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a Field Experiment in Spain”

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Weight, Attractiveness, and Gender when Hiring: a Field Experiment in Spain*

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Abstract: Being overweight or obese is associated with lower employment and earnings, possibly arising from employer discrimination. A few studies have used field experiments to show that obese job applicants are, in fact, discriminated against in the hiring process. However, whether *overweight* job applicants also face employer discrimination is still an open question. To this end, we have designed a correspondence testing experiment in which fictitious applications are sent to real job openings across twelve different occupations in the Spanish labor market. We compare the callback rate for applications with a facial photo of a normal weight person to the one for applications with a photo of the same person manipulated into looking overweight.

Applications with a photo of the weight-manipulated male receive significantly fewer callbacks for a job interview compared to normal weight, and this differential treatment is especially pronounced in female-dominated occupations. For women, we find the opposite result. Weight-manipulated female applications receive slightly *more* callbacks, especially in female-dominated occupations. Our experimental design allows us to disentangle whether employers act on attractiveness or weight when hiring. For men, the weight manipulation effect is explained by an attractiveness *premium*, while for women we find evidence of an attractiveness *penalty*, as well as a weight penalty, in explaining the effect.

JEL classification: J64, J71

Key words: Obesity, overweight, gender, attractiveness, hiring, correspondence testing

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I. Introduction

The prevalence of overweight and obesity among adolescents in the world has more than quadrupled since 1975, reaching a share of 18 percent in 2016.¹ Due to their excess weight, employers might associate these individuals with higher health costs and lower productivity when entering the labor market, making it more difficult to find jobs. In fact, a large literature in economics, psychology and sociology has documented systematic differential treatment against obese job applicants in both laboratory and field experimental settings.² The latter set of studies show that *obese* job applicants are discriminated against in the hiring process, and obese women more so than men (Rooth, 2009; Busetta, Campolo and Panarello, 2020; Campos-Vazquez and Gonzalez, 2020). However, while being overweight is associated with lower employment and earnings³, and despite their far larger fraction in the population⁴, no study has to date included the overweight category in a similar field experimental setting. Hence, whether *overweight* job applicants also face employer discrimination remains an open question.

To answer this question we implement a correspondence testing experiment in which fictitious applications are sent to 3,155 real job openings across twelve different occupations in the Spanish labor market during 2017 and 2018. In Spain it is common practice to include a photograph in a resume, which facilitates using facial photographs to signal an applicant's weight status. The starting point is a photo of a normal weight male or female, which is digitally manipulated into being overweight. However, the weight-manipulation not only makes the applicant overweight, but also lowers his/her attractiveness. Since attractiveness has been found to matter for hiring we adapted our experimental design to be able to disentangle whether employers act exclusively on the overweight signal or whether attractiveness also plays a role in the hiring decision (e.g., López Bóo et al., 2013; Ruffle and Shtudiner, 2015). To this end we send a third application where the applicant is of normal weight, but with a similar attractiveness rating to the overweight applicant. When comparing the hiring outcome for weight-manipulated photos to these ones we effectively control for attractiveness, and capture the weight effect. When we instead compare the hiring

¹ <https://www.who.int/news-room/fact-sheets/detail/obesity-and-overweight>, accessed February 22, 2023.

² E.g., Roehling (1999), Rudolph et al. (2009), Giel et al. (2012), Flint et al (2016).

³ E.g., Lundborg et al. (2014), Caliendo and Gehrsitz (2016) and Pinkston (2017).

⁴ Worldwide more than half of the adult population is overweight (39%) or obese (13%), see reference in footnote 1. For Spain 45% of the men and 31% of women are overweight, see Spanish National Institute of Statistics (2020).

outcomes of the two normal weight groups of photos we effectively control for weight, and capture the attractiveness effect. The studies mentioned above have found weight discrimination to vary by gender, and studies on gender discrimination have found it to vary by occupation (Booth and Leigh, 2010; Carlsson, 2011). Hence, we explore whether and how these effects and mechanisms differ between men and women and in male- and female-dominated occupations.

Our findings show that physical appearance plays a notable role in the hiring process also in Spain. Applications of overweight males receive 26% fewer callbacks for a job interview compared to when of normal weight. This differential treatment is especially pronounced in female-dominated occupations for which the weight-manipulated male receives 46% fewer callbacks. This effect acts through attractiveness rather than weight itself. Interestingly, both the size and mechanism are the same as found for obesity in Sweden (see Rooth, 2009). For women, we find results going in the opposite direction, with the weight-manipulated female applications receiving slightly more callbacks (4%). This effect is driven by applications in female-dominated occupations in which they receive 50% more callbacks. This effect is found to be driven by an underlying attractiveness *penalty*, as has previously been found by Ruffle and Shtudiner (2015). The fact that more attractive women are penalized hides an underlying weight penalty for overweight women in male-dominated occupations. Hence, women are penalized on both weight and attractiveness in the hiring process.

The remainder of this article is organized as follows. Section II provides a discussion of the relevant literature for our analysis. Section III shows how both weight and attractiveness are signalled using facial photographs, while Section IV presents the design of the experiment regarding the choice of occupations and the construction of applications. Section V outlines and presents the descriptive results, while Section VI analyses weight and attractiveness differences in callback rates by occupation and gender. Section VII concludes.

