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Abstract

Empirical evidence suggests that physical characteristics such as obesity can result in a salary gap in the work place. It is, however, not clear how much of this (gap) is due to factors emanating from the demand or supply side of the market. In this paper we use a field experiment to study whether a part of this wage gap can be attributed to personality traits of individuals on the supply side. Monitors randomly select individuals to respond to a questionnaire. Individuals can make money requests for completing the questionnaire. In the questionnaire they also self-report several personality chracteristics. We find that the more obese individuals perceive themselves to be, lesser is the money they request. The negative association between money requests and obesity is mostly driven by female participants. The effect of (self-perceived) non-obese individuals is asymmetric across gender. Self perceived "normal" females, perceived thin by the monitors, request more, meanwhile, males in this category request less relative to those that do not overstate their obesity levels. Our results suggest that lower salary request may anchor obese individuals to lower thresholds and may partly explain the wage gap.

Keywords: Self-reported obesity, field experiments, willingness to accept, gender bias.

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1 Introduction

Individuals suffering from obesity face prejudice and discrimination in their daily social interactions (See Puhl and Heuer 2009, for an extensive review). Numerous empirical studies have reported the negative effects of obesity, measured by body mass index on wages and employment rates (Cawley 2004, Cawley and Danziger 2005, Garcia and Quintana-Domeque 2006, Cawley 2007, Brunello and D'Hombres 2007, Han, Norton and Stearns 2009).[1] Further, although weaker this result still holds when more complex measures of obesity are employed (Burkhauser and Cawley 2008, Johansson et al. 2009, Wada and Tekin 2010).[2]

Evidence on discrimination attributed to obesity can also be found in experimental psychology studies. In a meta-analysis on weight discrimination (Roehling et al. 2008) it was demonstrated that overweight job applicants and employees were evaluated more negatively and had more negative employment outcomes compared to non-overweight counterparts.[3]

Note that, all aforementioned studies have looked at the demand side of the labor market, little is known about the behavior of employees who represent the supply side. There may be other individual factors arising from the supply side that could also be playing a role in determining the final wage. For example, the labour market has a well known feature where employers can elicit a prospective employees willingness to accept for the job in question. These wage proposals from prospective employees could very well work as an anchor for wage determination especially if they are below an employers wage threshold. This could be thus another channel that reinforces the wage discrimination in the workplace as such individuals would

[1] Cawley (2004) finds that for white females, an increase of 64 pounds above average weight was associated with a 9% decrease in wages. Han, Norton and Stearns (2009) find that the negative relationship between the BMI and wages is larger in occupations requiring social interactions and for older people. Brunello and D'Hombres (2007) observe that a 10% increase in the average BMI reduces the hourly wages of males by 1.9% and females by 3.3% while Garcia and Quintana-Domeque (2006) find a negative correlation between wages and obesity, ranging from -2 to -10% only for women.

[2] Burkhauser and Cawley (2008) claim that total body fat is negatively correlated with employment for some groups. Johansson et al. (2009) find that only waist circumference has a negative association with wages for women. Wada and Tekin (2010) report that body fat is associated with decreased wages for both males and females while they also present evidence suggesting that free fat mass is associated with increased wages.

[3] Studies included in the analysis were those using simulated employment decisions and demonstrated an effect between target weight and job-related outcome variables. Out-come variables included hiring recommendations, qualification/suitability ratings, disciplinary decisions, salary assignments, placement decisions, and coworker ratings.

start from a lower wage. Initial requests, or initial offers, are important because they can serve as anchors in the negotiation process and influence subsequent offers. The importance of the adjustment from an anchor in making judgments under uncertainty was first described by Tversky and Kahneman (1974). Further, several empirical and experimental studies in the negotiation-bargaining literature have confirmed its importance (Galinsky and Mussweiler 2001, Ritov 1996).

While elicitating wage proposals may result in lower wage anchors. Another important issue is self-perception, or self esteem. If ones self esteem is lower then this may be another channel that pushes their requests down. This then implies that the willigness to accept from these individuals may be further lowered.

