio-demographic groups with perfectly identical productive characteristics. Its prohibition is set out in article L. 1132-1 of the French Labor Code.

Discrimination on the labor market on the grounds of disability is singular, compared to other discrimination criteria, because disability can alter the productive capacities of individuals. However, according to the law of February 11, 2005, it is the responsibility of companies to re-establish the equality of productive capacities by putting in place proportionate and reasonable accommodations.

The economic literature identifies two main sources of discrimination. The first one

is "taste-based" discrimination. It results from exogenous preferences of employers, employees and/or customers to not be in interaction with a person from a particular socio-demographic group, here with persons with disabilities, and induces their negative attitude towards them (Becker, 1957). Thus, employers would focus on maximizing their utility rather than their profit, by seeking to satisfy their preferences or those of workers or clients to employ only persons without disabilities. Discrimination may also result from the lack of information about the productive characteristics of job applicant with a disability. The employer will then supplement the information on the observable and objective characteristics of this candidate (such as his or her professional experience and diplomas) with beliefs about the average and dispersion of the unobservable productive characteristics of persons with disabilities (Phelps, 1972; Arrow, 1972). In both cases, it constitutes a criminal offense.

The correspondence test method (that we will present in this thesis) is the most used method for assessing discrimination. It has been used to determine the magnitude of the stigma effect in the labor market of different forms of disability, such as motor disability (Ravaud et al., 1992; Mbaye, 2018; Stone & Wright, 2013; Ameri et al., 2018; Belle-mare et al., 2019, 2020; Bjørnshagen & Ugreninov, 2021); unspecified physical disability (Capéau et al., 2012); depression (Baert et al., 2016); obesity (Rooth, 2009; Agerström & Rooth, 2011; Busetta et al., 2020; Campos-Vazquez & Gonzalez, 2020); HIV (Drydakis, 2010); Asperger's syndrome (Ameri et al., 2018); mental disability (Hipes et al., 2016; Bjørnshagen, 2021); and deafness, hearing impairment, blindness and autism (Baert, 2016). The meta-analysis by Lippens et al. (2021) highlighted an overall result: candidates to employment with disabilities have 44% lower chance of receiving a positive callback from the employer.

Discrimination is not only an ethical problem. According to Carcillo & Valfort (2018), it is also costly in economic (by leading to non-employment and underpayment of individ-

uals, thus reducing production), human (by having negative consequences for individuals, such as depression, which can hamper their productivity) and a social terms (by creating widespread distrust and hindering social cohesion).

The non-employment of persons with disabilities could therefore increase their isolation, but also their economic vulnerability and so their dependence on assistance programs. A vicious circle can then be created, since their reduced chances of accessing the labor market would make them more vulnerable to unemployment and long-term inactivity, thus putting more pressure on public spending. This makes it necessary to implement employment policies for persons with disabilities.

Public policies for the employment of persons with disabilities

In order to promote employment, job retention and equal treatment in employment for persons with disabilities, many measures have been taken over the last few decades. These public employment policies for persons with disabilities are at the interface between employment policies and disability policies. We will present the main ones: coercive measures (aimed at the labor demand), and financial and non-financial incentives (aimed at both labor supply and labor demand).

The binding legal framework

Many countries have instituted an anti-discrimination policy and/or an employment quota of disabled workers policy to encourage employers to hire and retain disabled workers. In France, the employment quota policy, better known as the obligation to employ disabled workers¹⁵ (hereafter quota) and anti-discrimination policies coexist and complement each other.

¹⁵*L'Obligation d'Emploi de Travailleurs Handicapés (OETH).*

The employment quota policy

The employment quota of disabled workers requires employers to have a minimum proportion of disabled workers in their workforce. Under the law *En Faveur de L'Emploi des Travailleurs Handicapés*, July 10, 1987¹⁶, all establishments, public and private, with 20 or more employees for more than 3 years must hire at least 6% of disabled workers¹⁷. To qualify under this employment quota, disabled workers must have a registered disability¹⁸ (for instance, hold a disability pension or be registered under the *Registered Status of Worker with Disability* (RSWD)). This quota for disabled workers, hired on a full-time or part-time basis under a fixed-term or open-ended contract, may be met directly but also indirectly¹⁹. 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 (*Association de Gestion du Fonds pour l'Insertion Professionnelle des Personnes Handicapées* (AGEFIPH) in the private sector, *Fonds pour l'Insertion des Personnes Handicapées dans la Fonction Publique* (FIPHFP) in the public sector). Its amount is based on the number of employees that the establishment should have hired, multiplied by a coefficient depending on the size of the company²⁰.

¹⁶Support for the Employment of Disabled Workers, July 10, 1987.

¹⁷In reality, the quota, has been reformed twice since this law. Initially in 1987, the quota was only mandatory for private establishments (with at least 20 employees) which were subject to penalties for non-compliance. Since the law of February 11, 2005, public establishments with 20 or more employees are also subject to these same obligation and coercive measure. This law also broadened the definition of disability and increased the contribution to be paid to compensate for non-compliance with the quota. It also changed the method of calculating the quota, since each beneficiary of the employment quota now counts as one unit (whether he or she has an open-ended or fixed-term contract and regardless of the type and severity of the disability). The latest reform of the quota appeared with law of September 5, 2018, which came into force on January 1, 2020. One of the major changes is that the 6% employment quota must now be respected at the company level and no longer at the establishment level. This law made other changes, including that the company's workforce is now counted on average over the year rather than on December 31 of the year, and that all establishments (including those with less than 20 employees), must declare the number of disabled workers employed. This law also established a review of the quota every 5 years.

¹⁸The detailed list of quota's beneficiaries is set out in article L. 5212-13 of the French Labor Code.

¹⁹Employers can meet the quota indirectly, sometimes only to a certain extent, by taking on persons with disabilities on internships or work placement; by concluding supply, subcontracting or service contracts with the sheltered/adapted sector or with disabled self-employed workers; or by implementing an agreement for disabled workers.

²⁰For each missing disabled worker, the amount of this contribution will be 400 times the hourly

Despite this legislation, the employment quota of 6% of the workforce is not met overall. In 2016, the employment rate of disabled workers reached 3.8% in the private sector and 5.6% in the public sector²¹. Many companies prefer to pay the penalty rather than hire disabled workers.

Since the law of February 11, 2005, all companies, including those not subject to the quota policy, must make reasonable accommodations to the workstation of persons with a registered disability, i.e. according to the CRPD to implement "necessary and appropriate" measures to alleviate their difficulties at work, without causing "disproportionate burdens" for the company. 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.

In addition to France, most European countries have established some form of quota system for the employment of persons with disabilities. However, the definition of "a disabled worker", the size of the companies concerned, the number of disabled workers to be hired and the binding nature of the quota differ from country to country.

The anti-discrimination policy

The anti-discrimination policy prohibits any direct or indirect discrimination in the

minimum wage for establishments with 20 to 199 employees, 500 times the hourly minimum wage for establishments with 200 to 749 employees and 600 times the hourly minimum wage for establishments with 750 or more employees. It may be reduced when actions in favor of the employment of disabled workers have been carried out. If the quota is not reached and the establishment has not, or not fully, paid the contribution due, it must pay the Public Treasury a financial penalty corresponding to the amount of the contribution due or remaining due, weighted by 1,500 times the hourly wage and increased by 25%. For example, on January 1, 2019, the hourly minimum wage was 10.03 euros. An establishment with 100 employees had to hire at least 6 disabled workers to meet its employment obligation. If it has not hired any and has not implemented any action in favor of the employment of disabled workers over the last four years, it could satisfy its obligation by paying an annual financial contribution of 24,072 euros ($400 \times 10.03 \times 6$), i.e. 4,012 euros per missing disabled worker (400×10.03). An establishment with 200 employees has to hire at least 12 disabled workers to avoid paying this contribution. Each missing disabled worker has to be compensated by an annual contribution of 5,015 euros (500×10.03), i.e. 60,180 euros for the year if no disabled worker has been hired ($500 \times 10.03 \times 12$).

²¹AGEFIPH et FIPHP. "Les personnes handicapées et l'emploi - chiffres clés", juin 2019.

labor market on the grounds of disability. This principle, established in France by the law of February 11, 2005, complies with the European legal framework²². The prohibition of discrimination concerns all aspects of employment: internships, recruitment, training, sanctions, dismissals, remuneration, promotions and transfers. As we said previously, the failure to provide reasonable accommodations at work may also be considered a discriminatory practice.

Discrimination is direct when the contested decision is based on disability (e.g. when a job is forbidden to a person with a disability because of his/her disability). Conversely, it is indirect if this decision, apparently neutral, is not directly based on disability but may lead to unfavourable treatment of persons with disabilities.

The measures introduced to improve the employment of persons with disabilities are not limited to binding measures. A series of incentive measures have also been taken.

Financial and non-financial incentives

In addition to the binding legislative framework, financial and non-financial incentives have been implemented to stimulate both the labor supply and the labor demand, in particular through aids granted to employers and disabled workers by the government, the AGEFIPH and the FIPHFP.

Employers subject to the quota can benefit from aid for reception, integration and professional development, aid for adapting work situations, aid for finding solutions to maintain employment, aid for hiring under apprenticeship or professionalization contracts, or aid for training to maintain employment. Moreover, they can hire disabled workers under subsidized contracts (*contrats aidés*), which are contracts designed to encourage the labor demand by reducing the costs of hiring disabled workers (through subsidies or

²²The principle of non-discrimination finds its sources in Europe in the Amsterdam Treaty (article 13) signed on October 2, 1997, in the European Union Charter of Fundamental Rights (article 21) adopted on December 7, 2000, in the Council Directive 2000/78/EC of November, 27, 2000 “establishing a general framework for equal treatment in employment and occupation” and in the United Nations CRPD (article 5) ratified by the European Union on January 5, 2011.

reduced charges).

To stimulate the labor supply as well, there are two main types of action. The first concerns support for vocational training ("mainstream" and "specialized" vocational training which involves medico-social sector). The objective is to facilitate the return to education and training in adulthood in order to access appropriate career paths. For instance, vocational training aid can take the form of assistance in covering the costs of disabled trainees in the context of short training courses, training assistance in the context of access to employment or maintaining in employment, exceptional training assistance or continuity of remuneration during training. Secondly, there are also employment supports, essentially provided by *Pôle emploi* (the French public employment service) and *Cap Emploi* (the French organization specialized in supporting persons with disabilities and their employers towards and within employment). For example, a bonus is paid to any employee with an open-ended contract, ESAT employee, long-term job seeker or beneficiary of supported employment who declares for the first time to their employer that they are beneficiaries of the quota. Disabled workers can also benefit from human and material aids to compensate for their disability, or aid linked to the recognition of the seriousness of the disability. Moreover, incentives are also implemented to fight against the inactivity trap that would result from the minimum social benefits. For example, if we look at the *Allocation aux Adultes Handicapés* (AAH), the French non-contributory disability benefits program which is one of the most important social assistance programs in France, the *Maison Départementale des Personnes Handicapées* (MDPH) can grant automatically the RSWD to AAH recipients since 2009 (even if they have not applied for it). Recipients have also the obligation to declare their income quarterly since 2010 to benefit from it. The employment incentive is also reflected in the design of the AAH, which makes it financially attractive to work, without penalizing those who cannot.

The Covid-19 health crisis has also required the implementation of additional excep-

tional aid since 2020. These financial and organizational aids concern employees, job seekers with disabilities, employers and self-employed workers with disabilities. They include the support of additional costs of equipment such as inclusive masks for disabled workers and their immediate colleagues, the increase aid for work-study programs, specific aid for job retention, aid for setting up teleworking and travel aid for persons whose use of public transport would present a health risk.

Thesis contribution and structure

Disability is relatively little studied in economics compared to other criteria (as origin, gender, etc.), as shown for example by Lippens et al.'s meta-analysis on discrimination, although it is the subject of a highly developed arsenal of public policies. This can be explained at least by two main difficulties: the complexity of the concept of disability and the lack of data.

Firstly, economics is confronted with the complexity of disability, which covers a multitude of realities. If we look at the labor market, the obstacles to accessing to and maintaining in employment depend in particular on the person's disability (type and degree of disability) and on the interaction between the disability and the targeted job: the type of job, the work environment (premises, colleagues, etc.) and the means to alleviate the disability and restore equal conditions (medical equipment, adaptation of the workstation, etc.).

The lack of data on disability also limits the understanding of this concept, especially in economics. It would be explained by the lack of evidence, according to economists and public policy makers, that it is financially beneficial to integrate persons with disabilities (Mitra, 2018). In particular, disability is not very present in national survey data, and when it is, a small number of questions prevents us from understanding the plurality of situations. For the most comprehensive disability surveys, which are usually very

expensive to conduct, they are usually not repeated or are conducted at long intervals of time²³. Data on disability are also quite scattered and come from different organizations. It is thus difficult to have a clear estimate of the number of persons with disabilities²⁴ and to understand the situation of this population in all areas, especially since persons with disabilities may choose not to report it or may not be aware of their disability. This lack of data thus makes it difficult to implement adequate employment public policies targeted to persons with disabilities, as well as international comparisons (especially since there is no single definition of disability), and to evaluate the effectiveness of those already implemented. Data should therefore be updated (and in particular the main surveys on disability should be more regular), more visible and accessible to encourage their use, and more coordinated. In France, a "group of producers of statistical data on disability and autonomy" has been created at the end of 2020, which is intended to meet regularly on a permanent basis. It gives hope for greater coordination and visibility of data on disability and for an increase in the themes explored.

With this thesis, we bring new empirical results to understand the employment situation of persons with disabilities, by assessing some barriers to employment and public policies to overcome them in both the labor supply and labor demand side. There is also a particular focus on the least studied persons with disabilities: youth and women. The main question of this thesis is therefore to know if, despite the important arsenal of public policies that have been developed over the last three decades to stimulate the supply and demand of workers with disabilities, there are still barriers in their access to employment. More specifically, we attempt to answer several sub-questions. On the labor

²³For example, in France, the most comprehensive surveys on disability are ten-yearly surveys: *Handicaps, Incapacités, Dépendance* (HID) survey of 1998-2001 and *Handicap-Santé* survey of 2007-2009 conducted by INSEE. Now, they are conducted by another organism, DREES: "Care" survey of 2014-2016 and soon *Autonomie* survey. Apart from these surveys, it is possible to rely on other indicators present in more frequently conducted surveys, as the Labor Force Participation Survey conducted each year. However, the few and imperfect questions asked prevent us to well understand disability.

²⁴This is why many organizations prefer to give several figures depending on the vision considered (e.g. people declaring an administrative recognition of a disability, or a limitation in the activities of daily living, or difficulties/impossibilities in at least one functional dimension).

demand side, is the existence of discrimination in France on the basis of disability proven, and if so, what is its extend? Is it comparable to that on the grounds of other common discrimination criteria? What are its characteristics? On the labor supply side, is the design of the AAH sufficient to stimulate the labor supply of its recipients?

The objective of this thesis is therefore twofold: we assess the extent of some barriers to labor market entry and discuss the effectiveness of some main public policies implemented to overcome them.

We conducted three empirical chapters. We chose to focus on France and on the "mainstream" labor market. We looked at some of the barriers to access to employment: the existence of discrimination on the demand side of the labor market (chapters 1 and 2) and the risk of an inactivity trap created by disability benefits on the supply side of the labor market (chapter 3). We have chosen to focus only on financial incentives aimed at eliminating these barriers by stimulating the demand for workers with disabilities (employment quota, chapters 1 and 2) and the supply (possibility of combining disability benefits with income, chapter 3). To do this, we used self-constructed data with an experimental approach which allows us to overcome the lack of data (chapters 1 and 2), and national survey data with a quasi-experimental approach (chapter 3). The barriers to employment and the public policies implemented that we study in this thesis are not exhaustive. There are others that this thesis does not cover, as the inaccessibility of the workplace and transportation in terms of layout and distance.

In the first chapter, we assess the extent of discrimination in access to employment due to a visible disability (being a wheelchair user) and analyze its characteristics. For this purpose, we use an information access test, which consisted in sending to recruiters fictitious information request emails concerning the start date of the job vacancy, similar in all points except concerning the signal of a motor disability registered by the administration. Since this method is costly, it cannot be generalized to the entire labor market.

We therefore decided to focus our study on accounting jobs in the Paris region. This experiment was conducted in two waves: the first from June to July 2017 and the second from May to June 2019. In total, we sent 800 information request emails in response to 400 job offers in the public and private sectors. We provide evidence of discrimination in access to employment based on motor disability: the applicant with a motor disability is significantly less likely to receive a positive callback than those without disability. We also provide evidence that this discrimination is higher in the private sector, in establishments with less than 20 employees (not subject to the quota) and against women. These results raise questions about the effectiveness of the employment quota for disabled workers which does not eliminate discrimination in hiring. Although its primary objective is to promote the labor demand for disabled workers, the fight against discrimination remains its indirect objective.

However, this chapter leaves some questions unanswered. Would evidence of discrimination also be provided by the more traditional correspondence test with fictitious applications? Is there also such discrimination on the grounds of an invisible disability? How strong is the extent of this discrimination compared to other discrimination criteria? What is the effect of reporting a registered disability, which can qualify the employer for the quota and financial aid?

The second chapter provides some answers. Using a multi-criteria experiment with fictitious CVs and cover letters, we measured the extent of discrimination in hiring based on an invisible disability (a hearing disability). We compared it to discrimination due to other potential grounds of discrimination: origin, gender and place of residence. Two different professions were tested in the Paris region: caregiver assistant occupation, which is a low-skilled profession requiring many interactions with the public, and administrative manager occupation, a skilled profession requiring less interaction. To evaluate the effect of the signal of an administratively registered disability (having the RSWD), the fictitious

job candidate with a hearing disability mentioned one out of two times in his/her application having the RSWD and specified to the employer his/her eligibility for government financial aid if he/she hires him/her. From October 2019 to February 2020, we sent 2315 applications in response to 463 job vacancies in the public and private sectors. This study reveals the existence of discrimination in access to employment due to hearing disability in both professions tested. However, it is twice higher in caregiver assistant occupation than in administrative manager occupation. Moreover, this discrimination on the grounds of hearing disability is similar in magnitude to that on the grounds of a North African origin in the administrative manager occupation, but twice higher on the basis of origin in caregiver assistant occupation. However, we find no evidence of a difference in callback rates by place of residence or gender. This study does not allow us to conclude that discrimination in hiring is systematically lower in the public sector than in the private sector, nor that being eligible for a public subsidy reduces discrimination in hiring against the candidate with a disability.

These first two chapters provide new evidence that discrimination in hiring hinders access to employment for persons with disabilities, whether or not disability is visible. The binding financial measure studied (the quota), which is intended to stimulate labor demand of disabled workers, does not eliminate it.

What about the labor supply? Is there sufficient incentive to work? If not, are financial mechanisms to stimulate it effective?

Persons with disabilities can, under certain conditions, benefit from minimal resources since their capacity to work may be reduced. In particular, they can benefit from the AAH, the French disability assistance program, from the age of 20 (or even 16 if they are not dependent on their parents for family benefits). This program does not contain a notch, so that each additional euro of income from work leads to an increase in total income. Its design aims to provide a subsistence income, while limiting the risk of an

inactivity trap that it could create.

The objective of the third chapter is to study the effect of the AAH on the employment of its recipients. To do so, using data from the 2013-2019 French Labor Force Survey, we exploit the young age discontinuity in the AAH eligibility (age 20) to instrument the effect of this allowance on employment. For this purpose, we use a fuzzy regression discontinuity design. We decided to focus on low-skilled youth with disabilities between 18 and 25 years old. We show that the AAH has a relative large disincentive effect on employment, despite its design. However, the magnitude of this disincentive effect is heterogeneous: it is stronger for women and for persons reporting a low activity limitation (approximated by a low level of disability). Focusing on working time of employed women, we also show that they are more likely to work part-time when they receive the AAH. The disincentive effect therefore concerns both the intensive and the extensive margin. The possibility to combine disability benefits with employment does not appear to be sufficient to eliminate the disincentive to work. These results support the development of non-monetary actions (as vocational training), in order to increase their level of qualification and their reservation wage, and thus to increase the gap between the amount of the AAH and the expected income of the job. These policies should mainly target those who are furthest from employment in order to promote their transition to employment when their health condition allows it.

The results of this thesis show that, despite efforts in recent years to promote the employment of persons with disabilities, labor market conditions are still not very favorable to them, even though employment is the preferred place to promote inclusion and economic independence or quasi-independence. They therefore argue for reforming and/or complementing existing public policies for the employment of persons with disabilities.

Chapter 1

Discrimination in access to employment due to motor disability in the Paris region¹

¹This chapter is based on an original paper: Mahmoudi, N. (2021). Discrimination dans l'accès à l'emploi due au handicap moteur, en Île-de-France. *Revue Française d'Économie*, 36(1), 141-184.

1.1 Introduction

Since the 1990s, we have witnessed a growing awareness in public authorities and civil society of the need to improve the inclusion of persons with disabilities. This has been reflected in the increasing focus on this point in political agendas, legislation, economic research and the media. Many countries have established a legal framework to promote access to employment for persons with disabilities. The public policies implemented can be grouped into two types. The first is the prohibition of any form of discrimination on the grounds of disability. For example, the failure to make reasonable adaptations to recruitment and/or working conditions for disabled workers is considered a discriminatory act. Anti-discrimination policies were introduced in the United States in 1990 with the Americans with Disabilities Act and in the United Kingdom in 1995 with the Disability Discrimination Act. Quota policies, on the other hand, impose a minimum percentage of disabled workers in a company's workforce. These policies are mainly implemented in Asian and European countries. Many countries, especially in Europe, have adopted both of these policies. This is notably the case in France.

In France, any private or public establishment with at least 20 employees for more than three years is required to have at least 6% of disabled workers. This employment quota policy, better known as the obligation to employ disabled workers (hereafter quota), was established by the law *En Faveur de L'Emploi des Travailleurs Handicapés*, July 10, 1987¹, reinforced by the law *Pour L'Égalité des Droits et des Chances, la Participation et la Citoyenneté des Personnes Handicapées*, February 11, 2005² and by the law *Pour la Liberté de Choisir son Avenir Professionnel*, September 5, 2018³. If the employer has not met this obligation to employ 6% of disabled workers, he or she is required to pay an annual financial contribution to the AGEFIPH in the case of a private establishment, or

¹Support for the Employment of Disabled Workers, July 10, 1987.

²For Equal Rights, Opportunities, Participation and Citizenship of Disabled Persons, February 11, 2005.

³Freedom to Choose One's Professional Path, September 5, 2018.

to the FIPHFP in the case of a public establishment. In addition, discrimination based on disability, including in the labor market, is prohibited. The principle of non-discrimination in the employment market on this criterion was established by the law of February 11, 2005.

Despite these important public actions, persons with disabilities remain excluded from employment. In 2017, 489,100 disabled workers were beneficiaries of the quota in establishments with 20 or more employees, representing 4.8%⁴ of the total salaried workforce, so the 6% quota of disabled workers was not met⁵. That same year, according to the French Labor Force Survey, 43% of people aged 15 to 64 with an administrative registered disability or loss of autonomy were active according to *International Labour Organization* (ILO) definition. Among them, 35% were employed and 19% unemployed, compared to 65% and 9% respectively for the same age group of the full active population. Several factors can explain this doubling of the unemployment rate, including lower qualifications and productivity on average, a lack of accessibility (to the workplace, public transport, etc.), a lower incentive to work due to disability benefits, and the existence of significant discrimination in the labor market, i.e. a difference in treatment between two individuals with "perfectly identical" productivities by employers (Heckman, 1998). Since 2017, disability has been the leading reason for referrals for discrimination to the French Human Rights Defender, with 21.8% of referrals in 2017, 22.8% in 2018 and 22.7% in 2019⁶, followed by ethnicity and health status. Faced with this observation, persons with disabilities could decide against investing in their human capital, thus leading to the emergence of self-fulfilling beliefs and an increase in their dependence on financial supports which

⁴This direct employment rate is expressed in physical persons (i.e. the ratio between the number of beneficiaries of the quota and the number of employees subject to the quota).