II. Previous studies

The increase in the population's weight has sparked research on the association between obesity and labor market outcomes using survey data. This literature finds a sizable female obesity earnings/wage penalty both in the US (see e.g., Averett and Korenman, 1996; Cawley, 2004 and Pinkston, 2017), and in Europe (see e.g., d'Hombres and Brunello, 2007; Garcia and Quintana-

Domeque, 2006; Lundborg et al., 2014, and Caliendo and Gehrsitz, 2016). The corresponding results for men are more mixed, and the correlation is in some contexts even found to be positive.

When using survey data, it is difficult to identify the mechanism driving the association. It could be due to employers' negative perceptions of obese women or it could be due to characteristics of the applicant that are unobserved by the researcher that are responsible for the observed correlation. To circumvent this difficulty, researchers have relied on using correspondence testing experiments designed specifically to test for weight discrimination in recruitment.^{5,6} This literature consists of three studies which exclusively analyses the effect of *obesity* in hiring, where obesity is signalled by facial photographs attached to the job application. Table 1 shows relative callbacks by gender for these studies, i.e., the callback rate for normal weight job applicants relative to the callback rate for obese job applicants. The seminal paper is Rooth (2009), who studied obesity discrimination in the Swedish labor market. He finds that both male and female normal weight job applicants are at least 20 percent more likely to receive a callback than obese males and females. Busetta, Campolo and Panarello (2020) analyses obesity discrimination in the Italian labor market, and finds a similar level of obesity discrimination as the Swedish study, and that the discrimination effect is also the same for men and women. The third study, Campos-Vazquez and Gonzalez (2020), analyses the effect of obesity on employment in Mexico and finds clear evidence of discrimination against obese women, but not against obese men. The results imply that obese women need to send 37% more resumes to receive the same number of callbacks as normal weight women.

As mentioned in the introduction, weight manipulation also lowers the job applicants' attractiveness, and hence, our results also relate to the literature on hiring and attractiveness, see Table 1.^{7,8} For China, Maurer-Fazio and Lei (2015) find that unattractive female candidates need

⁵ The focus on the recruitment process address the concern that obese people, beyond receiving lower wages (the intensive margin), could also be hindered from entering the labor market (the extensive margin).

⁶ There is an extensive literature that has used correspondence testing experiments to study discrimination in recruitment based on ethnicity, gender and age, see Riach and Rich (2002), Bertrand and Duflo (2017) and Baert (2018a) for overviews.

⁷ There is also correlational evidence on beauty being associated with better labor market outcomes, see Hamermesh and Biddle (1994) for an early study and Hamermesh (2011) for a review.

⁸ There are two additional studies on the effect of attractiveness in hiring which do not include the necessary type of information for us to calculate relative callbacks. Patacchini, Ragusa and Zenou (2015) find that attractive women receive significantly more callbacks, whereas there is no attractiveness effect for men. Baert (2018b) finds that applicants with the most beneficial Facebook picture receive significantly more callbacks (but no results by gender).

to submit approximately 41% more applications than their attractive counterparts to receive the same number of interview callbacks, whereas unattractive male candidates need to submit only 24% more applications. For Argentina, López Bóo, Rossi and Urzua (2013) also find that less attractive applicants are less likely to be contacted after submitting a resume, with no observed gender differences. For both genders, attractive applicants receive 36% more callbacks than unattractive ones. Ruffle and Shtudiner (2015) also discover a gender gap in the impact of physical attractiveness on job market outcomes in the case of Israel, but with the result for women deviating from previous studies. They find that while attractive male job applicants receive significantly more callbacks than their less attractive counterparts, attractive women do not enjoy the same beauty premium. They provide evidence that the lack of a beauty premium for women is driven by feelings of jealousy and envy among female hiring managers. From the abovementioned papers on obesity discrimination, only Rooth (2009) addresses the attractiveness mechanism and concludes that the observed obesity penalty is driven by attractiveness for men, but driven by obesity for women.

Since the existing literature shows us that men and women are in some contexts treated differently in the hiring process by weight and attractiveness, our empirical analysis examines them separately.

III. Signalling being overweight and attractiveness through facial photos

In this section, we describe the procedure by which the photos used in the experiment were chosen. The experimental design implies signalling a job applicant's weight and attractiveness by attaching a portrait photograph to the job application. The end goal was to arrive at a photo pair of which the original facial photo was viewed as normal weight and then the same facial photo being manipulated into being viewed as overweight (but not obese). However previous research has shown that manipulating weight also changes attractiveness (e.g., Rooth, 2009). Therefore, the difference in the perception of the normal-weight and overweight versions of the same individual would potentially be related to both weight and attractiveness. To be able to disentangle these two mechanisms in our experimental context we added a third photo of a normal weight person with an attractiveness rating at, or just below, the one of the weight-manipulated photo.

The first step in this procedure selected around 150 photos of men and women, from an Internet photo site (www.iStock.com). The selection criteria were that they should be of different ages, be of normal weight, and to vary by attractiveness. Using this pool of facial photographs, we

selected 20 male and 20 female photos that most closely fulfilled our criteria. These photos were then sent to a professional graphist for manipulation into appearing overweight.