Socio-psychologists have highlighted the negative relationship between self esteem and obesity. In a nationally representative study of over 3000 adults, (Carr and Friedman 2005) find that obese individuals report lower levels of self-acceptance than normal-weight persons, which is fully mediated by perceptions of weight discrimination. Further, (Biro et al. 2006) report that BMI is an important predictor of self-esteem on a 2379 sample of 9 and 10 years old girls. Meanwhile, (Hesketh, Wake and Waters 2004) find that obesity/overweight precedes low self-esteem in a study of 1157 elementary school children in Australia.[4] Obese people are more vulnerable to lower self-esteem which, in turn, is correlated with lower initial wage requests and, by extension, with lower earnings.

Given this we run experiments where we elicit wage proposals for filling out a questionnaire. All experiments were conducted by interviewers who were trained for the task. Subjects were asked to fill out a questionnaire. They were then asked as to how much money they would like to request as compensation for the effort they made and for the information they provided. Note that this is an open-ended question (Greig 2008) and reflects a situation where the employer elicits a willigness-to-accept value from prospective employees.

Subjects also answered other questions on personal and physical characteristics on a 7 scale Likert question. One of the questions was regarding their own perceived obesity level. In this manner we obtained information about an individuals perceived obesity. This question is relevant to what we are interested in, i.e. how does self perception affect the revealed willingness to accept for completing the questionnaire? Whether someone self discriminates, in terms of a lower wage proposal, will be reflected through this question. Though obtaining information on ones own perception is important, it is equally important to obtain information regarding the perception of others. We control for this and asked the monitors to document how

[4]In the same direction, but more moderated, are the results of the two comprehensive reviews of self-esteem and obesity in youths by French, Story and Perry (1995) and Wardle and Cooke (2005).

they perceived the individual they were interviewing.

Finally, we also check for differences in wage proposals based upon gender. Several studies (Rosenbaum 1984, Gerhart 1990, Barron 2003, Greig 2008) demonstrate that men make significantly larger salary requests than women. This then leads to a lower first salary and consequently to a more modest career advancement. According to this literature, differences in men's and women's entitlement are due to several factors: group-based social inequities, intra-group and intra-personal comparison biases, group differences in reference standards (Major 1994), socialization pressure (Wade 2001), effectiveness in competitive environments (Gneezy, Niederle and Rustichini 2003). However, how physical characteristics such as obesity may contribute to self discrimination has not been studied so far.[5]

Self fulfilling prophecy theory (Merton 1948) on the working environment argues that employers[6] who form false general beliefs for obese employees[7], develop differential treatment towards their obese employees who eventually shape their behavior in an expectancy-consistent manner. Expecting lower wages, obese workers request, or they are willing to accept, lower wages. The same conclusion is also supported by the statistical discrimination theory as explained in (Piketty 1998).

The main focus of this experimental study can be stated through the following questions: Do obese individuals, i.e., who self-report a higher-than median level of obesity, request less money than non-obese people? Secondly, does the interaction between obesity and gender have any significant effect on money requests? Finally, are there gender differences in self discrimination?

The study is organized as follows: the experimental methods are described in section 2, while the data and results are presented in section 3 and 4, respectively. In section 5, we make a comparison between self and monitor reported data on obesity. Finally, section 6 concludes with a discussion of the results.

[5]Mobius and Rosenblat (2006) is a close experimental paper that focus on "beauty". They decompose the beauty premium in an experimental labor market where employers determine wages of workers who perform a maze-solving task.

[6]Wang, Brownell and Wadden (2004) provide evidence that obese people, unlike other minority groups, appear to hold negative attitudes toward in-group members (weight bias internalization), no distinction between obese and non-obese employers is necessary to be made.

[7]Research to date (see Puhl and Heuer 2009 for an extensive review) suggests that the most common stereotypes about obese employees include views that they are less hard-working, less perseverant, less conscientious, less agreeable, less emotionally stable, less extraverted etc. than their normal-weight counterparts. Nevertheless, it is also true that obesity is related to less self-control and health problems, two aspects which have negative impact on work outcomes.