⁵Dares. "L'obligation d'emploi des travailleurs handicapés en 2017", Dares résultats, novembre 2019, n° 053.

⁶For the Annual Activity Reports of the French Human Rights Defender for the years 2017, 2018 and 2019, see the following documents:

Défenseur des droits. "Rapport annuel d'activité 2017", 2018.

Défenseur des droits. "Rapport annuel d'activité 2018", 2019.

Défenseur des droits. "Rapport annuel d'activité 2019", 2020.

weigh more heavily on public spending. Underemployment of disabled people is likely to be higher the more severe⁷ the disability is (Berthoud, 2003; Jones, 2011), thus incurring a significant social and economic cost. They may also choose not to reveal their disability when it is invisible (e.g. such as psychological disability and long-term physical conditions) which reinforces the information asymmetry (Akerlof, 1978) between employers and job seekers.

Faced with the rise of this type of discrimination in employment, whether real or supposed, we conducted a controlled experiment to measure its extent, characterize it and to assess whether the quota prevents or even reduces it. To do this, we conducted a correspondence experiment and, more specifically, an information access test. Since this method is costly and does not allow us to cover the entire labor market or to test all types of disabilities, our study focused on wheelchair users.

Among the categories of disability recognized in France by the law of February 11, 2005 (physical; sensory; mental, cognitive or psychic; disabling disease), being in a wheelchair falls under the category of physical disability and, more specifically, motor disability (for the purposes of conciseness, we will use this term in the rest of our study). People in wheelchairs also belong to the category of people with reduced mobility.

We chose to study this type of disability because it is usual for the candidate to inform the recruiter of it before a job interview, in part to ensure that the premises are accessible. Another reason is that this disability does not, in principle, affect the productivity of workers dealing with administrative tasks, including accounting jobs, the

⁷The request for recognition of a disability situation is filed with the MDPH, which also evaluates the person's level of disability, and will be awarded by the CDAPH which will rely on a multidisciplinary team (composed of doctors, psychologists, etc.). The degree of a person's disability is assessed through his or her disability level, which measures the extent of the consequences of his or her disability in daily life. There are three ranges of disability levels:

- A disability level of less than 50%, which corresponds to mild disorders that do not hinder the performance of daily life activities;
- A disability level between 50% and 79%, when the problems are significant and interfere with the performance of daily activities without affecting autonomy in basic activities;
- A disability level of more than 80%, when the disorders are severe and greatly impede the person's daily life and autonomy.

area we decided to test. Moreover, these occupations experience tightness (i.e. job ads are more numerous than job applications), so employers may have difficulty filling these positions. This correspondence test was conducted in the Paris region, an employment area in which the number of job offers for these professions is significant.

We created profiles for four fictitious candidates who differ according to their gender and whether or not they had a motor disability with the associated RSWD⁸.

In this study, we apply a rather broad definition of discrimination since the two candidates, reference and disabled, are not perfectly identical because of the potential costs associated with hiring a worker with a motor disability, even though the employer is eligible for government aid to cover these costs. These costs depend on the type and degree of disability, but also on the occupation and work environment. They are likely to be higher in smaller companies with a lower adaptation capacity and more difficulty in offsetting these costs. Two qualitative studies conducted in France and the United States respectively have shown how these costs can vary. In addition to the adaptation of the workstation and/or working hours, the employer may apprehend a lower productivity of the disabled worker, higher absenteeism and longer training, involving a substantial investment of time on the part of all the members of the company and thus lower overall productivity (Fanjeau, 2007). It may also anticipate additional administrative costs or greater legal liability, since it is difficult to dismiss a disabled worker, for example (Kaye et al., 2011). In addition, knowing that the disabled population is on average less qualified and less productive, the disabled applicant specifies in his/her email that his/her disability does not affect his/her productivity in order to reassure the employer and to allow the discrimination to be isolated and measured. Finally, for the sake of simplicity, we refer to discrimination in hiring, but in reality, it is discrimination in the response to

⁸The application for RSWD is filed with the MDPH in the applicant's place of residence. It is then granted by the CDAPH to any person over 16 years old whose possibilities of obtaining or keeping a job are reduced due to the alteration of at least one physical, sensory, mental or psychological function. It is granted for a period of 1 to 10 years, renewable, or even for life if the disability cannot evolve favorably.

a request for information about a vacant position.

Our main results are as follows. We show a significant difference in treatment of candidates with motor disabilities in the accounting professions in the Paris region. This difference is higher in the private sector and for women. We also show that the quota seems somewhat effective in increasing access to employment for disabled workers by reducing discrimination but seems too moderate to prevent it entirely.

The difficulty in choosing disability as a criterion for studying discrimination lies in its varieties and intensities. It can also be temporary or definitive, evolving or not, visible or not, and even multiple.

1.2 Discrimination in access to employment on the grounds of disability: a review of the literature

A few studies using the correspondence experiment method have highlighted the existence of discrimination in access to employment against persons with motor disabilities (Ravaud et al., 1992; Mbaye, 2018 for the case of France, Stone & Wright, 2013; Bellemare et al., 2020; Bjørnshagen & Ugreninov, 2021 abroad), in particular in the accounting professions (Ameri et al., 2018; Bellemare et al., 2019 for the United States and Canada respectively), despite the existence of public policies aimed at favoring access to employment in the countries studied. These last two studies are the closest to our own.

In a correspondence test of 6,016 job ads in the accounting field in the United States, Ameri et al. (2018) showed that the non-disabled candidate received 6.58% of positive callbacks from employers (defined as an invitation to job interview or requests for additional information, for example), compared to 4.80% for the candidate with a motor disability, i.e. a difference of 1.78 percentage points to the disadvantage of the candidate with a disability. This differential treatment was most prevalent among well qualified

applicants and small private firms not subject to the Americans with Disability Act.

Bellemare et al. (2019) tested 1,477 private Canadian companies and found that the applicant with a motor disability received half as many job interview offers as the reference applicant (7.2% and 14.4% respectively). Specifically, for accounting assistant positions, the probability of the candidate with a motor disability receiving a positive response is 24.9 percentage points less than the reference candidate.

In addition, two studies have shown that UK accounting firms tend to be inflexible and unsympathetic to their disabled workers (Duff & Ferguson, 2011) and relatively insensitive to their welfare (Duff et al., 2007).

Such discrimination in hiring has therefore been identified in France for other professions and abroad in the field of accounting, but it has been little characterized.

For example, in which sector is it most present? To this question, elements of answers can be found in the studies of Mbaye (2018) and Barnay et al. (2015). The first, using the correspondence test method for museum receptionist jobs, found significant differences in callback rates to the disadvantage of the candidate with a motor disability in both the public and private sectors, with a higher level of discrimination in the private sector. The second, using French administrative data, showed that in the five years following its onset, a person's disability significantly reduces his or her probability of remaining employed in the private sector, but has no significant effect in the public sector.

We don't know either the capacity of the quota to reduce or prevent discrimination, since it has not, to our knowledge, been the subject of any evaluation. Although its initial objective is to improve the employment rate of persons with disabilities, the fight against discrimination, which hinders employment, is also indirectly part of its objectives. The literature only provides us with elements of an answer as to its effect on employment. Barnay et al. (2019) have shown that the first version of the quota (resulting from the law of July 10, 1987) reduced the probability of a person with a disability who is eligible

for the 6% quota being employed in the private sector. One hypothesis formulated by the authors is that some private establishments prefer to pay the financial penalty rather than hire disabled workers. The effect of this policy was neutral in the public sector. However, the second version of the quota (resulting from the law of September 11, 2005) would have increased the employment rate of disabled workers, in particular in the private sector (Barnay et al., 2022). Outside France, a few studies evaluating hiring quota policies have highlighted their effectiveness (Lalive et al., 2013; Mori & Sakamoto, 2018; Malo & Pagán, 2014) even though quotas are not always fully met (Krekó, 2019).

In addition, the studies using correspondence test data that we previously discussed showed the existence of discrimination in hiring against both men and women with disabilities, but did not compare the magnitude of the differences in treatment toward them.

However, we know from Baldwin & Johnson's (1995) study in the United States that women with disabilities experience higher (wage) discrimination on two grounds (their gender and their disability). This suggests that they are more discriminated against than men in the same situation. Firth (1982) found that women had a lower callback rate when applying for qualified accounting jobs in Great Britain, a finding confirmed in France for administrative manager positions (Petit, 2007). Gender apart, is the same true for persons with disabilities, i.e. are they more penalized when applying for jobs that require higher qualifications?

Several hypotheses emerge from this literature review. In addition to measuring the extent of discrimination in hiring due to motor disability in the accounting professions in the Paris region, the main contribution of our study is to characterize this discrimination by verifying the validity of the following hypotheses:

- Discrimination in hiring on the grounds of motor disability is higher in the private sector than in the public sector.
- Discrimination in hiring on the grounds of motor disability is higher in establish-

ments with fewer than 20 employees (exempt from the quota) than in establishments with 20 or more employees⁹.

- Discrimination in hiring on the grounds of motor disability is higher in higher skilled accounting jobs than in lower skilled ones¹⁰.
- Discrimination in hiring on the grounds of motor disability is higher for women than for men.
- Discrimination in hiring on the grounds of motor disability is higher when both candidates send a high quality email than when both send a poorer quality email.

By adding this last hypothesis, we wanted to apply the methodology used by Bertrand & Mullainathan (2004) to requests for information by a candidate with a motor disability. The objective is to see if variation in the quality of email requests for information has an impact on hiring discrimination due to motor disability, an aspect which, to our knowledge, has never been tested. In a correspondence test on ethnicity, Bertrand & Mullainathan (2004) varied the quality of CV submitted by fictitious applicants and found that quality of CV had a greater influence on the callback rate for reference applicants (with “white-sounding” names) than for applicants with names with an African-American resonance. Having a higher quality CV, therefore, does not allow African-American candidates to attract more recruiter interest, further widening the gap in the callback rate

⁹However, in our data, we have no information on whether establishments with at least 20 employees had already met their legal obligation to employ 6% of disabled workers at the time of data collection, nor whether they had at least 20 employees for at least 3 years. For the sake of simplicity, however, we refer to establishments as being eligible or ineligible for the quota on the basis of the size of their workforce.

¹⁰We approximated the level of qualification required for the position to be filled by taking the minimum diploma required. At the end of their secondary education, students can choose a vocational track, at the end of which they obtain CAP (*Certificat d’Aptitude Professionnelle*) or BEP (*Brevet d’Etudes Professionnelles*) certificates. Otherwise, they can take the general or technological track, at the end of which they obtain the BAC (*Baccalauréat*) certificate. After that, they can continue their studies to “BAC + 2” level, a qualification received following two years of study after the *baccalauréat* (e.g. *Brevet de technicien supérieur*, BTS certificate). We consider a position to be ‘skilled’ if it requires a minimum of “BAC +2”. Below this level, the position is regarded as low-skilled (i.e. when no diploma is required, or when the position requires a CAP, BEP or BAC diploma).

between them and reference candidates with CVs. One advantage of creating applications of different quality is that it takes into account the variance in unobservable productivity characteristics and overcomes this bias introduced by the correspondence test, an aspect that was criticized by Heckman and Siegelman in 1993 (Neumark, 2012). For Neumark, when observable characteristics that vary the quality of the application and that may impact on the probability of being recruited are included, discrimination can be measured even if there are unobservable differences between the fictitious applicants.

1.3 Empirical method

1.3.1 Presentation of the correspondence test method

To carry out this study, we used the correspondence test method. It has become an established method for measuring discrimination. In the labor market, the correspondence test currently used is the job interview access test. It consists of sending, in response to the same job offers, fictitious applications (CV and cover letter) that are similar in all respects except for the characteristic being studied (gender, age, ethnicity, for example). While the job interview access test was the approach initially adopted, a new method has been developed in recent years: the information access test (Ahmed et al., 2009 for the housing market and L'Horty, 2016 for the labor market). This technique involves sending emails to the employers in the sample establishments requesting information about the job to be filled, the sole difference between the applicants being the discrimination criteria under study. We use this method because it allows us to test a larger number of job offers with different qualification levels, without having to produce several variants of applications (CV and cover letter).

The correspondence test method has several advantages. It eliminates unobservable heterogeneity bias. Indeed, candidates' characteristics that might influence the recruiter's

choice (gender, assumed age, writing style, for example) are set by the researcher and are therefore observable. It also eliminates selection bias by sending the fictitious candidates' applications on the same day to the same job ads. However, the results of correspondence tests cannot be generalized because the data produced are not representative of the labor market. They are specific, partial and localized (Heckman, 1998). The results obtained are therefore highly dependent on the sample studied. For a deeper understanding of this method, its advantages and disadvantages, see the article by du Parquet & Petit (2019) and those by Duguet (2021) for the methods to analyze these experimental data.

1.3.2 Performance of two waves of the correspondence test

This correspondence test was conducted in two waves, the first from June to July 2017 and the second from May to June 2019. We posit that this was not two separate studies but rather one study broken down into two waves, even if they differ slightly. We will statistically test the validity of this assumption.

In these two waves, the objective was to send requests for information from the fictitious job applicants (an applicant with a disability and a reference applicant) about the starting date of the accounting position advertised. This information is generally not provided in the job ads. We chose to study accounting jobs, in both the public and private sectors, since they can be performed by an employee in a wheelchair without their disability affecting their productivity. At the moment when data were collected, these occupations were experiencing tightness in the labor market, limiting the numbers of negative responses from employers to both candidates. Finally, the number of jobseekers and job openings in these occupations was high, reducing the risk of detection.

The emails sent were similar in all respects, except for reporting whether or not the candidate had a motor disability and RSWD. In total, we sent 800 requests for information via email in response to 400 job ads (200 in the first wave and 200 in the second) in the

public and private sectors. The data obtained are self-constructed experimental data.

The second wave of correspondence test enriched the first wave, which focused only on women and on a single type of information request email written in formal language (so emails are of higher quality). In the second wave, we included male applicants and a second type of email requesting information which was written in everyday language (so emails are of lower quality). This second wave allowed us to apply Bertrand & Mullainathan's (2004) method to our study, provided us with more observations and allowed us to make the fictitious applications more representative of real people in the labor market who differ in the quality of their applications.

1.4 Experimental data collection protocol

1.4.1 Presentation of the fictitious candidates and the differences between the two waves of correspondence tests

We assigned common French surnames to the fictitious candidates of this correspondence test and used the 10 most common first names given in 1987, their fictitious year of birth. By giving the applicants the same potential signals of age and supposed origin, we avoided introducing such heterogeneity biases in the recruiter.

The first wave of this correspondence test included only women since accounting jobs tended to be held by women¹¹ in 2017 according to French Labor Force Survey data. Two fictitious profiles were thus created (see Table 1.1):

- Julie Dubois: candidate with a motor disability;
- Aurélie Legrand: reference candidate.

¹¹According to the 2017 French Labor Force Survey, the proportion of women employed in accounting occupations (including accounting managers, bookkeepers and intermediate accounting occupations) was 72.26%, compared with 27.74% for men.

For the second wave, we added two candidates:

- Romain Dubois: candidate with a motor disability;
- Nicolas Legrand: reference candidate.

Table 1.1. Individual characteristics of fictitious candidates

Candidate	Gender	Disability	Year	Consonance of the first and last names
Julie Dubois	Woman	Yes	1987	French
Aur�lie Legrand	Woman	No	1987	French
Romain Dubois	Man	Yes	1987	French
Nicolas Legrand	Man	No	1987	French

Source: Motor disability correspondence test (TEPP-CNRS).

In the second wave, the gender of the applicant and the language style used in the email were randomly selected each day. We thus had two sets of information request emails sent by the fictitious job applicants (see Table 1.2).

Table 1.2. Distinctive characteristics of the two waves of the correspondence test

	1 st wave	2 nd wave
Applicants:		
- Women	X	X
- Men		X
Information request sets:		
- A (formal language)	X	X
- B (everyday language)		X

Source: Motor disability correspondence test (TEPP-CNRS).

Thus, information requests sent by male applicants as well as those written in everyday language are under-represented in our sample. This may mean that the effects associated with men and applicants who sent an information request in everyday language will be less precise in our estimates (the statistical power may be lower).

1.4.2 Protocol

We created an email address for each fictitious candidate. The email sent by the candidate with a disability (Julie or Romain Dubois) mentioned his/her motor disability and his/her RSWD, and specified that this did not affect his/her productivity. By indicating his/her administrative status of disabled worker, the candidate is communicating to the recruiter that he/she is eligible under the quota. Recruiting this candidate helps an employer with at least 20 employees to meet the requirements of the 6% quota.

We only responded to job offers for fixed-term or permanent contracts corresponding to several levels of qualification, published or updated within the previous three days. These job ads were, for example, for bookkeeper, accountant, or accounting manager positions. They included the recruiter's email address but did not mention the start date of the contract.

For each job offer tested, both candidates (with a disability and without) sent their information request email on the same day a few hours apart to reduce the risk of detection. For all job offers tested on the same day, we kept the same gender for both candidates (two male or two female candidates) as well as the same order of sending (the first email was sent by the candidate with a disability and the second by the reference candidate; or conversely). The messages sent are listed in Table 1.3.

1.4.3 Composition of the sample

As shown in Table A.1 in the appendix, most of the job ads in our sample are in private sector establishments and generally indicate the size of their workforce (if necessary, we tried to obtain this information on the Internet). In fact, in our sample, there are almost as many establishments subject to the quota as there are establishments exempt from it. These establishments are mainly companies, most often offering a full-time permanent contract (of 35 hours per week) and calling for professional experience but not a particular

Table 1.3. Email requests for information

	Reference candidate	Candidate with a disability
Set A	Dear, Your job offer, reference no. XXXX, is of great interest to me and I am planning to send you my application. However, there is no indication of when the contract starts. Would it be possible to provide me with this information? Thanking you in advance, Best regards, Nicolas/Aurélie LEGRAND	Dear, I am very interested in your job offer (XXXX) and I intend to apply. Could you please let me know the start date? For information, I am registered as a disabled worker (RSWD) and I use a wheelchair. But that doesn't affect my skills in any way. Thanking you. Cordially, Romain/Julie Dubois
Set B	Dear, Your offer XXXX interests me a lot and I will be sending you my application. But it does not indicate when the contract starts. Is it possible to have this information? Thanking you in advance, Best regards, Nicolas/Aurélie LEGRAND	Dear, I am very interested in your job offer (XXXX) and I'll be applying soon. When does this job start? I am registered as a disabled worker (RSWD) and I am in a wheelchair but this has no effect on my work. Thanking you. Cordially, Romain/Julie Dubois

Source: Motor disability correspondence test (TEPP-CNRS).

level of diploma (or at least no diploma requirement is specified in most of the job ads). In a majority of cases, the salary is negotiable. The positions are mainly advertised by the employer directly and when the identity of the recruiter is mentioned, it is most often a woman. Finally, these job ads rarely explicitly solicit applications from persons with disabilities.

These job and establishment characteristics apply to both the correspondence test as a whole and the two waves studied separately. The observable characteristics of the job offers, of the establishments and of the recruiters are therefore homogeneous on average

across the two waves of the correspondence test.

1.5 Descriptive statistics

In the correspondence test as a whole, as in each individual wave, the average rate of positive callback is about 1.4 times lower for the candidate with a disability (see Figures 1.1 and 1.2). It is 43.75% for this candidate, compared with 61% for the reference candidate in the correspondence test as a whole, i.e. 45.5% and 64% respectively in the first wave and 42% and 58% respectively in the second wave.

Figure 1.1. Gross positive callback rate for the correspondence test as a whole

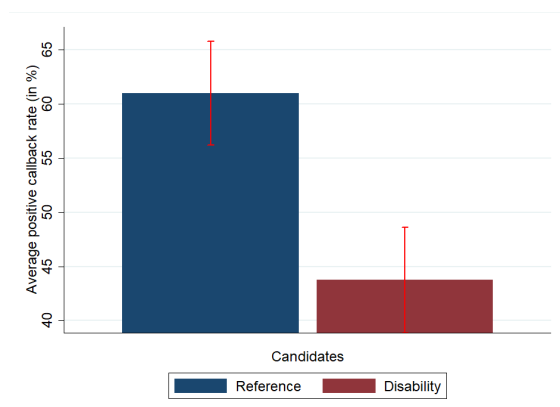
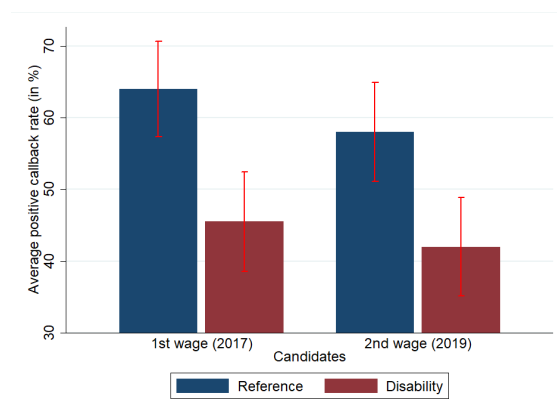


Figure 1.2. Gross positive callback rate for each wave of the correspondence test



Source: Motor disability correspondence test (TEPP-CNRS).

Only a little more than a third of the establishments tested responded positively to both candidates (see Table 1.4). When they responded positively to only one of them, it was most often to the reference candidate (89 positive callbacks while the candidate with a disability received none, compared to 20 in the opposite configuration). This conclusion, which also applies to each wave, calls for a study of the differences in callback rates.

To check whether the differences in response rates are statistically significant, we present comparison of means tests (see Table 1.5). We are only interested in the absolute rates and differences between the rates of positive callbacks. Indeed, the number of strictly

Table 1.4. Breakdown of positive callbacks

	No positive callback to either candidate	Positive callback to the reference candidate only	Positive callback to the candidate with a disability only	Positive callback to both candidates	Total job offers
Total for the full test	136 (34 %)	89 (22.25 %)	20 (5 %)	155 (38.75 %)	400
Total for the 1 st wave	63 (31.5 %)	46 (23 %)	9 (4.5 %)	82 (41 %)	200
Total for the 2 nd wave	73 (36.5 %)	43 (21.5 %)	11 (5.5 %)	73 (36.5%)	200

Interpretation: Of the 400 establishments tested in the full correspondence test, 136 (i.e. 34% of the establishments tested) did not respond to either candidate.

Source: Motor disability correspondence test (TEPP-CNRS).

negative callbacks, i.e. excluding non-callbacks, is low. The candidate with a disability received 10 compared to 4 for the reference candidate. The difference in the rate of strictly negative callbacks between the two candidates is therefore not significant.

By positive callback, we mean any response to the question asked about the contract start date, any request for a CV/cover letter or additional information and/or any invitation to contact the establishment again.