In a second step, we employed Netsonda Inc., a market research company, to implement a web survey in Spain with the purpose of evaluating the 40 photo-pairs on weight, attractiveness, age and nationality.

Each survey respondent evaluated 15 randomly picked photos, shown on screen in a cv-like format of 3.5cm by 4.5cm. The respondent never evaluated both the original and manipulated version of the same person. The panel of 177 survey respondents consisted of slightly more women (54%) and were 41 years old on average. Each photo was evaluated by approximately 30 respondents, and for each photo we calculated the average attractiveness grading and the share being considered normal weight, overweight or obese.

The third and final step used these gradings to select the photos to be employed in the field experiment. Our first selection was to discard photo-pairs that were viewed as non-Spanish (none), too old, or whether the manipulated photo was viewed as obese (despite our attempts). This excluded approximately 5-7 photo pairs for the male and female sample.

In the end, six pairs of photos, three females and three males and with each person included both as normal weight and overweight, were used in the study (see Panel A and B in Table 2). Table 2 shows weight and attractiveness ratings for each of the photos. The weight rating is calculated as the average rating across respondents after setting normal weight to 0, overweight to 1 and obese to 2. All photos in Panel A are perceived as normal-weight, i.e., have a rating equal or close to 0.

Panel B shows that the weight manipulation results in a clear increase in the weight rating, which now is close to 1 (the overweight status). Importantly, for male photo M4, 9% of the respondents rate him as obese, while 76% view him as overweight. For the other two male photos (M5 and M6) no respondent rate them as obese. For women, 10 and 20 percent of the respondents' rate photo W5 and W6 as obese, and 83 and 72 percent rate her as overweight, respectively. No respondent rates photo W4 as obese.

Hence, the weight manipulation has transformed the persons from being viewed as normal weight to be viewed as overweight, but not obese. But the manipulation has also transformed the person to be perceived as less attractive. The attractiveness rating in Panels A and B (Table 2) is

expressed in standard deviations⁹ and is lower for the overweight category within each photo pair. The change in the attractiveness rating varies from 0.4 standard deviation to 1, and it is of similar magnitude for both men and women (0.7, 0.4 and 0.7 for men, and 0.4, 0.6 and 1.0 for women).

To be able to disentangle the weight and the attractiveness effect on callbacks, we will include the photos in Panel C (of Table 2) into the experiment. These photos are rated as normal weight and have an attractiveness rating slightly lower than the ones being overweight. For men we could only find two photos among the 20 that fulfilled our criteria on weight and attractiveness, while for women we found three photos.

IV. Experimental design

The field experiment was conducted between March 2017 and June 2018. During this period, all job advertisements in selected occupations found on a few different employment search websites were collected.¹⁰ A clear majority of employers posting vacant jobs at these sites want applications to be sent in by e-mail. This facilitates our experimental design of attaching photos to the job application, since it can be done electronically. We only sent one job application to each posted job, which resulted in a total of 3,155 applications being sent. The advantage of this strategy in contrast of sending several applications to a same job offer is that we do not create an externality by affecting the pool of competitors to the job offer (see Philips, 2019).

For each occupation we have only one job application, but seventeen different photos/applicants (8 males and 9 females, see Table 2). Hence, each occupation has a pool of 17 photo-specific applicants, and the sending procedure randomly picks one for each job. The randomization ensures that in the aggregate weight and gender of the applicants are fully balanced.¹¹ Callbacks for a job interview were received via telephone or e-mail. To minimize inconvenience to the employer, invitations were promptly declined.

⁹ The attractiveness rating question ranged from *very unattractive* to *very attractive*, on a 5-point scale from -2 to +2, with average attractiveness of 0. It is calculated within gender using all 40 photos of the web survey. For men the attractiveness rating across the 40 photos varies between 2.1 to 4.0, while for women it varies between 2.5 to 4.3.

¹⁰ We used several employment search websites, which posts job vacancies throughout Spain. The two most common websites we used were: *InfoJobs* (<https://www.infojobs.net/>) representing 66 percent of our applications, and *Indeed* (<https://es.indeed.com/>) representing 11 percent.

¹¹ We also employ 12 common male and female names that are balanced across application types.

Choice of occupations

Our objective was to include occupations in the field experiment to arrive at a representative picture of the labor market. Since gender discrimination has been found to vary depending on if the occupation is more male or female, and that gender discrimination could interact with weight and attractiveness effects, we also wanted to have a roughly even split between male- and female-dominated occupations. To this end, we contacted the *Adecco* company, the world's second largest human resources provider and temporary staffing firm (www.adecco.com). They selected 12 occupations which cover a substantial part of the labor market.¹² Seven of the chosen occupations were male-dominated; programmer, mechanical engineer, accountant, sales manager, maintenance supervisor, industrial operator, and cook, while the remaining five were female-dominated; nurse, receptionist, shop sales assistant, tele sales assistant and cleaner. We applied to jobs all over Spain, but the bulk of jobs (68 percent) were applied to in the regions of Madrid, Barcelona, Valencia and Seville.¹³

Construction of applications

The job applications had to be realistic while not referring to any real persons. Also, because the competition from other applicants was considerable, and the unemployment rate in Spain is high, especially among young candidates, the applicants had to be well qualified. Hence, our fictitious applicants have skills (at least) comparable to average applicants for that job and have previous job experience in the type of job applying for. *Adecco* built 12 CVs (one per occupation) based on real life applications available on their database (see Appendix 1 for a template of a fictitious job application for an auditor). Across occupations, applicants' age varies between 25 and 31, and their previous work experience varies between 4 and 12 years.

