Can Social Media Lead to Labor Market Discrimination? Evidence from a field experiment[*]

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Abstract

The advance of social media is allowing employers to screen applicants' online profiles to obtain additional personal information on potential employees without the applicants' awareness. We investigate whether employers rely on such online information when deciding to call back an applicant for interview. We set-up a field experiment over a 12-month period, involving more than 800 applications from two fictitious applicants which differed in a signal - their perceived origins - available only from their Facebook profiles. A significant 37% gap between the two applicants highlights that personal online profiles are used to screen and select applicants. For most recruiters, Facebook profiles have become a new, reliable, informal source of information on applicants. Additionally, during the experiment an unexpected change in the Facebook layout altered the display of our online signal. This natural experiment gives us some insight into the existence of search costs for recruiters when screening a personal online profile.

Keywords: Field experiment; Labor Market; Labor Discrimination; Online Social Media; Privacy.

JEL Codes: C93; D83; J7; M51.

1 Introduction

Discrimination based on race and ethnic background, or more generally on personal traits of members of minorities, is a major economic concern. With the advance of social media, such personal traits can now be found simply by online screening. This makes social media appealing for recruiters looking for information about job applicants they can not find on the application material. While it may help improving the matching between applicants and recruiters, hiring decisions can thus be affected by information which are unrelated to the applicants' professional skills. Despite large potential consequences, the impact of social media on hiring discrimination has been largely overlooked in the economic literature so far. Documenting such practices is all the more essential as the discrimination occurs without the applicant's awareness.[1] We propose here an experimental setting to assess whether social media constitute a new source of discrimination by affecting hiring decisions.[2] More precisely, we investigate if recruiters discriminate job applicants on the sole basis of the information they find on Facebook profiles.

The labor market discrimination literature has well documented the negative impact on hiring of personal traits associating people to minority groups in term of sexual orientation, religious beliefs or political opinions (see Riach and Rich, 2002; Bertrand and Duflo, 2016). Among these personal traits, the negative effect of belonging to a racial minority has been widely studied and observed worldwide (Bertrand and Duflo, 2016). Usually, information about applicants are gathered by recruiters through the application material (resume, cover letter, etc.), during the interview or through word-of-mouth (Rees, 1966; Granovetter, 1995).[3] A distinct feature of our study is that the personal traits we use are not disclosed in the application material. Indeed, on social media the personal traits disclosed by individuals are not dedicated to professional purposes but rather to friends and relatives in a broad sense. More recently, scholars have pointed out the effect of the Internet on the labor market (Autor, 2001; Kuhn and Mansour, 2014). Concerning the hiring process, Clark and Roberts

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[1]For instance, Facebook, the most popular social media, has reached more than 1.5 billion monthly active users in 2015. Information about Facebook users (birthdate, occupation, etc.) are often publicly available, even for non-users. Accessing much more information is possible simply by filling a free registration form. For most social media, and especially Facebook, it is not possible to know if a person did actually screen a profile, except if she left an explicit trace (message, 'like', etc.). For recruiters, this is an important feature of social media sites, as the use of personal information for selecting applicants is illegal in many regions, whether it was found online or elsewhere.

[2]Our experiment was conducted on Facebook, which is being marketed as a personal social media site where individuals relate to friends in a broad sense, and to family, but not as a professional social network site. On the other hand, LinkedIn, for instance, claims to connect potential future co-workers, including potential future employees/employers.

[3]See for instance Bertrand and Mullainathan (2004) for evidence of hiring discrimination based on information included in application material.

(2010) reviewed declarative surveys which document the emerging use of social media by recruiters to screen applicants. However, those practices vary widely among the different surveys, probably due to declarative bias stemming from the illegality of this practice. Those online information found by recruiters can be used for discriminatory purpose as it has been shown recently in other contexts such as short-term housing rental market (Edelman et al., 2016), online commerce (Doleac and Stein, 2013) or peer-to-peer loans (Pope and Snyder, 2011). Close to our paper, Acquisti and Fong (2014) use a field experiment to address the issue of hiring discrimination based on online information, for which they find evidence in the Southern U.S. when the applicant exhibits strong religious beliefs.

In this paper, we propose to test the use of social media for discriminatory purpose by recruiters in hiring decisions. For this, we set up a field experiment on the French labor market by creating two fictitious applicants, which differ in one signal - their perceived origins - that is only available in their Facebook profiles. While the control applicant has a typically French profile, the test applicant's profile reveals that he is from Marrakech, Morocco (North Africa) and speaks Moroccan Arabic, so as to be perceived as a candidate with Arabic origin. People of Arabic descent are a minority in France and are subject to hiring discrimination as shown by many studies on the French labor market (Duguet et al., 2010) or in other European countries.[4] Each applicant has a unique first-name and last-name combination on social media to ensure that a search on the Internet results in the right profile. Our candidates then apply for job openings for an accountant in the greater Paris area. We send one application per job opening using pseudo-random assignment method (see Ahmed et al., 2013; Acquisti and Fong, 2014). Sending one application per job opening alleviates any risk of detection, and further reduces the burden imposed by the experiment on recruiters. It also allows us to use identical application material, resume and cover letter, for both applicants.[5] The pseudo-random assignment method allows us to control, during the experiment, that the two fictitious candidates are applying for similar job positions. Following the literature on hiring, we consider a callback from a recruiter to set up a job interview as a positive outcome. Since the two applicants are similar except for the perceived origin (hometown and spoken languages) displayed only on their Facebook profiles,

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[4]The literature on labor market discrimination shows that this characteristic negatively affects an applicant's callback rate and more generally his labor market integration (Bertrand and Mullainathan (2004) for the US; Bisin et al. (2008) or Battu and Zenou (2010) for the U.K.; Duguet and Petit (2005), Duguet et al. (2010) or Edo and Jacquemet (2013) for France).

[5]In the usual testing methodology, two or more applications for a job opening are sent simultaneously, and the resumes and cover letters of the fictitious applicants need to be sufficiently different to avoid detection by the employer. This approach is called systematic attribution.

a significant difference in callback rates can stem only from observation by the employer of this signal, and the use of it for discriminatory purpose.

We applied to more than 800 job openings with our two fictitious applicants over a 12-month period between March 2012 and March 2013, including one main experiment and robustness checks. For the main experiment from March to September 2012, we sent 462 applications, evenly divided between the two applicants. The response rates for our fictitious applicants are significantly different, at respectively 21.3 % for the French candidate and 13.4 % for the Arabic applicant. The gap in callback rates in favor of the French applicant (vs Arabic) suggests that, beyond the application package, employers search for additional information on applicants, and use the information they found on the Facebook profile to discriminate. In our case, a small signal on the Facebook profile generates a significant and constant gap of 37 % in our two applicants' probability of being called for interview. Personal information posted on Facebook have thus a dramatic effect on the odds of being called for an interview. In other words, we show that Facebook profiles have become a new source of discrimination for recruiters and have significant effects in the hiring process. In addition to this result, we propose two robustness checks. First, we test for alternative names and find similar results. Thus our main result does not rely on the applicants' names. Second, we profit from an exogenous change in the default layout of the Facebook profiles in December 2012 to confirm that the gap between our two applicants rely on the differentiating signal (perceived French vs. Arabic orign). The layout change involves that a part of our signal, the spoken languages, was pushed back into a secondary tab instead of being displayed on the front page of the profiles as it used to be. Consequently, the gap in callback rates between the two candidates shrank dramatically, as if the two profiles were now identical in recruiters' eyes. The effect of this layout change on the outcome of our experiment confirms that recruiters did actually check our applicants' Facebook profiles, and took the spoken languages into account to callback applicants. This behavior is in line with Bisin et al. (2008) who highlight the effect of the spoken language as a marker of cultural identity and its subsequent discriminatory effect for perceived foreigners. Besides, this advocates for the existence of search costs when browsing an entire Facebook profile, which seems to limit the recruiters' depth of search for personal information. This suggests that an outcome as important as being call or not for a job interview is largely influenced by the way personal information are displayed on social media. The overall experiment confirms the importance of Facebook for recruiters and give us some insights into discrimination by recruiters when

screening social media. Our result has also consequences beyond discrimination: the screenings have been conducted even though the information available on personal social media is not dedicated primarily to employers, which illustrates that the separation between personal and professional spheres is increasingly blurred. Moreover and from a methodological standpoint, our experimental set-up using Facebook as a differentiating element between job applicants is promising for research since it allows for testing much more subtle signals than what can be found so far in the literature.

The article is organized as follows. The first section reviews the labor market discrimination and data-based discrimination literatures, with a special focus on digital markets. The second section describes the field experiment and our protocol and the third section presents the results of the field experiment. The following section checks for the robustness of our results. The final section offers some conclusions.

2   Literature review

We are interested here in understanding the use of social media as a new source of information for recruiters for discriminatory purpose. This question fits within three existing strands of the literature. The first strand refers to the role of non-professional information about applicants which can lead to hiring discrimination, such as ethnicity, sexual orientation, political opinions, etc. The second is related to the formal and informal channels of information used by recruiters to gather such personal information or traits about applicants. The third strand of literature is an emerging strand focusing on discriminatory outcomes based on the use of personal information on online markets, including the labor market.

Personal traits and labor market discrimination
From an economic viewpoint, the discrimination in hiring against minority group find its origins in two main mechanisms: recruiters dislike to interact with members of minority group (Becker, 1957) or these latter are expected to be less productive on average than other groups' members (Phelps, 1972 ; Arrow, 1973). A large empirical literature has emerged which aims to document the different personal traits which generate hiring discrimination and to measure the range of the negative effect (Riach and Rich, 2002; Bertrand and Duflo, 2016). These studies rely generally on field experiment

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so as to circumvent declarative bias associated with the illegality of this practice. Amongst personal traits which can lead to hiring discrimination, the negative effect of belonging to a minority race or ethnic group is the most documented in many contexts (Duflo and Bertrand, 2015).[6]

Using correspondence test methodology, many studies have manipulated fictitious applicant's name or first-name in a way they will be perceived as member of a racial or ethnic minority group. For instance, on the American labor market Bertrand and Mullainathan (2004) and Jacquemet and Yannelis (2012) manipulate the name and first-name of the fictitious applicants and assign whether typically African-American-sounding names ones or White-sounding ones. Both studies show that African-American names received about 50 % less callback than White-name ones. These results illustrate a large and systematic discrimination against the African-American racial minority compared to White-American majority group in United States. Based on a similar method, many other studies illustrate the existence of hiring discrimination against racial or ethnic minority based on applicants' name in different countries. In particular, Oreopoulous (2011) shows on the Canadian labor market significant hiring discrimination against Chinese, Indian or Pakistani-sounding name applicants compared to white majority group with English names. Galarza et Yamada (2014) observes in Peru discrimination against indigenous-sounding name against white ones. In Australia, Booth et al. (2012) show that applicants with Chinese or Middle Eastern name receive significantly less callback compared to the white majority group characterized by English names. The same results have been observed in Europe. On the Czech and German labor markets, Bartoš et al. (2013) find that Asian-sounding names applicants have significantly less callback than members of the white majority group signaled by typical Czech and German names. In France, Duguet et al. (2010) or Edo and Jacquemet (2013) shows that applicants with Arabic-sounding names receive significantly less callback compare to white-sounding with typical French names. In addition to names, somes studies have addressed the effect of applicants' foreign nationality. For instance, Firth (1981) show on the British labor market using a correspondence test that applicants with African, Indian or Pakistani nationality given by their place of birth have significantly less callback rate than British applicants. Duguet et al. (2010) highlight the negative effect on callback in France of an Arabic nationality (Moroccan) indicated on the resume compared to a French one. Those studies show clearly that applicants perceived through their name,

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[6]Other personal traits lead to labor market discrimination such as sexual orientation (Weichselbaumer, 2003; Drydakis, 2009; Patacchini et al., 2012; Ahmed et al., 2013), gender (Booth and Leigh, 2010) or attractiveness (Galarza et Yamada, 2014).

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first-name, nationality or cultural characteristics as member of a racial or minority group face hiring discrimination in many countries including France.

Those evidences brought us to choose in our experiment applicants' perceived origins (French or foreign) has a differentiating signal which is likely to generate discrimination. In the empirical literature on labor discrimination, personal traits are often not explicitly available but inferred from elements recruiters can find on the application material. This last point has led us to focus on the way recruiters gather personal traits of applicants, in other words, to pinpoint the source of information on applicants.

Informal sources of information for recruiters

Formal and informal channels of information can be distinguished based on the source of information on applicant for recruiters. In the formal channel of information, it is the applicant who provides explicitly information to recruiters. It consists mainly in the application material (resume, cover letter, reference letter, etc.) and, if selected, the interview. In both cases, information provided by the applicant are verifiable characteristics such as identity, education, work experience or qualifications (Rees, 1966; Spence, 1973; Holzer, 1987; DeVaro, 2008).