In the overall study, the applicant with a disability received 17.25 pp (percentage points) fewer positive callbacks than the reference applicant, which is significant at the 1% level. This difference between callback rates, although significantly high in both waves, appears to be higher in the first wave. Reassuring the employer that the applicant being in a wheelchair does not affect his/her productivity does not seem to be enough to attract the same interest as a candidate without a disability.

These first results point to the existence of discrimination in access to employment against the candidate with a motor disability. Table A.2 in the appendix also shows a significant negative difference in the treatment of this applicant in the private sector, in all

Table 1.5. Difference in negative and positive callbacks and callback rates

		All	1st wave	2nd wave
		Difference N (pp)	Difference N (pp)	Difference N (pp)
Strictly negative callbacks		6 (1.5 pp)	3 (1.5 pp)	3 (1.5 pp)
Positive callbacks		-69 (-17.25 pp ^{***})	-37 (-18.5 pp ^{***})	32 (-16 pp ^{***})

Interpretation: In the overall correspondence test, the candidate with a disability obtained 69 fewer positive callbacks than the candidate without a disability, i.e. a difference in the positive callback rate of 17.25 pp (significant at the 1% level).

Note: By callback rate gap, we mean the difference between the callback rate obtained by the reference candidate and that of the candidate with a disability. The significance levels used are 1% (***) , 5% (**) and 10% (*).

Source: Motor disability correspondence test (TEPP-CNRS).

establishments whether subject to the quota or not (and more precisely in those with fewer than 250 employees), in both higher skilled and lower skilled jobs, to a greater extent for women and regardless of the language type used in the e-mail. This is true for the overall correspondence test, but also for each wave of correspondence test (with the exception of eligible establishments in the first wave, especially those with 20 to 250 employees, and lower skilled jobs in the second wave where the results are not significant). As these results are preliminary, their robustness needs to be verified through an econometric analysis.

1.6 Econometric verifications and discussion of results

1.6.1 Strategy for estimation

Unlike the characteristics of our fictitious candidates, those of the job ads are not constant, nor are the characteristics of the two waves of the correspondence test which, although based on a sample of identical size, have an additional profile and information request set included in the second wave. This can make callback rates sensitive to a composition effect. To make sure that these characteristics do not influence the response rate of the candidates and thus any discrimination, we correct the discrimination coefficients

by taking these conditional preferences into account. To do so, we perform econometric estimations in order to produce *ceteris paribus* results of the effects of the variable of interest (see Tables 1.6 and 1.7).

The outcome variable that interests us here is the positive callback given by the recruiter to the job applicant. It is a binary variable that takes the value 1 when the applicant receives a positive callback and 0 in the case of no callback or a negative callback. In order to estimate the probability of the applicant with a disability receiving a positive callback, all other things being equal, we use a probit model with random effects at the job ad level, in order to take into account the non-independence of the callbacks to each applicant for the same job ad. A Hausman test confirmed the decision to use a random effects model rather than a fixed effects model. Note that we obtain the same results as in Tables 1.6 and 1.7 when we run a linear probability model (see Table A.3 in appendix), a random-effects logit model or a simple probit model.

The control variables chosen are the sector (public or private), the eligibility of the establishment for the quota, the level of qualification for the position (approximated by the minimum diploma requested/required), the gender of the candidate, the language level of the information request email, and the year in which the correspondence test was conducted. We also added the order of sending to ensure that this did not impact on the probability of getting a positive callback. For each control variable introduced, the reference modality we take is the one for which there were the most positive callbacks (except for the uninformed values).

Let y_{ij} be the dichotomous qualitative outcome variable representing a positive callback by the recruiter to job candidate i (with or without a disability) following the request for information sent in response to job ad j . If candidate i receives a positive callback to job ad j , y_{ij} takes the value 1 and 0 in case of no callback or negative callback. Using a random-effects probit model, we model the probability of candidate i receiving a positive

callback given the characteristics of job ad j , with G , the distribution function following a normal distribution. The callbacks obtained from the employer to the information requests are non-independent. The answer given by each employer to a candidate may indeed depend on the answer given to the other candidate. We then include in our model the unobserved group effect α_j , which is common to all observations in group j , as well as the individual residual ϵ_{ij} . They both follow a normal distribution. We then obtain the following model:

$$P(y_{ij} = 1 \mid x_{ij}, x_j, \alpha_j, \epsilon_{ij}) = G(\beta_0 + \beta_1 x_{ij} + \beta_2 x_j + \alpha_j + \epsilon_{ij}) \quad (1.1)$$

with $i = 1, 2$ and $j = 1, \dots, 400$.

We make the following assumptions:

$$\epsilon_{ij} \sim \mathcal{N}(0, \sigma_\epsilon^2) \text{ with } \sigma_\epsilon^2 = 1 \text{ and } \alpha_j \sim \mathcal{N}(0, \sigma_\alpha^2)$$

The intra-group and inter-group variances are σ_ϵ^2 and σ_α^2 respectively. We therefore assume that these group effects are independent of the other control variables (a particularly strong assumption according to Givord & Guillerm, 2016).

The marginal effect of each explanatory variable on the probability of a positive callback is calculated for each observation while taking into consideration unobserved effects α_j and ϵ_{ij} . The average of these marginal effects in the sample is represented in Table 1.6 for each explanatory variable. Since interaction terms are introduced in Table 1.7 and we use a non-linear model, the calculation and interpretation of the marginal effects are delicate (Ai & Norton, 2003). We will therefore simply report the coefficients of our estimates in this table.

1.6.2 Evidence of significant discrimination on the grounds of motor disability

In Table 1.6, we measure, all other things being equal, the probability of the applicant with a disability obtaining a positive callback compared to the reference applicant and thus evaluate the discrimination in hiring. To do this, we take into account the distinctive characteristics of the candidates, i.e. whether they have a disability or not (model 1), but also the differences between the two waves of correspondence test and the order in which the applications were sent (model 2) as well as those of the job offers (model 3). In model 3, we included the variable indicating whether or not the establishment is eligible for the quota, rather than the variable indicating the range of the number of employees in the establishment, due to a lack of observations for certain ranges.

Without including any control variables in our model, having a motor disability decreases by 17.0 pp the probability of obtaining a positive callback to a job ad in the accounting field in the Paris region, all other things being equal (model 1). If we include the specific characteristics of the two waves of the correspondence test and the order in which applications were sent only (model 2), or if we also include the distinctive characteristics of the job ads (model 3), the difference in treatment amounts to 17.3 pp, all other things being equal. All three results are significant at the 1% level. Discrimination in access to employment against the applicant with a motor disability is therefore robust given the control variables chosen, despite the existence of an important legal framework to prevent it.

This confirms the conclusions drawn from our descriptive statistics, but also the studies by Ameri et al. (2018) and Bellemare et al. (2019). However, we cannot compare the magnitude of our results with those of the previously cited studies since correspondence test results depend strongly on the sample studied and also because the econometric methods used are not the same.

The control variables, with the exception of job qualifications, do not have a statistically significant effect on the probability of receiving a positive callback regardless of disability. In this respect, models 2 and 3 confirm that the year in which the study was carried out did not have an impact on the difference in treatment between candidates, which backs up our contention that we did not carry out two separate correspondence tests, but rather a single correspondence test in two waves. We also observe that gender and the information request set did not affect the probability of obtaining a positive callback and thus that the overrepresentation of women and of formal language in our study does not seem to be a real problem. Finally, the order of sending the applications, chosen randomly each day, did not affect the probability of obtaining a positive callback either.

After having highlighted the existence of discrimination in access to employment due to motor disability, we will now characterize it by verifying the validity of our hypotheses.

1.6.3 Characterization of discrimination: verification of hypotheses

In Table 1.7, we present estimates, including different cross-effects, that allow us to characterize this discrimination and to test our hypotheses. We essentially discuss the results of model 2 which, unlike model 1, includes control variables in addition to those tested by the hypotheses.

Verification of hypothesis n° 1: "Discrimination in hiring on the grounds of motor disability is higher in the private sector than in the public sector"

Our results seem to confirm this first hypothesis, since discrimination against applicants with motor disabilities is significantly lower in the public sector than in the private sector. It is significant at the 10% level in the public sector¹² and at the 1% level in the private

¹²The coefficient of discrimination on the grounds of disability in the public sector is equal to the sum of that of the private sector (-0.948) and the difference in treatment between the public and private sectors (0.503). To determine the significance of this coefficient, we changed the reference variable in

Table 1.6. Estimates of discrimination using random-effects probit model

	(1)	(2)	(3)
Distinguishing characteristics of candidates			
Disability (ref.: reference candidate)	-0.170*** (0.024)	-0.173*** (0.024)	-0.173*** (0.024)
Specific characteristics of the correspondence test waves			
Correspondence test wave (ref.: 1 st wave)		-0.033 (0.057)	-0.009 (0.061)
Information request set (ref.: set A)		0.018 (0.060)	0.024 (0.060)
Gender of applicant (ref.: woman)		-0.048 (0.060)	-0.052 (0.060)
Sending order (ref.: rank 1)		0.026 (0.025)	0.026 (0.025)
Distinguishing characteristics of job ads			
Sector (ref.: private sector)			0.091 (0.069)
<i>Quota eligibility (ref.: not eligible)</i>			
Eligible establishment			0.030 (0.050)
Number of employees not known			0.058 (0.059)
<i>Level of qualification of the position (ref.: BAC+2)</i>			
Low-skilled (CAP, BEP or BAC)			-0.154** (0.075)
Not known			-0.074* (0.045)
ρ	0.739***	0.738***	0.732***
Number of observations	400	400	400

Interpretation: Including the control variables, the candidate with a disability has 17.3 pp less chance than the reference candidate to receive a positive callback to his/her request for information. Without including control variables, this difference in treatment amounts to 17.0 pp.

Note: The significance levels used are 1% (***), 5% (**) and 10% (*). The average marginal effects of the random-effects probit models are presented in this table. Standard errors, in parentheses, have been clustered at the job ad level to account for the non-independence of callbacks from recruiters. ρ is the within-group correlation, i.e. the share of the total variance in the error term that is due to unobserved heterogeneity at the job ad level. In all three models, this means that about 73% of the total residual variance is explained by unobserved establishment effects. This random effect at the establishment level is significant at the 1% level.

Source: Motor disability correspondence test (TEPP-CNRS).

our regressions. In these new regressions, the variable "disability" represents the discrimination due to disability in the public sector and its significance. We proceed in the same way to find discrimination on the grounds of disability in establishments eligible for the quota, for low-skilled jobs, for men, when

sector.

However, this result is only significant at the 10% level, probably because of the small number of observations in the public sector (59 public establishments tested). It would therefore benefit from being checked by a similar correspondence test involving more observations from this sector.

There are several reasons for the lower level of discrimination in the public sector, including its duty to set an example as outlined in the circular of December 3, 2008 *Relative à L'Exemplarité de L'État au Regard du Développement Durable Dans le Fonctionnement de ses Services et de ses Établissements Publics*¹³. This circular emphasizes the State's social responsibility to provide access to the civil service for persons with disabilities as well as to maintain them in employment. To this end, their inclusion must be upheld by human resources management policies. For example, in 2016, 5.6% of those employed in the public sector were disabled workers, compared to less than 4% in the private sector¹⁴. The cultural and organizational standards in this sector (recruitment by competitive examination, bureaucratic or institutionalized personnel management practices, for example) could also be contributory factors that explain this lower discrimination in hiring (L'Horty, 2016). Other factors could be the lower exposure to competition (Long, 1975) with less pressure to reduce hiring costs and increase productivity.

Verification of hypothesis n° 2: "Discrimination in hiring on the grounds of motor disability is higher in establishments with fewer than 20 employees (exempt from the quota) than in establishments with 20 or more employees"

The second hypothesis, aimed at evaluating the effectiveness of the quota, is also validated. We observe significantly less discrimination at the 5% level in establishments subject to

everyday language is used in the e-mail and for the second wave of correspondence test.

¹³The need for the State to show exemplary behaviour in the context of sustainable development in the operation of its services and public establishments, December 3, 2008.

¹⁴The methods of calculating employment rates for disabled workers are different in the public and private sectors and therefore cannot be compared.

the quota than in those that are not.

Several factors may justify this result, including the desire to avoid the financial penalties for establishments with 20 or more employees that do not comply with the legally imposed quota, or the greater importance attributed to personnel management policies in large companies (e.g. diversity management, signing on to charters and certification).

However, despite the risk of financial sanctions, discrimination on the basis of disability remains present in the establishments subject to the quota (significant at the 1% level), which raises questions about the effectiveness of this public policy. Is this policy inadequate because the quota is too high and/or because the financial penalty is too low?

The low effectiveness of the quota could stem from the insufficiency of the financial penalty. According to a study by Barnay et al. (2019), establishments with 20 or more employees would prefer to pay the financial penalty rather than hire a person with a disability. Increasing the amount of the penalty and/or taking into account the company's turnover in the calculation method could improve its effectiveness and make it more dissuasive.

Another explanation could also be found in the quota. Although our data do not allow us to ascertain whether this 6% quota was already filled in the tested establishments that we identified as discriminating, nor that the establishments had more than 20 employees for at least 3 years, we know that this quota is not being met in France overall. In 2017, the direct employment rate of disabled workers in establishments with 20 or more employees was 4.8%. The employment quota threshold therefore does not seem too low. On the other hand, this quota system could have a stigmatizing effect, sending a signal to recruiters that persons with disabilities are not competitive enough to enter the regular labor market without assistance. It could therefore improve the effectiveness of this quota policy if it was combined with non-monetary actions to promote understanding of disability in the workplace and break down prejudices about the productivity of disabled workers. These

actions could take the form of annual awareness campaigns in each establishment, through documents (such as internal letters or memos), posters, videos or conferences. It could also be relevant to designate a disability referent in each establishment (and not only in those with more than 250 employees as is the case since the law of September 5, 2018). Furthermore, the less stigmatized disabled workers are, the more they may be encouraged to declare their disability and thus benefit from human or material assistance necessary to carry out their activity.

Finally, although they are not obliged to respect the 6% quota of disabled workers, discrimination on the basis of disability remains prohibited in establishments with less than 20 employees. However, our study has shown that it occurs in these establishments, with a result significant at the 1% level. It may be reduced or eliminated by the September 5, 2018 law. Entering into force on January 1, 2020, it aims in particular to simplify the declaration concerning the obligation to employ disabled workers and to make companies more responsible. From then on, the 6% quota must be respected at the company level and no longer at the establishment level. Moreover, companies with less than 20 employees must also declare the number of disabled workers employed (without any obligation to respect the quota). This law also aims to develop an inclusive employment policy by including all types of employment in the count of quota beneficiaries (internships and work experience, for example). It would be interesting to undertake another study to evaluate the effectiveness of this reform in companies both eligible and ineligible under the quota after its entry into force.

The quota would therefore make it possible to reduce discrimination in access to employment for persons with disabilities although it would not eliminate it.

Verification of hypothesis n° 3: "Discrimination in hiring on the grounds of motor disability is higher in higher skilled accounting jobs than in lower skilled ones"

We show a significant difference in treatment of the disabled applicant at the 1% level in

both the higher skilled and lower skilled jobs. However, our estimates do not allow us to confirm that discrimination on the grounds of disability is higher in higher skilled jobs than in lower skilled jobs. This could be due to the small number of lower skilled job ads in our sample, but also to the fact that more than half of the job ads tested did not mention the qualification level required for the position. Finally, we approximated the level of qualification for the position using the minimum diploma required and considered that a job requiring a minimum of BAC +2 was a qualified job, a debatable assumption.

Verification of hypothesis n° 4: "Discrimination in hiring on the grounds of motor disability is higher for women than for men"

Our results show that women with disabilities, like men with disabilities, are discriminated against. However, this discrimination is significantly higher at the 5% level against women than against men, despite the over-representation of women in accounting jobs, thus confirming our fourth hypothesis. However, the underrepresentation of men in our sample may have weakened the accuracy of the probability of them obtaining a positive callback.

The combination of two grounds for discrimination as defined by article L. 1132-1 of the French Labor Code for women with disabilities, i.e. their gender and their disability, could explain this result. They would therefore be doubly penalized which would confirm the conclusions of Baldwin & Johnson (1995). This result also confirms the conclusions of the 2016 report of the French Human Rights Defender on the employment of women with disabilities, highlighting the existence of discrimination in access to employment against them because of their gender, their disability and a combination of these two criteria. This is also in line with the findings of Petit et al. (2011) and Meurs & Pailhé (2008) who found a doubly penalty for women with African origin in accessing to employment because of their gender and another criterion of discrimination, their origin. However, focusing only on the criterion of gender, the study by Challe et al. (2018), based on correspondence test data from the field of accounting in the Paris region, did not reveal

any discrimination on the basis of gender (except when a breakdown by civil service level is carried out, as significant discrimination was found in the State and hospital civil services). Women's disadvantage in the labor market does not end when they enter the labor market. When they are employed, they may also be victims of discrimination, including wage discrimination, whether they have a disability (Baldwin & Johnson, 1995) or not (Meurs & Ponthieux, 2000).

Verification of hypothesis n° 5: "Discrimination in hiring on the grounds of motor disability is higher when both candidates send a high quality email than when both send a poorer quality email"

Our estimates do not allow us to validate this last hypothesis, although we do find evidence of disability discrimination when the email was written in formal language (significant at the 1% level) and when it was written in everyday language (significant at the 5% level).

It is possible that the language level used in the information request email did not send a strong enough signal of applicant qualification or that the difference between the two types of language used was not flagrant enough. In addition, unlike Bertrand and Mullainathan, we tested the quality of application using information request emails rather than CVs and cover letters. Thus, the signal for difference in application quality may also have been too weak. Proportionately fewer information requests were written in everyday language in our sample and this may also have reduced the precision of these estimates. Finally, we have indicated previously that nearly half of the job offers tested did not ask for or require a particular level of education. Thus, it is possible that most of our applications were to lower skilled jobs, which might be less demanding with regard to writing style.

Verification of the evolution of discrimination between the two waves of the correspondence test

Finally, we did not find a change in discrimination between 2017 and 2019. The

differences in treatment due to disability in the first wave and the second wave were significant at the 1% levels but the difference between these two waves is not. This could be due to changes in the accounting profession or changes in the supply of jobs or jobseekers between these two years according to the *Pôle emploi* statistics. It should also be remembered that the same establishments were not tested in the two waves, which could also explain the fact that we cannot conclude that there has been any change in discrimination.

Table 1.7. Characterization of discrimination by a random-effects probit model

	(1)	(2)
Hypothesis n° 1 - Sector		
Disability	-0.917*** (0.153)	-0.948*** (0.158)
Public sector	0.247 (0.364)	0.193 (0.375)
Disability x public sector	0.450 (0.305)	0.503* (0.302)
ρ	0.738***	0.734***
Hypothesis n° 2 - Workforce of the establishment		
Disability	-1.142*** (0.222)	-1.171*** (0.226)
Establishment eligible under the quota	-0.079 (0.279)	-0.145 (0.289)
Disability x establishment eligible under the quota	0.566** (0.276)	0.588** (0.276)

ρ	0.743***	0.738***
Hypothesis n° 3 - Level of qualification for job		
Disability	-1.343***	-1.409***
	(0.463)	(0.460)
Lower skilled job (CAP, BEP or BAC)	0.527	0.583
	(0.464)	(0.468)
Disability x lower skilled job	0.393	0.441
	(0.490)	(0.485)
ρ	0.739***	0.736***
Hypothesis n° 4 - Gender of candidate		
Disability	-1.010***	-1.044***
	(0.164)	(0.168)
Man	-0.630**	-0.578*
	(0.297)	(0.338)
Disability x man	0.594**	0.628**
	(0.285)	(0.284)
ρ	0.744***	0.740***
Hypothesis n° 5 - Language used in the email		
Disability	-0.944***	-0.967***
	(0.160)	(0.162)
Everyday language	-0.265	-0.054
	(0.289)	(0.332)
Disability x everyday language	0.343	0.352
	(0.280)	(0.281)
ρ	0.741***	0.735***

Year of correspondence test		
Disability	-0.924***	-0.944***
	(0.187)	(0.189)
2 nd wave of correspondence test	-0.308	-0.116
	(0.250)	(0.333)
Disability x 2 nd wave of correspondence test	0.136	0.136
	(0.247)	(0.247)
ρ	0.739***	0.733***
Control variables	NO	YES
Observations	400	400

Interpretation: Including the control variables (model 2), the probability of receiving a positive callback in the private sector is significantly lower for the disabled applicant than for the reference applicant. This discrimination in access to employment due to disability is also lower in the public sector than in the private sector.

Note: The significance levels used are 1% (***), 5% (**) and 10% (*). The coefficients of the probit random-effects models are presented in this table. The standard errors, in parentheses, have been clustered by job offer to account for the non-independence of recruiter callback. ρ is the within-group correlation, i.e. the share of the total variance of the error term that is due to unobserved heterogeneity at the job ad level. For hypothesis n° 1, this means that, taking into account the control variables, about 73.4% of the total residual variance is explained by unobserved establishment effects. This random establishment effect is significant at the 1% level.

Source: Motor disability correspondence test (TEPP-CNRS).

1.7 Conclusion

Using an information access test, we highlighted the existence of discrimination against a candidate with a motor disability (wheelchair user) in access to accounting jobs in the Paris region. We have shown that this discrimination is higher in establishments not

subject to the quota for the employment of disabled workers, but that it still exists in establishments subject to this legal framework, which raises questions about the effectiveness of this public policy. It could be that the amount and the method of calculation of the financial penalty in case of non-compliance with the 6% quota of disabled workers are not sufficiently dissuasive and that establishments with 20 or more employees would rather pay this penalty than hire disabled workers. It may also be that the quota system sends a stigmatizing signal about workers with disabilities, who are perceived as not productive enough to compete on the normal labor market without legal support. However, our analysis remains limited because we don't know if the establishments tested had a minimum of 20 employees for at least 3 years, or if they had already reached the 6% quota at the time they were tested. Our study also found that discrimination is higher in the private sector and against women with disabilities. However, we were unable to find evidence of differential treatment based on the qualification level required for the job being filled or the quality of language used to make the request for information, nor did we find any variation in discrimination between 2017 and 2019. The results of our study are specific to the sample studied and therefore cannot be generalized to all types of disabilities or to the entire labor market. The results of the correspondence test provide evidence of discrimination in access to employment, but are not representative of the overall market.

To reduce such discrimination, we recommend reviewing the amount and method of calculation of the financial penalty for non-compliance with the quota. We suggest increasing the amount and/or incorporating the company's turnover in the calculation method. The objective is to counteract the preference of establishments to pay the financial penalty rather than hire persons with disabilities and encourage a move towards a more inclusive society.

We also suggest that this public policy be complemented by actions aimed at improving understanding of disability and the economic and societal reasons for more inclusiveness.

This could help reduce stereotypes and prejudices about persons with disabilities, particularly concerning their productivity. Duff & Ferguson (2007) found that in the United Kingdom, in the accounting professions, companies and accounting firms have low understanding of disability and are not motivated to assimilate persons with disabilities.

Finally, it might be interesting to carry out a large-scale correspondence test on other types of disability, other regions and/or other professions to support our findings and generalize them.