The application consisted of a detailed CV of education and work experience on the first page and a short personal presentation on the second page. The CV contained a name, an email address, a telephone number, and a postal address. Postal addresses were included in the resumes to prevent any invitations being lost or returned to the employer. The postal address was from

¹² An additional requirement was that in order to make satisfactory progress in the collection of cases, it was necessary for the demand for labor to be relatively high in the chosen occupations.

¹³ Out of the 3,155 jobs applied to 1,080 were applied to in the region of Madrid, 585 in Barcelona, 228 in Valencia, and 258 in Seville.

central Madrid but neutral of potential neighbourhood stereotypes. The e-mail address and the telephone number, including an automatic answering service, were registered at a large Internet provider and a phone company for each fictitious applicant. Names and surnames were chosen to reflect ordinary individuals and thus the most common Spanish names and surnames were used. In this way potential checking of applicants in social networks became unpractical, even impossible.

To sum up, the design of the experiment ensures that the only reason why recruiters differ when selecting whom to invite for a job interview is related to information extracted from the name (gender) or the photo (gender, weight and attractiveness).

V. Descriptive results

Table 2 shows the descriptive statistics of the field experiment for men and women separately (top and bottom panels, respectively). In total we applied to 3,155 jobs, 1,578 for men and 1,577 for women, see first column. Our aim was to apply to 150 jobs for each gender and occupation. For seven of the occupations there were enough jobs available that allowed us to fill that quota, but for example for maintenance supervisor only 87 jobs were applied to for each gender.

As previously discussed, we have three categories of fictitious job candidates; the attractive-normal weight job applicant, its weight-manipulated “twin” being overweight and average looking, and last the average looking-normal weight job applicant.¹⁴ Turning to the results of the experiment, the second column gives the callback rate – the share of jobs for which the job applicant has been called back for a job interview – of the attractive-normal weight job applicant, which is 17.3 and 14.6 percent for men and women, respectively. The next column gives the callback rate for their overweight “twin”, which is 13.2 percent for men and 15.2 percent for women. Surprisingly, while the weight-manipulation decreases the callback rate for men, it increases it slightly for women. From this information, we can calculate the relative callback rate for men and women: the callback rate of the first category (attractive-normal weight) divided by the overweight category (see column 5). This measure is often used in correspondence testing studies to take into account that the average callback rate varies across groups or occupations. This measure states that overweight male job applicants receive 24 percent fewer callbacks (i.e., $1/1.31$),

¹⁴ As a reminder, the design of the experiment ensures that the difference in callbacks between the different categories of job candidates is attributable to recruiters using information extracted from the photo as a decision variable in the process of selecting whom to invite for a job interview.

and have to apply to 31 percent more jobs in order to have the same number of callbacks as its attractive-normal weight twin. For women the relative callback rate is below, but close to one.

The fourth column provides the callback rate for the (attractiveness) control category – the average looking-normal weight applicant. The callback rate for males of this category is 12.9 percent, 4.4 percentage points lower than the callback rate for attractive-normal weight males. For women of this category the callback rate is 17.5 percent, 2.9 percentage points *higher* than the callback rate for attractive-normal weight females. In relative terms, average looking males have to apply to 34 percent more jobs to have the same number of callbacks as the more attractive males, see column 6. For women it is the opposite with average looking females having to apply to 17 percent fewer jobs to reach the same number of callbacks as the more attractive females. Hence, there seems to be a beauty premium for men, but a beauty penalty for women, when applying for jobs in Spain.

Table 3 also provides the same type of data description for each of the twelve occupations separately. These occupations are grouped according to being male- or female-dominated, with seven of the occupations being male-dominated. The difference in above results by gender stands out even more when looking by occupation. We arbitrarily choose the threshold of 20 percent higher/lower relative callback rate (1.2/0.8) to indicate a penalty/premium to one applicant category over the other. For men, the relative callback rate between the attractive-normal weight applicants and their overweight twin in column 5 is larger than 1.2 for seven of the occupations, while it is lower than 0.8 for three occupations (sales managers, cooks and cleaners). For women, the corresponding relative callback rate is above 1.2 for four occupations, and lower than 0.8 for seven occupations (sales managers, maintenance supervisor, industrial operator, shop and tele sales assistants, nurses, and receptionists). Hence, judging from the number of occupations with a penalty or premium, there exists an overweight penalty for men, but an overweight premium for women.

Turning to the relative callback rates between attractive and average looking applicants of similar weight in column 6, we find, for males, that it is larger than 1.2 for seven occupations, and less than 0.8 for only one occupation (cooks). Interestingly, there is almost a perfect overlap of the occupations with a relative callback rate above 1.2 for the two relative measures in columns 5 and

6.¹⁵ For women, the relative callback rate in column 6 is larger than 1.2 for five of the occupations, and lower than 0.8 for another five occupations (programmers, accountants, sales managers, shop and tele sales assistants). Hence, there is no clear picture of whether a more attractive facial photo being attached to the job application helps or hurts women when applying for a job.

