Facebook profile picture appearance affects recruiters' first hiring decisions

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Abstract

We investigate whether the publicly available information on Facebook about job applicants affects employers' hiring decisions. To this end, we conduct a field experiment in which fictitious job applications are sent to real job openings in Belgium. The only characteristic in which these candidates differ is the unique Facebook profile that can be found online with their name. Candidates with the most beneficial Facebook picture obtain approximately 38% more job interview invitations compared to candidates with the least beneficial picture. In addition, we find suggestive evidence for a higher effect of Facebook profile picture appearance on hiring chances when candidates are highly educated and when recruiters are female.

Keywords

Attractiveness, Facebook, hiring, Internet, personality, screening

Introduction

A recent theme in popular media has been that employers increasingly use the personal information available on social networking websites (SNS) to make hiring decisions (see, for example, CareerBuilder, 2012). Furthermore, contributions to the academic literature have provided arguments why this supposed use of SNS by employers may be rational. First, Kluemper and Rosen (2009) have found that recruiters can accurately determine productivity-related traits solely on the basis of the personal information about a candidate available on SNS. Moreover, this information can be gained with little time

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and effort and covertly (Berkelaar, 2014; Brown and Vaughn, 2011; Ramirez et al., 2002; Westerman et al., 2008). Second, according to Back et al. (2010) and Gosling et al. (2008), people's appearance on SNS reflects their actual personality traits and not their self-idealisations. However, this rationality of online screening is not absolute (e.g. when recruiters use SNS to confirm a hiring decision that they have in fact already made; Elzweig and Peeples, 2009), and ethical concerns can be raised (e.g. the fact that information on employees is publicly available does not mean that these employees want to share this information with employers; Brown and Vaughn, 2011).

Given popular and scholarly evidence that suggests that employers consult SNS for hiring decisions, in this article, we measure by means of scientific tools to what extent the information publicly available on SNS affects hiring decisions. In this study, we focus on the impact of the only social media item employers are able to use, in practice, to screen many job candidates: their Facebook profile picture. Our main research question is the following:

> *R1*. Does job candidates' Facebook profile picture appearance affect recruiters' first hiring decisions?

To answer this question, we conducted a randomised field experiment in Belgium. We constructed two template résumés and cover letters, equal in all job-relevant characteristics, for male graduates holding either the same secondary or tertiary education degree. These pairs of applications were sent to 1056 genuine job openings in various sectors. To each of the applications, we randomly assigned one of the four facial pictures with diverging scores on perceived attractiveness and the Big Five Personality Dimensions (agreeableness, conscientiousness, emotional stability, extraversion and openness). In half of the application pairs we sent out, these pictures were attached to the résumés, while for the other half of the pairs, they were used as Facebook profile pictures. By monitoring the subsequent reactions from the employer side, the (absolute and relative) unequal treatment based on the pictures revealed by the Facebook profile (and résumé) pictures was directly identified and could be given a causal interpretation.

This experimental setting allowed us to answer two secondary research questions:

> *R2*. How does the effect of particular Facebook profile pictures on recruiters' decisions compare with their effect when attached to the candidates' résumés?

> *R3*. To which extent does the effect of Facebook profile picture appearance on hiring outcomes vary by candidate characteristics (such as education level) and job characteristics (such as level of customer contact and gender of the recruiter)?

Literature review and hypotheses

From a broad perspective, this study contributes to the broad literature on SNS in the social and behavioural sciences. This literature was reviewed by, for instance, Caers et al. (2013), Rains and Brunner (2015), Roth et al. (2013), Wilson et al. (2012) and Zhang and Leung (2015). Many of these reviews highlight that SNS have disrupted

hiring practices. In this study, we measure the extent to which the availability of a particular SNS affects first selection outcomes.

In addition, our study contributes to the broad literature on (profile) picture selection and evaluation via social media. This literature shows that due to their use on social media, personal photographs have become more effective as objects of communication than of memory. For individuals who share them, they have become a tool for self-representation and self-expression (Van Dijck, 2008; Van House, 2011). For those who see them, these pictures lead to social comparison and impression formation (Haferkamp and Krämer, 2011; Lebel and Danylchuk, 2014; Wang et al., 2010). Whether this impression formation not only affects one's digital brand and popularity but also one's employment chances is central to this study.

From a narrower perspective, our study is most closely related to six studies on the self-reported use of SNS by recruiters.[1] These six studies are summarised in Table A.1 (available online). Depending on the time, country and sector where the survey is conducted, the proportion of examined recruiters indicating that they employ SNS when screening job candidates varies between 8.1% (use of Facebook in Greece in 2009–2010) and 50.0% (use of any SNS in the United States in 2010; Caers and Castelyns, 2011; Chang and Madera, 2012; Gibbs et al., 2015; Nikolaou, 2014; Roulin and Bangerter, 2013; Tufts et al., 2015). In addition, while Gibbs et al. (2015) found that employers perceive SNS as being more useful in recruiting lower level employees than higher level employees, Chang and Madera (2012) found the opposite to be true.