Appendix

Table A.1. Characteristics of the job offers tested

	Complete test		1 st wave		2 nd wave	
	N (%)	Job ads	N (%)	Job ads	N (%)	Job ads
Sector		400		200		200
- private	341 (85.25 %)		155 (77.50 %)		186 (93 %)	
- public	59 (14.75 %)		45 (22.50 %)		14 (7 %)	
Type of establishment		393		194		199
- association	11 (2.80 %)		1 (0.52 %)		10 (5.03 %)	
- accounting firm	55 (13.99 %)		24 (12.37 %)		31 (15.58 %)	
- company	285 (72.52 %)		131 (67.53 %)		154 (77.39 %)	
- public institution	42 (10.69 %)		38 (19.59 %)		4 (2.01 %)	
Workforce of the establishment		400		200		200
- not indicated	75 (18.75 %)		58 (29 %)		17 (8.50 %)	
- less than 20 employees	164 (41.00 %)		67 (33.50 %)		97 (48.50 %)	
- at least 20 employees	161 (40.25 %)		75 (37.50 %)		86 (43 %)	
Type of contract		375		175		200
- fixed-term contract	102 (27.20 %)		53 (30.29 %)		49 (24.50 %)	
- open-ended contract	273 (72.80 %)		122 (69.71 %)		151 (75.50 %)	
35 hours per week	206 (64.38 %)	320	78 (63.41 %)	123	128 (64.97 %)	197
Full time	337 (93.35 %)	361	149 (92.55 %)	161	188 (94 %)	200
Experience		400		200		200
- not requested	112 (28.00 %)		53 (26.50 %)		59 (29.50 %)	
- desired	19 (4.75 %)		16 (8.00 %)		3 (1.50 %)	

- required	269 (67.25 %)		131 (65.50 %)		138 (69.00 %)	
Similar experience	102 (25.50 %)	400	66 (33 %)	200	36 (18 %)	200
Diploma		400		200		200
- not requested	186 (46.50 %)		80 (40.00 %)		106 (53.00 %)	
- desired	68 (17.00 %)		23 (11.50 %)		45 (22.50 %)	
- required	146 (36.50 %)		97 (48.50 %)		49 (24.50 %)	
Level of diploma re- quired/desired		214		120		94
- low-skilled (CAP, BEP or BAC)	34 (15.89 %)		22 (18.33 %)		12 (12.77 %)	
- high-skilled (BAC +2 minimum)	180 (84.11 %)		98 (81.67 %)		82 (87.23 %)	
Negotiable salary	275 (80.17 %)	343	100 (68.97 %)	145	175 (88.38 %)	198
Other benefits	73 (18.25 %)	400	34 (17 %)	200	39 (19.50 %)	200
Intermediate	47 (11.75 %)	400	29 (14.50 %)	200	18 (9 %)	200
Woman recruiter	218 (68.34 %)	319	81 (64.29 %)	126	137 (70.98 %)	193
Encouraged applica- tions from persons with disabilities	7 (1.75 %)	400	4 (2 %)	200	3 (1.5 %)	200

Interpretation: Of the 393 establishments tested that indicated the type of establishment for the position to be filled, 11 were associations (i.e. 2.80% of the establishments tested).

Source: Motor disability correspondence test (TEPP-CNRS).

Table A.2. Differences in positive callbacks according to the characteristics of the job ads tested and the level of language used in the email

	Complete test		1 st wave		2 nd wave	
	Difference N (pp)	Job ads	Difference N (pp)	Job ads	Difference N (pp)	Job ads
a) Depending on the sector						
- public sector	-5 (-8.47 pp)	59	-3 (-6.67 pp)	45	-2 (-14.29 pp)	14
- private sector	-64 (-18.77 pp ^{***})	341	-34 (-21.93 pp ^{***})	155	-30 (-16.13 pp ^{***})	186
b) Depending on the establishment's eligibility under the quota						
- not eligible under the quota	-38 (-23.17 pp ^{***})	164	-22 (-32.84 pp ^{***})	67	-16 (-16.49 pp ^{**})	97
- eligible under the quota	-18 (-11.18 pp ^{**})	161	-4 (-5.33 pp)	75	-14 (-16.28 pp ^{**})	86
- not known	-13 (-17.33 pp ^{**})	75	-11 (-18.96 pp ^{**})	58	-2 (-11.76 pp)	17
c) Depending on the workforce of the establishment						
- less than 10 employees	-26 (-21.67 pp ^{***})	120	-15 (-32.61 pp ^{***})	46	-11 (-14.86 pp [*])	74
- 10 to 19 employees	-13 (-28.89 pp ^{***})	45	-7 (-33.33 pp ^{**})	21	-6 (-25 pp [*])	24
- 20 to 250 employees	-14 (-12.07 pp [*])	116	-2 (-4.08 pp)	49	-12 (-17.91 pp ^{**})	67
- 251 employees and more	-3 (-7.14 pp)	42	-2 (-8.00 pp)	25	-1 (-5.88 pp)	17

d) Depending on the desired/required diploma level

- low-skilled	-9	34	-7	22	-2	12
(BAC max.)	(-26.47 pp**)		(-31.82 pp**)		(-16.67 pp)	
- high-skilled	-34	180	-18	98	-16	82
(BAC +2 min.)	(-18.89 pp***)		(-18.37 pp***)		(-19.51 pp**)	
- not known	-26	186	-12	80	-14	106
	(-13.98 pp***)		(-15.00 pp*)		(-13.21 pp*)	

e) Depending on the gender of the applicant

- woman	-24	103			-24	103
	(-23.30 pp***)				(-23.30 pp***)	
- man	-8	97			-8	97
	(-8.25 pp)				(-8.25 pp)	

f) Depending on the quality of the information request email

- set A (formal	-57	300	-37	200	-20	100
language)	(-19.00 pp ***)		(-18.50 pp***)		(-20.00 pp***)	
- set B (everyday	-12	100			-12	100
language)	(-12.00 pp*)				(-12.00 pp*)	

Interpretation: Among the 164 job ads tested from establishments not eligible under the quota, the candidate with a disability received 23.17 pp fewer positive callbacks than the reference candidate, this result being significant at the 1% level.

Note: The significance levels used are 1% (***), 5% (**) and 10% (*).

Source: Motor disability correspondence test (TEPP-CNRS).

Table A.3. Estimates of discrimination using linear probability model

	(1)	(2)	(3)
Distinguishing characteristics of candidates			
Disability (ref.: reference candidate)	-0.173*** (0.025)	-0.177*** (0.025)	-0.177*** (0.025)
Specific characteristics of the correspondence test waves			
Correspondence test wave (ref.: 1 st wave)		-0.032 (0.059)	-0.008 (0.062)
Information request set (ref.: set A)		0.017 (0.060)	0.021 (0.060)
Gender of applicant (ref.: woman)		-0.049 (0.061)	-0.051 (0.061)
Sending order (ref.: rank 1)		0.030 (0.025)	0.030 (0.025)
Distinguishing characteristics of job ads			
Sector (ref.: private sector)			0.088 (0.066)
<i>Quota eligibility (ref.: not eligible)</i>			
Eligible establishment			0.029 (0.050)
Number of employees not known			0.057 (0.060)
<i>Level of qualification of the position (ref.: BAC+2)</i>			
Low-skilled (CAP, BEP or BAC)			-0.156** (0.077)
Not known			-0.081 (0.078)
Number of observations	400	400	400

Interpretation: Including the control variables, the candidate with a disability has 17.7 pp less chance than the reference candidate to receive a positive callback to his/her request for information. Without including control variables, this difference in treatment amounts to 17.3 pp.

Note: The significance levels used are 1% (***), 5% (**) and 10% (*). Standard errors, in parentheses, have been clustered at the job ad level to account for the non-independence of callbacks from recruiters.

Source: Motor disability correspondence test (TEPP-CNRS).

Chapter 2

Is disability more discriminatory in hiring than ethnicity, address or gender? Evidence from a multi-criteria correspondence experiment²

²This chapter is based on an original paper, co-authored with Yannick L'Horty, Pascale Petit and François-Charles Wolff, accepted for publication in the journal *Social Science & Medicine*. It was carried out within the framework of a research agreement with the *Direction Générale de l'Administration et de la Fonction Publique* (DGAFP, DESPERADO III project).

2.1 Introduction

Persons with disabilities disproportionately experience poverty (United Nations, 2019), low employment rates (Mussida & Sciulli, 2016), low wages (Gunderson & Lee, 2016), part-time work (Autor & Duggan, 2003; Polidano & Vu, 2015) and job insecurity (Mitra & 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, 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 WHO's first World Hearing Report (World Health Organization, 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 taste-based (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 (RSWD) in the application and the existence of financial aid available to the employer. In 2008, 16% of people with moderate to total hearing loss had a registered disability according to the

Handicap-Santé French survey.

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 & 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.

2.2 Literature review

In the growing literature on hiring discrimination, the correspondence test has gradually been established as the reference technique for data collection (Bertrand & 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 few correspondence tests have been applied to motor impairment. In other countries, different forms of disability have been studied with this method, as shown in the general introduction. 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 sev-

eral grounds other than disability (e.g. Bertrand & Mullainathan, 2004) and others have tested the impacts of different types of disability (Stone & 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 hearing disability and ethnicity that are similar to each other, but higher than those 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 & 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 & 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.*

2.3 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 administrative manager ads, and four female applications and one male 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. By way of illustration, Table B.1 in the appendix shows the identities of the caregiver assistant applicants, followed by their CVs and cover letters.

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 2.1.

Table 2.1. Composition of the test sample of job ads

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

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

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.

2.4 Results

2.4.1 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 2.2, 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.

Table 2.2. Callback rates by candidate and type of job

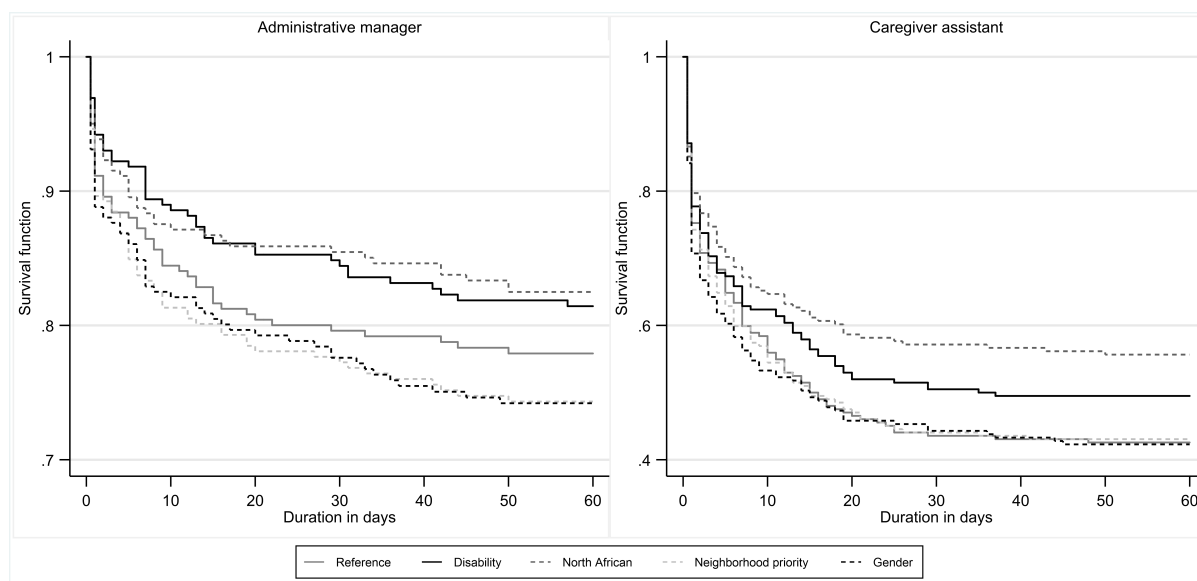
Sample	(1) Jobs	(2) Neither candidate gets positive callback	(3) Both candidates get positive callback	(4) Only reference candidate gets positive callback	(5) Only tested candidate gets positive callback	(6) Net discrimination rate	(7) Positive callback ratio (reference vs tested)
Reference: Administrative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

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% (*).

In Figure 2.1, 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.

Figure 2.1. Kaplan-Meier estimates of time before callback



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

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

In Figure 2.2, 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

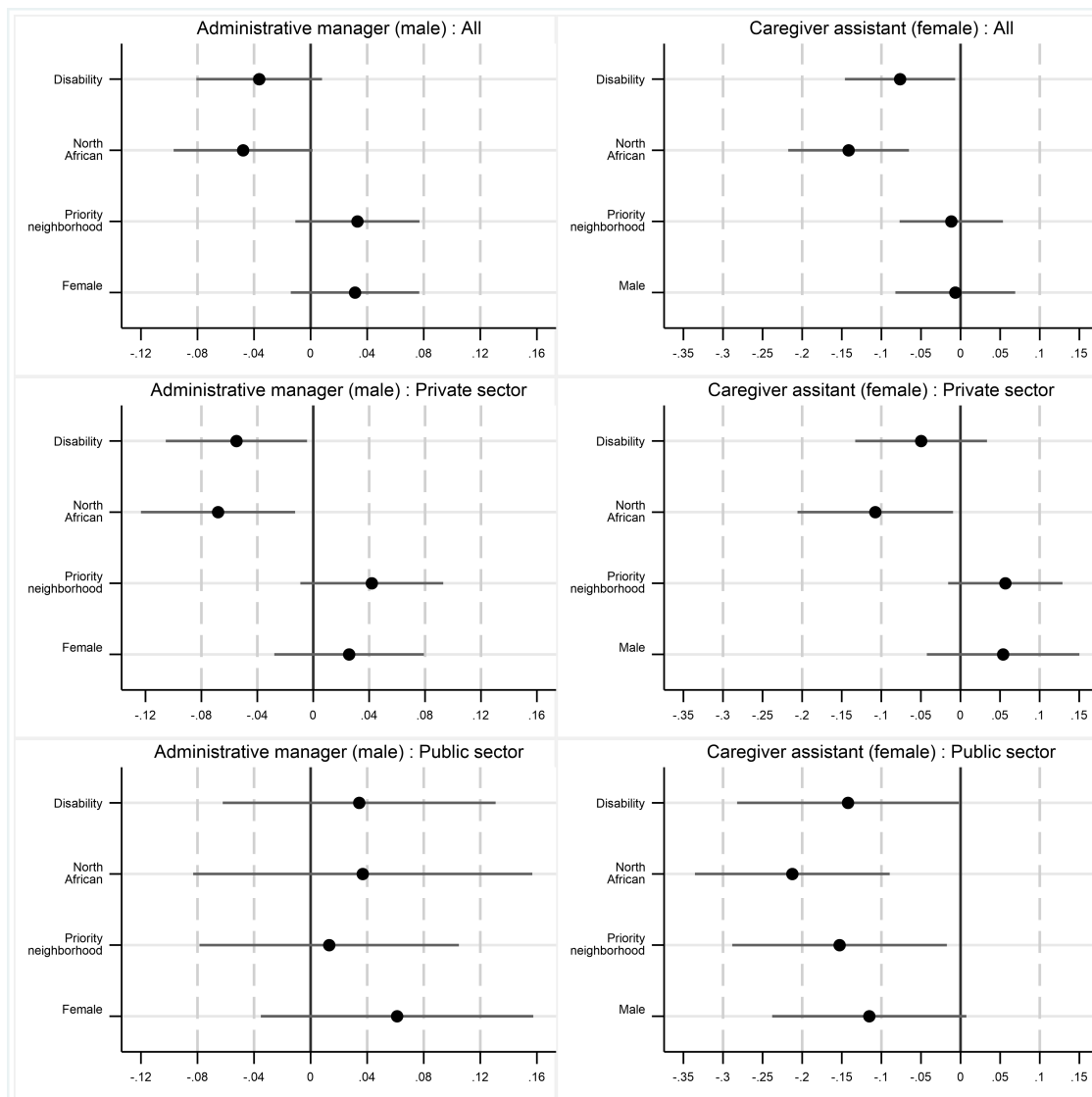
and North African candidates ($p=0.733$). Conversely, the negative effect of disability is different from the positive effect of priority neighborhood ($p=0.001$) and female gender ($p=0.002$). Differences between tested candidates are observed in the private sector only. For the caregiver assistant 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.

2.4.2 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:

$$Pr(R_{ji} = 1) = \sum_k \gamma_k * c_{ki} + \theta * S_{ji} + X_{ji}\beta + \epsilon_{ji} \quad (2.1)$$

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

Figure 2.2. Differential in callback rates compared to the reference candidate

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

$k = 4$ 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_{ji} 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 2.3.

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 & 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 & 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:

$$Pr(R_{ji} = 1) = \sum_k \gamma_k * c_{ki} + \sum_k \delta_k * c_{ki} * S_{ji} + \theta * S_{ji} + (X_{ji} * S_{ji})\beta + \epsilon_{ji} \quad (2.2)$$

In (2.2), 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).

Table 2.3. Linear probability estimates of callbacks

Variables	(1) Administrative manager (male)		(2) Caregiver assistant (female)	
	coef.	st. error	coef.	st. error
<i>Pooled estimates</i>				
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	
<i>Estimates with public sector interaction</i>				
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	

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.

We have implemented several robustness checks (reported in the 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 B.2). 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 B.3).

2.4.3 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 2.4 describes the pattern of callback according to firm size and registered dis-

ability. 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 severity of 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.

Table 2.4. Callbacks of the candidate with a disability based on the eligibility of the structure and the registered disability status

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

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

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

In Table 2.5, 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, $p=0.060$).

Table 2.5. Linear probability estimates of callbacks based on registered disability

Variables	Administrative manager (male)		Caregiver assistant (female)	
	(1A) Public	(1B) Private	(2A) Public	(2B) Private
	coef.	coef.	coef.	coef.
	st. error	st. error	st. error	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
R ²	0.412	0.101	0.312	0.153

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.

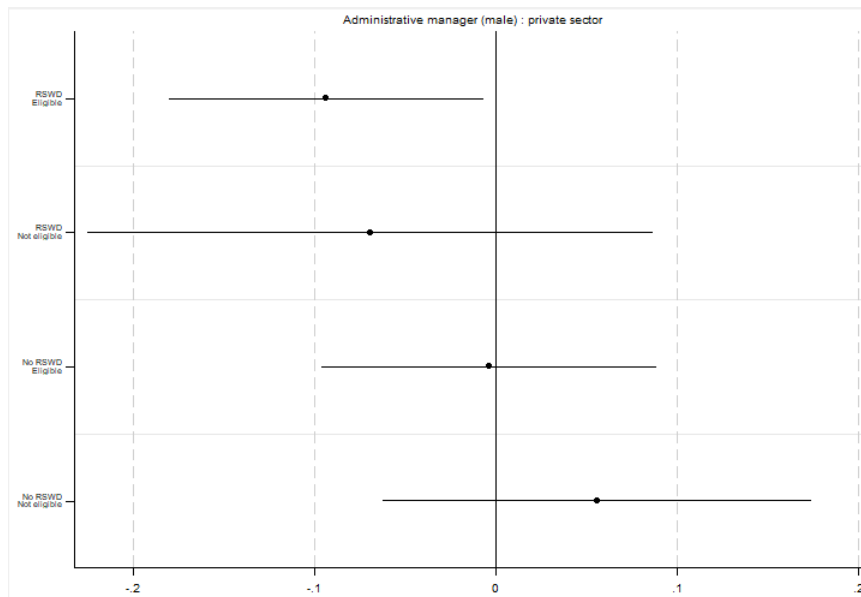
Next, we consider the influence of being eligible for the quota, defined as having a registered disability and responding to a job ad published by a company with 20 or more employees. Our analysis remains limited due to two reasons. First, we do not know whether the eligible companies have already reached 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 2.3. 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 severity of 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).

Figure 2.3. 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.

2.5 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.

Appendix

A. Examples of applications

Below, we present an example of five CVs and five cover letters used to apply for jobs as caregiver assistants. Four applications were from women, one from a man. These applications correspond to standard applications used in the French labor market, both in terms of the content of the applications and their presentation. Table B.1 shows the link between the identities of the fictitious candidates and their discriminating characteristics.

Table B.1. Identity of the candidates for caregiver assistant jobs

Identity of the fictitious candidate	Discriminating characteristic
Elodie GIRARD	Reference candidate (woman)
Pauline ROCHE	Applicant living in a deprived area (woman)
Aziza KHALIS	Candidate of North African origin (woman)
Thomas ROUX	Non-modal sex candidate in the profession (man)
Marion MOREL	Disabled applicant mentioning her disability in her application letter and randomly her administratively recognized status as a disabled worker (woman)

Elodie GIRARD
48 rue des Vinaigriers
75010 PARIS

06 41 95 81 99
Elodie.grd@yahoo.com
32 years old - single - no children

Caregiver assistant

SKILLS

Hygiene and comfort care, monitoring, stimulation, listening, communication
Public: sick and dependent elderly people, people with disabilities, people in hospital, people with mental health problems

12 YEARS OF EXPERIENCE

Since 2014: Permanent contract	<u>Caregiver assistant</u> Residence for the elderly "Les Baudemonts" in Thiais (94)
2013-2014: Fixed term contract	<u>Caregiver assistant</u> Rehabilitation Center in Coubert (77)
2012-2013: Fixed term contract	<u>Home caregiver assistant</u> Coviva company in Chelles (77)
2009-2012: Permanent contract	<u>Caregiver</u> Residence for the elderly "Le Galilée" in Le Mans (72)
2007-2009: Fixed term contract	<u>Caregiver</u> Hand surgery department at the hospital in Le Mans (72)
2006-2007: 6 four-week internships	<u>Trainee care assistant</u> Residence for the elderly La Floraissance in Le Mans (72) General surgery department at Le Mans Hospital (72) Home for the disabled in Le Mans (72) Public mental health establishment of the Sarthe in Allonnes (72) Geriatric department at Le Mans Hospital (72) Long-term care unit at Le Mans Hospital (72)

TRAINING

July 2007:	<u>State diploma - caregiver assistant</u> Le Mans training institute for caregiver assistants (72)
2005-2006:	One year of study in management in Le Mans (72)
June 2005:	<u>Baccalaureate in tertiary sciences and technologies (A-level)</u>

OTHER SKILLS AND HOBBIES

Mobility: driving license, private car.

Computer skills: Word, Excel, internet navigation.

Other activities: Handball and music.

Pauline Roche

196 boulevard Barbès 75018 Paris

06.28.07.22.87

roche_pauline@laposte.net

Current situation:

Single, 31 years old, no children

Driving license

Personal car

EXPERIENCED CAREGIVER ASSISTANT

Daily preventative care, hygiene, maintenance and well-being, interpersonal skills and availability to patients

PROFESSIONAL EXPERIENCE

January 2015 - today: Caregiver assistant on permanent contract

Residence for the elderly "le Bosquet aux Renards" in Evry

June 2014 - December 2015: Caregiver assistant on fixed-term contract

Residence for the disabled "Soleil" in Massy

January 2013 - April 2014: Caregiver assistant on fixed-term contract

Medical unit at the "Saint André" polyclinic in Reims

April 2011 - December 2012: Home caregiver assistant on fixed-term contract

"Adélia services" in Reims

September 2008 - March 2011: Caregiver assistant on permanent contract

Residence for the elderly "La Girandière" in Epernay

Traineeships as a caregiver assistant in 2008

"Clinic de Champagne" in Reims: medical-psychological Unit

'Maison Blanche" Hospital in Reims: geriatric unit

Sebastopol Hospital: palliative medicine unit

Residence for the elderly "L'Escale" in Reims

Home for disabled adults "L'Aurore" in Reims

Home for disabled children "Galopet" in Reims

DIPLOMAS

2008: Obtained the State Diploma of Caregiver Assistant (IFAS of Reims)

2007: 1 year of study in Management of Commercial Units in Reims

2006: Baccalaureate in tertiary sciences and technologies in Reims (A-level)

OTHER SKILLS AND HOBBIES

IT (Windows office pack).