To conclude, the above analysis shows great difference across occupations in how employers and recruiters value weight and attractiveness of job applicants when hiring, and suggests that men and women are treated differently. Next we turn to a more elaborate regression analysis of the effect of weight and attractiveness.

VI. Empirical analysis

In this section, we analyse the effect of the weight manipulation and attractiveness ratings on the probability of being called back for a job interview using linear probability models. All models include occupation fixed effects, but those estimates are not shown in the tables. In Table 4 we make three comparisons shown in Model A to C. First, Model A compares the probability to receive a callback between the attractive-normal weight and its overweight “twin”, which captures the weight manipulation effect. Second, Model B compares the same probability for the overweight and the average looking-normal weight job applicants, which captures the weight effect since these categories have similar attractiveness ratings. Last, Model C compares the attractive and average looking job applicants, which captures the attractiveness/beauty effect since both categories are of normal weight. Hence, we compare the three groups of photos in Table 2 by gender, and use an indicator for group belonging in the regressions. In Panel A we group all occupations together, while Panel B and C divide the occupations into whether they are male- or female dominated, respectively. These latter analyses should be seen as explorative since they were not part of the pre-registered ethical approval.

A. Weight manipulation and the probability of being invited for a job interview

The analysis begins by regressing the callback dummy on both the overweight indicator variable (Overweight) and occupation fixed effects, for men and women separately, essentially comparing

¹⁵ Spearman’s rank correlation is 0.45 for all 12 occupations.

the callback rates of photos in Panel A and B of Table 2.¹⁶ Starting with men and Model A, the first column of Table 4, reveals that overweight male applicants have a four percentage points lower probability of being called back for a job interview compared to their normal weight “twin”.¹⁷ This difference is statistically significant at the 5-percent level.

As a next step, we analyse whether the effect of the weight-manipulation on males’ callbacks varies between male- and female-dominated occupations. We find the effect of the weight-manipulation to be more pronounced for female-dominated occupations for which the weight-manipulation penalty has increased to 7.5 percentage points. This is a large effect and implies that overweight men have to apply to 88% more jobs to have the same number of callbacks as their normal weight “twins”. For male-dominated occupations the estimate is small and statistically insignificant.¹⁸

For women we do not find a statistically significant effect of the weight manipulation, and the estimate is also small in magnitude (.009), see column 4. However, this estimate hides an interesting heterogeneity between male- and female-dominated occupations. While the effect for male-dominated occupations implies a weight-manipulation penalty of 3 percentage points (not statistically significant), the estimate for female-dominated occupations instead implies a weight-manipulation *premium* of almost 6 percentage points.¹⁹ Hence, the attractive-normal weight applicant has to apply to 56% more jobs to have the same number of callbacks as their overweight “twin”.

Hence, the results thus far reinforce what we saw for the descriptive analysis – men manipulated into overweight have a lower callback rate, while weight-manipulated women have a higher callback rate in female-dominated occupations. Next, we turn to attractiveness as a possible explanation for the results.

¹⁶ The results differ only marginally when we include photo pair fixed effects, or when we exclude occupation fixed effects. While it would make sense to include photo pair fixed effects in Model A, it is not applicable for Model B and C, and hence, we keep the same specification for all three models.

¹⁷ The result is not driven by a single photo pair and is -.042, -.048, and -.031 depending on which pair is excluded.

¹⁸ The difference in estimates between male- and female-dominated occupations amounts to close to 6.5 percentage points (*p-value*=.10).

¹⁹ The difference in estimates between male- and female-dominated occupations then amounts to close to 9 percentage points (*p-value*=.04).

B. The effect of overweight controlling for attractiveness (the weight effect)

Table 2 shows that the weight manipulation not only changes the perception of the person's weight, but also how attractive the person is rated. One way to disentangle the two characteristics would be to include the attractiveness rating into Model A (see Rooth, 2009). However, the indicator for being overweight and the attractiveness rating have almost a perfect correlation, being .87 in both the male and female sample. Instead we rely on a different strategy and compare overweight individuals to normal weight job applicants with similar attractiveness ratings, i.e., comparing the callback rates of photos in Panel B and C of Table 2. This strategy effectively rules out attractiveness as the mechanism behind the effects in Model A, and captures the weight effect.

Model B in Table 4 then compares the probability of receiving a callback between overweight and normal weight job applicants when both are perceived as average looking. For men, the three estimates in column 2 (Panels A-C) are all small and statistically insignificant, suggesting that the weight manipulation penalty found in Model A is attributed to the overweight job applicant being perceived as less attractive, and not to being overweight. For women, the estimates from Model A are all reduced by about three percentage points, leading to the estimate for male-dominated occupations to be statistically significant at the 5-percent level. When having a similar attractiveness rating, the overweight female applicant has a 6 percentage points lower probability of being called back for a job interview (a 29% lower callback rate). This implies that women experience an overweight penalty in male-dominated jobs, but not so in female-dominated ones for which the effect is actually positive (but small and insignificant).²⁰

The overweight-penalty for women in male-dominated jobs was "hidden" in Model A since attractive women, the control category, are also penalized, but in this case due to their better looks. As a final exercise, we turn to a comparison of the two groups of normal weight applicants to learn more about how being attractive has an effect on being called back for a job interview.