2 Experimental methods

We conduct an economic field experiment with 270 subjects from different socioeconomic backgrounds. Twenty seven mediators-interviewers aged between 20-60 years and from varying socioeconomic backgrounds were recruited to help us (an mediators) to conduct the experiment. All of them were students at the School of Social Work at the Universidad of Granada taking a module on "*Economic Analysis of Social Work*". None of them had any past experience in economic experiments.

2.1 Stage 1: Mediators' Training

Mediators were trained for a total of six hours. Training included a general description of experimental methods with special reference to the experimental protocols. Additional instructions regarding the experiment were also given in detail. Each mediator was asked to independently recruit 10 subjects to participate in an economic experiment within one week's time. The interviewers had no information about the research focus of the study (before or after). By doing so it was ensured that subjects were not selected on the basis of any specific characteristic that were of interest to the experimenters.

The interviewers were also told that employed subjects were preferred and that they should aim for a balanced subject pool (based on gender). This was done as we were interesting in eliciting valuations from individuals who were in a workplace environment. After the first week, the mediators were asked to submit a list with the (codified) names of the ten subjects they had recruited.

2.2 Stage 2: Questionnaires and Implementation

In the second stage, every monitor answered a questionnaire (Q_j) describing the $j-$subjects she had recruited ($j = 10$ subjects). The questionnaire consisted of two parts: $Q(a)_j$ appearance and personality questions about j; $Q(b)_j$ Sally-Ann task (Wimmer and Perner 1983). They were also asked to describe the relationship between herself and the $j-$subject.

After completing and submitting the questionnaire to the researchers, the monitors received ten questionnaires (Q^j) and ten envelopes. These envelopes were delivered by them to their $j-$subjects for enclosing their private answers.

Questionnaires $Q(.)_j$ and $Q(.)^j$ were identical. The only difference is that the questions in $Q(.)_j$ were answered by each of the interviewer (describing the $j-$participants) while the questions in $Q(.)^j$ were self-reported by each of the $j-$subjects.

Since the b block was only used to distract participants (and interviewers) from the main goal of the research, we will focus now on the a block. It consisted of four questions about their appearance, namely obesity, beauty, height and manner of dress, and five questions about their personality characteristics, such as ambition, self-esteem, sociality, creativeness and benevolence.

All these questions are ranked on a 7-level Likert scale. *Obesity* is used as an explanatory variable while *beauty*, *ambition* and $self - esteem$ are used as control variables. The remaining questions were not related with the experiment but used to distract subjects (as we did with the Sally-Ann task).

At the end of the questionnaire participants were also asked regarding how much money they would like to receive for the task. Specifically, subjects were asked the following question: *How much money you would like to request as a compensation for the effort you made to fill out the questionnaire and for the information you provided us.*

We were thinking on alternative modes of elicititation like asking subjects to select between, for instance, 0 - 5 – 10 – 15 – 20 euros. However this would definitively anchor our participant's choices. Moreover, we felt that our open–ended question is suitable for the purpose of our experiment. That is, we did not want to "frame" subject elicitations. In fact, asking for an infinite amount is *optimal* in this "game", since this always ensures that they receive the highest quantity. It is due to this reason that the extreme values we obtain are of interest to us.

It was also clarified that the money available for the research project was provided by the Spanish government and did not belong to either the mediators or the researchers. Subjects were also asked to give their names and home addresses for receiving the money that would be paid to them. Participants were also assured about their personal data protection in agreement with the Spanish Law 15/1999.

2.3 Payments

Payments were made two weeks later according to the following rule: Subjects who requested 10 euros or more, were paid 10 euros. All the rest received the exact amount of their request. Table 1 summarizes relevant information for payments. Rows show the number of people not answering (n.a), requesting 0 euro, or a positive amount of money (> 0) while the columns indicate whether subjects provide no-info, incomplete or complete personal information.