Hobbies: Volleyball. Reading. Cinema.

Aziza KHALIS

39, rue Jules César 75 012 Paris

Khalisaziza8@gmail.com / 06.44.91.88.81

33 years old, single, no children, French nationality, mobile (driving license with vehicle)

CAREGIVER ASSISTANT SINCE 2007

PROFESSIONAL EXPERIENCE

Professional skills and qualities: Listening, prevention, monitoring, assistance with independence, hygiene and comfort care (toilet, meals, beds)

Since Oct. 15	CAREGIVER ASSISTANT <u>“Hippocrate”, retirement home in Châtenay Malabry (permanent contract)</u>
Aug. 14 to Sept. 15	CAREGIVER ASSISTANT <u>Home care, “ADMR” in Saint Arnoult in Yvelines (fixed term contract)</u>
June 10 to July 14	CAREGIVER ASSISTANT <u>“La Résidence du Lac”, retirement home in Vernon (permanent contract)</u>
March 09 to May 10	CAREGIVER ASSISTANT <u>Medical and psychological center in Bernay (fixed term contract)</u>
Sept. 07 to Feb. 09	CAREGIVER ASSISTANT <u>Surgical department of “the Bergouignan clinic” in Evreux (fixed term contract)</u>
Spring 2007	6 PERIODS OF INTERNSHIP AS A TRAINEE CAREGIVER ASSISTANT <ul style="list-style-type: none">- Functional rehabilitation department of the Evreux Hospital- “Auguste Ridou” retirement home in Vernon- Geriatric Service of the Evreux Hospital- Home care, “SSIAD” in Evreux- Home for the disabled of “the Marie-Hélène Association” in Evreux- Psychiatric department of “the New Navarre Hospital” in Evreux

CURSUS

Jul 07	STATE DIPLOMA IN CAREGIVER ASSISTANT (IFAS INSTITUTE, EVREUX)
Sept. 05 to Apr. 06	1 YEAR OF STUDIES IN MARKETING TECHNICS (EVREUX)
June 05	BACCALAUREATE IN TERTIARY SCIENCES AND TECHNOLOGIES (A-level)

OTHER COMPETENCES AND LEISURE

IT (Internet-Word-Excel).
Music, basketball, cinema

Thomas Roux

12 rue de Chanzy
75011 Paris
t.roux002@gmail.com
06-56-71-29-63

Driving license with vehicle
32 years old single (no children)

Experienced caregiver assistant

Accompanying people, helping with mobility, prevention and listening
Helping with toiletry needs, meals, making beds, helping with nursing care

EXPERIENCES

January 2016 to present (permanent contract): Caregiver assistant

"Les Opalines" home care, Noisy le Grand

June 2014 to December 2015 (fixed-term contract): Caregiver assistant

Institute for disabled children "L'envolée", Dammarie-Les-Lys

January 2013 to April 2014 (fixed-term contract): Caregiver assistant

Home for disabled people "Les champs blancs", Joigny

April 2011 to December 2012 (fixed-term contract): Caregiver assistant

Emergency Department, Joigny Hospital

September 2008 to March 2011 (permanent contract): Home caregiver assistant

"Epnak" in Auxerre

Caregiver assistant internships during training

Rehabilitation care, "Clinéa Clinique Le Petit Pien", Monéteau

Home care, Hospital of Auxerre

Care in a psychiatric department, "CHS de l'Yonne", Auxerre

Care for disabled people, "Foyer de vie Esperance", Auxerre

Care in the geriatric department, Auxerre Hospital

Care for the elderly, Retirement home "Le Saule", Auxerre

DIPLOMAS

2008: State Diploma in caregiver assistant at IFAS, Auxerre

2007: First year of Business and Administration Management, Auxerre

2006: Baccalauréate in tertiary sciences and technologies (A-level)

LEISURE

Regular use of computers, football and reading

Marion MOREL
19 rue Legendre
75017 Paris
06 44 05 95 68
Morel.marion24@gmail.com

Born in 1985 - single - no children - driving license and car

EXPERIENCE AS A CAREGIVER ASSISTANT

Main activities: hygiene care, comfort care, helping with meals, maintenance of rooms and equipment, monitoring and listening to patients, supporting nursing care.

- Since August 2014 **Caregiver assistant** on permanent contract
Residence for the elderly "Les jardins des acacias", St Maurice
- April 2013 to July 2014 **Caregiver assistant** on fixed-term contract
Psychiatric Unit, Hospital, St Maurice
- February 2012 to March 2013 **Caregiver assistant** on fixed-term contract
Rehabilitation Unit, Hospital, Yerres
- From June 2009 to January 2012 **Home caregiver assistant** on permanent contract
"La Parentèle", Le Havre
- August 2007 to May 2009 **Caregiver assistant** on fixed-term contract
Cancerology Unit, Hospital, Rouen
- In 2007** **Caregiver assistant internships** during training at IFAS
Maternity ward, Jacques Monod Hospital, Montivilliers
Residence for disabled people, "La maison des lys", Malaunay
Residence for the elderly, "La boiserie", Bois Guillaume
Home care, "HAD du cèdre, Bois Guillaume
Geriatric Unit, Hospital, Rouen
Emergency Department, "Clinique de l'Europe", Rouen

TRAINING

- July 2007 **State diploma - caregiver assistant**, IFAS, Rouen
September 2005 to May 2006 1 year of studies in insurance, Rouen
June 2005 Baccalaureate (Tertiary Science and Technology), Rouen

HOBBIES

Sport, computers and music

Marion MOREL
19 rue Legendre
75017 Paris
06 44 05 95 68
Morel.marion24@gmail.com

Born in 1985 - single - no children - driving license and car

Worker with a registered disability (RSWD)

EXPERIENCE AS A CAREGIVER ASSISTANT

Main activities: hygiene care, comfort care, helping with meals, maintenance of rooms and equipment, monitoring and listening to patients, supporting nursing care.

- Since August **2014** **Caregiver assistant** on permanent contract
Residence for the elderly "Les jardins des acacias", St Maurice
- April 2013 to July **2014** **Caregiver assistant** on fixed-term contract
Psychiatric Unit, Hospital, St Maurice
- February 2012 to March **2013** **Caregiver assistant** on fixed-term contract
Rehabilitation Unit, Hospital, Yerres
- From June 2009 to January **2012** **Home caregiver assistant** on permanent contract
"La Parentèle", Le Havre
- August 2007 to May **2009** **Caregiver assistant** on fixed-term contract
Cancerology Unit, Hospital, Rouen
- In 2007** **Caregiver assistant internships** during training at IFAS
Maternity ward, Jacques Monod Hospital, Montivilliers
Residence for disabled people, "La maison des lys", Malaunay
Residence for the elderly, "La boiserie", Bois Guillaume
Home care, "HAD du cèdre, Bois Guillaume
Geriatric Unit, Hospital, Rouen
Emergency Department, "Clinique de l'Europe", Rouen

TRAINING

- July 2007 **State diploma - caregiver assistant**, IFAS, Rouen
- September 2005 to May 2006 1 year of studies in insurance, Rouen
- June 2005 Baccalaureate (Tertiary Science and Technology), Rouen

HOBBIES

Sport, computers and music

Elodie GIRARD
48 rue des Vinaigriers
75010 PARIS
06 41 95 81 99
Elodie.grd@yahoo.com

Company details

Application for a caregiver assistant
position (reference of the job ad : XXX)

Paris, December 1st, 2019

Dear Madam or Sir,

I have been made aware of your job ad for a caregiver assistant. I would like to apply for the position because I think that I meet your requirements.

As you can see from my CV, I have been working for more than five years as a caregiver assistant in the residence for the elderly "Les Baudemonts" in Thiais. I work with sick and dependent elderly people. I carry out various care and activities for these people: hygiene and comfort care, meals, tidying and cleaning the rooms, stimulation activities, surveillance and prevention. I have good interpersonal skills with my patients and colleagues and I enjoy working in a team.

Before this job, I worked in a rehabilitation center. I have also worked in home care and in different departments in hospitals. This has given me experience as a caregiver assistant with different types of patients. These experiences complete the skills I acquired during my studies for my caregiver assistant diploma which I obtained at the IFAS in Le Mans in 2007.

I would be pleased to meet you to present my motivations and experience in more detail.

Thank you for your attention. Please accept, Madam or Sir, the assurances of my highest consideration.

E. GIRARD

Pauline Roche
196 boulevard Barbès 75018 Paris
06.28.07.22.87
roche_pauline@laposte.net

Company details

Application for the job ad of caregiver assistant (ref.: XXX)

Paris, December 1st, 2019

Dear Madam or Sir,

I am applying for a job as a caregiver assistant. I think that the profile of your job ad corresponds to my skills.

I obtained a State Diploma in caregiver assistant in 2008. After six internships in hospitals, a residence for the elderly, a clinic and homes for disabled adults and children, I have held five jobs as a caregiver assistant. I am currently working in Evry in the residence for the elderly "le bosquet aux renards".

I carry out preventive care, maintenance, well-being and hygiene for patients. During my different experiences, I worked with elderly people, disabled people, hospitalized people and people with psychological disorders. I also worked as a home caregiver assistant for one and a half years.

My different experiences since 2008 in private or public establishments and my State diploma of caregiver assistant have given me know-how and great versatility. I also have a good capacity to listen to patients and I integrate easily in a team.

I would like to meet you to convince you of my motivation. I am at your disposal for any interview.

I hope that my application will be of interest to you. Please accept, Madam or Sir, the assurances of my highest consideration.

Pauline Roche

Aziza KHALIS

39, rue Jules César 75 012 Paris

Khalisaziza8@gmail.com / 06.44.91.88.81

Company details

SUBJECT: Response to a job ad for a caregiver assistant

Paris, December 1st, 2019

Madam, Sir,

I am interested in your vacancy for a caregiver assistant (reference: XXX) and I would like to apply.

Since obtaining my state diploma of caregiver assistant in 2007, my professional experience has been varied. I have held several jobs as a caregiver assistant in different structures. I am currently a caregiver assistant in a retirement home where I provide daily hygiene and comfort care for the elderly, listening to them, monitoring and stimulating them. I am always very motivated and available for my patients and colleagues. Before, I was a home caregiver assistant. I have also worked in a medical and psychological center and in a clinic. Finally, I have also done several internships in hospitals during my studies.

I am at your disposal for an interview or further information.

I hope that my application will be of interest to you and please accept the assurances of my highest consideration.

Aziza KHALIS

Thomas Roux

12 rue de Chanzy
75011 Paris
t.roux002@gmail.com
06-56-71-29-63

Company details

Job application

Paris on December 1st, 2019

Dear Madam or Sir

I am very interested in your job ad for a caregiver assistant position (réf : XXX). I think I fit the profile you are looking for as I am an experienced caregiver assistant.

I passed the State Diploma of Caregiver assistant from the IFAS in Auxerre in 2008 and since then I have spent 11 years as a caregiver assistant in different structures, which has given me the necessary skills for this job.

I carry out many tasks: toileting, serving meals, making beds, helping with care, but also accompanying, helping with mobility, prevention and listening to people. Since 2016, I have been looking after elderly people in "the Opalines" medicalized retirement home in Noisy-le-Grand. Before this job, I worked with disabled children and adults in institutions. I also have several experiences as a caregiver assistant in different departments in hospitals.

I am applying for a job because I think I am the right person for you. For this, I am sending you my CV, and I am at your disposal for any interview.

I remain at your disposal for any further information and would like to thank you for your consideration.

Thomas Roux

Marion MOREL
19 rue Legendre
75017 Paris
06 44 05 95 68
Morel.marion24@gmail.com

Company details

Subject: RESPONSE TO AN ADVERTISEMENT FOR A CAREGIVER ASSISTANT (REFERENCE XXX)

Paris, December 1st, 2019

Dear Madam or Sir

I am interested in your advertisement for a caregiver assistant in your establishment. I would like to apply for this position.

I obtained a state diploma as a caregiver assistant in 2007 and I had the opportunity to work in different establishments which allowed me to gain experience. On a daily basis, my main activities are hygiene and comfort care, I ensure the surveillance, the serving of meals and the maintenance of the rooms and the medical equipment. Finally, I assist the nurses when they carry out the care. I also attach great importance to listening and communicating with patients.

The institutions I have worked in and the patients I have cared for have been varied during my experience, which allows me to present my application.

I am currently working in a home for the elderly in St Maurice and would like to continue my career in an establishment like yours. My education and experience have given me the skills you are looking for in this position. I am highly motivated and efficient.

Finally, I would like to inform you that I have been severely deaf for about ten years and I wear a hearing aid in both ears. My disability has no impact on my professional practice.

I hope that my application will attract your attention and that you will grant me an interview. Please accept, Madam or Sir, the assurances of my highest consideration.

M. MOREL

Marion MOREL
19 rue Legendre
75017 Paris
06 44 05 95 68
Morel.marion24@gmail.com

Company details

Subject: RESPONSE TO AN ADVERTISEMENT FOR A CAREGIVER ASSISTANT (REFERENCE XXX)

Paris, December 1st, 2019

Dear Madam or Sir

I am interested in your advertisement for a caregiver assistant in your establishment. I would like to apply for this position.

I obtained a state diploma as a caregiver assistant in 2007 and I had the opportunity to work in different establishments which allowed me to gain experience. On a daily basis, my main activities are hygiene and comfort care, I ensure the surveillance, the serving of meals and the maintenance of the rooms and the medical equipment. Finally, I assist the nurses when they carry out the care. I also attach great importance to listening and communicating with patients.

The institutions I have worked in and the patients I have cared for have been varied during my experience, which allows me to present my application.

I am currently working in a home for the elderly in St Maurice and would like to continue my career in an establishment like yours. My education and experience have given me the skills you are looking for in this position. I am highly motivated and efficient.

As you can see from my CV, I have a recognition of disabled worker status (RSWD). I have been severely deaf for about ten years, and I wear a hearing aid in both ears. My disability therefore has no impact on my professional practice. On the other hand, my job can enable a company to benefit from financial aid.

I hope that my application will attract your attention and that you will grant me an interview. Please accept, Madam or Sir, the assurances of my highest consideration.

M. MOREL

B. Additional results

Table B.2. Cox proportional hazard estimates of callbacks

Variables	(1) Administrative manager (male)		(2) Caregiver assistant (female)	
	coef.	st. error	coef.	st. error
<i>Pooled estimates</i>				
Disability	-0.219	(0.133)	-0.170*	(0.091)
North African	-0.264*	(0.150)	-0.328***	(0.106)
Priority neighborhood	0.170	(0.110)	0.009	(0.083)
Female	0.170	(0.113)		
Male			0.052	(0.097)
Control variables	YES		YES	
Number of observations	1,305		1,010	
Log pseudolikelihood	-1,895.9		-3,548.6	
<i>Estimates with public sector interaction</i>				
Disability	-0.381**	(0.188)	-0.148	(0.114)
North African	-0.470**	(0.213)	-0.268*	(0.137)
Priority neighborhood	0.221	(0.146)	0.151	(0.099)
Female	0.136	(0.150)		
Male			0.137	(0.124)
Disability x public sector	0.444	(0.278)	-0.085	(0.244)
North African x public sector	0.609*	(0.312)	-0.241	(0.230)
Priority neighborhood x public sector	-0.137	(0.245)	-0.505**	(0.223)
Female x public sector	0.151	(0.249)		
Male x public sector			-0.312	(0.212)
Control variables	YES		YES	
Number of observations	1,305		1,010	
Log pseudolikelihood	-1,893.8		-3,516.0	

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

Note: Estimates from Cox proportional hazard 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 B.3. Random effect estimates of callbacks

Variables	(1) Administrative manager (male)		(2) Caregiver assistant (female)	
	coef.	st. error	coef.	st. error
<i>Pooled estimates</i>				
Disability	-0.038*	(0.023)	-0.079**	(0.035)
North African	-0.049**	(0.025)	-0.143***	(0.039)
Priority neighborhood	0.032	(0.022)	-0.014	(0.033)
Female	0.030	(0.023)		
Male			-0.009	(0.039)
Control variables	YES		YES	
Number of observations	1,305		1,010	
R ²	0.102		0.079	
<i>Estimates with public sector interaction</i>				
Disability	-0.055**	(0.026)	-0.052	(0.042)
North African	-0.068**	(0.028)	-0.110**	(0.050)
Priority neighborhood	0.042	(0.026)	0.053	(0.037)
Female	0.026	(0.027)		
Male			0.049	(0.050)
Disability x public sector	0.073	(0.052)	-0.094	(0.081)
North African x public sector	0.087	(0.064)	-0.105	(0.078)
Priority neighborhood x public sector	-0.041	(0.053)	-0.209***	(0.077)
Female x public sector	0.025	(0.053)		
Male x public sector			-0.166**	(0.078)
Control variables	YES		YES	
Number of observations	1,305		1,010	
R ² (between)	0.197		0.166	

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

Note: Estimates from random effect regressions with standard errors clustered at the job ad level. Significance levels are 1% (***), 5% (**) and 10% (*). Control variables include the requirement for 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.

Chapter 3

The effects of disability benefits on the
employment of low-skilled youth:

Evidence from France³

³This chapter is based on a working paper co-authored with Sylvain Chareyron.

3.1 Introduction

Persons with disabilities are more likely to experience poverty and economic vulnerability (United Nations, 2019). Their impairment combined with the environment in which they find themselves can hinder access to or retention of employment, and thus deprive them of a reasonable income from work. This justifies the need for specific social protection measures for them. The 1948 Universal Declaration of Human Rights, the 1966 International Covenant on Economic, Social and Cultural Rights and the 2008 United Nations Convention on the Rights of Persons with Disabilities recognize their right to social protection.

Disability benefit is one of the social protection programs that address this need, motivated by a societal desire for equity and solidarity. It aims to compensate for the financial consequences of disability by ensuring that persons with disabilities receive a minimum of resources, thus improving their financial security. The amount disbursed is generally lower than the average wage of a full-time employee, an old-age pension or unemployment benefits. Unlike most social benefits, they are paid to people who are not always able to work, as disability can by its nature limit activity. In European Union member states, in 2018, disability benefits represented 7.6% of the total spend on social protection benefits (stable since 2010), making it one of the most important social protection programs¹.

The number of countries with a disability benefits program has steadily increased since the 1960s. According to the International Labour Organization (2014), 168 countries out of 183 (or 92%) surveyed in 2012-2013 have a disability benefits scheme enshrined in national legislation. While most of these schemes are contributory, some are non-contributory (means-tested, or universal) or even mixed, combining contributory and

¹Eurostat. "How much is spent on disability benefits in the EU?", December 3, 2020.

In the European Union, in 2017, social protection expenditures accounted for 28.1% of the GDP (Eurostat. "Expenditure on social protection", April 22, 2022).

non-contributory schemes. The difficulty in designing a program of disability benefits, therefore, is to find the balance between providing persons with disabilities the security of a minimum income but yet not creating an inactivity trap. However, the trade-off between income from work and income from disability benefits only applies to those whose ability to work is reduced but not totally lost. Severely disabled persons cannot respond to financial incentives since labor market income is out of their reach (Hanel, 2012; Maestas et al., 2013).

In recent years, the issue of disincentives to work due to receipt of disability benefits has become more salient with the increased availability of less physically demanding jobs (Autor et al., 2003) and the creation of new employment protections for workers with disabilities (e.g., requirements to hire a certain proportion of workers with disabilities, requirements on employers to adapt their workstations). Employment has thus become more accessible to persons with disabilities, which makes the question of the trade-off between income from benefits and income from work all the more germane. Moreover, the relative weight of disability benefits in social security programs is growing as the number of beneficiaries increases. The increase in the number of beneficiaries and therefore the greater ease with which these benefits can be accessed, is due in particular to the broader definition of disability, increased life expectancy and an aging population. In this regard, Mitra (2008) has provided evidence that the growth of disability benefits, in the case of South Africa, may partly explain the decline in employment of persons with disabilities. It is thus necessary to understand the effects of these benefits on the employment of recipients.

In France, disability benefits take the form of social insurance (disability pension) and social assistance (e.g. Allowance for Disabled Adults, in French *Allocation aux Adultes Handicapés*, hereafter AAH). The focus of this study is the AAH, a French income-tested non-contributory disability benefits program. It is defined by the International Labour Or-

ganization (2014) as a program that pays benefits to members of a vulnerable population (usually on a means-tested basis). Since no prior contribution is required, it is possible to avail of it from a young age without ever having worked - from the age of 20 (or even 16 if the individual is no longer dependent on their parents). Its amount, although lower than the French minimum wage, is however higher than *Revenu de Solidarité Active*, the French minimum income for the unemployed and for workers with very low labor income. To reduce the risk of an inactivity trap for those who are able to work and to facilitate the transition from these benefits to employment, the AAH has a special element in its design: every additional euro of income from work increases the total income, which sets it apart from other programs. It ensures that every additional euro of income from work leads to an increase in total income, which sets it apart from others disability benefits programs that often have a notch. Introducing incentives to work into the design of social minima has an ethical/social justice dimension: the need for promoting the insertion/reinsertion of individuals on labor market and avoiding assistance traps (Fleurbaey et al., 1999).

In many countries offering disability benefits programs that allow people to work while receiving them (e.g. in United States and Austria), beneficiaries lose some or all of their benefits if their earnings exceed a certain threshold. This creates a discontinuous step change in tax liability (a notch) which reduces the incentive to work (Kostøl & Mogstad, 2014; Ruh & Staubli, 2019) because it may encourage persons with disabilities to choose to keep their resources below this threshold. However, in France, the AAH has no such notch and earned income can supplement benefits for the first 6 months of work. After that period, a marginal tax rate on household income of 20% or 60% is applied. The disincentive to work should be relatively low in this configuration but part-time work may be preferred to full-time. Indeed, the United Nations recommends that countries provide disability benefits that can be combined with employment (full or part-time) in order to facilitate the integration of persons with disabilities into the workplace (United

Nations, 2019).

Our estimation strategy exploits a discontinuity in the eligibility conditions for AAH. Eligibility for the AAH starts at age 20 for most individuals. As argued by Hahn et al. (2001), the study of a policy discontinuity is more suitable than natural experiments based on policy changes over time to obtain a proper identification, as it is not necessary to control for changes in the economic environment. Bargain & Doorley (2017) also show that more traditional cross-sectional identification performs poorly compared to identification using an age discontinuity. The aim of our study is therefore to evaluate how receiving the AAH affects employment. The few studies on this topic that use regression discontinuity methods have used a discontinuity at a later age (Chen & Van der Klaauw, 2008; Müller & Boes, 2020). No evidence of the effect of disability benefits on the employment incentive of youth is available using this type of method. Since the AAH is attributable from age 20, we will study the effect of this allowance on the employment of youth with disabilities. Promoting the employment of youth, and especially youth with disabilities, is particularly important given their low employment rate. In fact, persons with disabilities have fewer opportunities to participate in the labor market than persons without disabilities and this is even more the case for transition-age youth. For instance, in 2020 in France, 8% of 15-24 years old with disabilities were employed compared to 28.5% for non-disabled youth of the same age². We focus on low-skilled youth with disabilities³ (with a level of education lower than the *baccalauréat*) because it is expected that financial incentives will elicit a higher response from them. The wage they could obtain is distinctly lower than that of more educated individuals and so, is more directly comparable with disability benefits. Indeed, the literature has shown that the response by low-skilled youth to financial incentives is strongly significant (Meghir & Phillips, 2010; Lemieux & Milligan, 2008; Bargain &

²INSEE. "Emploi, chômage, revenus du travail - Travail, santé et handicap", INSEE références, édition 2021.