The informal channel of information consists in information acquired by recruiters from former colleagues and/or acquaintances of the applicant through referrals and word-of-mouth (Rees, 1966; Montgomery, 1992; Granovetter, 1995; Albrecht and van Ours, 2006; van Ommeren and Russo, 2008). Since the works of Rees (1966) and Granovetter (1995), many studies have highlighted the importance of referrals and recommendations in hiring (Obukhova and Lan, 2013). Former or current good employees are considered as reliable source of information about potential recruits because they recommend candidates with similar competences and their recommendation may affect their reputation as referee (Rees, 1966; Sterling, 2014). The empirical literature underlines the complex effects of informal contacts and networks on labor outcomes due to individual, relational and employer heterogeneity (Ionnides and Loury, 2004; Pellizzari, 2010; Cappellari and Tatsiramos, 2015). More recent studies using newly available data show that informal channels of information matter as they carry reliable information, which would spread only with difficulty through formal channels (Bayer et al., 2008; DeVaro, 2008; Kramarz and Skans, 2014).

The empirical literature on labor market shows that both channels of information is used by recruiters (Rees, 1956; Granovetter, 1995). However, as mentioned by Autor (2001) or Kuhn (2014), labor market and hiring process are heavily impacted by the Internet. Some scholars, mainly using declarative surveys, point out the present the Internet, and especially social media, as an emerging channel of information on applicants (Clarks and Roberts, 2010). Only very few works have intended to focus on the potential discriminatory behaviors which can originate from this new practice.

Social media as new channel of information for discriminating applicants?

Our article fits more specifically in a growing trend of studies which focus on the use of online information used for discrimination in online markets. In online selling of used goods, Doleac and Stein (2010) show that when a picture is attached to an ad, it conveys information about the seller's race and has consequences on the negotiation with prospective buyers. In an online peer-to-peer lending market, Pope and Sydnor (2011) shows that, for similar credit profiles, White (vs. African-American) borrowers enjoy both a higher chance to be funded and a lower interest rate afterwards. In the short-term rental housing market, Edelman et al. (2016) create fictitious guests with distinct characteristics and are able to document an 8-point penalty in acceptance rate for guests with a typically African-American name. Similarly in the car sharing market, the identity of the driver influences the match with passengers (Farajallah et al., 2016).

In the labor-market context, the paper which is closest to ours (Acquisti and Fong, 2014) addresses the question of discrimination based on social media information using field experiment. Acquisti and Fong (2014) implemented a correspondence test using random assignment method, i.e. only one fictitious application sent by job position with random assignment, on the US labor market in 2013. This field experiment has been carried out in a similar timeframe as ours but was developed independently. They tested four differentiating signals only available on social media about their fictitious applicants: strong religious belief, sexual orientation and marital status. For each signal, they sent about 1,000 applications in different American cities. They found a discriminatory effect for the applicants displaying strong religious belief in certain Southern U.S. but no overall evidence of discrimination based on social media screening.

3 Experimental design

We opt for a field experiment so as to show evidence of a discrimination that is based on the use of online social media by employers. More precisely, we conduct a correspondence test using pseudo-random assignment to detect whether employers rely on the information they find on social media profiles. In this section, we describe the design of our experiment, that is the creation of our two applicants with identical resumes and cover letters, but with different profiles on a social media website. We detail below (1) our methodological choices, (2) the characteristics of the fictitious applicants and (3) our application protocol.

3.1 Methodology

Labor market and field experiments

In order to capture whether employers' real practices rely on an information on social media, and to circumvent declarative biases, we choose to conduct a field experiment. In the labor market literature, field experiments rely on two main methodologies: audit/situation testing and correspondence testing. Audit testing consists of real people, usually professional actors, briefed by the experimenters, applying for the opening and presenting themselves for a job interview. The audit approach allows a focus on employers' hiring behaviors along the multiple steps of the hiring process, i.e. i) whether they call the candidate for an interview, ii) whether they offer the position after the interview, and iii) the wage level offered. One of the limitations of this approach is that it is difficult, in practice, to ensure applicants' similar performance in face-to-face interviews. Also, the actor's direct interaction with the employer during the interview raises concerns about experimenter bias.[7] Correspondence testing involves fewer methodological issues (Riach and Rich, 2002). It allows for better control over the experimental environment, especially the content of applications. This method is less time-consuming and easier to reproduce (Bursell, 2007). In addition, although correspondence testing reveals discrimination at the interview callback stage and not at the final hiring decision stage, it has been shown that about 90% of the discrimination occurs in the former stage (Riach and Rich, 2002). According to Bursell (2007), correspondence testing is a type of randomized experiment[8] and, therefore, provides

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[7] See Bertrand and Mullainathan (2004) and Bursell (2007) for other labor market-related audits results and limitations.

[8] For examples of correspondence tests, see Brown and Gay (1985) and Hubbuck and Carter (1980) for the UK, Riach and Rich (1991) for Australia, Bertrand and Mullainathan (2004) for the US and Duguet and Petit (2005), Duguet et al. (2010) and Edo and Jacquemet (2013) for France.

the most convincing way to draw causal inferences. The main difficulty lies in constructing two applications that are similar in all the relevant characteristics except the one that is tested. In addition and in order to avoid detection by the employer, the two application materials need to be sufficiently different, but similar enough to each other, so that the difference in callback is attributable exclusively to the tested characteristic.

Pseudo-random assignment

Following Ahmed et al. (2008), we carry out a correspondence test using pseudo-random assignment, which consists of sending one application per job opening. For this, we create two fictitious applicants with identical application materials (resumes and cover letters) plus one manipulated characteristic (which we call a signal) available only in their Facebook profile. This approach has three main advantages. First, the two applicants are identical in terms of competences and experience, which drastically limits potential compounds. Second, since the applications are sent to two different samples of firms, there is no risk of detection. Third, as a consequence, each recruiter receives only one application. This means that our study interferes only marginally with the hiring process compared to sending multiple applications for each opening. This is desirable from both an efficiency and an ethical point of view. Therefore, we ensure that our two applicants apply for positions with similar characteristics using a pseudo-random assignment procedure. We do this by responding to job openings available on pole-emploi.fr, the website of the French public employment agency. Ads on Pôle Emploi provide detailed information on both the job position and the firm.

Following the literature, we consider a callback from a recruiter to set up a job interview as a positive outcome. Since the two applicants are similar except for a signal only available on their Facebook profile, a significant difference in the callback rate may stem from the observation of the signal by recruiters. Another approach would be to track whether recruiters did visit our candidates' profiles, using a system similar to Google Analytics. However, data gathered in this way would be almost useless for economic analysis. For example, if the information relied on the recruiters' IP address, it would not be possible to distinguish the IP address of the company from the IP address of the Internet service provider, especially for smaller firms.[9] As a consequence, the most meaningful statistic obtained from an analytics tool would be the total number of visits to our profile, and not

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[9]In addition, recruiters can log into Facebook using assumed names and not mentioning their position in their profile.

the actual part of the recruiters who visited it. Also, it is not possible for an individual to include an analytics code in his or her Facebook profile.

3.2 Fictitious applicants

Resumes and cover letters

The construction of the application material is based on three goals: i) to create similar material for the two applicants, ii) to build realistic material and iii) to maximize the number of interview calls so as to increase the statistical significance. Since our two applicants have the same resume and cover letter, we ensure that the two application materials are similar. Then, before the start of the experiment and alongside conducting pre-tests, we interviewed human resources managers to ensure the relevance of the cover letters to the current job market conditions. We also used pre-defined parts of the letter and of the resume with standard sentences corresponding to the common profiles sought by recruiters, and included them according to what was specified in the ad.[10] A cover letter and a resume that are too general and too standardized are usually not sufficient since employers often seek a specific professional profile (customer, supplier, asset manager, etc.). We used information on the recruiting firm available on the Internet from official websites, web articles, etc. If we were unable to find information about the firm, we sent an unspecific cover letter. Resumes and cover letters were submitted by email as pdf files accompanied by a standard message. To maximize hiring opportunities, our applicants are employed when they apply, and have never been unemployed.[11] Moreover, the applicants have a three-year higher education degree in accounting, flawless school records, and three internships with various experience suitable for most accounting jobs. We decided to create fictitious applicants in accounting for two main reasons. Firstly, accountant is a back-office job with usually no direct contact with customers. Then, discrimination based on customers' preference should not occur and affect the hiring process. Secondly, accountant positions are among the most regularly published add on Pôle Emploi website in many different sectors. It insures a minimum number of add we can apply to each week. It allows us not not to focus on few sectors with specific practices in hiring.

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[10]See Appendix 10-13 for the templates and final versions of the resume and cover letter.

[11]Blanchard and Diamond (1994) propose a theoretical matching model which assumes that employers always hire the worker with the lowest unemployment duration. For empirical evidence of this practice, see Eriksson and Rooth (2014). Using Swedish data, they show that a recent unemployment period has a negative effect on applicants' interview call rate during hiring.

For each applicant, on both the resume and the cover letter, we provide the following information, in order: name, address, owning a driving license, date of birth and age, phone number and e-mail address. The applicant's address is in an affluent district of Paris (15th arrondissement) in order to avoid location-based discrimination. The applicant holds a driving license. The phone numbers are distinct in each resume so as to track candidates' callbacks. The e-mail address of each applicant is registered on Gmail with the user names following the same pattern "firstname.lastname@gmail.com".

Social media profiles

In our experiment, the only difference between our two applicants consists of an Arabic signal (i.e. perceived as foreign), which appears on only one applicant's profile. The Arabic profile mentions that the applicant is from a Moroccan city (Marrakech), and speaks Moroccan Arabic. The control profile is from a French city (Brive-la-Gaillarde) and speaks Italian. Thus, we differentiate our applicants by city of origin and language spoken, as displayed on the social media profiles (see figure 1 for screenshots of the two Facebook profiles).

We chose this signal because many studies highlight the negative impact of an applicant's perceived origins or ethnicity on interview call rates (Bertrand and Mullainathan, 2004; Ahmed et al., 2008; Duguet et al., 2010; Jacquemet and Yannelis, 2012; Berson, 2012).[12] In particular, studies conducted in Europe show that applicants' foreign languages skills act as a signal of foreign cultural identity (Bisin et al., 2008; Battu et al., 2010). Discrimination can thus stem from this signal when the supposed cultural identity is different from the recruiter's, or, on the other hand, it can reinforce the perceived cultural similarities between the applicant and the recruiter (Edo, Jacquemet and Yannelis, 2013). The work of Duguet et al. (2010) and Edo and Jacquemet (2013) are of particular interest to us since we use very similar fictitious applicants in terms of education, qualifications and job search area (i.e. Paris region). These two studies used correspondence tests to measure the extent of discrimination against Arabic applicants for accountant or assistant-accountant positions in the Paris region. They show a gap of 35%-40% in callback rates in favor of the French compared to the Arabic applicants. Therefore, provided that the signal is perceived, we expect it to have a negative impact on the odds of being called for interview.

In order to ensure that the foreign origin signal is conveyed only by the social media profile, the

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[12]Other discriminatory factors highlighted in the literature include homosexual orientation (Weichselbaumer, 2003; Drydakis, 2009; Ahmed et al., 2013) and language skills (Oreopoulos, 2009; Edo, Jacquemet and Yannelis, 2013).

first and last names of each applicant are French-sounding, namely Thomas Marvaux and Stéphane Marcueil. The first names were picked from the top-five first names for the year of birth. Each first name-last name combination is unique on Facebook,[13] and our fictitious profiles are the sole results when searching on these first and last names on the three leading French language web search engines, and on Facebook.[14]

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[13]A profile named Thomas Marvaux, unrelated to our experiment, currently shows up on a less popular social network site, Badoo.com, if one searches on this candidate's name. This profile appeared for the first time after our experiment had been conducted and was not present during the time of the experiment. Therefore, a recruiter could not have seen this profile in addition to our Facebook profile. Moreover, additional changes in the layout have been made by Facebook since the experiment took place. For this reason, the screenshots that are included in the Appendix may not correspond to the current layout of a Facebook page.