Table 1
Personal Information and Money Requests

	no-info	*incomplete*	*complete*	*Total*
Requests				
n.a.	17	5	1	23
0€	53	21	19	93
>0€	2	45	107	154
Total	72	71	127	270

There were 72 subjects who requested 0 euros, gave no answer, or did not give their personal information. Among the 154 individuals who asked for a positive amount of money two provided no personal data at all while 45 of them provided incomplete data. From the sample of 107 subjects who both provide all the necessary personal data and ask for a positive amount of money, there was a fraction of subjects (16%) who did not provide the mediators with a photocopy of their ID for completing the payment (required under Spanish tax regulation). Finally, the 89 subjects who asked for a positive amount of money, gave complete personal information and provided copies of their ID were paid.

2.4 Ethical concerns

All participants were assured that that their anonymity will always be preserved (in agreement with the Spanish Law 15/1999 for Personal Data Protection). Subjects were informed that no association will ever be made between subjects' real names, the corresponding codes and the final results. All experimental procedures were checked and approved by the Vice-Dean of Research of the School of Economics at the University of Granada, the institution coordinating the experiment.

3 Data considerations

In most cases the variables used in our analysis are generated from the raw data obtained directly from the experiments. However, it was necessary to transform the initial raw variable in the case of (the dependent variable) *money*.

3.1 Dependent Variable: Money

The dependent variable under consideration is the amount of money that subjects requested in compensation for the effort they made to fill out the particular ques-

tionnaire. We see that the empirical distribution of the variable is not continuous. Our participants requested money (if any) in a very heterogenous way:

- 93 subjects (34%) requested 0 euros, meanwhile, 23 did not answer how much they will be willingness to accept to complete the questionnaire.
- Among those who requested a positive amount of money, 4.46% of them requested more than 250 euros.
- Further, there are several focal points (apart from 0) such as 10, 20, 30, 50,100 which have frequencies of more than 5% each.

Sice we have several people asking nothing, others asking a large amount and a number of focal points (10, 20, 30, 50 and 100 euros; frequencies $> 5\%$ each) we decice to generate an ordinal variable around these points. The 6 ordered categories variable is generated as follows:

Table 2

Dependent Variable: Money

label	0	1	2	3	4	5
categories	0	$1-15$	$16-30$	$50-70$	$90-100$	>149
n	116	39	46	28	17	24

In the regression analysis done in the next section, the dependent variable *money* is represented in two different ways.

money(.) is a 6-category ordinal variable which includes all the observations exactly as described above (Table 2). This variable attempts to shed light on the question: *Who requests more money?*"

money(1/0) is a dichotomous variable. The first category includes the 116 subjects who requested 0 euros, while the second category, which is an aggregation of categories 1-5 of the variable money, includes the 154 persons who requested a positive amount of money. In this case the question under examination is: *Who requests money and who does not?*"

3.2 Independent Variables

Recall that the objective of this study is to see how subjects perceive themselves and whether it affects their willingness-to-accept. Given this we use self-reported obesity instead of any objective measurement like BMI. We will discuss this issue at the end of the section.

The variable *obese*, an ordinal self-reported explanatory variable describing the level of subjects' obesity (from 1=very thin to 7=very obese), is not easy to interpret. Values of the variable (1, 2, ..., 7) are not ranked directly. Perceiving that one is very thin does not necessarily imply that one is more attractive relative to someone who feels obese. Due to this reason two dummy variables were generated from the original variable using $obese = 4$ as the reference point[8]:

dobese a dummy variable taking value 1 if the subject reports level 5, 6 or 7 in the question on obesity and 0 otherwise,

dthin a dummy variable taking value 1 if the subject reports level 1, 2 or 3 in the question on obesity and 0 otherwise.

Miller and Downey (1999) conclude in their meta-analysis that heavy people have low self-esteem. Additionally, the relation is stronger for people who perceive themselves as heavy (than for people who actually are) and are thus likely to be perceived as heavy by others. To control for possible con-founding effects we use the following independent variables:

beauty an ordinal self-reported explanatory variable describing the level of subjects' beauty (from 1(very ugly) - 7 (very beautiful)).

ambition an ordinal self-reported control variable describing the level of subjects' ambition (from 1(not ambitious at all) - 7 (very ambitious)).