The aforementioned six studies based on self-reported information from employers suffer, in our opinion, from two methodological problems. First, employers' reported attitudes and behaviour might not represent their actual hiring behaviour (Pager and Quillian, 2005). They might adapt their answers to their perception of whether the use of SNS in the recruitment process is socially desirable.[2] Second, even if the measures of SNS use by employers based on self-reported information square with their actual behaviour, these measures would still not reveal the extent to which the information on SNS *affects* hiring decisions. Moreover, as mentioned earlier, recruiters may just use SNS to confirm a hiring decision that they have, in fact, already made (Elzweig and Peeples, 2009).[3]

Finally, the present research builds on the multidisciplinary literature dealing with the beauty premium (Hamermesh and Biddle, 1994; Mobius and Rosenblat, 2006) and personality premium (Barrick and Mount, 1991; Uysal and Pohlmeier, 2011) in the labour market. The theoretical mechanisms underlying better labour market outcomes for more attractive people are, for instance, productivity drivers related to beauty, such as self-confidence (Mobius and Rosenblat, 2006) and employer discrimination (Mauzer-Fazio and Lei, 2015). Concerning the personality premium, the psychological literature provides evidence for personality traits having an effect on job proficiency (Barrick and Mount, 1991). In particular, conscientiousness has been found to be a driver of productivity and, consequently, of labour market success (Baert and Decuypere, 2014; Mueller and Plug, 2006). In addition, emotional stability and openness to experience are positively related to beneficial labour market outcomes (Baert and Decuypere, 2014; Uysal and Pohlmeier, 2011).

Drawing on the suggestive evidence on the use of SNS by recruiters and the academic literatures on impression formation via social media pictures and the premium for beauty and personality in the labour market, we propose the following hypothesis:

H1. Job candidates with more physically and psychologically attractive Facebook profile pictures will receive more positive callbacks in response to their job applications.

Concerning the relative effect of variation in Facebook profile pictures compared to the effect of these pictures when employed as résumé pictures, we are in two minds. On one hand, the probability that a candidate's facial picture is seen is higher when it is attached to her or his résumé than when it is made available as a Facebook profile picture. Consequently, the chance of affecting hiring outcomes is higher for résumé pictures than for Facebook profile pictures, ceteris paribus. On the other hand, the magnitude of the impact of a facial picture might be higher when it is seen as a Facebook profile picture than when it is seen as a résumé picture. This assumption is supported by the evidence mentioned in the introduction regarding people's appearances on SNS reflecting their actual personality traits and not their self-idealisations. In addition, Roulin and Bangerter (2013) and Berkelaar and Buzzanell (2015) describe the information on the SNS profiles of job candidates as 'more honest signals of their ability and commitment' (because job candidates might not be aware that employers screen their personal Facebook profiles) and as 'less subject to extreme impression management', at least in the perception of recruiters, compared to information in their résumés. As a consequence, the fact that only some recruiters screen Facebook may be compensated for by their perception of Facebook profile pictures as more honest signals of applicants' ability and commitment. A caveat in this respect is that the aforementioned studies focused on perceptions based on extensive Facebook profiles (not only showing a profile picture). Consequently, their findings cannot just be generalised to our setting. Nevertheless, supported by this literature, we propose the following hypothesis:

H2. Facial pictures equally affect positive callback when these pictures are used as Facebook profile pictures and when they are used as résumé pictures.

Finally, we propose hypotheses with respect to the heterogeneity of the effect of a person's Facebook profile picture appearance on hiring outcomes by candidate characteristics and job characteristics. First, one could expect that highly educated candidates would be screened more on Facebook, as they seem to be more engaged in social media (Correa et al., 2010).[4] Second, based on the fact that women employ social media in general, and Facebook in particular, more than men (Vasalou et al., 2010), a beneficial Facebook profile picture might be expected to yield a higher surplus when recruiters are female, ceteris paribus.[5] Third, in line with Mauzer-Fazio and Lei (2015), we expect the returns on perceived attractiveness and beneficial personality traits to be higher in jobs where customer contact is more important. Fourth, when an employer must fill a vacancy in an occupation where labour market tightness[6] is high, recruiters are expected to have a lower number of job candidates, so discriminating on (Facebook profile or résumé)

picture appearance is going to be costlier (Baert et al., 2015). For this reason, we expect that the surplus of a highly rated Facebook profile picture is going to be higher in occupations where labour market tightness is low. These lines of reasoning yield the following hypotheses:

H3a. Facebook profile picture appearance affects hiring chances more for highly educated candidates.

H3b. Facebook profile picture appearance affects hiring chances more when recruiters are female.

H3c. Facebook profile picture appearance affects hiring chances more for jobs where customer contact is more important.

H3d. Facebook profile picture appearance affects hiring chances more for vacancies that are easy to fill.

Methods

Correspondence experiment

Over the past few decades, social and behavioural scientists have conducted various correspondence experiments to measure unequal treatment in the labour market (Bertrand and Mullainathan, 2004; Correll et al., 2007). Within this type of experiment, pairs of fictitious job applications are sent to real job openings. These applications differ only in the characteristic that is to be tested. This characteristic is randomly assigned within each pair of applicants. By monitoring the subsequent callbacks, unequal treatment in first hiring decisions based on this characteristic can be identified. This measure of unequal treatment can be given a causal interpretation. Selection based on individual unobservable characteristics is eliminated as the researcher fully controls the information available to the employer. This allows her or him to disentangle unequal treatment from alternative explanations of heterogeneous hiring outcomes, such as differences in preferences and behaviour at the employee side or differences in human capital.[7]

We conducted our field experiment between November 2013 and May 2014 in the labour market of Flanders, the northern part of Belgium.[8] During the period of the experiment, we tested 1056 vacancies in the database of the Public Employment Agency of Flanders, that is, the region's most important job search channel. More concretely, we randomly selected 528 vacancies for jobs targeting labour market entrants with a secondary education degree in commerce and 528 vacancies for jobs targeting labour market entrants with a master's degree in commercial sciences. A total of two job applications of graduates, identical in terms of productivity-relevant characteristics, were sent to the selected vacancies. To each candidate within our pairs of applicants, we randomly assigned one of the four facial pictures differing in attractiveness and personality traits. For half of the pairs, these pictures were employed as the pair members' Facebook profile picture.[9] By monitoring the subsequent callbacks for these pairs by profile picture, unequal treatment based on the candidates' Facebook profile picture could be identified (and H1 could be tested). For the other half of the pairs, the same pictures were used as

the pair members' résumé picture. As a result, we were able to test H2.[10,11] Figure A.1 (Figure A.2, available online) summarises the data gathering process for the sub-experiment in which the pictures were used as a Facebook profile picture (résumé picture). This data gathering is described in more detail below.