[14]The market shares of the web search engines in France in December 2012 were: 90.1% for Google, 3.3% for Bing and 1.5% for Yahoo (source: http://www.atinternet.com, retrieved June, 2014).
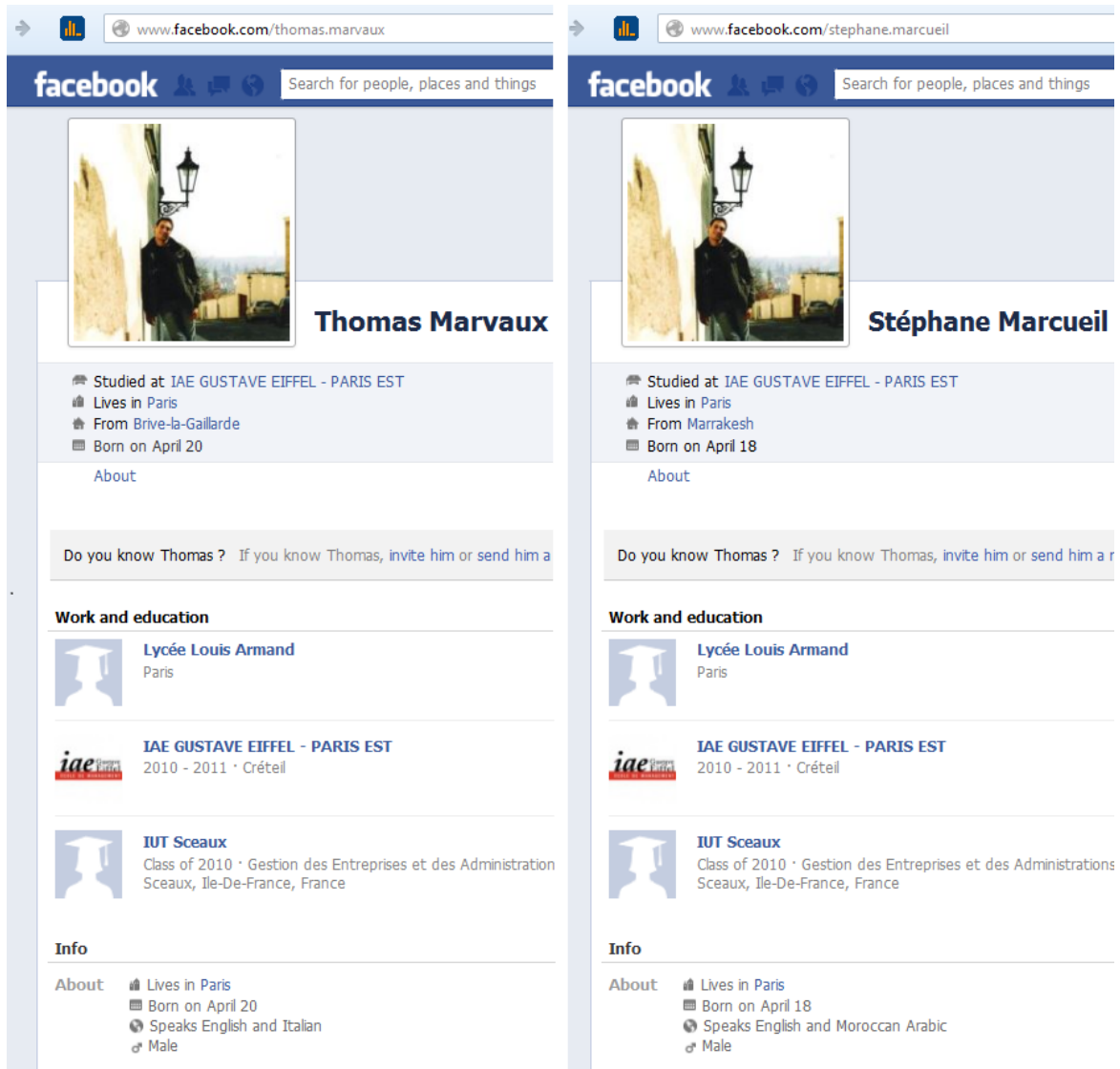
Figure 1: Screenshots of the social media profiles of our two applicants: the only differences lie in the **city of origin** and the **language spoken**.

3.3 Applying to job openings

Job openings selection

We selected job openings published between 19 March, 2012 and 30 September, 2012 on the French public agency for employment website - *Pôle Emploi*. We focus on this website because job openings from this website provide systematic and detailed information on jobs (wage, type of contract, working hours, required education and work experience, etc.) and firms (name, location, sector, size,

etc.). This information is crucial for pseudo-random attribution of applicants to job offers and for statistical analysis. Other popular French employment websites - Monster, Keljob, Indeed, etc. - provide fewer details and, therefore, were not considered. Moreover, we selected only openings that provided a recruiter's direct contact information (contact name and e-mail), and excluded those which required the applicant to contact a third-party, usually a recruitment agency or Pôle Emploi. Only openings for long-term work relations were considered, i.e. with regular (undefined work duration) or fixed-term contracts (six or more months). In France to break these types of contracts involves high severance payments in addition to legal and administrative procedures.[15] In this context, recruiters are expected to be more careful when screening applicants.

Our applicants have a bachelor's degree (i.e. three years of undergraduate education) in accounting, and we responded to ads in the three relevant categories (accountant, assistant-accountant and aid-accountant) in the Pôle Emploi categorization. For each selected opening, we generated the application material, i.e. the resume and the cover letter, using pre-defined key sentences to match the advertised job. At this point, to avoid experimenter bias, the material was not assigned to an applicant. Assignment to an applicant occurred only after all the application material had been generated.

Pseudo-random assignment procedure

We observe the recruiters' behavior based on the differences (if any) in return rates for the two fictitious applicants. The candidates have identical application packages and differ only in selected information on their social media profiles. As Ahmed et al. (2013) and Acquisti and Fong (2014), we use a pseudo-random assignment procedure where only one application is sent per job offer. The type of applicant is pseudo-randomly assigned to each application, so that, along the whole experiment, similar job offers are attributed to each applicant. This pseudo-random assignment is based on job position (accountant, assistant-accountant, etc.), required work experience and firm size and sector (see Table ?? for descriptive statistics). Half of the recruiters in our sample receive an application from the control candidate and the other half an application from the Arabic candidate. The traditional systematic assignment procedure provides information on how a given employer responds to every candidate who applies. However, we are interested in showing that employers that received an application from the test candidate called him for interview less often, on average, than employers who received application material from the control candidate. We control for this systematic difference

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[15]See Lamy (2012) and Blanchard and Landier (2002) for more details about the French employment protection rules.

not being due to firm or job characteristics. In addition, when using a testing approach the experimenter needs to construct two fictitious candidates who are sufficiently different to avoid detection, but sufficiently similar that the difference in interview call rates between the two candidates can be attributable only to the factor of interest, and not to other factors which were changed to differentiate the two candidates. The pseudo-random assignment procedure requires that the number of applications is doubled, but completely alleviates the trade-off between the risk of candidates being detected and the ability to interpret the results. Since our candidates never both apply to the same company, the risk of detection is considerably lower than systematic assignment. Also, since we do not need to differentiate the candidates artificially to avoid detection, we use strictly identical candidates. Figure 2 summarizes the experiment timing.
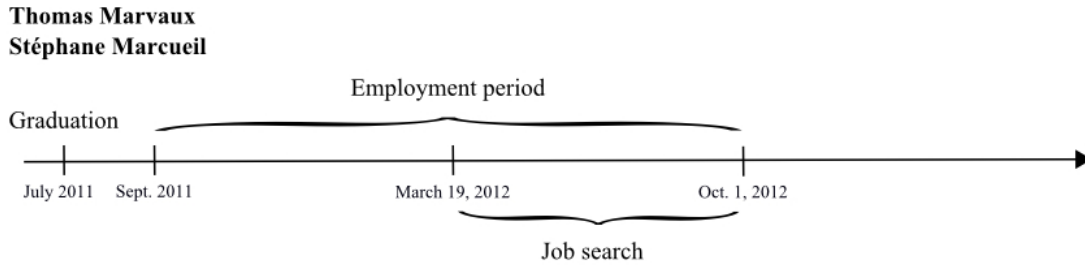
Figure 2: Experiment timing

4   Results

The results of the experimentation are presented as follows. Firstly, we present the main outcome of the experiment based on graphics and independence test (model-free evidence). Secondly, robustness checks of this result are provided using a Probit model. Thirdly, we provide additional robustness checks related to the names of fictitious applicants and the signal perception by recruiters.

4.1   Model-free evidence

We sent a total of 462 applications from 19 March, 2012 to 30 September, 2012. Applications for both candidates were sent at similar rates over this period. Each job opening receives one application from us, and we ensure that the two applicants apply to similar positions according to the observable char-

acteristics of job positions using pseudo-random attribution process. Table 1 presents a description of the job positions for each applicant.

Variable	Description	Control candidate	Test candidate
Job position (%)	Accountant	44.3	43.1
	Specialized acc.	9.6	10.3
	Accounting assistant	23.9	29.3
	Acc. & secretary assistant	18.7	14.7
	Other accounting assistant	3.5	2.6
Contract (%)	Regular	28.7*	19.4*
	Fixed-term	71.3*	80.6*
Fixed-term contract length (mean/sd/min/max, month)		8.2/4.1/6/24	7.8/3.3/6/24
Worktime† (mean/sd/min/max, hours/week)		34.3/5.4/7.5/39	34.2/5.6/16/43
Required education (%)	Not specified	40.4	38.8
	Vocational certificate	1.3	2.1
	High school diploma	11.3*	5.2*
	Associate degree	42.6	49.6
	Bachelor's degree	4.4	4.3
Required work experience (%)	No experience	25.2	27.1
	6 months-1 year	12.6	12.5
	2 years	27.8	23.3
	3 years	16.5	19.4
	4 or 5 years	17.9	17.7
Mean wage (mean/sd/min/max, €/hour)		12.3/2.4/9.2/23.4	12.3/2.2/8.5/19.8
Application delay‡ (mean/sd/min/max, days)		1.3/1.2/0/5*	1.6/1.3/0/6*
Size (%)	0-5 employees	23.5	23.3
	6-19 emp.	27.8	29.7
	20-49 emp.	17.8	19.0
	50-249 emp.	21.3	21.1
	250+ emp.	9.6	6.9
Firm status (%)	Private	83.0	83.6
	Public	6.5	4.7
	Not-for-profit	10.4	11.6
Industry		see Appendix 1	
Location		see Appendix 1	
Total number of applications		230	232

* indicates a significant difference in mean or proportion between the two applicants at 5% threshold
† French standard weekly worktime = 35h.
‡ Number of business days between the ad publication and the application sending.

Table 1: Description of the job applications for each applicant, Mar.-Sep. 2012

Table 3 presents a summary of the experimentation results. During the period our applicants received 80 positive calls for interview. This global return rate is quite high (17.3%) compared to other studies carried out in the Paris region (Duguet and Petit, 2005; Duguet et al., 2010 or Edo and Jacquemet, 2013). The most plausible explanation for the higher interview call rate in our study is that we matched cover letter and resume to the job opening for each application, incorporating

pre-defined sentences corresponding to the characteristics of the firm and the advertised position. Recruiters mostly contacted our applicants by phone (68.0%) or e-mail (26.3%). A few used both phone and e-mail (5.7%). All the applicants' postal addresses were real, but no regular mail was ever received.

Type of applicant	Negative outcome	Positive outcome	Total
French profile	181 (78.7%)	49 (21.3%)	230
Arabic profile	201 (86.6%)	31 (13.4%)	232
Total	382 (82.7%)	80 (17.3%)	462

Table 2: Callback statistics by applicant

Type of applicant	French	Arabic	Ratio	Diff.	Total
Positive outcome	49 (21.3%)	31 (13.4%)	-	7.9%	80
Negative outcome	181 (78.7%)	201 (86.6%)	-	-	382
Total	230 (100.0%)	232 (100.0%)			462

Table 3: Callback statistics by applicant

The number of interview calls received by our two applicants shows a consistent gap in favor of the French applicant. In particular, Figure 3 shows a roughly constant gap of 8 percentage points between the two applicants in favor of the control candidate who received 21.3% of positive returns compared to 13.4% for the test candidate. A Chi^2 test ($Chi^2(1)=5.09$; Pr=0.024) confirms the significance of this difference.[16] This gap represents a drop of 37% in callbacks for the Arabic candidate. Figure 3 also shows an increase for both candidates in the average number of callbacks after June 2012. This change can be explained by the easing of the labor market after the French presidential elections in April-May of 2012. The number of applications sent every month follows the same evolution, showing that firms had more confidence in the economic context after the elections.

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[16] Equality of proportions test (Pr=0.024) and Fisher exact test (Pr=0.027) confirm the significance of this difference.
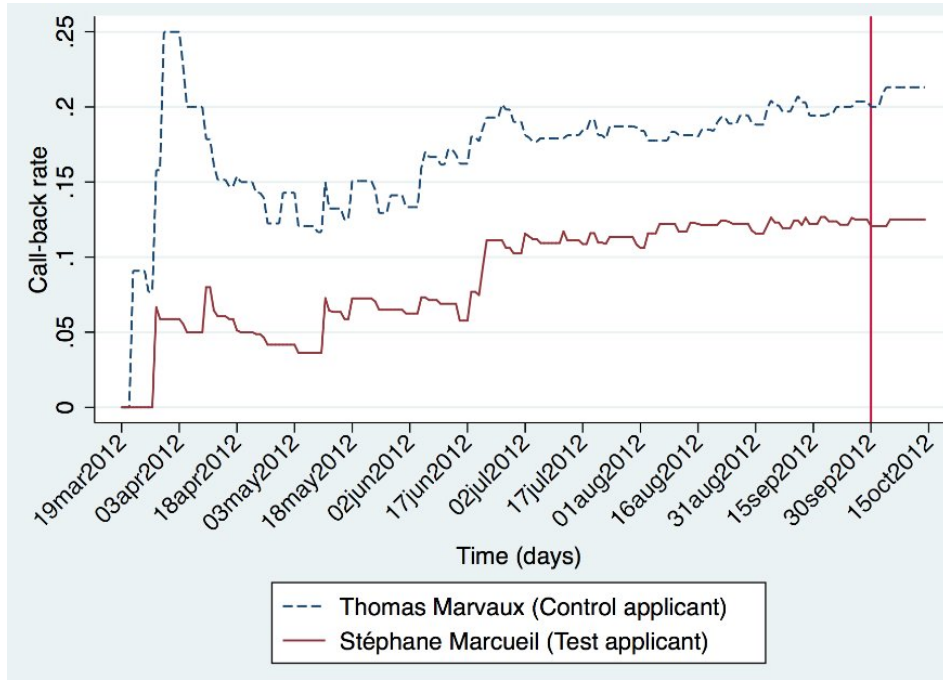
Figure 3: Applicants callback rates

Based on the experimental protocol in place, this gap in favor of the control candidate can result only from the joint choice of employers i) to screen applicants' Facebook profiles, and ii) to exploit the information collected from these profiles when deciding whether or not to call the candidate for interview. Indeed, employers use the information obtained from social media, and consider this information reliable although it is not part of the formal application package. The results show that the content of the online profile carry important weight for the decision to interview the candidate. In other words, personal information displayed on social media profiles has become a part of the application material for recruiters.