C. Attractiveness and the probability of being invited for an interview

To investigate whether attractiveness has an impact on the callback rate we turn to Model C, which compares the callback rate of attractive and average looking job applicants, when both are

²⁰ The difference in estimates between male- and female-dominated occupations amounts to close to 9 percentage points (p -value=.04).

perceived as of normal weight (i.e., comparing the callback rates of photos in Panels A and C of Table 2).²¹ In this analysis we regress the callback dummy on an indicator for being average looking and occupation fixed effects, separately for men and women. Model C reveals that average-looking male applicants have a 4 percentage points lower probability of being called back for a job interview compared to attractive male applicants, which is statistically significant at the ten percent level. This result almost mirrors the one for Model A. The estimate for male-dominated occupations is fairly large at -2.6 percentage points, but imprecisely estimated. For female-dominated occupations the effect is even more negative, and being average-looking instead of attractive yields a 6.3 percentage points lower callback rate. The average looking applicant has to apply to 65% more jobs to have the same number of callbacks as the more attractive applicant. Hence, men face a beauty premium when applying to jobs, and especially more so in female-dominated occupations.²² Turning to women, the effect of being average-looking compared to being attractive *increases* the callback rate by 3 percentage points overall, as well as in male- and female-dominated occupations, but the effects are imprecisely estimated.

Using standardized attractiveness ratings

As a next step we turn to using the standardized attractiveness rating for each of the photos in the regression, see Table 5. As previously discussed, the attractiveness rating is calculated using 40 photos for each gender that vary from being perceived as unattractive to very attractive, and hence, using this variable contains more variation than using a category dummy. The first row of Table 5 simply reiterates the estimate from Model C in Table 4 when all occupations are considered, but switches the indicator to one if it belongs to the group of attractive job applicants. Consequently, the estimates and standard errors are exactly the same as those in Table 4 (columns 3 and 6), but the sign switches. Being attractive increases the callback rate by 4 percentage points for males (p -value=0.06), but reduces it by three percentage points for women (p -value=0.12). This implies a difference in the attractiveness effect of 7.3 percentage points (p -value=.06) between men and women.

²¹ The identification of the effect in this section is not as clear cut as when the same photo was manipulated into being overweight. For these analyses we use photos of different individuals being rated differently on attractiveness, but the same on overweight, age and nationality. That said, the recruiter could value some other “signal” of the photo which we have not controlled for.

²² The difference in estimates between male- and female-dominated occupations is not statistically significant.

Next, we include the standardized attractiveness rating for each photo as a continuous variable in the regressions. For men we find that a one standard deviation increase in attractiveness increases the callback rate by 3.3 percentage points ($p\text{-value}=.20$), but reduces the callback rate by 3.4 percentage points for women ($p\text{-value}=.23$). Both estimates are imprecisely estimated, but the difference in the attractiveness effect between men and women amounts to .067 and is highly significant ($p\text{-value}=.03$).

VII. Conclusion

To examine the impact of physical appearance on the hiring process in Spain, we sent one resume per job to 3,155 real job openings across 12 different occupations. The experimental design involved signalling a job applicant's weight and attractiveness by attaching a photo to the job application. We manipulated the original facial photograph of normal-weight individuals to be perceived as overweight (but not obese). However, this weight manipulation makes the applicant to be perceived as less attractive as well. To be able to isolate the weight effect from the attractiveness effect we added a third group of photos of normal weight applicants with the same attractiveness rating as the weight-manipulated photos.

Our results reveal that the hiring process in Spain is influenced by physical appearance and that looks matter differently for men and women. The weight manipulation into being overweight decreases male's callbacks, and this effect is stronger in female dominated occupations. However, the decrease is not due to a weight penalty, but arises because the weight manipulation makes them less attractive. Hence, similar to Rooth (2009), the mechanism behind the weight penalty for males is due to overweight males being perceived as less attractive. Interestingly, the size of the attractiveness effect is actually similar in size to the attractiveness effect found in studies for Argentina and China.

Conversely, female applicants face both a weight and an attractiveness penalty. The weight effect is of the same magnitude as found in studies for Italy, Mexico, and Sweden, while an attractiveness penalty has previously been found for Israel by Ruffle & Shtudiner (2015). Interestingly, they argue that their penalty is related to jealousy and envy against very attractive women, while we find the same result when the differential treatment is between average looking and attractive, but not very attractive women. Overall, our findings suggest that physical appearance through photos attached to job applications plays a significant role in the hiring process

in Spain, with men benefiting from a beauty premium while women experience both beauty and weight penalties.

These findings emphasize the need to take actions to combat differential treatment based on physical appearance during the initial stages of the hiring process. Some effective policy measures could include mandatory anonymous CVs, discouraging or prohibiting the inclusion of photographs in job applications, or prioritizing gender diversity within hiring committees. These actions can help reduce the impact of beauty and weight biases on hiring. We hope that our study will contribute to the creation of a more equitable recruitment process.