Construction of job application template pairs

For each of the aforementioned two academic degrees held by our fictitious applicants, we created two template applications comprising a résumé and a cover letter. We will refer to them as Type A and Type B application types. These types were equal in all productivity-relevant characteristics but differed in layout and details, such as the particular cultural activity mentioned. To ensure that our application templates were realistic and representative, example applications from the Public Employment Agency of Flanders were used and calibrated for our purposes.

Type A and Type B applicants shared the following characteristics. They were single male graduates born, studying and living in comparable suburbs of the cities of Antwerp and Leuven. We appended a fictitious postal address (a real street but a non-existing street number) and a date of birth to all application templates. In addition, all applicants had the Belgian nationality, work experience from two student jobs, adequate (and comparable) information and communications technology (ICT) and language skills, a driver's licence and sports and cultural activities. Our candidates graduated in June 2013, from a school with a comparable reputation, without any grade retention experience. In line with the particular vacancy to which the pair of applications was sent, a specialisation was chosen. For the secondary education degree in commerce, the specialisations used were (a) commerce (no specific specialisation), (b) accountancy, (c) ICT, (d) secretariat and languages and (e) tourism. For the master's in commercial sciences, the specialisations used were (a) accountancy and taxes, (b) financial management, (c) human resource management, (d) international affairs and (e) marketing management. These different specialisations allowed us to apply for various occupations.[12]

The minimal differences between Type A and Type B application templates could not bias our results. This is the case as the treatment of interest – that is, the candidate's facial picture – was, for each vacancy, randomly assigned to these types (as a résumé or Facebook profile picture). This random assignment is the subject of the next subsection. Moreover, the regression analysis presented below shows that these minimal differences did not yield different callback outcomes for our two application types.

Randomised assignment of Facebook profile and résumé pictures

The pictures used for our experiment were selected from those employed in the laboratory experiment of Baert and Decuypere (2014). In that study, which was to some extent a preparatory study for the present one, 195 raters scored 22 pictures of young graduates, selected from picture databases, on the Big Five Personality Dimensions and on attractiveness. Personality traits were rated using the Ten-Item Personality Inventory (Gosling et al., 2003) for each photograph. This yielded a single index for each personality trait between 1 and 7 for each picture. Attractiveness was measured by the participants'

assessment of the statement 'I see this person as attractive' on a 7-point Likert scale, yielding a final index between 1 and 7.

Based on the testers' rating, we identified four facial pictures with diverging scores on attractiveness and personality. These pictures are included in Figures A.3 to A.6 (available online). Pictures 1 and 2 are facial pictures that received beneficial scores. Picture 1 was chosen for its high score both on attractiveness, extraversion, agreeableness, emotional stability and openness. This picture, however, had only a moderate score with respect to the personality trait that is generally found to drive productivity the most: conscientiousness (see earlier). Picture 2 was chosen for its high score on conscientiousness (and moderate scores with respect to attractiveness and the other personality dimensions). Picture 3 got relatively moderate scores for all characteristics. Picture 4 was a picture yielding poor scores, both on attractiveness and personality traits.[13]

The random assignment of one of the four pictures to each of the two job application template types was realised by a procedure in which we alternated between the 12 possible pairs of applications sent to employers. For each vacancy, one of the four pictures was assigned to Type A template, and one of the (remaining) three pictures was assigned to Type B template.

In addition, we alternated pairs who revealed their facial pictures by pasting them directly into their résumé and pairs who made their pictures publicly available as their Facebook profile picture. For the latter pairs, no picture was added to their résumés. For these pairs, the first name and surname of the candidates led, by searching for it on Google or by typing it into the Facebook search bar, to a single Facebook profile (and no other Google hits). These fictitious profiles were under our control and only publicly displayed the (current) profile picture of the candidate (resulting in similar profile settings for the pair members). For the former pairs (pasting their facial pictures directly into their résumé), the common first name and surname combinations of the candidates' led to tens of Facebook profile pictures, preventing the employer from screening the candidate through Facebook. It is important to mention that we made sure that the names we chose did not represent a different social background, following Bloothooft and Onland (2011) who linked the suffix of the first name Dutch-speaking parents choose for their children to these children's later wages.

The combinations of application template types and experimental identities by facial picture were sent to the employers between 24 November 2013 and 20 April 2014, in an alternating order, each time with approximately 24 hours between the pair members.

Classifications of callbacks

In the next section, we will analyse the employers' response to our fictitious applications. Callbacks were received by telephone voicemail or email. We follow the literature in distinguishing between two definitions of positive callback. Positive callback in strict sense means the applicant was invited for an interview concerning the posted job. Positive callback in broad sense also includes a request to contact the recruiter by telephone or to provide more information by email or the proposal of an alternative job. All callbacks received later than 30 days after sending out the application were neglected.

Before presenting our results, we restate our first two hypotheses in terms of the experimental design. In line with H1, we expect that candidates who have Picture 1 or Picture 2 as their Facebook profile picture have, given the beneficial scores of these pictures on perceived attractiveness and personality, better chances of being hired than candidates who have Picture 3, and they, in turn, have better chances of being hired than those who have Picture 4 as their Facebook profile picture. We have no a priori expectations concerning the relative treatment of candidates who have Picture 1 versus candidates who have Picture 2 as their Facebook profile picture.