³In reality, we are interested in youth with little or no qualifications but for the sake of simplicity we refer to "low-skilled" youth with disabilities.

Doorley, 2011).

Our main contributions are threefold. The first original aspect of our study is the examination of an original disability benefits program that does not contain a notch (and therefore should not have a strong disincentive to work) and that can be availed of by adults with disabilities from a very young age (since there are no employment and contribution requirements). The second originality is that we use a discontinuity regression method to explore the impacts of a young age discontinuity in eligibility in this disability benefits program. We believe that it allows us to identify in a particularly credible way the effect of the AAH on employment. Thirdly, this article is also innovative in that it examines employment incentives for youth with disabilities. Previous studies have focused more on the population of persons with disabilities over the age of 45.

Our results indicate that AAH reduces labor market participation of low-skilled youth with disabilities. Benefiting from AAH reduces by 27.5 percentage points the probability that they will be in employment. This relatively large effect suggests that the absence of a notch in the French program is not sufficient to eliminate the work disincentive. This effect, while high, is consistent with results in the literature on the effect of disability benefits on the employment of its recipients, but higher than that of similar programs for the non-disabled. This effect is particularly strong for women, who are known to have important labor supply elasticities (Eissa & Liebman, 1996; Piketty, 1998; Briard, 2020) with a reduction of 45 percentage points in their probability to be in employment. The effect is also more important for low-skilled youth with a low level of activity limitation than for those with a high level of activity limitation. This confirms the presence of heterogeneous elasticity across different groups. Focusing on working-time for employed women, we find also that the program increases their likelihood of working part-time by 36.5 percentage points.

3.2 Literature review

The literature on the effects of disability benefits programs on the employment of beneficiaries is important and has been growing steadily in recent years, as evidenced in particular by the survey of Dal Bianco (2019). Numerous studies have shown that beneficiaries tend to have reduced labor market participation and earnings (Bound, 1989; Campolieti, 2001; Chen & Van der Klaauw, 2008; Maestas et al., 2013; French & Song, 2014; Autor et al., 2015, 2016; Gelber et al., 2017). The negative effect is strong, ranging from a 6 to 28 percentage points drop in the probability of employment following the receipt of disability benefits. The few studies that have examined the heterogeneity of these effects have shown that in reality, this negative effect mainly concerns women, youth (in a broad sense), poorly-educated people and persons with a rather low level of disability (French & Song, 2014; Müller & Boes, 2020; Hahn et al., 2001; Maestas et al., 2013; Ruh & Staubli, 2019; Kostøl & Mogstad, 2014).

Most of these studies focus on disability insurance, which is a contributory disability benefit, although a few papers have examined the effects of the Supplemental Security Income (SSI)⁴ on employment (Muller et al., 1996; Hemmeter, 2014; Thornton, 1998). Moreover, the effects of these benefits on women's employment have been little studied (Kostøl & Mogstad, 2014; Ruh & Staubli, 2019; Müller & Boes, 2020; Campolieti, 2001).

Very few studies specifically look at these effects on youth with disabilities, and when they do, they take a fairly broad definition of the young population (those under 40 from a population of 18-60 years old) (Kostøl & Mogstad, 2014; Müller & Boes, 2020; Ruh & Staubli, 2019; Maestas et al., 2013; Von Wachter et al., 2011).

Yet the stakes involved in understanding the effects of these benefits on disabled youth are very high, especially since the transition from school to work is more complicated for them (Taylor et al., 2021). They are also more likely to be neither employed, nor in

⁴The SSI is the American non-contributory means-tested disability benefits program for children with disabilities, young adults with disabilities and the elderly.

training, nor in school (Mauro & Mitra, 2020). Moreover, the underemployment of this population is particularly costly to them and to society because it can lead to financial insecurity, poor health and loss of productive potential for the economy (Quintini & Martin, 2014). The likelihood that they will stay in the program for a long time is also high since they joined the program at a young age (Cai, 2006), especially if they are low skilled (Muller et al., 1996), incurring a high cost for public spending. Moreover, the exclusion of low-skilled youth from the labor market has a severely negative impact on their future professional careers, with a greater likelihood of earning low wages and having few hours of work (Ghirelli, 2015).

To analyze the effect of disability benefits on employment, many studies have used the method suggested by Bound (1989): a comparison group approach with a control group comprised of rejected disability benefit applicants. Only a few studies have used discontinuity in the eligibility criteria for this purpose, and when they did, they studied the effects of this discontinuity on older beneficiaries (over 45 years) (Chen & Van der Klaauw, 2008; Müller & Boes, 2020). Very few address the effect of disability programs on youth. Using merged survey data and administrative data for the 1990s, Chen & Van der Klaauw (2008) have exploited the fuzzy discontinuity in the disability insurance allocation scheme in the United States generated by the program's eligibility rules for "marginal applicants" to explore the impacts on beneficiaries at ages 45, 50 and 55. These applicants are those for whom occupational factors (age, education, work experience, etc.) need to be considered, in addition to medical factors, in the decision to award disability insurance because of the difficulty in assessing their health status. The study finds that in the absence of the disability insurance, the employment rate of this group would have been 6-12 percentage points higher and their monthly work hours 16-20 hours higher in the long term.

Müller & Boes (2020) exploited a discontinuity in the disability insurance allocation in

Switzerland that occurs at age 56, applying in particular a fuzzy regression discontinuity. A common practice of disability insurance offices is to use the age of claimants as a key factor in benefit allocation (individuals aged 56 or older being more likely to receive these benefits). Their study shows that being in receipt of these benefits decreases the probability of having full-time work (by about 35 percentage points), increases the probability of working part time (by about 32 percentage points) but has almost no effect on being active or inactive. These effects are heterogeneous, however, as the shift from full-time to part-time is more likely to be found among men, relatively able recipients, and those with middle to high incomes, while the shift from active to inactive is more likely to be found among women, less able recipients, and those with low incomes.

Another related study, although not one based on an eligibility-based discontinuity, is by Kostøl & Mogstad (2014). They exploit a temporal discontinuity in the Norwegian disability insurance program to investigate whether financial incentives affect the labor supply of recipients. Their study shows that older recipients approaching retirement age do not respond significantly to these incentives, unlike those in the prime of their lives (aged of 18-49 years old). Thus, they find that many recipients have considerable ability to work that can be effectively encouraged by financial incentives to work. These incentives would lead to an increase in their income and a reduction in program costs.

3.3 Background

3.3.1 Institutional background

The *Allocation aux Adultes Handicapés* (AAH) is a French social benefit that ensures a minimum income for persons with disabilities. It was created by the law *D'Orientation en Faveur des Personnes Handicapées*, June 30, 1975⁵. In 2018, 9.71 billion euros were spent

⁵Orientation in Favour of Persons with Disabilities, June 30, 1975.

on the AAH out of the total 742.11 billion euros spent on social protection benefits⁶. In France in terms of the number of recipients, the AAH is the first financial support for persons with disabilities and the second largest minimum social benefit behind the *Revenu de Solidarité Active* with 1.24 million beneficiaries at the end of 2020 against 1.22 million at the end of 2019⁷. With the number of recipients having increased since its creation in 1975, these benefits are likely to weigh more and more heavily on public spending. It is therefore important that these benefits, while ensuring a livable minimum income for persons with disabilities, encourage them to seek work or to remain in the employment they have.

The amount of the AAH is below the monetary poverty threshold, set at 60% of median income. As of November 1, 2019, the AAH amounted to 900 euros per month for a single person without children, while the poverty line was 1,102 euros per month⁸.

This means-tested benefit is claimed by filling in an application form and sending it to the MDPH located in the applicant's area of residence. If the request is accepted by the CDAPH, the benefit is granted for a period ranging from one year to permanently depending on the level of impairment⁹. In case of professional activity in a mainstream work environment, a declaration of resources must be sent quarterly so that the amount of the benefit can be calculated by the *Caissees d'Allocations Familiales* (CAF) or the *Mutualité Sociale Agricole* (MSA), the paying agencies.

To benefit from this financial aid, two types of conditions must be met. First, there

⁶Drees. "La protection sociale en France et en Europe en 2018 - Résultats des comptes de la protection sociale", édition 2020.

⁷Drees. "Minima Sociaux et Prestations Sociales - Ménages aux Revenus Modestes et Redistribution", édition 2021.

⁸INSEE. "En 2019, le niveau de vie médian augmente nettement et le taux de pauvreté diminue", INSEE première, n°1875, octobre 2021.

⁹AAH is paid for a minimum period of 1 year. For beneficiaries whose level of disability is between 50% and 79%, the maximum duration of allocation is 2 years if the CDAPH believes that their incapacity can improve during this period, and 5 years otherwise. In any case, it ceases to be paid from the legal retirement age. On the other hand, for those with a level of disability of at least 80%, it is granted for a maximum of 20 years if it is believed that their activity limitation can improve (the maximum was 10 years before 2017), and otherwise for life.

are health conditions which are examined by the CDAPH. The MDPH's multidisciplinary team attribute a level of disability according to a guide scale (*guide-barème*)¹⁰, which is used by the CDAPH as a basis for deciding on the allocation of the AAH. The applicant must have a long-term disability with an activity restriction of 80% or between 50% and 79% for the CDAPH to recognize that the applicant has substantial and lasting limitations in accessing employment due to his or her disability¹¹.

Administrative conditions must also be met and are reviewed by the paying agencies. The applicant must reside in France¹² and be at least 20 years old (or at least 16 years old if he or she is living independently of his or her parents). The amount of the AAH depends on the applicant's family situation: marital status, household resources and number of children.

Figure 3.1 summarizes in a simplified manner the conditions to be met in order to benefit from the AAH, provided that the conditions of residence are respected.

Except in specific cases, the family's non-salaried resources are deducted from the amount of the benefit. The amount of the benefit is also calculated according to the amount of the household's professional income¹³.

Under certain conditions, particularly in terms of total income and/or level of disability, the AAH can be combined with various benefits (such as the *Revenu de Solidarité Active*, work bonus, disability compensation benefit and disability pension). It can also be combined with income from work. In details, earned income can be combined with AAH benefits for the six first months of work (which corresponds to an abatement rate of 100%). After this period, work income are deducted from the allowance with an abate-

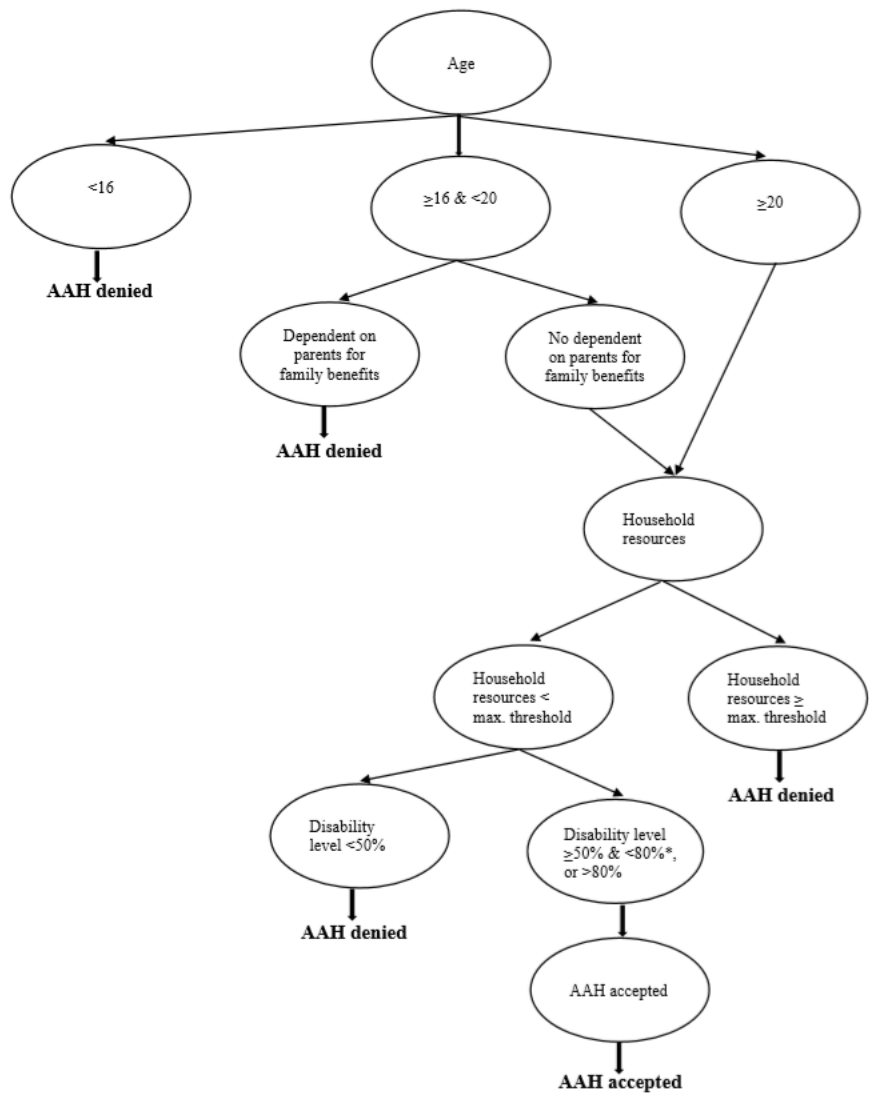
¹⁰Appendix 2-4 of the French Social Action and Family Code.

¹¹The restriction is considered substantial if the difficulties encountered in accessing employment are significant and cannot be compensated for (e.g. with workstation adjustments), and lasting if its foreseeable duration is at least one year from the date the AAH application is submitted.

¹²In metropolitan France or in certain departments or communities (Guadeloupe, French Guiana, Martinique, Reunion, Saint-Barthélemy, Saint-Martin or Saint-Pierre-et-Miquelon). For foreigners, it is necessary to be a legal resident for at least 3 months, except if they have a professional activity.

¹³The net income of the household of the year before last (N-2) is taken into account.

Figure 3.1. Conditions for receiving the AAH



Note: *If the level of disability is between 50% and 79%, there must also be substantial and lasting restriction on access to employment.

ment mechanism when the individual works in a mainstream environment: it is then a "differential AAH". The abatement rate, i.e. the marginal tax rate, depends on the amounts earned: 80 % below 30% of the gross monthly minimum wage¹⁴ (i.e. 20% of the income will be taken into account to reduce the amount of the AAH) and 40% above

¹⁴In 2019, the gross monthly minimum wage was €1,521.22. 30% of this amount then corresponds to approximately €456.

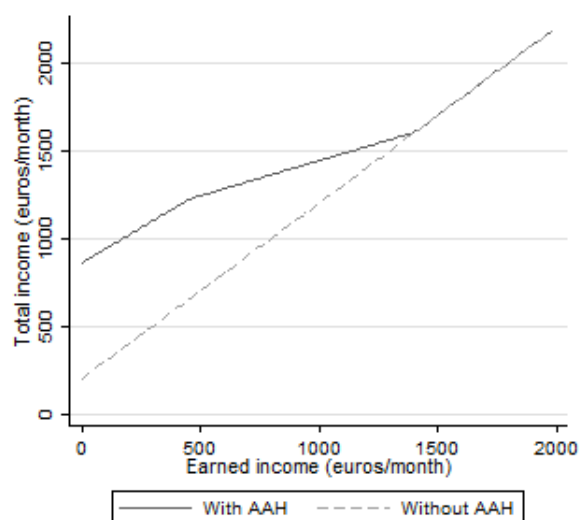
(i.e. 60% of the income will be taken into account to reduce the amount of the AAH). If beneficiaries have other resources than AAH, this benefit is paid at a reduced rate.

The following formula shows the situation for a single person without children:

$$\begin{aligned} \text{Total income} = \text{earned income} + \text{AAH} - 20\% \times \text{earned income} \leq \text{€}456 \\ - 60\% \times (\text{earned income} > \text{€}456 - 456) \quad (3.1) \end{aligned}$$

Figure 3.2 presents the budget constraint of a single individual without children. The dashed line corresponds to his/her budget constraint when he/she cannot benefit from AAH (before age 20 for most individuals) and the solid line to his/her budget constraint with AAH¹⁵. It is possible to observe that there is no configuration for which the increase in earned income does not correspond to an increase in total income.

Figure 3.2. Total income with and without AAH



Note: April 2019 AAH amounts are used. The figure corresponds to the budget constraint of a single individual without children. Without AAH (before age 20), the individual receives income from work + €200 of housing allowance.

¹⁵The budget constraint with AAH corresponds to the situation where the initial 6-months abatement rate of 100% has ended.

Despite the absence of a notch, the expected effect of the AAH on employment is negative compared to a situation without disability benefits. The AAH could negatively impact the labor supply by having a disincentive effect on employment since by providing an income to its beneficiaries, they could decide to favor leisure over work (income effect). The disincentive effect could also be due to a reduction in the marginal gain from working an extra hour, from 1 in the absence of the program to 0.6 or 0.8 with AAH (substitution effect). The effect could be on the extensive and/or intensive margin. Depending on their utility function, beneficiaries might decide not to work because AAH provides them with a minimum level of income, whereas they would have had to work without the benefit of the program to obtain this level of income. They might also decide to work less while remaining employed. Therefore, in a discrete setting, we expect a negative effect of the program on employment but possibly an increase in part-time employment for those who are employed. The prevalence of part-time work among persons with disabilities (Pagan, 2007) is largely explained by their health status (Schur, 2003). Working part-time could indeed allow to adjust the job to the disability (medical appointments, necessary rest, etc.)

3.3.2 The specifics of low-skilled youth with disabilities

In France, after primary education, students enter secondary education around the age of 11. Secondary education is divided into two cycles. The first cycle of secondary education corresponds to the *collège*. At the end of *collège*, around the age of 16, students pass the *brevet national* exam¹⁶. Then, they can enter the second cycle of secondary education. Students can choose to integrate the vocational track, at the end of which is passed the CAP (*Certificat d'Aptitude Professionnelle*) or the BEP (*Brevet d'Études Professionnelles*) certificates between the ages of 16 and 17. Otherwise, they can choose to go to the

¹⁶Today, this diploma has little/no value and is not required to integrate high school.

general track or the technological track which ends with the national examination of the *Baccalauréat* (generally at 18 years old). Since obtaining the *Baccalauréat* diploma generally conditions access to higher education (such as university), it is therefore considered in our study as a high level of graduation.

School is compulsory until the age of 16 (with a compulsory training until the age of 18 since the start of the 2020 school year). In terms of schooling, this is the age when students are in their last year of *collège* where the *brevet* diploma is passed, or even in their first year of high school. The legal working age is also set at 16 years old. However, the employment of non-emancipated minors is conditioned to the authorization of their legal representatives. Moreover, the exercise of certain professional activities are forbidden to them (in particular those involving risks for their health or their safety).

In our study, we only consider low-skilled youth with disabilities, who are between 18 and 25 years old and who have no more than a CAP or BEP certificate. These exams are theoretically passed between the ages of 16 and 17, so even though they repeat a year, which is quite common, they are theoretically available for work at age 18.

Low-skilled workers have a lower reservation wage than skilled workers and are less attached to the labor market, making their job search costs greater (Bargain & Doorley, 2017). When they have disabilities, they combine three factors that can penalize them in accessing employment: their age (and therefore generally their lack of experience), their disability and their low level of education. Their low employment rate was further reduced following the financial crisis of 2008 and the great recession. Their non-employment has a social cost (poverty, lack of inclusion, feeling of abandonment), but also an important economic cost given the potential loss of human capital and social benefits that will potentially be granted to them (such as the AAH). Generally, because of their age, they have not worked (or not worked enough) and are therefore not entitled to unemployment benefits or any other social minimum than the AAH.

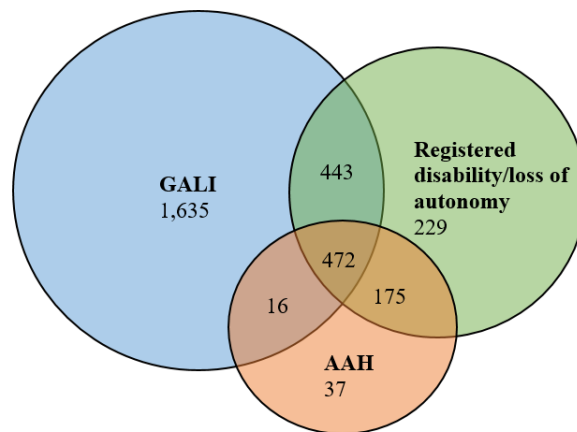
3.4 Data and sample selection

We use data from the French Labor Force Survey (LFS) conducted each year in France by the National Institute of Statistics and Economic Studies (*Institut National de la Statistique et des Études Économiques*, INSEE). This survey is designed to collect information on individuals aged 15 years old and over, living in various groups of approximately 20 adjacent dwellings. A random selection of ordinary dwellings is made and all inhabitants over 15 years old living in the same dwelling are interviewed. Data recorded in the survey are multipurpose. This survey collects information on labor market status (employment, unemployment and inactivity as defined by the ILO), occupational activities, education, social benefits, geographic and social origin, health, and individual, household and housing characteristics. Our study focuses on pooled data over the period 2013-2019. Since 2013, information on social benefits and health, and in particular on the disability status of individuals, has been collected. We restrict our sample to individuals with disabilities who are therefore potentially eligible to benefit from the AAH program. More precisely, we restrict the sample to individuals who are either: *i*) limited by a health problem for at least six months in the activities that they usually do (the survey options being ‘strongly limited’, ‘limited but not strongly’ or ‘not limited’), *ii*) registered administratively as disabled or as having a loss of autonomy (the survey options being ‘yes’, ‘request in progress’ or ‘no’), *iii*) recipient of the AAH (the survey options being ‘yes’ or ‘no’).

The first variable used to assess disability is the Global Activity Limitation Indicator (GALI). GALI is considered to be a relevant, valid and reliable overall indicator of disability (Van Oyen et al., 2006; Jagger et al., 2010; Berger et al., 2015; Van Oyen et al., 2018; Dauphin & Eideliman, 2021). Widely used in Europe in various surveys, it allows several aspects of disability to be combined in a single question. However, since GALI is a self-reporting indicator it may be subject to reporting bias. In addition, because the question is quite long and broad, it may be interpreted differently by different respondents. Thus,

in order to identify the disabled population as well as possible, we also take a frequently used administrative variable into account (in addition to the AAH): the administrative registration of disability/loss of autonomy¹⁷. The use of these different indicators is justified by the complexity of the nature of disability and allows us to approach disability in different ways, since not all individuals respond to all three indicators in the same way or at the same time¹⁸ as shown in Figure 3.3.

Figure 3.3. Respondents aged 18-25 identified as potentially having a disability based on the indicators used



Note: This figure reports numbers of observations in our sample by the disability variable(s) considered.
Source: French Labor Force Surveys 2013-2019.