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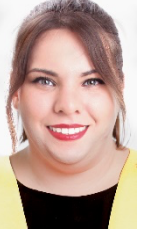





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Tables & Figures:

Table 1. Relative callbacks from correspondence testing experiments on obesity and attractiveness

	Men	Women	Country
Obesity:			
Rooth (2009)	1,21	1,25	Sweden
Busetta, Campolo & Panarello (2020)	1,20	1,26	Italy
Campos-Vazquez & Gonzalez (2020)	1,00	1,37	Mexico
Attractiveness:			
Maurer-Fazio & Lei (2015)	1,24	1,41	China
López Bóo, Rossi & Urzua (2013)	1,36	1,36	Argentina
Ruffle & Shtudiner (2015)	2,14	0,94	Israel

Table 2. Weight and attractiveness ratings of the photos included in the field experiment.

<i>Panel A. Normal weight</i>					
M1	M2	M3	W1	W2	W3
					
Weight rating:					
0.0	0.0	0.0	0.0	0.3	0.0
Attractiveness rating:					
0.6	0.5	1.2	0.6	1.0	1.1
<i>Panel B. Overweight</i>					
M4	M5	M6	W4	W5	W6
					
Weight rating:					
0.9	0.8	0.7	0.8	1.0	1.1
Attractiveness rating:					
-0.1	0.1	0.1	0.2	0.4	0.1
<i>Panel C. Average-looking normal weight</i>					
M7	M8		W7	W8	W9
					
Weight rating:					
0.2	0.0		0.3	0.0	0.5
Attractiveness rating:					
-0.3	-0.3		0.1	0.2	0.1

Note: The male and female faces in Panel A has been manipulated into being overweight, see panel B. The weight and attractiveness ratings come from a sample of 177 employed adults. See the text in Section III for details of the weight and attractiveness ratings. A weight rating of normal weight is 0, while the weight rating of overweight is 1. The attractiveness rating is the standardized attractiveness rating using the full set of 40 photos for each gender for its calculation.

Table 3. Aggregated/Descriptive results for the correspondence testing experiment. Men and women separately.

	Jobs No.	Callback rates			Relative callback rate (2)/(3)	Relative callback rate (2)/(4)
		Normal weight	Overweight	Average looking-normal weight		
	(1)	(2)	(3)	(4)	(5)	(6)
Men total	1,578	0.173	0.132	0.129	1.31	1.34
<i><u>Male-dominated occupations</u></i>	849	0.181	0.169	0.154	1.07	1.18
Programmer/IT	151	0.487	0.467	0.514	1.04	0.95
Mechanical engineer	150	0.105	0.080	0.054	1.31	1.94
Accountants	115	0.207	0.121	0.071	1.71	2.92
Sales managers	99	0.080	0.160	0.000	0.50	inf
Maintenance supervisor	87	0.136	0.91	0.143	1.49	0.95
Industrial operator	97	0.042	0.041	0.042	1.02	1.00
Cook	150	0.105	0.133	0.135	0.79	0.78
<i><u>Female-dominated occupations</u></i>	729	0.163	0.088	0.100	1.85	1.63
Shop sales assistants	150	0.079	0.013	0.000	6.07	inf
Nurses	150	0.211	0.173	0.162	1.22	1.30
Tele sales assistants	150	0.368	0.187	0.297	1.97	1.24
Receptionists	150	0.105	0.000	0.000	inf	inf
Cleaners	129	0.031	0.061	0.031	0.51	1.00
Women total	1,577	0.146	0.152	0.175	0.96	0.83
<i><u>Male-dominated occupations</u></i>	848	0.182	0.150	0.212	1.21	0.86
Programmer/IT	150	0.553	0.453	0.730	1.22	0.76
Mechanical engineer	150	0.105	0.040	0.027	2.63	3.89
Accountants	115	0.172	0.155	0.286	1.11	0.60
Sales managers	99	0.040	0.080	0.125	0.50	0.32
Maintenance supervisor	87	0.046	0.068	0.000	0.68	inf
Industrial operator	97	0.042	0.082	0.042	0.52	1.00
Cook	150	0.158	0.093	0.108	1.70	1.46
<i><u>Female-dominated occupations</u></i>	729	0.102	0.153	0.133	0.67	0.77
Shop sales assistants	150	0.073	0.162	0.184	0.45	0.40
Nurses	150	0.132	0.240	0.108	0.55	1.22
Tele sales assistants	150	0.184	0.293	0.270	0.63	0.68
Receptionists	150	0.108	0.133	0.079	0.81	1.37
Cleaners	129	0.031	0.015	0.031	2.07	1.00

Note: "inf" implies that we cannot calculate it since the denominator is 0.

Table 4. The effect of overweight and average looks on the probability of a callback for a job interview. Men and women.