Results

Positive callback ratios

In total, the candidates who had Picture 1, Picture 2, Picture 3 or Picture 4 as a Facebook profile picture obtained a positive callback in strict sense (broad sense) in 9.8% (22.7%), 7.6% (19.3%), 7.6% (22.7%) and 5.3% (17.0%) of their applications, respectively. The mentioned callback rates perfectly follow the ordering as expected based on H1, as restated at the end of the previous section. There is one exception: the positive callback rate in broad sense is higher for those who had Picture 3 as a Facebook profile picture (22.7%) than for those who had Picture 2 (19.3%).

The corresponding positive callback rates are 6.8% (18.9%), 9.5% (20.4%), 5.7% (18.6%) and 5.3% (14.8%) for the candidates who attached Picture 1, Picture 2, Picture 3 and Picture 4 directly to their résumé. These numbers follow the aforementioned ordering without any exception.

To compare the mentioned positive callback rates in a structured manner, we calculate a statistic frequently employed in correspondence studies: the positive callback ratio (PCR). This statistic is calculated by dividing the positive callback rate when using a particular picture (as a Facebook profile or résumé picture) by the corresponding positive callback rate when employing another particular picture. Table 1 presents the PCRs, following the strict sense definition of positive callback, at the level of the total data set and for various subsamples.[14] As we use the positive callback rates of the pictures with a lower index (picture number) as the numerator of these ratios and the corresponding callback rates of the pictures with a higher index as the denominator, PCRs above 1 are expected given H1. A single exception in this respect is the PCR comparing candidates with Picture 1 to candidates with Picture 2: as indicated earlier, we have no a priori expectations concerning their relative hiring chances.

At the level of the total data set, Panel A.1 of Table 1 shows a PCR in strict sense that is significantly higher than 1 when comparing candidates using Picture 1 as a Facebook profile picture to candidates using Picture 4 for the same purpose ($p = .020$). More concretely, the PCR is 1.857, indicating that the former candidates obtained 85.7% more job interview invitations. This finding supports H1.

The significant PCRs for the pairs of candidates pasting the facial pictures directly into their résumés (presented in Panel B.1) are also consistent with our expectations. More concretely, when the pictures are employed as résumé pictures, we find a

Table 1. The probability of positive callback in strict sense by Facebook profile and résumé pictures: positive callback ratios (PCRs).

	(1) PCR Picture 1 versus Picture 2	(2) PCR Picture 1 versus Picture 3	(3) PCR Picture 1 versus Picture 4	(4) PCR Picture 2 versus Picture 3	(5) PCR Picture 2 versus Picture 4	(6) PCR Picture 3 versus Picture 4
A. Pictures used as Facebook profile picture						
A.1. All vacancies (N=528)	1.300 (1.099)	1.300 (1.047)	1.857*** (2.343)	1.000 (0.000)	1.429 (1.138)	1.429 (1.218)
A.2. Classified by education level of candidates						
Middle educated (N=264)	0.833 (0.339)	1.000 (0.000)	1.667 (0.825)	1.200 (0.444)	2.000 (1.015)	1.667 (0.828)
Highly educated (N=264)	1.500 (1.539)	1.400 (1.217)	1.909** (2.246)	0.933 (0.254)	1.273 (0.693)	1.364 (0.942)
A.3. Classified by gender of recruiter						
Female (N=272)	1.545 (1.474)	2.079** (2.123)	1.767* (1.759)	1.345 (0.869)	1.143 (0.345)	0.850 (0.370)
Male (N=192)	0.824 (0.364)	0.659 (0.825)	1.176 (0.739)	0.800 (0.581)	1.427 (0.601)	1.783 (1.400)
A.4. Classified by level of customer contact in the posted job						
No intensive contact (N=283)	1.371 (1.232)	1.452 (1.328)	1.995** (2.184)	1.058 (0.181)	1.455 (0.958)	1.375 (0.901)
Intensive contact (N=245)	1.076 (0.141)	1.008 (0.016)	1.495 (0.848)	0.937 (0.221)	1.389 (0.631)	1.482 (0.756)
A.5. Classified by bottleneck status of occupation						
No bottleneck (N=385)	1.282 (0.909)	1.340 (1.065)	2.396** (2.546)	1.045 (0.169)	1.869* (1.691)	1.788 (1.544)
Bottleneck (N=143)	1.394 (0.684)	1.183 (0.773)	1.113 (0.266)	0.848 (0.336)	0.798 (0.366)	0.940 (0.131)
B. Pictures used as résumé picture						
B.1. All vacancies (N=528)	0.720 (1.202)	1.200 (0.577)	1.286 (0.950)	1.667*** (2.194)	1.785*** (1.984)	1.071 (0.198)

The PCR is calculated by dividing the positive callback rate when using a particular picture by the corresponding positive callback rate when using another particular picture. T-statistics, indicating whether the ratios are significantly different from 1 and based on standard errors corrected for clustering at the vacancy level, are in parentheses. The number of jobs with a female or a male recruiter does not equal the total number of vacancies, as for some vacancies, we could not identify the gender of the recruiter.
*p < .1; **p < .05; ***p < .01.

statistically significant preference in respect of employers for Picture 2 above Picture 3 ($p = .029$) and Picture 4 ($p = .048$).