4.2 Main results

In order to confirm our first result, we use a Probit model to control for different variables which can affect the probability of being invited to attend an interview. The main estimated equation is presented below:

$Pr(Interview_{ijt}) =$

$$+ \beta_1 ArabicApplicant_i$$

$$+ \beta_2 ApplicationDelay_j$$

$$+ \beta_3 JobCharacteristics_j$$

$$+ \beta_4 FirmCharacteristics_j$$

$$+ \beta_5 Time_t$$

$$+ \alpha + \epsilon_{ijt}$$

$ArabicApplicant_i$ is a dummy variable equals to one for the Arabic applicant, and zero for the French one. $ApplicantDelay_j$ is a set of dummy variables that indicates the number of days between the add publication of the job offer j and the application. $JobCharacteristics_j$ includes different job characteristics such as contract type, job position, mean wage offer, etc. related to the job offer j.[17] $FirmCharacteristics_j$ is a vector of characteristics related to the firm that offers the job j such as industry, size, location, etc. $Time_t$ is a set of monthly dummies, while α and ϵ are respectively a constant and error terms.

Table 4 provides three specifications of the Probit model described above. Model 1 contains only the main explanatory variable (plus time dummies and constant). Model 2 includes all the available control variables, and Model 3 includes all the control variables except "mean wage offer" due to multicollinearity issues.[18] In all three specifications, the Arabic signal only available on the online profile is associated with a significant negative impact on the probability of being invited for an interview. These results confirm that social media has become a reliable source of information for recruiters during hiring.

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[17]We distinguish the variable *mean wage offer* from the other variables in the model due to multicolinearity with the other job characteristics.

[18]The condition index of Model 2 is equal to 29.8. This is very close to the threshold indicating multicollinearity problems according to Belsley et al. (1980). This multicollinearity issue is not surprising since the wage offered is related to the required education level and to other job characteristics such as required experience, industry, job position and firm size among others. Once we exclude "mean wage offer" in the model 3, the condition index falls to 20.4.

Dep. var.: callback (yes/no)	Model 1	Model 2	Model 3
Arabic applicant	-0.313**	-0.431***	-0.404***
	(0.139)	(0.159)	(0.156)
Application delay controls	No	Yes	Yes
Job characteristic controls	No	Yes	Yes
Mean wage offer	No	Yes	No
Firms' characteristic controls	No	Yes	Yes
Time dummies	Yes	Yes	Yes
Constant	-0.796***	1.826**	0.386
	(0.093)	(0.784)	(0.592)
Observations	462	462	462
Pseudo-R2	0.012	0.232	0.216

Robust standard errors in parentheses. *, ** and *** mean respectively significant at 10%, 5% and 1% thresholds. Omitted variable for applicant type is French applicant.

Table 4: Probit model results

5   Robustness checks

We propose in this section two robustness checks of our results. First, we test if changing the applicant names have an impact on the experiment outcome. Second, we take advantage of a Facebook policy change that occurred in December 2012, namely a change of profile layout, to show evidence of the perception by recruiters of Facebook information.

5.1   Alternative names

The names and first names of the applicants, even if they sound French and are very similar or frequent, can have an effect on the application outcome. In order to control for such effect, we use a second pair of fictitious applicants with new names and first names from October 2012 to March 2013. The new names are still selected from among the five most popular French-sounding first names,

and two French-sounding last names which are very similar. Again, the combinations are unique on Facebook. We also reset their work experience so that our second pair of applicants graduated in September 2012. The new candidates have short work experience ranging from 1 month to 6.5 months. Otherwise, our fictitious applicants would have had significantly more work experience at the end of the experiment, and discrimination against foreign origin individuals is known to decrease with applicants' work experience (Aeberhardt et al., 2010). Table 5 below summarizes the names of the applicants and their work experience in the global experiment and Figure 4 presents the experiment timing with the alternative names.[19]

First name and Name	Type of candidate	Timespan	Work experience
Thomas Marvaux	French	Mar. 2012- Sept. 2012	6.5 to 13 months
Stéphane Marcueil	Moroccan		
Julien Bautrant	French	Oct. 2012- Mar. 2013	1 to 6.5 months
Nicolas Lautrant	Moroccan		

Table 5: Names and first names of applicants used in the experiment
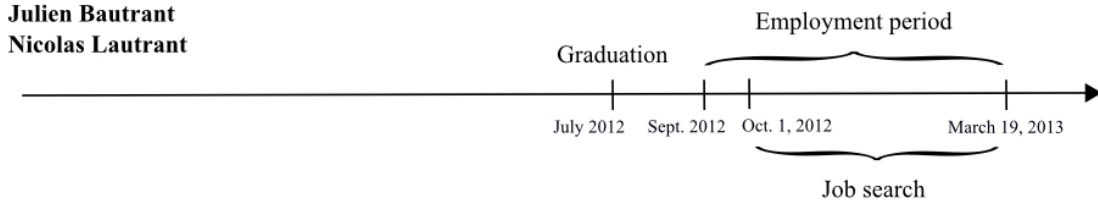
Figure 4: Experiment timing with the alternative names

Figure 5 shows that applicants of the same type but with different names have, one month after they started applying for position, a similar cumulative callback rate. Additionally, this callback rate is higher for the French applicants than it is for the Arabic ones.[20] This comparison is carried out only for the first two months (60 days) of each pair of applicants as the Facebook layout change occurred after two month of use of the second pair.

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[19]More descriptive statistics on jobs and firms' characteristics in Appendix 4 and following.

[20]The gap between the callback rates of the two control applicants around 20 days of applications is due to the fact that, as callbacks start, a small difference in the number of calls from employers causes a large gap in the cumulative rate. This effect disappears after a month of application and the rate of returns stabilizes thereafter.
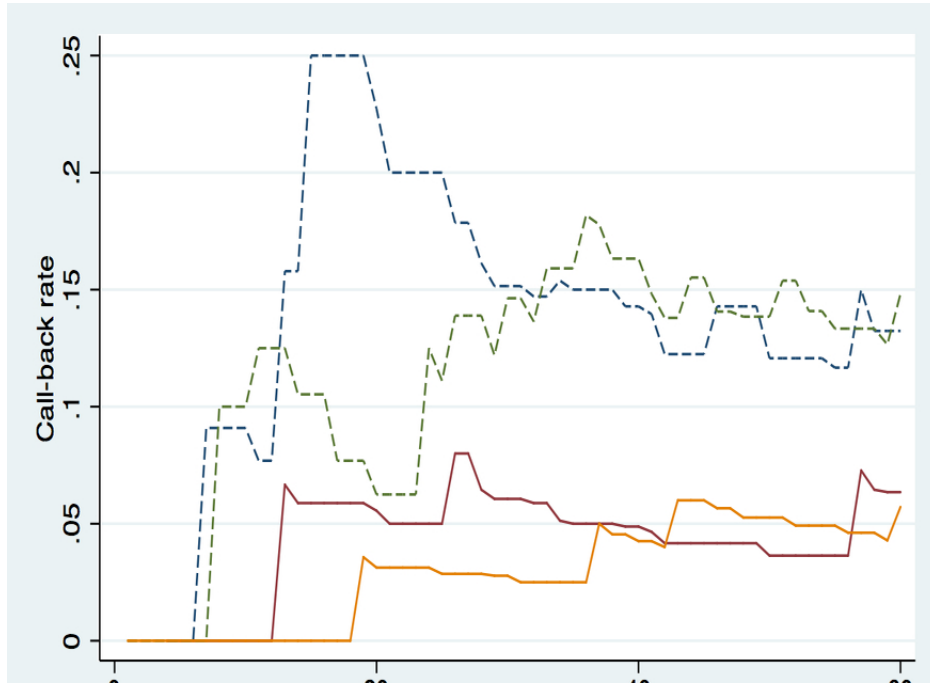
Figure 5: Callback rates in the first two months for each applicant

Additional evidences that the applicants' names do not affect the experiment outcome are presented in the next section. Indeed, we need to take into account the social media layout change that occurred when using the alternative names.

5.2 Social media layout change

In December 2012, two months after we started using alternatives names, the social media platform changed the default layout of the profiles, and our signal was split into two smaller signals on different tabs.[21] The profile layout changed from a single page to a front page with tabs to provide access to certain personal information. Specifically, information on city of origin is still displayed on the front page of the profile (default 'Timeline' tab requiring no click from the viewer), but information on

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[21]For further information see Yao R. 2013. "Improvements to Timeline", *http://newsroom.fb.com/News/584/Improvements-to-Timeline*, retrieved Nov., 2016 ; Milano D. 2012. "Facebook May Be Changing Your Timeline: Redesign Tests in Progress" *http://abcnews.go.com/blogs/technology/2012/12/facebook-may-be-changing-your-timeline-redesign-tests-in-progress*, retrieved Nov., 2016, and on other news, or bloggers' websites that observed this change about December 2012 (retrieved June, 2015): http://mashable.com/2013/01/08/facebook-timeline-change-new/, http://socialmediatoday.com/mohammed-anzil/1100946/facebook-way-change-your-timeline-again, http://www.cnet.com/news/facebook-looking-into-a-slimmer-trimmer-timeline-layout/, http://www.insidefacebook.com/2012/10/31/facebook-tests-timeline-layout-with-single-column-of-posts/ and http://www.marismith.com/facebook-single-column-timeline-layout/.