Variable	Men:			Women:		
	Model A	Model B	Model C	Model A	Model B	Model C
Panel A. All occupations						
Overweight	-0.040** (0.020)	0.003 (0.019)	-	0.009 (0.021)	-0.022 (0.021)	-
Average looks	-	-	-0.043* (0.024)	-	-	0.030 (0.024)
No of obs	1,190	1,179	787	1,188	1,187	779
E[callback]	0.17	0.13	0.17	0.15	0.17	0.15
Panel B. Male-dominated occupations:						
Overweight	-0.010 (0.029)	0.016 (0.029)	-	-0.031 (0.028)	-0.061** (0.028)	-
Average looks	-	-	-0.026 (0.033)	-	-	0.029 (0.033)
No of obs	641	634	423	640	634	422
E[callback]	0.18	0.15	0.18	0.18	0.21	0.18
Panel C. Female-dominated occupations:						
Overweight	-0.075*** (0.027)	-0.012 (0.025)	-	0.056* (0.031)	0.021 (0.031)	-
Average looks	-	-	-0.063* (0.033)	-	-	0.032 (0.034)
No of obs	549	545	364	548	553	357
E[callback]	0.16	0.10	0.16	0.10	0.13	0.10

Notes: This table reports the probability of being invited for a job interview for men and women using a linear probability model. All regressions include occupation fixed effects. Model A reports the weight-manipulation effect, i.e., compares the overweight relative to their normal weight twin (the benchmark). Model B reports the weight effect, i.e., compares the overweight relative to normal weight with a similar attractiveness rating (the benchmark), while Model C reports the attractiveness effect, i.e., compares being average looking relative to being attractive (the benchmark), and both groups being normal weight. The mean outcome (E[callback]) refers to the benchmark category. *, **, and *** denote the ten, five and one percent significance level, respectively.

Table 5. The effect of attractiveness on the probability of a callback for a job interview. Men and women.

Variable	Men:		Women:	
	Model A	Model B	Model A	Model B
Attractive (=1)	0.043* (0.023)	-	-0.030 (0.024)	
Attractive (std)	-	0.033 (0.021)		-0.034 (0.028)
No of obs		787		779
E[callback]		0.151		0.160

Notes: This table reports the probability of being invited for a job interview for men and women using a linear probability model. All regressions include occupation fixed effects. Model A reports the effect of being attractive relative to being average looking with both groups being normal weight. Model B uses the same sample but instead reports the effect of being attractive using the standardized attractiveness rating of each photo. *, **, and *** denote the ten, five and one percent significance level, respectively.

Appendix 1: Example of an Auditor application: CV and motivation letter (English version)

In the CV, only the photo, name, postal address, e-mail and phone would change across applications, apart from grammatical gender agreements in the rest of the text.

Daniel Fernández González
March 7th, 1986
Ayala St., 100, 1ª stair, 3ºD, Madrid
602540483
danielfernandezgonzalez11@gmail.com



PROFESSIONAL EXPERIENCE

September 2015 – Currently: SENIOR EXPERIENCED AUDITOR at **DELOITTE S.L, Madrid.**

- Direct communication with clients. Relation and management of projects and work teams.
- Annual accountancy review, analytic review, consolidation, reporting, supervision and test of internal administrative control of companies, carrying out risk maps, budget and deviation analysis, etc.
- Planning, field work and final revision of the financial statement of companies.
- Knowledge and experience: IFRS, US GAAP, SOX.
- Main clients: Grupo TRAGSA, Globalvía, Hipoges Iberia, Gowai Investments, Grupo RIOCAL.

September 2010 – August 2015: SENIOR AUDITOR at **KPMG AUDITORES S.L, Madrid.**

- Main clients: DIA, Samsonite, PROSEGUR, UNEDISA, Conde Nast, Wolter Kluwers, Seur, AstraZeneca, Esteé Lauder, General Electric Real Estate, GMR Marketing, Knight Frank, Jones Lang, Kinopolis.

September 2005 - September 2010: COORDINATOR AND HOSTESS OF EVENTS at **Real Madrid Club de Fútbol**, Premios Goya, Mutua Madrid Open, numerous congress and fairs at IFEMA as Madrid Fashion Week, Fitur, Salón del automóvil, etc.

EDUCATION

September 2004 - June 2010:

DEGREE IN BUSINESS ADMINISTRATION AND MANAGEMENT, at **Universidad Complutense de Madrid.**

LANGUAGES

English: 2010 - Advanced in English - British Council School.

2008 - First Certificate in English - Cambridge.

French: Basic skill.

COMPLEMENTARY INFORMATION

Computing: High level of Office IT: Microsoft Office Word, Excel, Power Point, Visio, E-views.

Other Courses:

2008 - 2009: Stock Market and other financial ones by Bolsa de Madrid.

2009 - 2010: Additional training in computers by Universidad Complutense de Madrid.

2010 - Current (continuous training by KPMG Auditores S.L y Deloitte S.L.): Normative courses of annual accountancy, general accountancy criteria update, infrastructure and ISAS, consolidation, management override of controls, risk management, tax for audit, interpersonal skills, leadership model, the power of language and communication, money laundering prevention.

Driving Licence B1 and own car.

Travel availability.

Willing to relocate.

Madrid, June 12th 2017

Human Resources Department
Company name
Company address

Dear Sir / Madam:

I am writing to you in connection with your job offer published on XXX, about the AUDITOR position.

As you can see in the resume attached, I have experience as auditor. Since I finished my Degree in Business Administration and Management, I have been working on auditor positions to renowned clients in the capital market. I like new challenges and working in a Company that allows me to grow in a professional field.

I would like to have the opportunity to enlarge this information personally and tell you everything I could provide to your business if you decide to rely on me. I would like to settle in XXXX, so the position that you offer meet my professional and personal expectations.

I look forward hearing from you, I am at your disposal for an interview if you consider it.

Yours sincerely.