Next, to explore the support for H3a, H3b, H3c and H3d, we present PCRs for sub-samples of our data by candidate and job characteristics. More concretely, we breakdown our data by proxies of (a) the education level of the candidates (Panel A.2 of Table 1), (b) the gender of the contact person in the vacancy (Panel A.3) as a proxy for the gender of the person (people) deciding whether or not to invite the candidate to a job interview, (c) the level of customer contact in the posted job (Panel A.4) and (d) the bottleneck status of the occupation (Panel A.5). The level of customer contact in the posted job is considered to be intensive in cases where being customer oriented is mentioned explicitly as a required skill in the job vacancy advertisement. Concerning (d), following Baert et al. (2015), we first matched each vacancy one to one with an occupation in the classification list of the Public Employment Agency of Flanders. For each of these occupations, we were able to look up their 'bottleneck' status. Each year, the Public Employment Agency of Flanders combines three statistical criteria concerning labour market tightness in the occupation in order to indicate which occupations have this status.[15]

The statistics presented in Panels A.2, A.3, A.4 and A.5 of Table 1 show that our finding of more favourable hiring chances for candidates using Picture 1 (and Picture 3) as their Facebook profile picture compared to Picture 4 is driven by the applications (a) with highly educated candidates, (b) with female recruiters, (c) for posted jobs with low levels of customer contact and (d) for non-bottleneck occupations. So, the presented statistics are in line with our hypotheses except for the breakdown of the PCRs by level of customer contact in the posted job. We come back to the significance of these dimensions of heterogeneity in unequal treatment based on Facebook profile picture appearance in the next subsection.

Regression analysis

As we randomly assigned the four facial pictures to the two applications we sent to the tested vacancies, regressing positive callback at the individual application level on these pictures and other candidate and vacancy characteristics should lead to exactly the same statistical results for a sample size approaching infinity (both for the subsample of candidates who used these pictures as their Facebook profile picture and the subsample of candidates who used them as their résumé picture). However, our sample size is finite. Consequently, observable and unobservable determinants of hiring outcomes that vary across vacancies may happen to correlate with the facial pictures used. To control for this potential correlation, we perform a regression analysis controlling for random effects at the vacancy level.[16] In addition, this regression analysis allows us to measure the independent effect of the aforementioned variables (a), (b), (c) and (d) interacted with the Facebook profile (or résumé) picture of the candidate.

Table 2 presents our regression results for the subsample of candidates who have their facial picture as their Facebook profile picture. We regress the outcome of positive callback in strict sense (Models (1), (2) and (3) in Table 2) and positive callback in broad sense (Models (4), (5) and (6)) on various sets of variables by means of a linear probability model with random effects at the vacancy level.[17]

Table 2. The probability of positive callback by Facebook profile picture: regression analysis.

	(1)	(2)	(3)	(4)	(5)	(6)
Picture 1	.026* (0.014)	.026* (0.014)	.027* (0.014)	.038** (0.019)	.038** (0.019)	.039** (0.020)
Picture 2	.000 (0.011)	.001 (0.011)	.003 (0.011)	.011 (0.017)	.011 (0.018)	.012 (0.018)
Picture 3	.006 (0.010)	.006 (0.010)	.008 (0.010)	.041** (0.021)	.041** (0.021)	.041** (0.021)
Application template Type A (normalised)		.004 (0.007)	.004 (0.007)		.019 (0.012)	.019 (0.012)
First application sent (normalised)		−.008 (0.007)	−.006 (0.007)		.000 (0.012)	.003 (0.012)
Picture 1 × highly educated (normalised)			.053** (0.027)			.082** (0.036)
Picture 2 × highly educated (normalised)			.014 (0.020)			.062* (0.035)
Picture 3 × highly educated (normalised)			.054*** (0.019)			.125*** (0.038)
Picture 1 × male recruiter (normalised)			−.042* (0.023)			−.046 (0.033)
Picture 2 × male recruiter (normalised)			.016 (0.020)			.009 (0.033)
Picture 3 × male recruiter (normalised)			−.029 (0.020)			−.016 (0.037)
Picture 1 × vacancy with intensive customer contact (normalised)			−.002 (0.028)			.037 (0.037)
Picture 2 × vacancy with intensive customer contact (normalised)			−.030 (0.020)			−.015 (0.035)
Picture 3 × vacancy with intensive customer contact (normalised)			−.010 (0.018)			.010 (0.038)
Picture 1 × bottleneck occupation (normalised)			−.028 (0.023)			−.018 (0.037)
Picture 2 × bottleneck occupation (normalised)			−.026 (0.021)			−.038 (0.040)
Picture 3 × bottleneck occupation (normalised)			.004 (0.019)			.046 (0.044)
Constant	.068*** (0.012)	.068*** (0.012)	.067*** (0.014)	.182*** (0.019)	.180*** (0.019)	.171*** (0.020)
Dependent variable: positive callback in strict sense	Yes	Yes	Yes	No	No	No
Dependent variable: positive callback in broad sense	No	No	No	Yes	Yes	Yes
Random effects at vacancy level	Yes	Yes	Yes	Yes	Yes	Yes
F-test for equality of coefficients for 'Picture 1' and 'Picture 2' (p-value)	.068	.068	.075	.205	.206	.201
F-test for equality of coefficients for 'Picture 1' and 'Picture 3' (p-value)	.101	.100	.107	.909	.909	.906
F-test for equality of coefficients for 'Picture 2' and 'Picture 3' (p-value)	.656	.657	.681	.160	.160	.158
Observations	1056	1056	1056	1056	1056	1056

The presented results are linear probability model estimates with standard errors in parentheses. Summary statistics for all variables can be found in Table A.2 (available online). Except for the picture indicators, all variables are normalised by subtracting their mean value among the candidates with Picture 1, Picture 2 or Picture 3 as their Facebook profile picture.
$*p < .1$; $**p < .05$; $***p < .01$.