We also consider individuals with a level of education lower than *baccalauréat* diploma. Thus, the highest level of diploma included is the CAP or the BEP which are vocational qualification certificates. There are two main reasons for this choice. Firstly, low-skilled individuals are expected to be more sensitive to financial incentive. The wage that they could receive tends to be lower than for individuals with a higher level of education and is

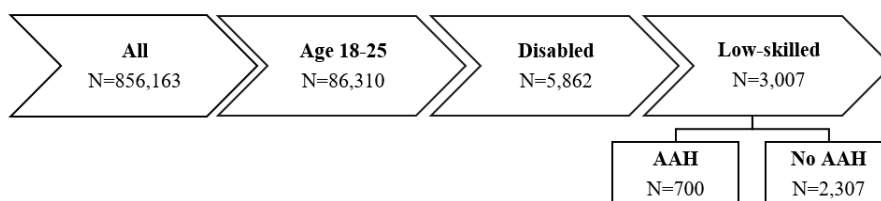
¹⁷We do not take into account the individuals who have not responded to the questions about the GALI, the AAH or the administrative recognition of a disability (i.e. when they do not answer, or declare not to know about the GALI or the registration of disability/loss of autonomy, or when their application for registration is pending).

¹⁸37 individuals declare having the AAH without having an activity limitation or a registered disability. Since GALI is a declarative and subjective variable, a disabled person receiving the AAH may, for example, consider that he/she has no limitation of activity or restriction of participation in society because his/her environment is adapted. Conversely, he/she may could have a low level of disability but feel strongly limited.

in more direct competition with social allowances. Restricting the sample to low-skilled individuals with less than a *baccalauréat* diploma also ensures that they are available for work after age 18. Finally, we focus on individuals aged between 18 and 25. We made this decision because, although people may work from age 16 onwards and we focus on young people with little education, some may still be in school between 16 and 18. For example, the CAP and BEP certificates are usually awarded between the ages of 16 and 17 but repeating a school year is not uncommon in France, so it is more prudent to limit the sample to those over 18. The upper limit of 25 years is chosen arbitrarily but we performed sensitivity analysis on the age window as explained below.

In total, our sample consists of 3,007 individuals, including 700 AAH recipients and 2,307 non-AAH recipients.

Figure 3.4. Sample selection



Source: French Labor Force Surveys 2013-2019.

3.5 Empirical strategy

We exploit the age discontinuity in the AAH eligibility to instrument the effect of the allowance on labor supply using a fuzzy regression discontinuity method. The objective is therefore to find out if there is a significant increase in the uptake of this AAH by youth with disabilities at the age of 20 and if there is, if the AAH has an effect on the probability of employment of its beneficiaries. This corresponds to a fuzzy *Regression Discontinuity Design* (RDD). Indeed, even if age is perfectly measured, there is some

discrepancy around the discontinuity since it is possible to receive the AAH before age 20 under certain conditions. Because the first and second stages have binary outcomes, an approach using nonlinear instrumental variables appears to be the most appropriate one (Ozier, 2018). We estimate a bivariate probit. This approach explicitly models endogeneity through the correlation between the residuals of the two equations. The following equations are estimated:

$$Y_{ia} = 1 \quad \text{if } \alpha + \beta \cdot D_{ia} + f(t) + \phi X_{ia} + \epsilon_{ia} > 0$$

$$= 0 \quad \text{otherwise}$$

$$D_{ia} = 1 \quad \text{if } \gamma + \delta T20_{ia} + g(t) + \Phi X_{ia} + \mu_{ia} > 0$$

$$= 0 \quad \text{otherwise}$$

With Y_{ia} the employment outcome of individual i at age a , $T20_{ia}$ indicates whether the individual is over 20 years old and is in consequence eligible for AAH and D_{ia} indicates whether he/she benefits from the allowance.

X_{ia} is a set of controls (gender, nationality, the *département*¹⁹ of residence of the individual and the year and quarter of the survey)²⁰. As indicated by Lee & Lemieux (2010), if the RD design is valid, it is not necessary to include the controls to obtain consistent estimates of the treatment effect. Covariates only reduce the sampling variability and thus increase the precision of the estimates. For example, because the unemployment rate varies substantially across *départements*, we can increase the precision of the estimates by including *départements* fixed effects.

¹⁹In France a *département* is a geographical and administrative unit that can be thought of as a county. There are 101 of them with an average population of about 660,000 inhabitants.

²⁰As indicated by Lee & Lemieux (2010), time dummies can be treated like any other baseline covariate in an RDD setting.

$f(\cdot)$ and $g(\cdot)$ are polynomials of age centered around 20 years. ϵ_{ia} and μ_{ia} are random errors. β captures the treatment effect and δ the intent-to-treat (ITT). δ captures the fuzziness of the RDD: the lower the δ , the fuzzier the design and the greater the discrepancy between ITT and the treatment effects. In fact, $\delta = 1$ would mean that the discontinuity is perfectly related to the benefit of the AAH which corresponds to a sharp RDD. In our case, the relationship is not deterministic since it is possible to receive the AAH before age 20 under certain conditions. The underlying identifying assumption is that $f(\cdot)$ is a smooth continuous function of the running variable age. The main argument for assuming that $f(\cdot)$ is a smooth function is that employment or work hours typically exhibit regular age profiles. As advocated by Lemieux & Milligan (2008), $f(\cdot)$ should be flexible enough to accommodate non-linearities in the age profiles, but there is no reason – based on human capital or related theories of behavior over the life cycle and given the absence of particular fiscal or labor market policies – to expect an abrupt change at a particular age like 20 or 25. The running variable is the age measured by quarter. Although age is available in days, we believe that it is unlikely that any response to the treatment would occur at this temporal level. In consequence, the running variable is discrete and we use a parametric form for the function $f(\cdot)$ (Lee & Lemieux, 2010). Different parametric forms are used for the function $f(\cdot)$ (quadratic, cubic and then linear splines, i.e. with different slopes on each side of the discontinuity).

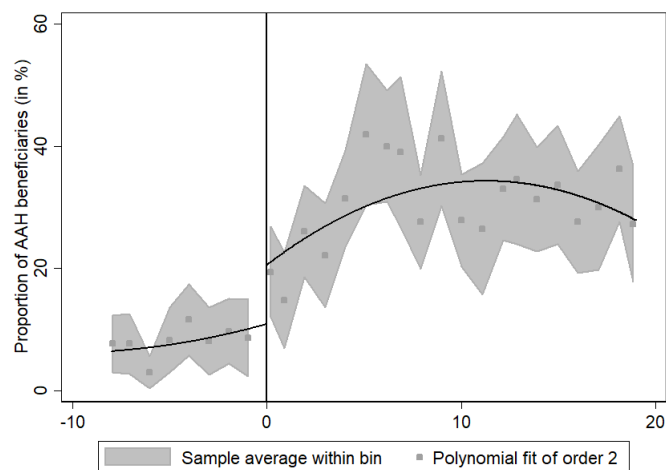
3.6 Results

3.6.1 Graphical analysis

Figure 3.5 plots the relationship between age in a quarter and the proportion of low-skilled youth with disabilities that benefit from AAH. We observe a sharp increase in the proportion of beneficiaries at age 20 when most people become eligible for the AAH. Some

people may have been eligible before age 20 if they were no longer dependent on their family, which explains why the proportion of beneficiaries below this age was low but not null. After age 20, the proportion of youth with disabilities who are AAH beneficiaries jumps to about 30%. There are various reasons to explain why this proportion remains far from 100%. Our sample is restricted to people who have some minimum level of health limitations and therefore potentially meet the eligibility criteria for AAH. However, we cannot be sure that they are all eligible because we do not have exactly the exact information that would be used to determine eligibility for AAH. For example, the degree of disability of respondents is not known. Also, they may not be eligible because their earned income is too high. It is also possible that some of these people are eligible but choose not to avail of the AAH program. The non-take-up phenomenon has been observed in many means-tested programs (Chareyron & Domingues, 2018).

Figure 3.5. Proportion of low-skilled youth with disabilities that benefit from AAH



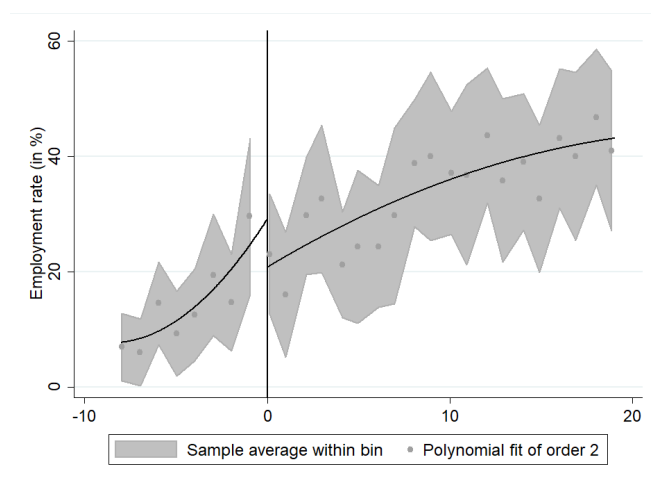
Note: 0 represents the first quarter of age 20. Shaded areas correspond to 99% confidence intervals.

Source: French Labor Force Surveys 2013-2019.

Figure 3.6 shows the relationship between age and employment rate. Again, there is a clearly visible discontinuity at age 20 with a distinct drop in the employment rate after this cut-off. Except for this discontinuity, there appears to be an upward trend in the

employment rate throughout this age window. This is consistent with the well-known concave relationship between labor market variables, such as employment and earnings, and age (Mincer, 1974).

Figure 3.6. Employment rate of low-skilled youth with disabilities

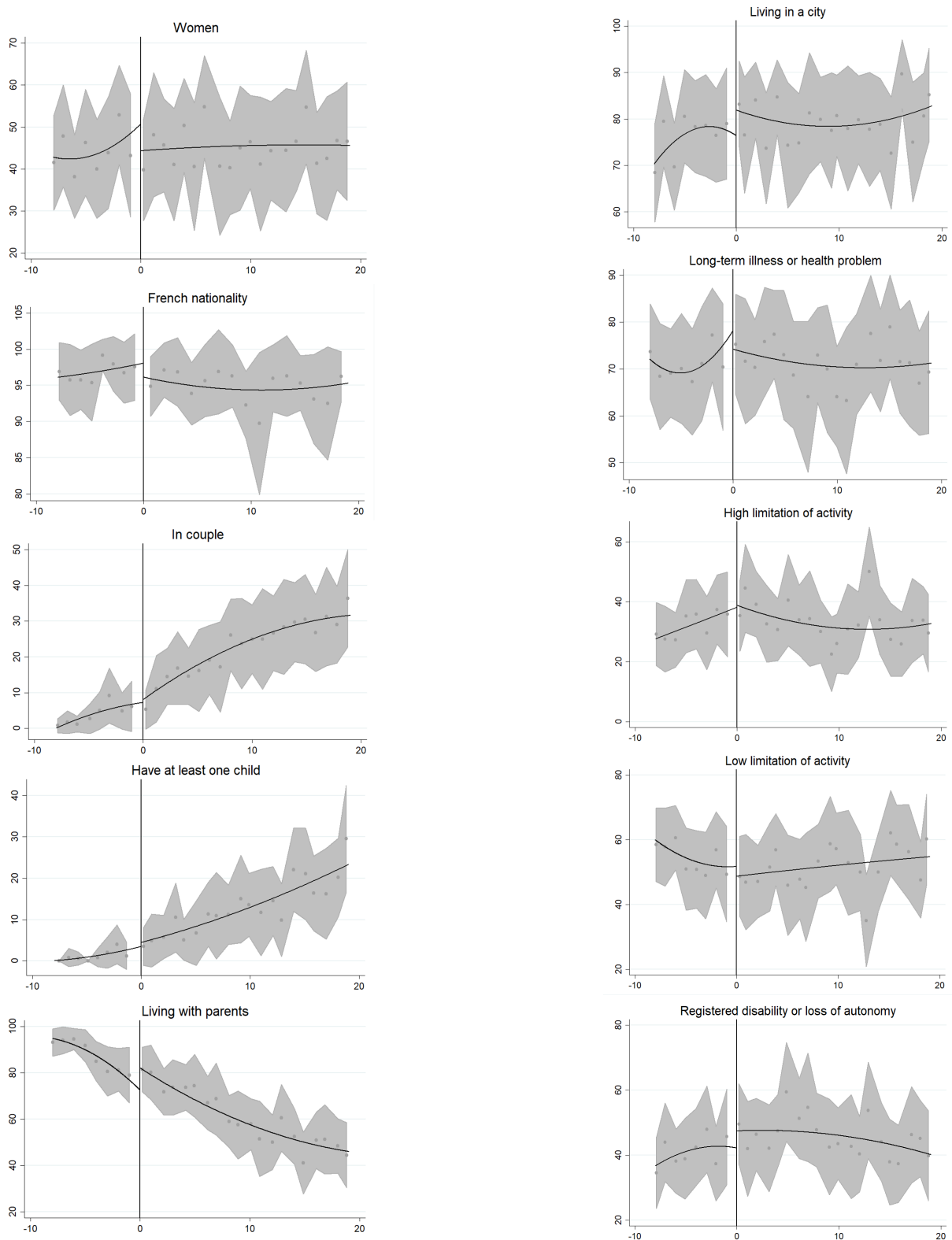


Note: 0 represents the first quarter of age 20. Shaded areas correspond to 99% confidence intervals.

Source: French Labor Force Surveys 2013-2019.

Finally, in Figure 3.7, we present the evolution of some individual characteristics around age 20. Since we assume that people under age 20 are a good counterfactual for people over age 20, there should be no discontinuity in the variables other than those potentially affected by the disability benefits. In consequence, we plot the evolution of the proportion of women, French citizens, people living in a city, in a relationship, having at least a child, living with parents, with low and high limitation of activity, with a registered disability, and people with chronic illness. There appears to be no discontinuity at age 20 for these variables. This is reassuring for the assumption we made about the smoothness of the $f(\cdot)$ function. Nevertheless, we include some control variables in our regressions to increase the precision of the estimates.

Figure 3.7. Individual characteristics by age



Note: The figure displays individual characteristics by age in quarter. 0 represents the first quarter of age 20. Shaded areas correspond to 99% confidence intervals.

Source: French Labor Force Surveys 2013-2019.

3.6.2 Main results

Results of the estimates of equations (1) and (2) are presented in Table 3.1. Columns (1) and (2) present the estimates of the effect of the discontinuity (at age 20) on the probability of benefiting from the AAH and columns (3) and (4) present the estimates of the effect of benefiting from the AAH on the probability of employment, with or without control variables. The main estimates are conducted on low-skilled youth with disabilities between the ages of 18 and 25. In the lower part of the table, we present estimates on varying age windows by restricting alternatively the sample to youth below 22, 23 and 24 years old.

The results of the first and second stages are quite stable regardless of the parametric specifications of the function $f(\cdot)$. The signs of the estimated effects do not vary with the specification of the $f(\cdot)$ function used. The magnitude of the estimated effects of the second stage tends to decrease slightly and become less significant with the linear spline polynomial. We observe that the addition of controls strongly increases the precision of the estimates. Indeed, there is probably a relatively large variation in employment by location that leads to discrepancies and low precision if not controlled for. Among the different specifications, we choose to favor the linear spline which is the form advised by Lee & Lemieux (2010) because it gives the most conservative effect. The results of the second stage are slightly sensitive to the age windows under consideration. When the sample is restricted to individuals under the age of 22, the effect of AAH on employment is no longer significant, and this is also the case for individuals under the age of 24 when no controls effects are included.

Regarding the second stage, the results indicate that benefiting from the AAH decreases the probability of employment by about 27.5 percentage points. This result appears to be within the range of the findings in previous studies. Using the Bound method, Maestas et al. (2013) found that receipt of the Social Security Disability Insurance (SSDI,

the disability insurance program in the United States) is associated with a drop in employment of approximately 28 percentage points in the two years after the initial determination. Chen & Van der Klaauw (2008) found relatively large variations in the estimated effect depending on the method and population considered. They found a reduction of less than 20 percentage points in labor force participation using the Bound approach. They found a smaller response of 6-12 percentage points when a regression discontinuity approach was used on a group of ‘marginal’ applicants whose medical condition is more difficult to assess and whose disability determination is based on vocational factors. In consequence, the negative employment effect of the AAH, although not notched and providing an income gain for each additional euro earned in wages, appears substantial and not much smaller than the effect of notched programs. It should be noted, however, that this effect is found for a low-skilled young population who are likely to be particularly sensitive to incentives.

In any case, these results indicate that the absence of a notch in the French disability benefits program is not sufficient to eliminate the work disincentive. This is a different conclusion than the one obtained for the general French minimum income program, where notches were eliminated in a new program design (Bargain & Doorley, 2011) thereby removing the effect of a slight disincentive to work among low-educated youth that existed in the old program (Bargain & Vicard, 2014). This difference could be explained by the specificities of the population with disabilities which could induce a more persistent inactivity trap than for the non-disabled population. Indeed, the weakness of the inactivity trap phenomenon obtained for the non-disabled population can be explained by the presence of social pressures that make employment a norm to reach, even if the financial gains it brings are low. This type of phenomenon may be less present for persons with disabilities for whom the social norms regarding employment are different. Moreover, the wages of the low-skilled are more competitive with the minimum social benefits, knowing

that the population with disabilities is on average rather low-skilled. They could therefore be more concerned by the trade-off between receiving minimum benefits and income from work.

Table 3.1. RDD estimates of the effect of AAH on employment of low-skilled youth with disabilities

	First stage: AAH recipient		Second stage: employment	
	(1)	(2)	(3)	(4)
Polynomial specification for age				
Quadratic	0.118** (0.042)	0.121** (0.040)	-0.330* (0.171)	-0.335*** (0.069)
Cubic	0.124*** (0.036)	0.125*** (0.037)	-0.339* (0.170)	-0.339*** (0.071)
Linear Spline	0.180*** (0.035)	0.175*** (0.034)	-0.226 (0.169)	-0.275** (0.096)
N. Obs.	3,007	3,007	3,007	3,007
Linear Spline with age below				
Age<22	0.075** (0.025)	0.081*** (0.021)	-0.307 (0.243)	-0.218 (0.436)
Age<23	0.137*** (0.032)	0.138*** (0.035)	-0.321** (0.149)	-0.367*** (0.111)
Age<24	0.159*** (0.034)	0.154*** (0.034)	-0.259 (0.166)	-0.307** (0.099)
Controls	NO	YES	NO	YES

Note: *p<0.1; **p<0.05; ***p<0.01. Average marginal effects are presented. Standard errors clustered at age in quarter are in parentheses. Controls are: year and quarter of the survey, gender, nationality and *département* of residence of the individual.

Source: French Labor Force Surveys 2013-2019.

3.6.3 Robustness

Labor market policies

To our knowledge, no minimum social benefit or other financial aid compete with the AAH at age 20, so there would be no trade-off between the AAH and financial aid. Nevertheless, it is interesting to know the range of labor market policies governing the employment of youth with disabilities that affect labor supply but also labor demand. We are therefore interested in youth employment public policies, especially those targeting youth with low or no qualifications and persons with disabilities.

First of all, on the labor supply side, youth can benefit from several types of assisted contracts in the form of work-study programs which include apprenticeship contracts and work initiation contracts. Most of these contracts are open to youth between the ages of 16 and 25 with little or no qualifications, with the aim of helping those unemployed who have social and professional difficulties in finding a job. In addition, hiring them under these contracts allows employers to benefit from financial aid and/or a reduction in social security contributions.

Persons with disabilities, especially youth, can also benefit from specific assistance in the labor market. First of all, they can benefit from vocational training support (e.g. additional aid for training and education with remuneration being maintained during training). They can also benefit from employment assistance (e.g. human and/or material assistance to compensate for their disability).

Employers, and in particular private employers subject to the French employment quota of disabled workers, can also benefit from financial aid when they hire disabled workers (e.g. aid for the reception, integration and professional development of these workers and aid for the adaptation of their work environments). However, this employment quota obligation and these financial supports are not conditional on being over 20 years old. For example, the official disabled worker status which qualifies a person for

inclusion in the employment quota of disabled workers is accessible to people over 16 years old, the legal working age.

Manipulation effect

One element for the RDD to be valid is that the aggregate distribution of the assignment variable must be continuous around the cut-off.

As stated previously, it is unlikely that the validity of our results could be questioned based on sample selection, since our sample comprises low-skilled youth and, for most people, the level of diploma attained is generally decided before age 20. Another concern could be the possibility of people falsifying their date of birth in the application to gain the AAH benefit (i.e. people aged 19 claiming to be 20 in order to access AAH). This is unlikely, however, since verification is relatively easy for the French authorities.

We can, however, confirm that the density of the running variable is not affected by the discontinuity. Figure C1 presents the estimated densities of the running variable from local polynomial regression for the two years before and after the cut-off. We observe no graphical evidence of manipulation of the running variable. An equal number of individuals (81) have one quarter more than 20 years old as those who have one quarter less than 20 years old. The McCrary test confirms the absence of a manipulation effect: the null hypothesis that the density of age is the same just above and below the cut-off cannot be rejected with a p-value of 0.99.

In addition, we decided to retain in our sample those individuals still in education so as to avoid reducing our sample (529 individuals concerned, including 39 AAH recipients). As a robustness check, we reran our estimates by removing these observations. The main results - i.e. those in column 4 - remained similar (Table C1 in appendix), hence the choice to keep these observations.

However, as indicated by Decreuse & Wilemme (2019), the impacts of minimum in-

come policies could be underestimated since the search efforts of individuals tend to gradually decrease with age before entitlement when efforts are based on the expected surplus. Indeed, for a person who plans not to work after age 20 because he or she will benefit from the AAH, the incentive to search for a job decreases as age 20 approaches. The discontinuity could, therefore, be reduced.

Falsification test

As a falsification test, we checked that the age cut-off of 20 years old has no effect on the employment probability of a group that is unaffected by the AAH. To this purpose, we examine the relationship between age and employment for the population of low-skilled youth without disability. The Figure 3.8 presents this relationship. The comparison between the two youth groups (Figure 3.6) is striking. Contrary to youth with disabilities, there is no sharp decrease in the employment rate at age 20 of the non-disabled group. On the contrary, employment continues to increase immediately after age 20. In this population, we observe the usual concave employment profile, with employment increasing with age and then flattening rapidly (Bargain & Doorley, 2011).

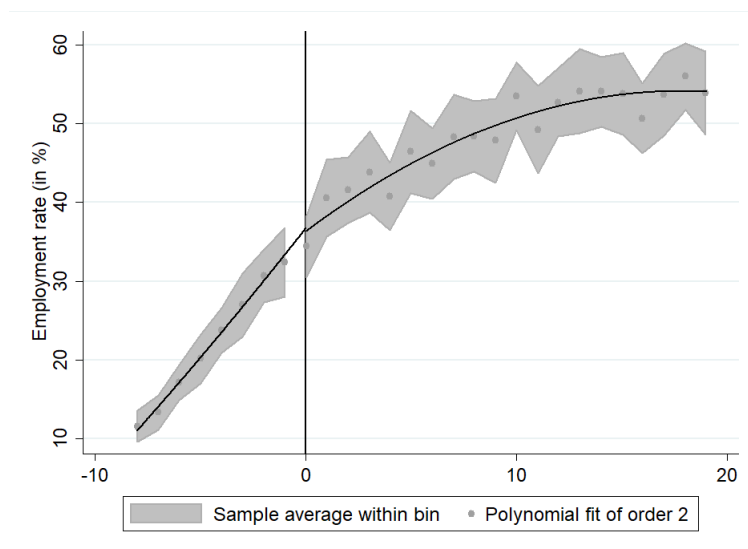
3.7 Heterogeneity and extension

3.7.1 Heterogeneity: gender and level of disability

We now explore the heterogeneity of the AAH effect by gender and level of disability. To this end, we re-estimate our main specification for the subsamples of men, women, individuals with low disability and individuals with high disability. The level of disability is approximated using the GALI²¹. The results are presented in Table 3.2.