language(s) requires a click on the 'About' tab and scrolling down the page to access the information. Figures 6 and 7 below show screenshots of Facebook's new layout. This exogenous change allows us to better understand the way the signal has been perceived by recruiters. This modification may have created a search cost to access the entire signal (i.e. city of origin and spoken languages). If indeed the mechanism we suggest holds, that is recruiters do look at the Facebook profiles, then the effect should become less significant if the information is harder to retrieve. This intuition is confirmed since the layout change has greatly affected the perception of the differentiating signal by recruiters, as the constant gap of 8-points we have observed since the beginning of the experiment did not hold anymore after December, 2012. This result appears to be coherent with the literature that highlights the role of the spoken languages as a significant factor of job discrimination (Bisin et al., 2008; Oreopoulos, 2009; Edo et al., 2013). We present here the detailed results.
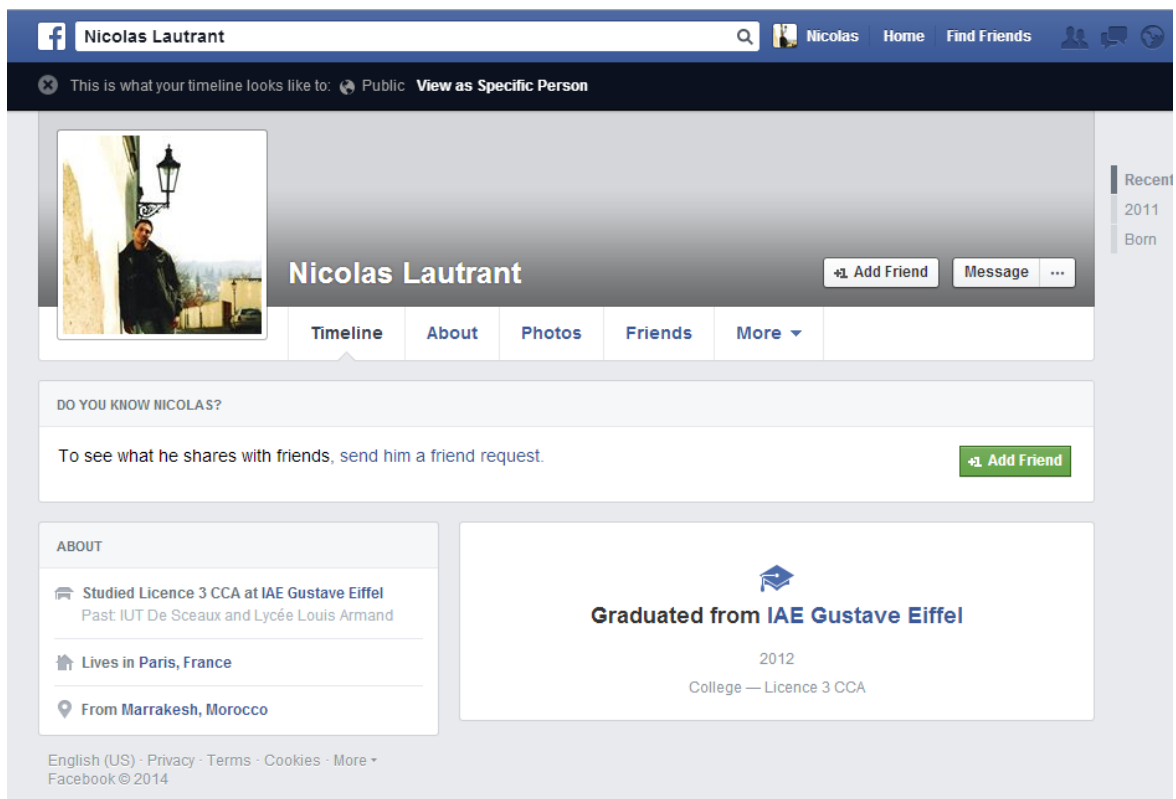
Figure 6: Screenshot of the social media profile of the Arabic applicant with the new layout: default "Timeline" tab displaying only the origin town (same kind of display for the French applicant).
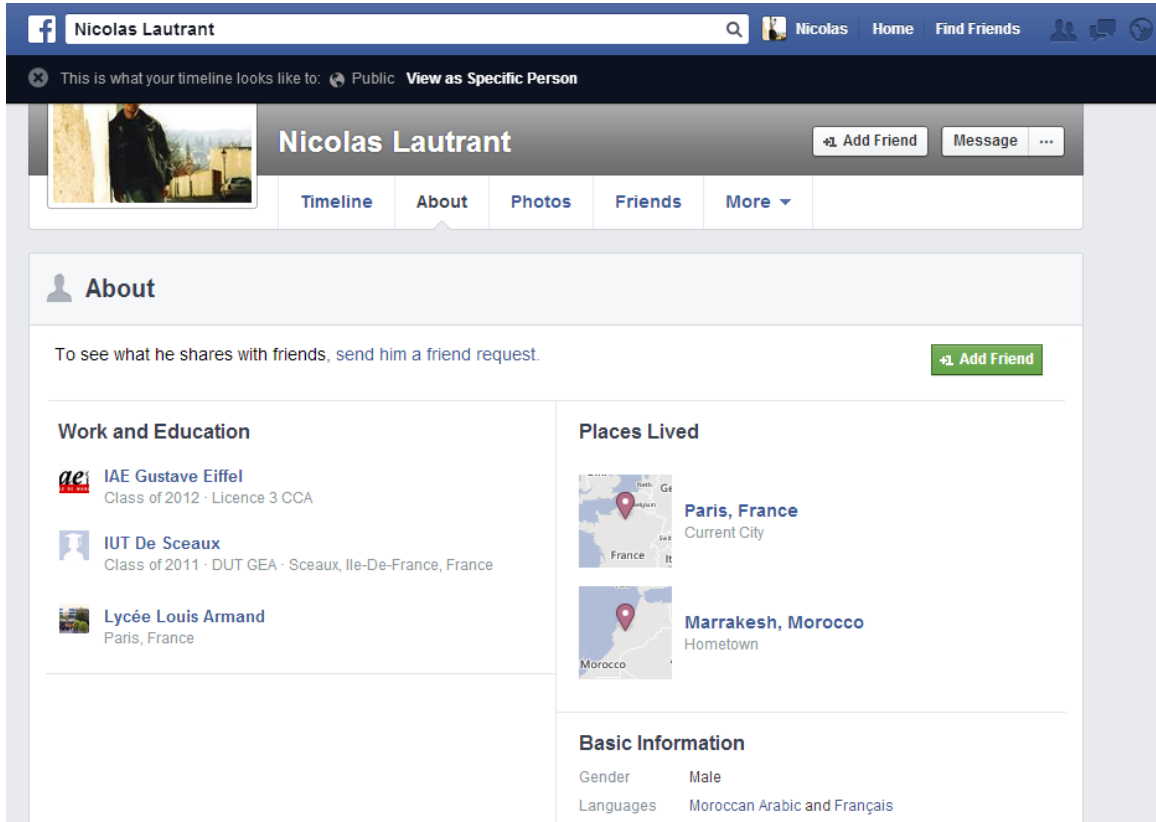
Figure 7: Screenshot of the social media profile of the Arabic applicant with the new layout: "About" tab displaying the origin town and the spoken languages (same kind of display for the French applicant).

Table 6 and Figure 8 below show that the callback rates before and after the layout change are clearly different. Before the layout change (October-November 2012), we again observed in Table 6 an 8-percentage point gap in callback rates between the French (16.0%) and the Arabic (7.1%) candidates. A Chi^2 test indicates the significance of this difference at the 10% threshold (Chi^2(1)=2.84; Pr=0.092).[22] This result provides some evidence that our previous findings did not arise from our applicants' names and first names. The period before the layout change (March-November 2012) confirms our main result: a Facebook profile can be, for most recruiters, a source of discrimination of the applicants.[23]

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[22]The corresponding Fisher exact test is slightly above the 10 percent significance level (Pr = 0.13).

[23]In the first 8 months of the experiment, the French applicant received 62 positive callbacks from 311 applicants (19.9%); the Arabic applicant was called 36 times from 302 applications (11.9%), i.e. Chi^2(1) = 7.33; Pr = 0.007.

	Before layout change Oct.-Nov. 2012			After layout change Dec. 2012-Mar. 2013			Overall experiment Oct. 2012-Mar. 2013
	Callbacks		Applications	Callbacks		Applications	Applications
French candidate	13	16.0%	81	9	8.3%	109	190
Arabic candidate	5	7.1%	70	15	13.0%	115	185
Total	18	11.9%	151	24	10.7%	224	375

Table 6: Callback rates before and after Facebook layout change for alternative names
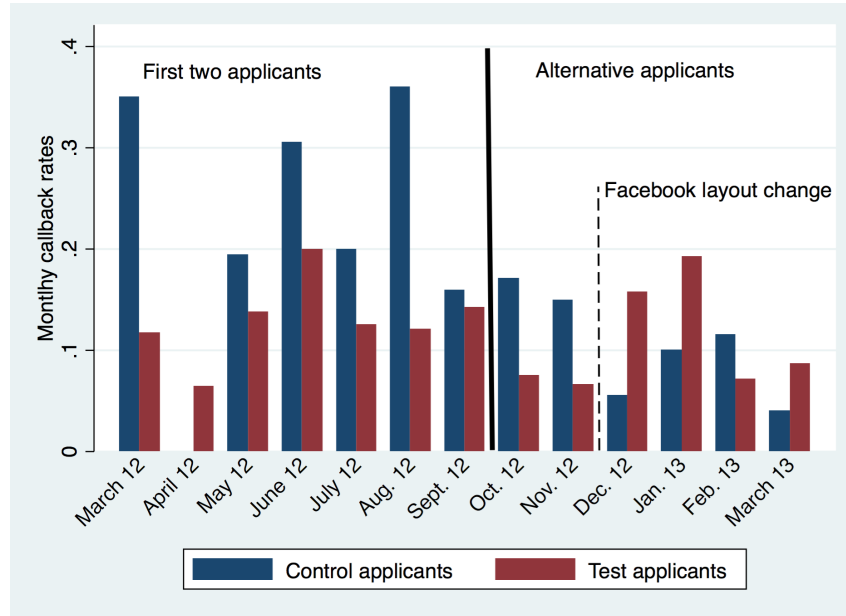
Figure 8: Monthly callback rates

After the Facebook layout change, the Arabic candidate is called back at a rate that is not statistically different from that of the French applicant, respectively 13.0% and 8.3% (Chi^2(1)=1.34; Pr=0.24). In order to better understand the consequences of the layout change, we present in the table below the respective effects of the new layout and of being an Arabic applicant on the probability of receiving a callback. More precisely, we estimate the following equation using Probit model:

$$Pr(Interview_{ijt}) =$$

$$+ \beta_1 ArabicApplicant_i \times LayoutChange_t$$

$$+ \beta_2 ApplicationDelay_j$$

$$+ \beta_3 JobCharacteristics_j$$

$$+ \beta_4 FirmCharacteristics_j$$

$$+ \beta_5 Time_t$$

$$+ \alpha + \epsilon_{ijt}$$

Where $LayoutChange_t$ is a dummy variable that is equal to one after the social media layout change (i.e. after Dec. 2012), and zero before. The other variable or set of variables are similar to their description provided in the section "Main results". The introduction in the model of an interaction term, which indicates the Facebook layout change, allows us to strengthen and deepen our previous results.

Dep. var.: callback (yes/no)	
French app. & new layout	-0.795***
	(0.277)
Arabic app. & old layout	-1.072***
	(0.328)
Arabic app. & new layout	-0.356
	(0.253)
Application delay controls	Yes
Job characteristic controls	Yes
Mean wage offer control	No
Firm characteristic controls	Yes
Time dummies	Yes
Constant	1.587**
	(0.739)
Observations	375
Pseudo-R2	0.206

Robust standard errors in parentheses. *, ** and *** mean respectively significant at 10%, 5% and 1% thresholds. Omitted variable for applicant type and layout is French applicant and old layout.

Table 7: Layout change impact on application outcome

For the second pair of fictitious applicant, before the layout change we still observe in Table 7 a negative and significant effect of the Arabic candidate compared to the French one. This result confirms that Facebook has become a new informal source of information for recruiters and affects significantly the matching process on the labor market.

The second interesting point is that there is no more difference between the French applicant with old layout and the Arabic applicant with new layout (i.e. without the spoken language on the front page). In other words, once the differentiating signal has been mitigated - disappearance of spoken language from the front page - the two applicants are not anymore considered as different by recruiters. It tends to highlight the similarity of the two fictitious applicant and highlights the role of spoken language as the main differentiating factor between them. This result is in line with other studies on discrimination showing that languages are important explanatory factors in job discrimination (Bisin et al., 2008; Oreopoulos, 2009; Edo, Jacquemet and Yannelis, 2013).[24] It illustrates the existence of search costs associated with the screening of social media platforms. Exploring all the tabs seems to be costly and then recruiters tend not to carry out a thorough screening of applicants' personal social media profiles, and only rely on the front page. More study is required to characterize this behavior further. For instance, the applicants' education level in our experiment is three years undergraduate study; it remains to be seen whether more senior jobs would involve more thorough social media profile screening.

6 Conclusion

This study complements the relatively scarce literature on recruiters' search strategies. We investigated the potential use of personal social media platforms, in our case Facebook, as a reliable source of information on applicants for recruiters during hiring. Such non-observable practices are affected by a strong declarative bias due to the ethical and legal issues surrounding the collection of applicants' personal data. Therefore, we set up a field experiment using real job applications for accountants in the greater Paris area. The experiment consists of creating two fictitious applicants who differed only in their perceived origins, observable solely on their Facebook profiles. In line with the literature

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[24]The second element of our signal, namely "city of origin", does not seem to have an impact if isolated from spoken language. As illustrated by Bisin et al. (2008), foreign spoken language seems to act as signal of foreign culture belonging.

on discrimination, this signal – if observed and considered reliable – is expected to have a significant negative effect on the callback rates for interview, of the test applicant compared to the control. Conversely, if recruiters do not screen applicants' Facebook profile, the quasi-similarity of their application material (resume and cover letter) should lead to similar callback rates for both. During 6.5 months (from mid-March 2012 to September 2012), we applied for job openings for accountants in the Paris region using pseudo-random assignment method, and sent more than 460 applications.

The period from March to September 2012 shows a clear and consistent gap of 8 percentage points between the French (21.3%) and the Arabic (13.4%) applicants. The design of the experiment ensures that the 37% difference in callback rates results from observation of the Arabic signal only available on the test applicant's Facebook profile. This significant difference indicates that social media platforms are a new informal source of information for screening applicants. For many recruiters, Facebook profiles have become a part of the application material and affects significantly the matching process on the labor market.

An unexpected change in the layout of Facebook profiles occurred in December, 2012 and modified the nature of the last four months of our experiment. This modification strongly affected the Arabic signal, since only a part of it (i.e. home town) still appeared on the Facebook front page, while the second part (i.e. language spoken) was positioned at the bottom of a secondary page (in the "About" tab). This natural experiment allowed us to learn more about the social media screening practices of recruiters since, after this change, the two candidates exhibited no significant difference in callback rates. This suggests that screening is quite superficial, which illustrates the existence of search costs for employers to browse an entire profile.

An implication for policy of this paper is that applicants should know that their personal social media profiles are considered reliable means of assessment and selection by many French recruiters. In this study, a small difference in the online profiles led to a drop of 37% in the number of calls for interview. This result illustrates the large impact of social media platforms, and especially Facebook, on the labor market. Therefore, it is important for applicants during a job search to treat the social media profile as part of the application material. A communication campaign could be organized to inform people of the secondary use of their online personal information and the potential consequences

for the probability of finding a job and for their professional careers. Our findings suggest also potential solutions, ranging from locking one's profile, to cleaning one's social media profile during job search or various assessment periods, to the use of multiple social media profiles ("official" accessible to anyone, and private), to the use of an avatar. The impact of not having an online presence when searching for a job should be assessed in further studies.