In Model (1) and Model (4), we include only indicators of using Picture 1, Picture 2 and Picture 3 as Facebook profile picture (thus implicitly choosing Picture 4 as the reference picture) as explanatory variables. The regression results in Table 2 show that having Picture 1 as a Facebook profile picture increases the probability of a job interview invitation with 2.6 percentage points (or 38.2%, that is, 0.026/0.068; $p = .055$) and the probability of obtaining any positive reaction with 3.8 percentage points (or 20.9%; $p = .048$) in comparison with having Picture 4. In addition, having Picture 3 increases the probability of a positive callback in broad sense with 4.1 percentage points (or 22.5%; $p = 0.049$).[18] These effects controlling for random effects at the vacancy level are somewhat lower than the ones derived from the corresponding PCRs mentioned above.

Next, in Model (2) and Model (4), we include indicators of the template type employed and the submission order. As the picture assignment is, by construction, not correlated with them, the inclusion of these additional variables does not change the Facebook picture effects. Moreover, positive callback outcomes vary neither by template type (as announced before) nor by place in the sending order.

Finally, in Model (3) and Model (6), we add interactions between the facial pictures used as Facebook profile picture and indicator variables by which we want to investigate the heterogeneous effects of these pictures. These variables are (a) an indicator for highly educated candidates, (b) an indicator for male recruiters, (c) an indicator for jobs with intensive customer contact and (d) an indicator for bottleneck occupations. The results for these models confirm our findings based on the descriptive analysis with respect to the higher surplus of highly scored Facebook profile pictures for highly educated candidates and – to a lesser extent – when recruiters are female. However, we do not find significant interactions with the indicator for jobs with intensive customer contact or the indicator for bottleneck occupations after controlling for random effects at the vacancy level. In conclusion, while the analysis of our data supports H3a and H3b, we do not find convincing evidence for H3c and H3d.

The corresponding regression results when employing the subsample of candidates pasting the facial pictures directly into their résumés follow the same pattern.[19] In line with the results presented in Panel B of Table 1, we find the highest positive callback rates when using Picture 2 as a résumé picture.

H2 predicted that facial pictures equally affect positive callbacks when they are used as Facebook profile pictures and when they are used as résumé pictures. By comparing the effects of using Picture 1, Picture 2 and Picture 3 (in comparison with Picture 4) as Facebook profile picture in Table 2 to the corresponding effects of attaching these pictures to one's résumé, we observe (a) quite comparable effects with respect to Picture 1 and Picture 3 (thus supporting H2) and (b) a substantially higher effect of Picture 2 when used as a résumé picture.[20]

Discussion

In this study, we investigated whether the publicly available information on Facebook about job applicants affects employers' hiring decisions. Thereby, we directly contributed to the literature measuring the use of social media in screening job candidates. We argued that this literature, based on self-reported data, suffers from two methodological

problems: (a) reported attitudes and behaviour may deviate from actual behaviour and (b) using SNS does not mean letting SNS affect decisions. To overcome these issues, we conducted a field experiment in the Belgian labour market. Pairs of fictitious job applications were sent to genuine job openings. To each application within a pair, we randomly assigned one of the four facial pictures varying in attractiveness and personality. For half of the vacancies, these pictures were directly pasted into the résumés, while for the other half, we assigned a candidate name to the résumés, which, by searching for it on Google or by typing it into the Facebook search bar, led to a single Facebook profile. These fictitious profiles were under our control and only publicly displayed the profile picture.[21]

We found that candidates with the most beneficial Facebook picture got approximately 38% more job interview invitations and 21% more positive reactions in a broad sense compared to candidates with the least beneficial picture. This surplus of a favourable Facebook picture was higher for the highly educated and when recruiters were female. Moreover, except for one picture used, we could not reject that variation in Facebook profile pictures affects positive callbacks with the same magnitude as (the same) variation in résumé pictures.

From a broader perspective, two important take-away messages from our study are the following. First, our results support the idea that SNS have disrupted hiring practices, as mentioned in several reviews on SNS in the social and behavioural sciences. This digital disruption cannot be neglected by scholars in related academic fields such as labour economics, human resource management, sociology of work and occupational psychology. Theories on matching employees and employers which were built before the breakthrough of social media should be adapted to the existence of social media as a search and matching channel (or at least, their robustness against the use of these new media should be proved).[22] Second, our results corroborate the observation in the literature on (profile) picture selection and evaluation via social media that pictures on these media have a particularly strong effect on impression formation when other information is limited, as is the case in a résumé (Wang et al., 2010). Whether this implies that Facebook profile picture appearance affects recruiters' first hiring decisions to a lesser extent when résumés and cover letters are more extensive[23] could not be investigated based on our experimental design but is an appealing direction for further research.

In addition, from a practical point of view, job seekers should see the publicly available online information about them as an extension of their résumé. For this reason, they should take proper care with respect to what they share on the Internet. By extension, agencies guiding these job seekers should consider, in addition to the classical résumé writing tips, coaching job candidates with respect to their digital impression management.

We end by acknowledging four research limitations inherent to our research focus and our experimental design. A first important limitation of this study is that we measured only the impact of a very specific social media item, that is, individuals' Facebook profile picture, on hiring chances.[24] However, for many job candidates, this profile picture is the only substantial element that they make publicly available on Facebook, and by extension – given that Facebook is by far the most popular SNS – on social media. As a consequence, this profile picture is often the only social media item employers are able to screen in practice. Nevertheless, we are in favour of future