We observe that the disincentive to work induced by receipt of the AAH is higher for

²¹The relevance of using the GALI to study degrees of severity of disability is limited (Tarazona et al., 2021), but it is only used here to divide the sample into two.

Figure 3.8. Employment rate of low-skilled youth without disability

Note: 0 represents the first quarter of age 20. Shaded areas correspond to 99% confidence intervals.

Source: French Labor Force Surveys 2013-2019.

women than for men²². This gender difference may explain why we do not see a completely clear effect in Figure 3.6. The AAH reduces the probability of employment for women by 43.4 percentage points, whereas we find no significant effect for men. It seems consistent with Simonnet & Danzin's study (2014) on the French minimum income who find did not show any real effect on men either. The estimate of the effect on men, however, is highly imprecise as shown by the standard errors, so that we can't conclude that there is no disincentive effect on this population. In any case, this result is in line with previous studies showing that women have the highest elasticity (Eissa & Liebman, 1996; Piketty, 1998; Briard, 2020). More precisely, it is not surprising insofar as people who are more on the margin between employment and non-employment in low-wage jobs, as women, have a particularly high labor supply elasticity. The lack of observations prevented us from studying the effect of the AAH according to the different family configurations (whether the beneficiary is married and/or has at least one child), which can be explained by the

²²The difference is significant at the 5% level according to a Wald test.

young age of the individuals in our sample (age under 25).

We also observe that the disincentive effect is larger for those with a low level of disability (approximated by a low level of activity limitation) than for those with a high level of disability (approximated by a high level of activity limitation). This result is in line with the literature: the trade-off between labor income and disability benefits is only possible for those able to work (Hanel, 2012). Moreover, Maestas et al. (2013) showed that receipt of disability insurance decreases by 50 percentage points the employment probability only for those with less severe disabilities. Unlike our study, they find no effect on those with more severe disabilities. However, it should be kept in mind that in this study the degree of disability is approximated by the level of self-declared activity limitation.

Table 3.2. RDD estimates of the heterogeneous effect of AAH on employment of low-skilled youth with disabilities

	Second stage: employment			
	(1)	(2)	(3)	(4)
	Men		Women	
Linear Spline	-0.030 (0.132)	0.040 (0.229)	-0.448*** (0.016)	-0.434*** (0.015)
N. Obs	1,657	1,657	1,350	1,350
	High disability		Low disability	
Linear Spline	-0.324*** (0.096)	-0.334** (0.148)	-0.530*** (0.023)	-0.501*** (0.022)
N. Obs	980	980	1,586	1,586
Controls	NO	YES	NO	YES

Note: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. Average marginal effects are presented. Standard errors clustered at the age in quarter are in parentheses. For the sake of clarity, we have reported only the second stage of the bivariate probit estimates. Controls are: year and quarter of the survey, gender, nationality and *département* of residence of the individual.

Source: French Labor Force Surveys 2013-2019.

3.7.2 Extension: focus on working time

Since the effect of the AAH on employment is only proven for women, let us now focus on this subcategory of the population. By restricting our sample to low-skilled young women, we have 1,350 observations of which 285 receive the AAH and 1,065 do not receive it.

In Figure 3.9, we graphically observe a much more pronounced discontinuity in employment at age 20 for low-skilled young women than for the low-skilled young men (Figure 3.10). This may explain why overall, regardless of gender, we do not find a pronounced graphic effect in Figure 3.6.

Figure 3.9. Employment rate of low-skilled young women with disabilities

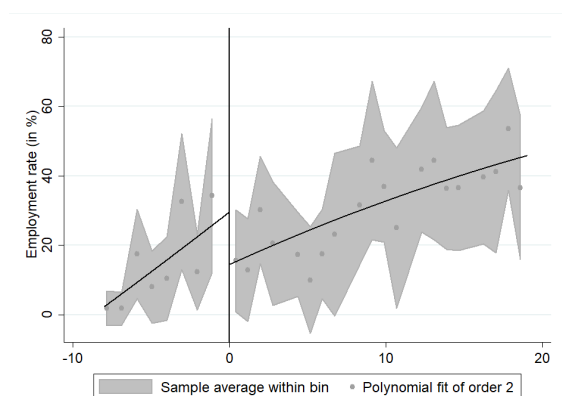
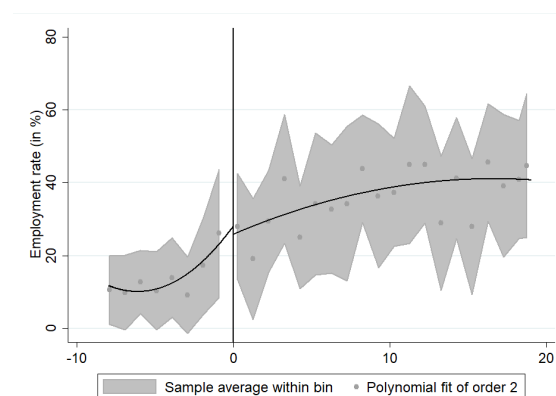


Figure 3.10. Employment rate of low-skilled young men with disabilities



Note: 0 represents the first quarter of age 20. Shaded areas correspond to 99% confidence intervals.

Source: French Labor Force Surveys 2013-2019.

Let us therefore go a little further for this subcategory of the population, by studying the impact of the receipt of AAH on the probability to work part-time (Table 3.3).

The outcome "part-time" takes the value 1 when the young woman works part-time and 0 otherwise. Table 3.3 shows that the chances of working part-time are increased by 36.5 percentage points (column 2) when these low-skilled young women receive the AAH. In consequence, it appears that the allowance affects labor participation both at the extensive and intensive margins. This result is also consistent with that of Chen & Van der Klaauw (2008) who found that the allowance reduces the number of hours worked per month by

12-32 hours. A possible explanation for this high rate of part-time employment is that it can be a way to reconcile a disability with a professional activity. Besides, beneficiaries of the employment quota of disabled workers, including AAH beneficiaries, can benefit from part-time work by right. This means that part-time employment cannot be refused by the employer. It can be granted for a period of 6 months to 1 year, renewable. In addition to allowing the person's health condition to be adapted to the job, there are some advantages: internal promotion and training rights, the constitution of retirement pension rights, the length of retirement pension insurance and periods of part-time work are counted as full-time for the calculation of advancement (in step and grade). They also benefit from the same leave entitlements.

Table 3.3. RDD estimates of the effect of AAH on working hours for low-skilled young women with disabilities

	Second stage: employment	
	(1)	(2)
	Part-time work	
Linear Spline	0.439** (0.111)	0.365*** (0.035)
N. Obs	828	828
Controls	NO	YES

Note: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. Average marginal effects are presented. Standard errors clustered at the age in quarter are in parentheses. For the sake of clarity, we have reported only the second stage of the bivariate probit estimates. Controls are: year and quarter of the survey, nationality and *département* of residence of the individual.

Source: French Labor Force Surveys 2013-2019.

3.8 Conclusion

To combat the precarious situation of persons with disabilities, disability benefit is granted under certain conditions. A few countries, including France, have designed these programs so that it is always financially more advantageous to work even while receiving these benefits. The objective is to promote the inclusion of this population in the labor market while avoiding the creation of an inactivity trap. In this study, we focus on the French allowance scheme for disabled adults (*Allocation aux Adultes Handicapés*, AAH), an original disability benefits program designed to incentivize work. It is one of the largest social assistance programs in France, yet its effects has never been evaluated. We evaluate the effect of this disability benefits program on employment of youth under age 25. To do this, we used an age-related discontinuity in the eligibility criteria: beneficiaries must be at least 20 years old (or at least 16 years old if they live independently of their parents). We used data from the French Labor Force Survey for the years 2013 through 2019 and we focused on low-skilled youth with disabilities (who have not attained the academic qualification of the *Baccalauréat*, the French high school diploma). This population has some specificities, including the fact that they have more limited access to the labor market and that any wages they are likely to earn are more comparable with disability benefits than those of more skilled individuals. Moreover, we should keep in mind that persons with disabilities do not always have the capacity to work, especially those with a high level of disability.

We can draw two main conclusions from our study. Firstly, receiving the AAH has a negative effect on the employment rate of low-skilled youth with disabilities since it decreases their chance of being employed by 27.5 percentage points. This effect is particularly important for woman: about 43 percentage points. The effect is also stronger for beneficiaries who declare having a low activity limitation than for those who declare having a high activity limitation (about 33 percentage points versus 50 percentage points),

which are approximated by a low and high level of disability respectively. When we focus on working time for employed women, we observe that the AAH has an effect on both the intensive and extensive margins: receiving these benefits increases the probability of women working part-time by about 36.5 percentage points.

The results confirm that women and persons with a low level of disability tend to have particularly high elasticity. Although they concern a responsive population (i.e. youth with a low level of education), our results also tend to indicate that even a program without a notch, designed to incentivize work, can have a substantial negative impact on labor force participation. A set of public policies have been implemented in recent decades to promote the employment of persons with disabilities, for instance with the obligation to employ disabled workers or the obligation to adapt the workstation in France, but more is needed on the supply and demand side of the labor market together.

The disincentive effect of the AAH may be due to a difference in social norms regarding employment between persons with and without disabilities, but also to the small gap between the AAH and the wage that recipients could expect from a job. A solution could be to reduce the trade-off between the AAH and work income by increasing their reservation wage (without reducing the amount of the AAH whose amount remains below the poverty line and is a necessary source of income for those who do not, or not fully, have the capacity to work). This could be done by improving their level of qualification, in order to qualify for higher wages and service occupations, and thus promote equal opportunities. In order to increase their level of qualification, public policies should operate at three levels: improve inclusion in the education system, promote support in the transition from school to the labor market (by further developing internships and apprenticeships, but also to set up a support service for the transition to employment²³) and promote vocational training. These policies should target the most incentive-sensitive

²³In the United States, for example, there are State vocational rehabilitation agencies that help youth with disabilities aged 16 to 24 make the transition from school to work, which have no equivalent in France.

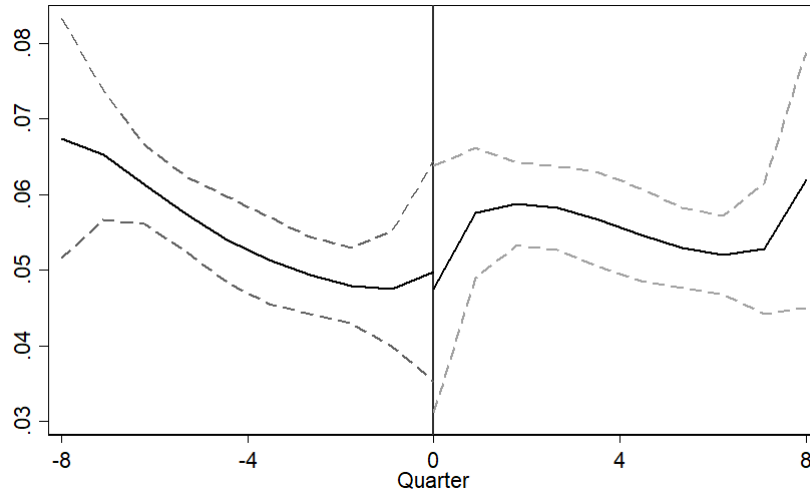
population to counteract the disincentive effect of the AAH: young women and youth with a low level of disabilities. In this regard, Kostøl & Mogstad (2014) had also shown that public policies targeting disability insurance beneficiaries aged 18-49 would be more effective, because of the high elasticity of their labor supply.

In addition to promoting the inclusion of low-skilled youth with disabilities and (quasi) financial independence, promoting their employment could also benefit to companies that could benefit from a different talent pool. There is also an issue in terms of public spending since encouraging the employment would reduce the amount of benefits paid and therefore the weight of social assistance spending. Understanding the effects of the AAH, particularly on employment, could therefore be useful for policymakers.

However, our study has some limitations, including the imperfect nature of the variable GALI used to define the disabled population, which is declarative. Furthermore, we do not know the degree of disability of the individuals studied, nor whether they are able to work. Since we used the discontinuity regression method, our results are only valid for the population around the cut-off (20 years) and cannot be extended to an older population. In this respect, the 18-25 years old are a specific population since, due to their young age, their disability is quite early and is certainly not related to an accident at work. Moreover, applying for the AAH could also depend to a large extent on family assistance (knowledge of this minimum benefit and of the steps to take to apply, etc.). The AAH will therefore be likely to have different effects on an older population. Finally, this study does not examine the effects of the AAH on employment according to different family configurations (marital status and parenthood). We are not interested either in the effect of the AAH on the quality of employment, knowing that this minimum social benefit, by constituting a financial cushion, can allow people to take more time to look for a more satisfying job. We leave these lines of inquiry for future studies.

Appendix

Figure C1. Density of the running variable



Note: 0 represents the first quarter of age 20. The solid line represents the estimated density of the running variable. The density is estimated from local third-order polynomial regressions estimated on each side of the cut-off. The dashed lines are confidence intervals at the 99% level.

Source: French Labor Force Surveys 2013-2019.

Table C1. RDD estimates of the effect of AAH on employment of out-of-school low-skilled youth with disabilities

	First stage: AAH recipient		Second stage: employment	
	(1)	(2)	(3)	(4)
Polynomial specification for age				
Quadratic	0.109** (0.053)	0.115** (0.051)	-0.256 (0.548)	-0.359*** (0.077)
Cubic	0.123** (0.047)	0.124** (0.048)	-0.318 (0.368)	-0.365*** (0.076)
Linear Spline	0.194*** (0.042)	0.188*** (0.043)	-0.180 (0.312)	-0.321*** (0.086)
N. Obs.	2,478	2,478	2,478	2,478
Linear Spline with age below				
Age<22	0.082** (0.029)	0.088*** (0.025)	-0.315 (0.332)	-0.375*** (0.060)
Age<23	0.154*** (0.042)	0.157*** (0.044)	-0.315 (0.241)	-0.390*** (0.077)
Age<24	0.173*** (0.042)	0.166*** (0.043)	-0.209 (0.314)	-0.362*** (0.077)
Controls	NO	YES	NO	YES

Note: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. Average marginal effects are presented. Standard errors clustered at the age in quarter are in parentheses. Controls are: year and quarter of the survey, gender, nationality and *département* of residence of the individual.

Source: French Labor Force Surveys 2013-2019.

General conclusion

Contributions

This thesis provides new evidence that access to employment for persons with disabilities is hindered by obstacles on both the supply and demand sides of the labor market, despite the importance of public policies implemented to promote it. In view of the economic and social issues related to employment, which is a lever in the fight against poverty and social exclusion that particularly affect persons with disabilities, the results of this thesis point to the need to reform and/or supplement the public policies already implemented.

We have thus shown that persons with visible disabilities (motor disabilities, chapter 1) and invisible disabilities (hearing disabilities, chapter 2) are victims of discrimination in access to employment, even though the fictitious candidates told the employer that their disability did not affect their productivity. The main financial incentive for stimulating the labor demand, the employment quota of disabled workers, seems insufficiently effective in removing this barrier to employment. More specifically, in the first chapter, using the information access test method to study discrimination in access to accounting jobs in the Paris region, we provided evidence that this discrimination is more important in the private sector than in the public sector. This could be explained in particular by the State's duty to set an example, by the culture and organizational modes, or by the lower exposure to competition in the public sector that would penalize less the hiring of disabled workers. We have also shown that discrimination is also higher against women than men,

who would then accumulate two criteria of discrimination, their gender and their disability. Finally, the difference in treatment on the grounds of disability is significantly higher in establishments with fewer than 20 employees (not subject to the quota) than in those with at least 20 employees, while remaining present in establishments with at least 20 employees. Although the primary objective of the employment quota for disabled workers is to stimulate labor demand, the fight against discrimination is indirectly part of its objectives. However, by failing to eliminate it, its effectiveness seems limited.

In the second chapter, using a multi-criteria correspondence test with fictitious CVs and cover letters, we assessed the extent of discrimination in administrative manager and caregiver assistant occupations in the Paris region. We compared it to discrimination on the grounds of origin, gender and place of residence. We have shown evidence that discrimination in hiring based on hearing disability is twice as important in caregiver assistant profession, which requires a lot of interaction with the public, than in administrative manager profession. This discrimination is, however, similar in magnitude to that on the grounds of origin in the last occupation, and half of that experienced by the North African candidate in the profession of caregiver assistant. We do not find any evidence of a difference in callback rates based on place of residence or gender. In this study, however, we cannot conclude that discrimination on the grounds of disability is systematically lower in the public sector than in the private sector. Furthermore, being eligible for financial aid for the hiring of disabled workers (for companies subject to the quota when a candidate with the RSWD applies) does not seem to promote access to employment.

The third chapter looked at the potential inactivity trap created by the AAH, the French non-contributory means-tested disability benefits program. We then questioned the effectiveness of a financial incentive aimed at stimulating the labor supply to overcome this brake on employment: the possibility of combining the AAH with a job, so

that beneficiaries are always financially advantaged when they work. Using the French Labor Force Surveys data for the pooled years 2013-2019, we focused on low-skilled youth with disabilities. We showed that despite the absence of a notch, this disability benefits program have a disincentive to employment, especially for women and those reporting a low activity limitation (approximated by a low level of disability). Furthermore, when we consider the working time of employed women, we find that receiving AAH favors their part-time employment. The disincentive effect of the AAH on employment would therefore be on both the intensive and the extensive margin. The possibility of combining the AAH with a job therefore does not seem to stimulate the supply of work enough.

The results of this thesis therefore argue for an improvement of public policies in favor of the employment of persons with disabilities, both on the labor supply and on the labor demand sides. How can they be made more incentive-based?

Reviewing the amount and the method of calculation of the contribution to be paid in the event that the employment quota is not reached could be a first path to explore to encourage the labor demand. Because of the way it is calculated, the contribution to be paid decreases in relative terms with the person's income (it is higher for a low-wage employee²⁴) and is also lower for a firm with a high profit margin (the financial health of the firm is not taken into account). It is therefore necessary to fight against the preference of establishments to pay a financial contribution rather than to hire persons with disabilities. Increasing the amount of the contribution and/or taking into account the financial health of the company in its calculation could go in this direction, but we leave the evaluation of the effectiveness of such proposals for future studies. Furthermore, it seems necessary to complement this public policy with non-monetary actions, aimed at improving knowledge of disability in companies and the economic and societal challenges of better inclusion of persons with disabilities.

²⁴For example, the amount of the contribution would be 4120 euros (400 x 10.03) per missing beneficiary for a company with 20 to 199 employees. It would therefore be more attractive to hire skilled workers with high salary expectations than low-skilled workers with low salary expectations.

On the labor supply side, the design of the AAH seems insufficient to promote employment. It would therefore benefit from being supplemented by non-monetary actions aimed at reducing the trade-off between the AAH and work income. A solution could be to improve the level of qualification of the low-skilled by making schools more inclusive, by improving the support from school to the labor market and by promoting vocational training. This requires a more transversal vision of disability in the implementation of public policies since the effectiveness of public policies related to the employment of persons with disabilities can be impacted by other public policies (education and housing public policies for instance). An increase in their qualification could increase their reservation wage and thus the gap between the AAH and the income from work for those who have the capacity to work, without reducing the amount of the AAH which remains below the poverty line and which benefits a large number of people who cannot work because of their health condition.

Finally, developing evaluations of public policies in favor of the employment of persons with disabilities is also necessary to better understand and improve their access to employment, which requires, in particular, an increased inclusion of the disability issue in administrative and survey data.

Limitations and perspectives

The conclusions drawn from this thesis are specific to the studies conducted. The results of the first two chapters, using the correspondence test method, cannot be generalized because the data collected are not representative of the entire labor market (Heckman, 1998): they concern a sample of job ads in the Paris region only, for one or more types of occupations and for a given period. The results are therefore specific, partial and localized. The results of the last chapter using the discontinuity regression method apply only to the population studied, i.e. low-skilled youth with disabilities around the cut-off (age

20). It might therefore be interesting to conduct further studies on different populations. Moreover, the results of the correspondence tests may be underestimated, but they do have the merit of providing information on the first stage of the selection process. The design of the experiments conducted does not allow us either to know whether the discrimination highlighted is a taste-based discrimination or a statistical discrimination. In addition, the data available to approximate the disabled population in survey data, such as the GALI, remain imperfect.

Furthermore, in this thesis, we have discussed the effectiveness of a direct measure to promote the employment of persons with disabilities by influencing the labor demand (the quota) as well as an indirect measure by influencing the labor supply (the possibility of combining the AAH with a job). While the fight against poverty is the indirect objective of the first measure, it is the direct objective of the second. By promoting employment and combating poverty, directly or indirectly these policies contribute to improving the inclusion of persons with disabilities in society. However, the analysis of these public policies has its limits. The study of the quota in the first two chapters is imperfect because we do not know whether the establishments tested with at least 20 employees had this workforce for at least 3 years, nor whether they had already reached the 6% quota at the time of the experiments. Concerning the evaluation of the design of the AAH (the absence of a notch), this is more a discussion of our results than an evaluation as such.

The barriers in access to employment and employment incentives for overcoming them that we have analyzed are not exhaustive (we did not examine environmental barriers such as accessible public spaces and transportation, or non-monetary incentives). Moreover, no attention has been paid to barriers when workers with disabilities are employed (obstacles in keeping their jobs, in terms of salary, mobility and career development for instance). This could therefore constitute interesting paths for future research to fill the lack in the

literature.

We were interested only in the case of France, which is a high-income country. The effects could have been different in the case of low and middle income countries. Similarly, we focused on the "ordinary" labor market. Access to employment in the sheltered labor market would also merit further analysis.

Finally, this thesis has focused on the access to employment of persons with disabilities prior to the Covid-19 pandemic. Thus, it is possible that our results would have been different during and/or after this health crisis. In fact, the employment situation was further weakened by the Covid-2019 health crisis. The pandemic has increased inequalities against them²⁵, who are more likely to develop a severe form of Covid-19, and in particular their economic vulnerability and isolation (especially in low and middle income countries). While the consequences of Covid-19 on employment have been studied according to ethnicity, level of education, geography, gender and age (Hupkau & Petrongolo, 2020; Wilson & Papoutsaki, 2021; Blundell et al., 2020), disability has been rather neglected, although it was already before pandemic a factor favoring inequalities on the labor market. A few rare studies have shown that this health crisis penalized disabled workers more than able-bodied workers (Schur et al., 2021). For example, employment and income gaps between disabled and non-disabled workers one year after Covid-19 was quite small, but the probability of persons with disabilities of being temporarily unemployed was much higher (Jones, 2022). Covid-19 also changed work patterns. The use of telecommuting has increased, providing *a priori* more employment opportunities for persons with disabilities (Schur et al., 2020), although it raises questions about the increased isolation and exclusion it may cause. Yet, Bryan et al. (2021) has shown that during this pandemic, the opposite situation occurred: persons with disabilities were more likely to work in person rather than telecommuting and to be in jobs that were more exposed to

²⁵World Bank. "Disability inclusion", April 14, 2022 [<https://www.worldbank.org/en/topic/disability#1>].

the disease. Future research could therefore also analyze the effects of Covid-19 on the employment of persons with disabilities, including whether barriers to employment have been exacerbated, whether traditional and exceptional employment policies have been effective and the effect of new work patterns.

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