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Appendix 1. Job applications by industry and location (Mar.-Sep. 2012)

		Control applicant	Test applicant
Industry	Accounting	10.4	11.7
	Association/Union	3.1	3.5
	Transport	5.7	4.3
	Bank/insurance	2.6	4.8
	Construction	2.6	3.1
	Retail trade	5.2	6.5
	Wholesale trade	10.0	10.8
	Audit & consulting	5.6	6.9
	Culture/leisure	1.8	1.3
	Management	4.4	3.0
	Teaching/research	5.2	3.4
	Hotel/restaurant	6.1	4.3
	Real estate	3.	4.3
	Telecom/computer	4.4	5.2
	Health/social	6.5	5.6
	Public organizations	1.7	2.2
	Advertising/communication	4.8	4.3
	Business services	7.4	7.4
	Personal services	3.0	2.2
	Industry/energy/waste	6.5	5.2
Location	Seine-et-Marne	4.4	3.0
	Yvelines	9.1	8.6
	Essonne	4.8	9.1
	Hauts-de-Seine	16.1	15.5
	Seine-Saint-Denis	10.0	12.1
	Val-de-Marne	12.2	8.2
	Val-d'Oise	4.4	3.5
	Central districts of Paris	9.1	8.2
	North-East districts of Paris	6.5	5.2
	North-West districts of Paris	11.7	13.8
	South-East districts of Paris	5.2*	1.3*
	Applicant's district and contiguous districts of Paris	6.5	8.6
Number of app.		230	232

The table reports percents for industry and locations. * indicates a significant difference in proportion at the 5% threshold between the two candidates.

Paris areas definitions:

- Central districts of Paris: 1st, 2nd, 3rd, 4thand 5thdistricts ;

- North-East districts of Paris: 10th, 11th, 19thand 20thdistricts ;

- North-West districts of Paris: 8th, 9th, 17thand 18thdistricts ;

- South-East districts of Paris: 12thand 13thdistricts ;

- Applicant's district and contiguous districts: 15th, 14th16th, 17th, 6thand 7thdistricts.

Appendix 2. Experiment robustness check (March–Sept. 2012)

Endogenous variable: callback (yes/no)		Model 1	Model 2	Model 3
Applicant type	Control app.	ref.	ref.	ref.
	Test app.	-0.431***	-0.404***	-0.313**
		(0.159)	(0.156)	(0.139)
Application delay	No delay	ref.	ref.	
	1 day	0.264	0.200	
		(0.240)	(0.240)	
	2 days	-0.129	-0.188	
		(0.275)	(0.274)	
	3 days	-0.300	-0.327	
		(0.331)	(0.321)	
	4 days	0.269	0.267	
		(0.383)	(0.371)	
	5-9 days	0.820*	0.796*	
		(0.459)	(0.467)	
Contract type	Fixed-term	ref.	ref.	
	Regular	-0.034	-0.112	
		(0.196)	(0.195)	
Job position	Accounting assistant	ref.	ref.	
	Acc. & secretary assist.	0.254	0.198	
		(0.240)	(0.239)	
	Other accounting assist.	-0.598	-0.669	
		(0.562)	(0.557)	
	Accountant	-0.140	-0.322	
		(0.226)	(0.217)	
	Specialized accountant	0.141	-0.119	
		(0.305)	(0.299)	
Mean wage offer		-0.131***		
		(0.044)		
Required education	Bachelor's degree	ref.	ref.	
	Not specified	-0.619	-0.387	
		(0.386)	(0.367)	
	Vocational certificate	-0.766	-0.543	
		(0.722)	(0.695)	
	High school diploma	-1.199**	-0.898**	
		(0.477)	(0.454)	
	Associate degree	-0.318	-0.119	
		(0.377)	(0.362)	
Required work experience	No experience	ref.	ref.	
	6 months-1 year	-0.038	-0.013	
		(0.292)		
	2 years	0.178	0.076	
		(0.227)		
	3 years	-0.002	-0.154	
		(0.256)		
	4 or 5 years	-0.440	-0.736***	
		(0.296)		

Public transport time	Less than 30 minutes	ref.	ref.
	31-60 minutes	-0.359**	-0.353**
		(0.177)	(0.173)
	61-90 minutes	-0.764***	-0.759***
		(0.277)	(0.273)
	91-120 minutes	-0.734	-0.729
		(0.591)	(0.587)
	120+ minutes	-0.160	-0.327
		(0.586)	(0.670)
Industry	Accounting	ref.	ref.
	Association/Union	-0.287	-0.275
		(0.490)	(0.495)
	Transport	0.641*	0.701*
		(0.376)	(0.374)
	Bank/insurance	-0.304	-0.263
		(0.441)	(0.433)
	Construction	-0.029	0.016
		(0.770)	(0.760)
	Retail trade	-0.002	0.050
		(0.384)	(0.383)
	Wholesale trade	-0.250	-0.218
		(0.373)	(0.371)
	Audit & consulting	0.397	0.367
		(0.381)	(0.376)
	Culture/leisure	-0.957*	-0.941*
		(0.541)	(0.536)
	Management	-0.681	-0.515
		(0.489)	(0.454)
	Teaching/research	-1.658***	-1.506***
		(0.464)	(0.474)
	Hotel/restaurant	-0.882*	-0.793*
		(0.452)	(0.434)
	Real estate	0.046	0.098
		(0.445)	(0.433)
	Telecom/computer	-0.137	-0.225
		(0.403)	(0.407)
	Health/social	0.118	0.161
		(0.446)	(0.455)
	Public orga.	-0.098	0.015
		(0.660)	(0.657)
	Advertising/communication	-0.194	-0.207
		(0.423)	(0.409)
	Business services	-0.398	-0.379
		(0.417)	(0.421)
	Personal services	-1.153*	-1.009
		(0.678)	(0.644)
	Industry, energy and waste	-1.143**	-1.040**
		(0.531)	(0.501)

Firm status	Private	ref.	ref.	
	Public	0.423	0.382	
		(0.439)	(0.436)	
	Not-for-Profit	0.305	0.211	
		(0.313)	(0.316)	
Firm size	5- employees	ref.	ref.	
	6-19 emp.	0.176	0.162	
		(0.230)	(0.229)	
	20-49 emp.	0.378	0.322	
		(0.250)	(0.246)	
	50-249 emp.	0.338	0.247	
		(0.268)	(0.260)	
	250+ emp.	0.412	0.398	
		(0.309)	(0.307)	
Time dummies	March 2012	ref.	ref.	
	April 2012	-1.343***	-1.340***	
		(0.439)	(0.430)	
	May 2012	-0.329	-0.364	
		(0.379)	(0.382)	
	June 2012	0.048	-0.019	
		(0.361)	(0.364)	
	July 2012	-0.529	-0.576*	
		(0.340)	(0.344)	
	Aug. 2012	-0.205	-0.229	
		(0.371)	(0.373)	
	Sept. 9 2012	-0.310	-0.401	
		(0.374)	(0.375)	
Constant		1.826**	0.386	-0.796***
		(0.784)	(0.592)	(0.093)
Observations		462	462	462
Pseudo-R2		0.232	0.216	0.012

Robust standard errors in parantheses. *, ** and *** mean respectively significant at 10%, 5% and 1% thresholds.

Models 2 and 3, which include additional control variables, show that some of them have a significant influence on the likelihood of a positive outcome. The control variables, which turn out to be significant, highlight additional results about the hiring process generally. Firstly, we observe a negative impact of over-education on the probability of being selected. Secondly, during the experiment, the applicants' work experience ranged from 6.5 to 13 months. It appears that only a large difference between applicant's current work experience and that required by recruiters is an impediment. Only four or five years of experience difference from what the recruiter requires seems to negatively affect the odds of being offered an interview. Thirdly, we notice a negative non-linear effect of distance from the job. Commuting distances of 30-90 minutes have a negative influence compared to the reference, i.e. less than 30 minutes of transport. However, longer distances (over 90 minutes) do not have additional negative effects. This suggests that employers expect the successful applicant to relocate rather than suffer a long commute (van Ommeren et al., 1999). Finally, the effect is significant for a few industries, namely industry, teaching/research, hotel/restaurant, transport and personal services. A possible explanation for this is that, although we designed the applicants' resumes to fit as many sectors as possible, they do not fit all activities. The activities of teaching and research use very specific public accounting beyond the scope of our applicants' skills and education.

A difference in application delays can occur because at least two individuals are involved in prepar-

ing and checking applications, which then are sent in batches. The difference in application delays turns out to be significant, but is limited: the average is 1.3 days for the control candidate and 1.6 days for the test candidate, and all applications were sent within 5 and 6 days, respectively. According to robustness checks in Appendix 2, the type of contract does not influence the application outcome and application delay has no influence overall, except for a weak positive impact for long delays.

Appendix 3. Job and firm characteristics of applications for alternative names (Oct. 2012–March 2013)

Variable	Description	Control candidate	Test candidate
Job position	Accountant	37.4%	34.1%
	Specialized accountant	18.4%	22.7%
	Accounting assistant	29.0%*	20.0%*
	Acc. & secretary assistant	12.6%*	20.5%*
	Other accounting assistant	2.6%	2.7%
Contract	Regular	21.1%*	32.4%*
	Fixed-term	78.9%*	67.6%*
Fixed-term contract duration		7.2/2.5/6/18	8.3/4.7/6/36
Worktime		33.6/6.4/8/40	33.9/5.9/8/39
Required education	Not specified	34.2%	41.6%
	Vocational certificate	3.2%	2.2%
	High school diploma	8.9%	9.7%
	Associate degree	47.9%	41.1%
	Bachelor's degree	5.8%	5.4%
Required work experience	No experience	21.1%	18.4%
	6 months-1 year	10.5%	13.0%
	2 years	29.5%	28.1%
	3 years	18.4%	18.9%
	4 or 5 years	20.5%	21.6%
Mean wage		12.8/2.7/8.6/23.6	12.5/2.4/8.6/20.8
Application delay		2.7/1.5/0/7	2.5/1.7/0/9
Size	0-5 employees	23.7%	23.8%
	6-19 emp.	27.4%	24.3%
	20-49 emp.	22.1%	21.1%
	50-249 emp.	16.8%	18.9%
	250+ emp.	10.0%	11.9%
Firm status	Private	82.7%	82.1%
	Public	5.9%	5.0%
	Not-for-profit	11.4%	12.9%
Industry		See Appendix 5	
Location		See Appendix 5	
Total number of applications		190	185

* indicates a significant difference in mean or proportion between the two applicants at 5% threshold.
The table reports mean/sd/min/max for fixed-term contract duration (in month), for worktime
(in hours), for the mean wage (in €/hour) and for the application delay.(in days).

In the Table above, we can notice again some differences in proportion for some job positions and contract type. For job positions, these differences do not hold anymore if we consider all accounting assistant positions together. Concerning contract type, this is the opposite case as in the first part of the experiment (see Table ??). the difference is not due to the classification of the variables, but stems instead from our pseudo-random assignment method, which focuses on four characteristics - firm size, firm's industry, job position and required work experience. As a consequence differences can appear temporally among few control variables. According to models in Appendix 6, both job characteristics have not any significant influence on the outcome of the application.

Appendix 4. Job applications by industry and applicant's type for alternative names (Oct. 2012–March 2013)

		Control applicant	Test applicant
Industry	Accounting	10.5%	8.1%
	Association/Union	5.2%	3.8%
	Transport	2.1%	5.4%
	Bank/insurance	4.8%	2.7%
	Construction	4.2%	5.4%
	Retail trade	5.8%	4.3%
	Wholesale trade	12.1%	10.8%
	Audit & consulting	6.8%	6.0%
	Culture/leisure	2.1%	3.2%
	Management	5.3%	5.4%
	Teaching/research	1.6%	2.2%
	Hotel/restaurant	0.0%*	3.8%*
	Real estate	6.8%	5.4%
	Telecom/computer	3.2%	3.2%
	Health/social	4.7%	7.0%
	Public organizations	2.1%	1.6%
	Advertising/communication	2.1%	1.6%
	Business services	11.1%	9.2%
	Personal services	4.2%	6.0%
	Industry/energy/waste	5.3%	4.9%
Location	Seine-et-Marne	4.8%	6.0%
	Yvelines	10.5%	10.8%
	Essonne	7.9%	4.9%
	Hauts-de-Seine	16.8%	15.1%
	Seine-Saint-Denis	11.6%	8.1%
	Val-de-Marne	6.8%*	13.5%*
	Val-d'Oise	3.7%	4.3%
	Paris central districts	3.7%	4.3%
	Paris North-East districts	5.3%	6.5%
	Paris North-West districts	16.8%	13.5%
	Paris South-East districts	3.7%	7.0%
	Applicants' district and contiguous Parisian districts	8.4%	6.0%
Number of applications		190	185

Note: Proportion equality tests are not satisfied for one sector (hotel/restaurant) and one area (Val-de-Marne). However, these two firm characteristics have no significant influence on the outcome of application according to Appendix 6.