studies exploring whether other components of publicly available information (e.g. number and characteristics of Facebook friends; Tong et al., 2008; Walther et al., 2008) also affect the employment opportunities of users of social networking sites.[25] Second, our experiment focused on a very particular outcome: callback rates for first interviews. As a result, our findings do not allow us to say anything about unequal treatment based on Facebook profile picture appearance in the later stages of the screening process. However, Bertrand and Mullainathan (2004) have argued that lower numbers of interview invitations are likely to be reflected in a reduced number of job offers.[26] Third, our experimental design did not allow us to measure the proportion of employers that screened our fictitious Facebook profile pages, let alone to disentangle the subsets that found this page via Google versus via the Facebook search bar or to inspect the extent of the group of employers who searched for online information about our candidates but did not reach our profile pages.[27] Measuring these proportions was not a goal of our study. As mentioned earlier, in our opinion, it is not the extent of the screening of SNS (or the online pathway employers follow) that is of societal importance but the *effect* of this screening (in our case on hiring outcomes). Having this said, we welcome future studies that are able to decompose the effect of Facebook profile picture appearance on hiring outcomes into the product of (a) the proportion of employers using SNS as a screening tool and (b) the effect the information on SNS has on hiring decisions conditional on screening it. Finally, our experimental design only allowed us to measure the relative effect of the variation in (personality traits and attractiveness of) four particular pictures on first hiring decisions. As a consequence, we were not able to measure the effect of having a Facebook profile compared to the control situation of not having such a profile. This is a limitation, as recent research suggests that absence of online information might be punished by employers (Berkelaar, 2014). In addition, based on our data, it is not possible to tell whether personality or attractiveness (or a combination of both) drove the relative callbacks our fictitious candidates received. Moreover, it is a limitation that we did not let our pictures be scored on (relative) appropriateness for use as a Facebook profile picture and as a résumé picture.[28] These scores might have helped to explain the (limited) differences in how our pictures affected callbacks when used for both purposes.

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Declaration of Conflicting Interests

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Notes

1. Besides this literature, the effect of social networking appearance on hiring chances has also been tested by means of laboratory experiments (Roulin and Bangerter, 2013). However, these experiments do not allow one to measure the extent to which social networking websites (SNS) are used in practice when evaluating job candidates. In addition, Berkelaar and Buzzanell (2014, 2015) and Berkelaar et al. (2015) have conducted (qualitative) research on the general use of online information in personnel selection. Finally, Acquisti and Fong (2015) have studied how employers use online information in a broad sense to discriminate based on race and sexual orientation.
2. Madera (2012) has shown that perceived fairness and job pursuit intentions by job applicants are lower for organisations using SNS as a selection tool.
3. In addition to these two problems, the analysis of self-reported information on the use of SNS in screening job candidates is hampered by the variability in available information on candidates' profile pages due to variation in the extent to which these candidates are active on SNS and in their (customisable) privacy settings (Brown and Vaughn, 2011). This variability, which cannot be controlled based on employers' self-reports, might be correlated with other determinants of employment opportunities (e.g. the gender, education level, region, sector and personality of the candidate). Not taking into account this variability in available information might, as a consequence, bias measures of how appearance on SNS does affect hiring chances for different subpopulations.
4. However, theoretical and empirical studies show that, in general, unequal treatment based on subjective factors is lower for the highly educated as higher education degrees reduce uncertainty about job candidates (Baert et al., 2015). As a consequence, the need to make inferences about these candidates' ability based on informally gathered information about them is also lower.
5. Two implicit assumptions are made here: (a) the higher share of Facebook users among women translates into a higher share of recruiters using Facebook within the professional context and (b) Facebook profile pictures, when seen by recruiters, affect the hiring decisions of females at least as much as those of males.
6. The labour market tightness in an occupation is defined as the ratio of the number of vacancies in the occupation to the number of unemployed with the required qualifications (Baert et al., 2015).
7. For an in-depth discussion of the ethical aspects of the correspondence experimentation framework, we refer to Riach and Rich (2004).
8. The hiring landscape in Belgium is constrained by two characteristics of its labour market. First, overall, the competition for human capital is, compared to other European countries, relatively high (Gerard and Valsamis, 2015). An indicator for a country's labour market tightness is its job vacancy rate. This is the number of vacancies as a percentage of the sum of this number of vacancies and the number of occupied jobs. In the first quarter of 2014, the job vacancy rate was 2.2% in Belgium, while it was 1.5% in the EU-27. Only in Germany and Norway was this statistic higher (source: Eurostat, job vacancy rate). Second, related to the country's historically high employment protection and union coverage, labour market contracts are heavily regulated (Baert and Omey, 2015). With respect to social media use, following Global Webindex (http://www.globalwebindex.net/), in the first quarter of 2016,

about 59% of Belgian citizens aged 12 years or older used Facebook at least once each day. According to this statistic, it is the most popular social media tool in Belgium, followed at a distance by YouTube and Instagram. In contrast to most other social media tools, Facebook is used in Belgium by a substantial proportion of all age groups (source: Global Webindex, Q1 2016).

9. Our choice of a person's Facebook profile picture appearance as a social media item that is potentially screened by employers was motivated by the following considerations. First, with >1.49 billion monthly active users (as of 30 June 2015), Facebook is the world's most popular SNS (Facebook, 2015). Second, a substantial fraction of Facebook users allow other users to whom they are not connected as friends to see essentially only their name and Facebook profile picture. For this reason, being only able to judge job candidates' Facebook profile picture is a situation in which many employers find themselves in reality. Third, allowing only (randomised) variation in our fictitious candidates' facial pictures keeps the controlled experimental setting feasible. Fourth, facial pictures, nevertheless, allow employers to screen candidates' attractiveness and personality traits. This is potentially relevant information, as, following a survey of the popular job search website CareerBuilder (2012), the most important aspect that recruiters mention with respect to screening job candidates' Facebook profiles is making inferences about these candidates' personality that might not be as easily obtained through traditional screening.