Appendix 5. Robustness checks for alternative names (Oct. 2012–March 2013)

Applicant type	Control app.	ref.	ref.	ref.
	Test app.	-0.228	-0.207	-0.040
		(0.190)	(0.185)	(0.171)
Application delay	No delay	ref.	ref.	
	1 day	-0.650	-0.529	
		(0.477)	(0.469)	
	2 days	-0.626	-0.596	
		(0.488)	(0.479)	
	3 days	-1.142**	-1.020**	
		(0.510)	(0.500)	
	4 days	-1.945***	-1.851***	
		(0.624)	(0.592)	
	5-9 days	-0.989*	-0.917	
		(0.594)	(0.567)	
Contract type	Fixed-term	ref.	ref.	
	Regular	-0.173	-0.223	
		(0.223)	(0.221)	
Job position	Accounting assistant	ref.	ref.	
	Accounting, secretary and other assist.	0.250	0.160	
		(0.291)	(0.287)	
	Accountant	0.680**	0.439*	
		(0.287)	(0.260)	
	Specialized accountant	0.526	0.268	
		(0.338)	(0.317)	
Mean wage offer		-0.114***		
		(0.044)		
Required education	Bachelor's degree	ref.	ref.	
	Not specified or vocational certif.	-0.386	-0.335	
		(0.373)	(0.382)	
	High school diploma	-0.176	-0.051	
		(0.456)	(0.459)	
	Associate degree	-0.441	-0.352	
		(0.369)	(0.372)	
Required work experience	No experience	ref.	ref.	
	6 months-1 year	0.139	0.071	
		(0.300)	(0.295)	
	2 years	-0.214	-0.286	
		(0.248)	(0.246)	
	3 years	-0.118	-0.255	
		(0.301)	(0.300)	
	4 or 5 years	-0.459	-0.714**	
		(0.354)	(0.336)	
Public transport time	Less than 30 minutes	ref.	ref.	
	31-60 minutes	-0.266	-0.241	
		(0.227)	(0.227)	
	61-90 minutes	-0.928***	-0.837**	
		(0.356)	(0.354)	
	90+ minutes	-0.578	-0.461	
		(0.429)	(0.425)	

Industry	Accounting	ref.	ref.
	Association/Union	-0.845	-0.761
		(0.563)	(0.566)
	Bank/insurance	-0.742	-0.671
		(0.537)	(0.518)
	Construction and real estates	-1.010**	-0.907**
		(0.469)	(0.463)
	Retail trade, hotel and restaurant	-0.487	-0.417
		(0.525)	(0.527)
	Wholesale trade	-0.773*	-0.675
		(0.424)	(0.417)
	Audit & consulting	-0.865*	-0.814*
		(0.476)	(0.470)
	Culture/leisure	-0.822	-0.590
		(0.734)	(0.767)
	Management	0.172	0.172
		(0.444)	(0.444)
	Teaching/research	-1.194	-0.955
		(0.920)	(0.901)
	Telecom/computer	-0.940*	-0.930*
		(0.529)	(0.532)
	Health/social	-0.594	-0.332
		(0.548)	(0.513)
	Public orga.	-0.980	-0.645
		(0.963)	(0.981)
	Advertising/communication	0.126	0.041
		(0.561)	(0.565)
	Business services	-0.499	-0.437
		(0.398)	(0.400)
	Personal services	-0.918*	-0.729
		(0.483)	(0.477)
	Industry, energy, waste and transport	-1.579***	-1.302**
		(0.611)	(0.571)
Firm status	Private	ref.	ref.
	Public	0.679	0.664
		(0.511)	(0.502)
	Not-for-Profit	0.521	0.461
		(0.366)	(0.363)
Firm size	5- employees	ref.	ref.
	6-19 emp.	-0.585**	-0.562**
		(0.269)	(0.263)
	20-49 emp.	-0.296	-0.303
		(0.262)	(0.261)
	50-249 emp.	-0.011	-0.060
		(0.281)	(0.280)
	250+ emp.	-0.815**	-0.756**
		(0.385)	(0.379)

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Time dummies	Oct. 2012	ref.	ref.	
	Nov. 11 2012	0.086	0.094	
		(0.298)	(0.293)	
	Dec. 2012	0.109	0.180	
		(0.332)	(0.320)	
	Jan. 1 2013	0.014	0.119	
		(0.339)	(0.336)	
	Feb. 2013	-0.201	-0.182	
		(0.310)	(0.311)	
	March 2013	-0.561*	-0.538*	
		(0.340)	(0.325)	
Constant		2.440***	1.008	-1.196***
		(0.891)	(0.717)	(0.119)
Observations		375	375	375
Pseudo-R2		0.195	0.177	0.0002

Robust standard errors in parentheses. *, ** and *** mean
respectively significant at 10%, 5% and 1% tresholds.

Note: some sectors had to be merged due to perfect predictability of results otherwise. This is the case here for: construction and real estate, retail trade and hotel/restaurant, and industry, energy, waste and transport.

Appendix 6. Job and firm characteristics of the applications for alternative names before and after the layout change (Oct. 2012–March 2013)

Variable	Description	oct. 2012 - nov. 2012		dec. 2012 - march 2013	
		Control candidate	Test candidate	Control candidate	Test candidate
Job position	Accountant	30.9%	31.4%	42.2%	35.7%
	Specialized acc.	18.5%	17.1%	18.4%	26.1%
	Accounting ass.	32.1%	25.7%	26.6%	16.5%
	Acc. / secr. ass.	14.8%	21.4%	11.0%	20.0%
	Other acc. ass.	3.7%	4.3%	1.8%	1.7%
Contract	Regular	14.8%*	35.7%*	25.7%	30.4%
	Fixed-term	85.2%*	64.3%*	74.3%	69.6%
Fixed-term contract dur.		7.0/1.5/6/10	7.8/2.4/6/12	7.2/2.8/6/18	8.5/5.8/6/36
Worktime		33.0/6.6/8/39	33.8/5.9/8/39	34.0/6.2/9.5/40	33.9/6.0/9.5/39
Required education	Not specified	34.6%	42.9%	33.9%	40.9%
	Vocational certificate	2.5%	4.3%	3.7%	0.9%
	High school diploma	9.9%	8.6%	8.3%	10.4%
	Associate degree	48.2%	44.3%	47.7%	39.1%
	Bachelor's degree	4.9%*	0.0%*	6.4%	8.7%
Required work exp.	No experience	19.8%	21.4%	22.0%	16.5%
	≤ 1 year	11.1%	11.4%	10.1%	13.7%
	2 years	33.3%	35.7%	26.6%	23.5%
	3 years	22.2%	17.1%	15.6%	20.0%
	4 or 5 years	13.6%	14.3%	25.7%	26.1%
Mean wage		12.8/2.5/9.4/23.1	12.5/2.7/8.6/20.8	12.9/2.9/8.6/23.6	12.4/2.1/9.2/23.6
Applicat. delay		2.3/1.1/0/6*	1.6/0.9/0/4*	2.9/1.7/0/7	3.0/1.9/0/9
Size	0-5 employees	17.3%	22.9%	28.4%	24.4%
	6-19 emp.	28.4%	22.9%	26.6%	25.2%
	20-49 emp.	29.6%*	14.3%*	16.5%	25.2%
	50-249 emp.	17.3%	25.7%	16.5%	14.8%
	250+ emp.	7.4%	14.3%	11.9%	10.4%
Firm status	Private	82.7%	81.4%	81.7%	79.1%
	Public	3.7%	5.7%	6.4%	5.2%
	Not-for-profit	13.6%	12.9%	11.9%	15.7%
Industry		See Appendix 8			
Location		See Appendix 8			
Number of appl.		81	70	109	115

* indicates a significant difference in mean or proportion between the two applicants at 5% threshold. The table reports mean/sd/min/max for fixed-term contract duration (in month), for worktime (in hours), for the mean wage (in €/hour) and for the application delay.(in days).

* indicates a significant difference in mean or proportion between the two applicants at 5% threshold.

Significant difference in proportion or mean for the period before the layout change, namely for contract type, application delay, one education level and one firm size can be observed. Given the unexpected shortness of this period, this type of difference might be inevitable. However, it applied to only a few variables that have no significant influence on the outcome of applications according to Appendices 9 and 10.

Appendix 7. Job applications by industry and applicant's type for alternative names before and after the layout change (Oct. 2012–March 2013)

| | | oct. 2012 - nov. 2012 | | dec. 2012 - march 2013 | |
		Control applicant	Test applicant	Control applicant	Test applicant
Industry	Accounting	7.4%	7.1%	12.8%	8.7%
	Association/Union	5.0%	2.9%	5.5%	4.4%
	Transport	1.2%	4.3%	2.8%	6.1%
	Bank/insurance	4.9%	4.3%	4.6%	1.7%
	Construction	6.2%	7.1%	2.8%	4.4%
	Retail trade	4.9%	4.3%	6.4%	4.4%
	Wholesale trade	11.1%	14.3%	12.8%	8.7%
	Audit & consulting	7.4%	1.4%	6.4%	8.7%
	Culture/leisure	3.7%	1.4%	0.9%	4.4%
	Management	1.2%	7.1%	8.3%	4.4%
	Teaching/research	0.0%	1.4%	2.8%	2.6%
	Hotel/restaurant	0.0%	2.9%	0.0%*	4.4%*
	Real estate	11.1%	7.1%	3.7%	4.4%
	Telecom/computer	2.3%	4.3%	3.7%	2.6%
	Health/social	7.4%	5.7%	2.8%	7.8%
	Public organizations	1.2%	2.9%	2.8%	0.9%
	Advertising/communication	3.7%	1.4%	0.9%	1.8%
	Business services	13.6%	8.6%	9.2%	9.6%
	Personal services	4.9%	7.1%	3.7%	5.2%
	Industry/energy/waste	2.5%	4.3%	7.3%	5.2%
Location	Seine-et-Marne	3.7%	7.1%	5.5%	5.2%
	Yvelines	11.1%	11.4%	10.1%	10.4%
	Essonne	9.9%*	0.0%*	6.4%	7.8%
	Hauts-de-Seine	22.2%	14.3%	12.8%	15.7%
	Seine-Saint-Denis	9.9%	8.6%	12.8%	7.8%
	Val-de-Marne	3.7%	11.4%	9.2%	14.8%
	Val-d'Oise	2.5%	8.6%	4.6%	1.7%
	Paris central districts	0.0%	4.3%	6.4%	4.4%
	Paris North-East districts	7.4%	5.7%	3.7%	7.0%
	Paris North-West districts	21.0%	14.3%	13.8%	13.0%
	Paris South-East districts	0.0%*	8.6%*	6.4%	6.1%
	Applicants' district and contiguous Parisian districts	8.6%	5.7%	8.3%	6.1%
Number of applications		81	70	109	115

* indicates a significant difference in mean or proportion between the two applicants at 5% threshold.

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Appendix 8. Robustness checks for the alternative names before the layout change (Oct. 2012–Nov. 2012)

Endogenous variable: callback (yes/no)		Model 1	Model 2	Model 3
Applicant type	Control app.	ref.	ref.	ref.
	Test app.	-1.207***	-0.929**	-0.473
		(0.428)	(0.382)	(0.168)
Application delay	No delay	ref.	ref.	
	1 day	1.495	1.312*	
		(1.066)	(0.797)	
	2 days	0.652	0.404	
		(1.042)	(0.735)	
	3 days	-0.011	0.220	
		(1.052)	(0.784)	
	4-9 days	0.445	-0.092	
		(1.232)	(0.932)	
Contract type	Fixed-term	ref.	ref.	
	Regular	-0.213	-0.327	
		(0.482)	(0.464)	
Job position	Accounting assistant	ref.	ref.	
	Account., secretary and other ass.	-0.718	-1.024*	
		(0.640)	(0.563)	
	Accountant	1.095**	0.565	
		(0.533)	(0.427)	
	Specialized accountant	0.481	-0.236	
		(0.633)	(0.502)	
	Mean wage offer	-0.330***		
		(0.111)		
Required education	Bachelor's degree	ref.	ref.	
	Not specified or vocational certif.	-0.007	-0.333	
		(0.900)	(0.883)	
	High school diploma	-0.101	0.016	
		(1.148)	(1.086)	
	Associate degree	-0.443	-0.599	
		(0.890)	(0.864)	
Required work experience	No experience	ref.	ref.	
	6 months-1 year	0.368	-0.042	
		(0.659)	(0.632)	
	2 years	0.352	0.079	
		(0.476)	(0.417)	
	3 years	0.136	-0.443	
		(0.612)	(0.558)	
	4 or 5 years	0.763	-0.241	
		(0.681)	(0.527)	
Public transport time	Less than 30 minutes	ref.	ref.	
	31-60 minutes	-0.318	-0.067	
		(0.490)	(0.432)	
	61-90 minutes	-1.343	-0.413	
		(0.853)	(0.648)	
	90+ minutes	-0.152	0.411	
		(0.689)	(0.643)	

Firm size	5- employees	ref.	ref.	
	6-19 emp.	-1.191*	-0.931*	
		(0.650)	(0.554)	
	20-49 emp.	-1.010*	-0.750	
		(0.581)	(0.501)	
	50-249 emp.	-0.805	-0.488	
		(0.620)	(0.503)	
	250+ emp.	-2.309***	-2.223***	
		(0.771)	(0.853)	
Industry	Accounting	ref.	ref.	
	Association/Union	5.846***	5.244***	
		(1.172)	(0.967)	
	Construction and real estates	5.270***	4.349***	
		(0.885)	(0.599)	
	Retail trade, hotel and restaurant	7.021***	5.781***	
		(1.157)	(0.892)	
	Wholesale trade	5.718***	4.752***	
		(1.126)	(0.726)	
	Audit & consulting	6.304***	5.672***	
		(0.932)	(0.723)	
	Culture/leisure	-0.430	-1.178	
		(1.193)	(1.110)	
	Management	5.364***	4.435***	
		(1.104)	(0.906)	
	Telecom/computer	7.068***	5.354***	
		(1.150)	(0.909)	
	Health/social	5.958***	6.026***	
		(0.947)	(0.870)	
	Public orga., teaching/research culture/leisure	6.947***	7.150***	
		(1.176)	(1.075)	
	Advertising/communication	6.469***	5.645***	
		(1.303)	(1.123)	
	Business services	5.418***	4.614***	
		(0.967)	(0.767)	
	Personal services, bank and insurance	5.842***	5.293***	
		(1.012)	(0.844)	
	Industry, energy, waste and transport	6.574***	5.658***	
		(1.065)	(0.817)	
Firm status	Private	ref.	ref.	
	Public	0.208	-0.015	
		(0.643)	(0.583)	
	Not-for-Profit	-0.212	-0.603	
		(0.684)	(0.592)	
Time dummies	Oct. 2012	ref.	ref.	
	Nov. 1 2012	0.026	-0.018	
		(0.402)	(0.356)	
Constant		-2.434	-5.043***	-0.992***
		(1.686)	(1.378)	(0.168)
Observations		151	151	151
Pseudo-R2		0.355	0.303	0.027