10. By also sending out pairs disclosing their facial picture as a résumé picture, we anticipated a zero effect of the Facebook profile pictures on hiring outcomes. This zero effect could have been explained by two important reasons: (a) recruiters did not screen job candidates' Facebook profile pictures and/or (b) the pictures we used did not yield diverging hiring chances if they were screened. A non-zero effect of these pictures, when pasted directly to one's résumé, could have ruled out explanation (b), if we were willing to assume that Facebook profile pictures and résumé pictures, if they are screened, affect employers' hiring decisions roughly to an equal extent.

11. In Belgium, adding a picture to one's résumé is not uncommon. At the website of the Public Employment Agency of Flanders, it is written (in Dutch) that 'if you add a picture [to your résumé], your résumé gets a face' (https://www.vdab.be/werkinzicht/vragencv#foto), and résumés with pictures are used as example résumés (https://www.vdab.be/werkinzicht/cvvoorbeelden.shtml).

12. Testing multiple occupations (rather than just one) was important because it enabled us to avoid the danger inherent in many former correspondence experiments in which researchers simply selected an occupation with, potentially, a particularly high (or low) surplus of the tested characteristics. In addition, the variety in occupations enabled us to measure heterogeneous treatment effects by the customer contact level at the posted job level and labour market tightness at the occupational level (and thus allowed us to test H3c and H3d).

13. More concretely, Picture 1, Picture 2, Picture 3 and Picture 4 scored, on average, 4.34 (third highest out of 22 pictures), 3.53 (11/22), 4.22 (5/22) and 2.75 (22/22) on attractiveness; 4.66 (2/22), 4.32 (6/22), 4.11 (16/22) and 3.98 (18/22) on agreeableness; 4.43 (7/22), 4.86 (1/22), 4.23 (12/22) and 3.90 (15/22) on conscientiousness; 5.13 (1/22), 4.30 (11/22), 4.49 (7/22) and 3.66 (22/22) on emotional stability; 5.07 (3/22), 5.04 (4/22), 4.10 (13/22) and 2.88 (22/22) on extraversion; and 5.09 (2/22), 4.60 (10/22), 4.29 (13/22) and 3.55 (22/22) on openness. The consensus in the peer-reviewed literature is that all these factors have a non-negative effect on productivity, except for agreeableness, for which, besides zero effects, both (slightly) positive and (slightly) negative effects have been found (Baert and Decuypere, 2014; Barrick and Mount, 1991).

14. Analyses following the broad sense definition of positive callback, which are available on request, yield the same conclusions.

15. These criteria are the following: (a) there must be at least 10 vacancies registered in the database of the Public Employment Agency of Flanders for this occupation, (b) the vacancy filling rate in this occupation must be lower than the median filling rate for all occupations together and (c) the median duration until a vacancy in this occupation is filled must be greater than the median for all occupations together.

16. See, for example, Verbeek (2004) for an introduction to random effects models. Basically, this approach allows one to control for random factors, independently and identically distributed over, in our case, vacancies. As a result, the error term of the regression model consists of two components: a vacancy-specific component and a remainder component. Random effect models can be estimated by means of the command 'xtreg' in Stata. As an alternative, we estimated fixed effects models, that is, linear regressions in which the intercept terms vary over the vacancies (Verbeek, 2004). This, however, yielded the same conclusions.

17. For reasons of comparability of the results for our different regression models, except for the picture indicators, all the variables are normalised by subtracting their mean value among the candidates with Picture 1, Picture 2 or Picture 3 as their Facebook profile or résumé picture.

18. The standard errors of the effects of Picture 1, Picture 2 and Picture 3 vary from 0.010 to 0.014 (0.017–0.021) in Model 1 (Model (4)). This means that in Model (1), effects of 2–3 percentage points (i.e. between $0.010 \times 1.96 \times 100$ and $0.014 \times 1.96 \times 100$) and higher could be rejected at the 5% significance level, and in Model (4), effects of 3.5 percentage points and higher could be rejected. Broadly speaking, the power of the study, with 1056 fictitious applications for each sub-experiment is comparable to other, well-published studies conducting the same kind of experiments (e.g. Correll et al., 2007).

19. These regression results are available on request.

20. This was tested formally in an analysis of a data set pooling the information for both sub-experiments. This exercise, which is available on request, yielded the same conclusions.

21. At the time of the experiment, making (besides their name) only their current profile picture publicly available (and not, for example, their cover picture), was a 'privacy setting' chosen by a substantial number of people.

22. For instance, recently Lutgen and Van der Linden (2015) adapted the matching theory for which Peter Diamond, Dale Mortensen and Christopher Pissarides won the Nobel Prize in economics in 2010 to include the fact that social media helps both employers and employees to more easily find potential partners, even faraway.

23. This finding would be consistent with Arrow's (1973) theory of statistical discrimination.

24. In addition, this effect is measured for young, male candidates within the tested occupations only. As a consequence, our results cannot be generalised to the surplus of beneficial Facebook profile pictures in other occupations than those covered in this study and for other types of candidates.

25. The relative importance of these components could, for instance, be studied by means of eye tracking experiments in which recruiters are asked to make fictitious hiring decisions based on job candidates' (fully public) social networking profiles, with their eye movements being observed (and analysed) when screening these profiles.

26. Furthermore, because job interviews are costly, employers invite job candidates to an interview only if these applicants have a reasonable chance of getting the job (Baert et al., 2016).

27. We believe that the latter group should have been very small given the popularity of Google as a starting point to explore the Internet and the aforementioned popularity of Facebook in the SNS market.

28. We informally asked human resource managers to screen our pictures on appropriateness for both purposes. As a consequence, a candidate picture with a person wearing a headphone was excluded as these human resource managers judged this picture to be inappropriate for use as a résumé picture.

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