Appendix 9. Robustness checks for the alternative names after the layout change (Dec. 2012–March 2013)

Endogenous variable: callback (yes/no)		Model 1	Model 2	Model 3
Applicant type	Control app.	ref.	ref.	ref.
	Test app.	0.613*	0.614**	0.264
		(0.316)	(0.312)	(0.228)
Application delay	No delay	ref.	ref.	
	1 day	-1.805***	-1.746***	
		(0.678)	(0.677)	
	2 days	-1.197*	-1.197*	
		(0.662)	(0.654)	
	3 days	-2.067***	-2.016***	
		(0.786)	(0.774)	
	4-9 days	-2.629***	-2.617***	
		(0.796)	(0.780)	
Contract type	Fixed-term	ref.	ref.	
	Regular	-0.815**	-0.865**	
		(0.367)	(0.353)	
Job position	Accounting assistant	ref.	ref.	
	Account., secretary and other assist.	0.565	0.501	
		(0.500)	(0.478)	
	Accountant	0.989**	0.838**	
		(0.463)	(0.427)	
	Specialized accountant	0.646	0.439	
		(0.612)	(0.562)	
Mean wage offer		-0.060		
		(0.079)		
Required education	Bachelor's degree	ref.	ref.	
	Not specified or vocational certif.	-1.031*	-0.932*	
		(0.539)	(0.560)	
	High school diploma	-0.531	-0.469	
		(0.648)	(0.644)	
	Associate degree	-0.915+	-0.847	
		(0.553)	(0.547)	
Required work experience	No experience	ref.	ref.	
	6 months-1 year	0.361	0.297	
		(0.416)	(0.402)	
	2 years	-0.425	-0.449	
		(0.434)	(0.419)	
	3 years	-0.533	-0.597	
		(0.480)	(0.463)	
	4 or 5 years	-1.445**	-1.587***	
		(0.597)	(0.545)	
Public transport time	Less than 30 minutes	ref.	ref.	
	31-60 minutes	-0.013	-0.020	
		(0.365)	(0.364)	
	61-90 minutes	-0.845	-0.910*	
		(0.521)	(0.526)	
	90+ minutes	-0.908	-0.866	
		(0.766)	(0.722)	

Firm size	5- employees	ref.	ref.	
	6-19 emp.	-0.479	-0.505	
		(0.427)	(0.422)	
	20-49 emp.	-1.990***	-2.012***	
		(0.654)	(0.614)	
	50-249 emp.	-0.595	-0.636	
		(0.551)	(0.528)	
	250+ emp.	-0.923	-0.948	
		(0.959)	(0.947)	
Industry	Accounting	ref.	ref.	
	Construction and real estates	-1.283*	-1.165*	
		(0.696)	(0.667)	
	Retail and wholesale trade, hotel and restaurant	-1.728***	-1.573***	
		(0.571)	(0.567)	
	Audit, consulting and management	-1.428**	-1.380**	
		(0.583)	(0.590)	
	Health/social	0.204	0.274	
		(0.714)	(0.707)	
	Public organization, teaching/research, culture/leisure	-3.074***	-2.890***	
		(1.112)	(1.081)	
	Advertising/communication	-1.003	-1.019	
		(1.028)	(0.941)	
	Business services, computer/telecom, industry, energy, waste and transport	-1.308**	-1.194**	
		(0.521)	(0.510)	
	Personal services, bank and insurance	-1.257	-1.131	
		(0.818)	(0.806)	
Firm status	Private	ref.	ref.	
	Public	1.982**	1.881**	
		(0.902)	(0.891)	
	Not-for-Profit	0.058	0.103	
		(0.505)	(0.499)	
Time dummies	Dec. 2012	ref.	ref.	
	Jan. 1 2013	0.257	0.238	
		(0.394)	(0.394)	
	Feb. 2013	-0.101	-0.100	
		(0.415)	(0.403)	
	Mar. 2013	-0.600	-0.661	
		(0.406)	(0.414)	
Constant		3.558**	2.894**	-1.388***
		(1.473)	(1.245)	(0.174)
Observations		224	224	224
Pseudo-R2		0.389	0.387	0.009

Robust standard errors in parentheses. *, ** and *** mean respectively significant at 10%, 5% and 1% tresholds.

Note: some sectors had to be merged due to perfect predictability of results otherwise. This is the case here for: construction and real estate; retail trade, wholesale trade and hotel/restaurant; audit/consulting and management; public organization, research/teaching and culture/leisure; personal services and bank/insurance, and, business services, industry/energy/waste, computer/telecom and transport.

Appendix 10. Resume with pre-defined sentences before matching with a job opening for both applicants (translated in English)

Thomas MARVAUX Stéphane MARCUEIL
38, rue du Cotentin, 75015 Paris
Driver's license, class B
Born on April 20 18, 1991 – age 21
Tel. : 07 60 21 ** ** 07 61 93 ** **
e-mail : thomas.marvaux@gmail.com stéphane.marcueil@gmail.com

ACCOUNTANT

EDUCATION

2012	LICENCE 3 CCA (Accounting, Control, Audit) at the IAE Gustave Eiffel – Paris-Est Créteil University, **with second class honors**
2011	DUT GEA (Business and Administration Management) option Finance / Accounting at the IUT of Sceaux (92), **with second class honors**
2009	SCIENTIFIC BACCALAUREAT (Louis Armand High School, Paris 15th arrondissement), **with third class honors**

WORK EXPERIENCE

Since September 2012
    Cabinet ALF, Nogent-sur-Marne, Statutory audit Office
    Accounting assistant

February 2012 to end of April 2012 (3 months)
    Cabinet ALF, Nogent-sur-Marne, Statutory audit Office
    Internship : accounting assistant
- Financial accounting : accounts auditing, quarterly and annual figures, social and tax returns, payroll management
- Analytical accounting/Management control : data entry, analysis, trend charts -> if requested
- Cash management : control of cash position
- Relationship with other accountants and representatives in various industries -> if ad towards a client / supplier applicant
- Relationship with international clients -> if international experience requested

February to end of March 2011 (2 months)
    THERMOSANI, Vitry, SME in the construction sector (50 employees)
    Internship, Accounting department
- Financial accounting-Management : payroll posting
- Staff management : employment contracts -> if competences in human resources requested
- Cash management : DAILLY Act -> if cash management, factoring, bank reconciliations, salaries payroll
- Clients accounts : billing, customer reminders (mail and phone)
- Suppliers accounts : negotiations of extension with suppliers, bill payments

February 2010 (1 month)
    CAISSE D'EPARGNE, Paris 12th arrondissement
    Internship, Accounting department
- Financial Accounting : bank reconciliations, salary inputs, switchboard, filing

SKILLS

English :   Fluent
Spanish :   Moderate

Computer skills :
    Accounting software : Ciel, SAGE 100 (=COALA), CEGID (=CCMX), SAP FI -> one software per job opening
    Office software : Word, Access, Excel (pivot tables, macros)

Activities : soccer, badminton, takraw and movies

Thomas MARVAUX
38, rue du Cotentin, 75015 Paris
Driver's license, class B
Born on April 20, 1991 – age 21
Tel. : 07 60 21 ** **
e-mail : thomas.marvaux@gmail.com

ACCOUNTING ASSISTANT

EDUCATION

2012	LICENCE 3 CCA (Accounting, Control, Audit) at the IAE Gustave Eiffel – Paris-Est Créteil University, **with second class honors**
2011	DUT GEA (Business and Administration Management) option Finance / Accounting at the IUT of Sceaux (92), **with second class honors**
2009	SCIENTIFIC BACCALAUREAT (Louis Armand High School, Paris 15th arrondissement), **with third class honors**

WORK EXPERIENCE

Since September 2012
    Cabinet ALF, Nogent-sur-Marne, Statutory audit Office
    Accounting assistant

February 2012 to end of April 2012 (3 months)
    Cabinet ALF, Nogent-sur-Marne, Statutory audit Office
    Internship : accounting assistant
- Financial accounting : accounts auditing, quarterly and annual figures, social and tax returns, payroll management
- Cash management : control of cash position
- Relationship with other accountants and representatives in various industries

February to end of March 2011 (2 months)
    THERMOSANI, Vitry, SME in the construction sector (50 employees)
    Internship, Accounting department
- Financial accounting-Management : payroll posting
- Cash management : DAILLY Act, factoring, bank reconciliations, salaries payroll
- Clients accounts : billing, customer reminders (mail and phone)
- Suppliers accounts : negotiations of extension with suppliers, bill payments

February 2010 (1 month)
    CAISSE D'EPARGNE, Paris 12th arrondissement
    Internship, Accounting department
- Financial Accounting : bank reconciliations, salary inputs, switchboard, filing

SKILLS

English :   Fluent
Spanish :   Moderate

Computer skills :
    Accounting software : Ciel, SAGE 100
    Office software : Word, Access, Excel (pivot tables, macros)

Activities : soccer, badminton, takraw and movies

Appendix 12. Cover letter with pre-defined sentences before matching with a job opening for both applicants (translated in English)

Thomas MARVAUX Stéphane MARCUEIL
38, rue du Cotentin
75015 Paris
Tel. : 07 60 21 ** ** 07 61 93 ** **
e-mail : thomas.marvaux@gmail.com stephane.marcueil@gmail.com

Paris, March 15, 2013

Subject : Application for the position of Accounting Assistant – Ref. : xxx

Dear Xxxx,

Following your ad published on the website of Pôle Emploi, I send you my candidacy as an Acounting-assistant. Your company association organization firm caught my attention for

the team spirit, -> if firm size higher than 10 and request for cohesion
the highlighting of ethics, -> if large-size firm, see website
the human scale, -> if less than 10 employees
the international stature, -> if international firm, see website + ad
OR the strength of its development, -> if local or national development
the expertise, -> if niche
the commitment to sustainable development, -> if sustainable development

and the high standards of quality and rigor. These values fully correspond to the values acquired during my training and my past experiences.

Graduated with a Licence 3 Pro in Control, Accounting and Audit (IAE of Paris-Est University), I had opportunities to go on different internships and gain a solid understanding

in financial accounting and in clients accounts OR suppliers accounts OR social and tax returns and payroll management OR cash management OR labor law OR staff management -> depends on the speciality requested.

During these experiences, I learned how to carry out the various tasks entrusted to me in compliance with the procedures

and with autonomy. -> if consulting position or position of responsability.

These experiences, particularly in the ALF office and the Thermosani company, confirmed my interest for

the variety of tasks that an accountant position involved. -> if the requested number of tasks is significant
financial accounting -> if financial accounting
and payroll. -> if …
and cash management. -> if …
and clients accounts. -> if …

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and suppliers accounts. <mark>-> if …</mark>

In addition, I have successfully demonstrated interpersonal skills with both clients and suppliers or other accountants. <mark>-> if rapport requested OR clients / suppliers.</mark>

On the other hand, I have deepened my knowledge of accounting and office software.

Organized and thorough, I'm already efficient to accomplish the tasks you may entrust me. I would be happy to meet you to set out in more detail my experience and motivation.

Looking forward your response, please accept, <mark>Sir, Madam,</mark> the assurance of my highest consideration.

<mark>Thomas Marvaux Stéphane Marcueil</mark>

Appendix 13. Example of a sent cover letter (translated in English)

Thomas MARVAUX
38, rue du Cotentin
75015 Paris
Tel. : 07 60 21 ** **
e-mail : thomas.marvaux@gmail.com

Paris, March 15, 2013

Subject : Application for the position of Accounting Assistant – Ref. : ******

Dear *****,

Following your ad published on the website of Pôle Emploi, I send you my candidacy as an Accounting-assistant. Your company caught my attention for the high standards of quality and rigor. These values fully correspond with the values acquired during my training and my past experiences.

Graduated with a Licence 3 Pro in Control, Accounting and Audit (IAE of Paris-Est University), I had opportunities to go on different internships and gain a solid understanding in financial accounting and in cash management. During these experiences, I learned how to carry out the various tasks entrusted to me in compliance with the procedures. These experiences, particularly in the ALF office and the Thermosani company, confirmed my interest for the variety of tasks that an accountant position involves. On the other hand, I have deepened my knowledge of accounting and office software.

Organized and thorough, I'm already efficient to accomplish the tasks you may entrust me. I would be happy to meet you to set out in more detail my experience and motivation.

Looking forward your response, please accept, Sir, the assurance of my highest consideration.

Thomas Marvaux