$self - est.$ an ordinal self-reported control variable describing the level of subjects' self-esteem (from 1(no self-esteem at all) - 7 (high self-esteem)).

Recall that we also ask the mediators to report on subject characteristics. The following variables are incorporated from their responses:

$female$ a dummy variable taking the value of 1 if the subject is female and 0 otherwise.

age a continuous control variable describing subjects' age in years.

[8] 4 is in the middle of the distribution (1, 2, 3, **4**, 5, 6, 7).

wage a continuous control variable describing subjects' wage in euros.

Table 3 below summarizes the descriptive statistics for the variables used in our analysis. The subject pool was comprised of 55% females and 35% university students. About 37% of the subjects did not work at all, 18% worked in a low-level job and the remaining 45% had a medium or high-level job. The variable wage refers to the 171 subjects who currently have a job.

Note that one subject did not answer the questionnaire at all. Our sample is therefore restricted to 269 self-reported observations.

Table 3
Descriptive Statistics

Variable	N	Mean	Median	Mode	Std. Dev	Min	Max
obesity	269	4.18	4	4	1.05	1	7
dobese	269	0.33	0	0	0.47	0	1
dthin	269	0.20	0	0	0.40	0	1
beauty	269	4.79	5	5	0.97	1	7
ambition	269	4.52	5	5	1.34	1	7
self-est.	269	4.49	5	5	1.48	1	7
female	270	0.55	1	1	0.50	0	1
age	270	29.33	25	24	9.47	18	65
wage	171	1316	700	1500	848	100	7000

One can make the following observations from Table 3. The mean, the median and the mode of the variables *beauty*, *ambition* and $self-esteem$ are much higher than expected. Although the median value is 4, subjects overestimate their characteristics. However, in regard to *obesity* the mean value approaches the expected one, while the mode and the median are exactly 4.

Finally it is necessary to check whether our measure of obesity correlates with BMI. We have we run an additional experiment with 658 students where we asked then to fill the same questionnaire and also height/weight (see Bosch-Domènech et al. 2014). The results are highly significant: $r_{obese,BMI} = 0.505$ ($p = 0.000$) for females and $r_{obese,BMI} = 0.466$ ($p = 0.000$) for males. We clearly see that self-reported perceived obesity is highly correlated with self-reported BMI.

4 Results

First we will look at the relationship between the amount of money asked by the participants and their self-reported level of obesity. Following this we perform a probit regression analysis which allows us to control for other factors that may impact the dependent variables (such as, beauty, gender and other socioeconomic variables).

4.1 Preliminary results

We look at the relation between the dependent variable $money(.)$ and the explanatory variable obesity[9]. Figure 1 shows the average amount of money requested according to the different (self-reported) levels of obesity. The size of the bubble in the figure is proportional to the number of people belonging to each level of obesity. The number written in each bubble gives the number of subjects in each group.

At first glance there does not appear to be a clear trend between the two variables. However, looking only at obesity levels of 4-7, a clear negative trend can be seen. This leads us to the following observation: *The more obese individuals perceive themselves to be, the less money they request on average.* This is supported by the nonparametric tests (Cuzick and Mann-Whitney). The requests made by individuals at level 4, and at levels 5 and 6, are significant and negative[10]. On the other hand, there is no clear pattern for the average requests among the people who feel thin (level 1-3). These two observations support our argument that the variable obesity could actually be analyzed better if it is disentangled into two distinct variables, *dobese* and *dthin*.

4.2 Regression analysis

In the regression analysis we control for personal, and socio economic, characteristics and for the influence of monitors on the subjects' answers. The personal characteristics we control for are, *beauty*, personality characteristics such as *ambition* and $self-esteem$, and the socioeconomic variables of *age* and *wage*.

To control for the presence of the monitors is important as the interviews were conducted by them without supervision[11]. Consequently, we allow for $intra-group$

[9]Without controlling for other socio-demographic variables that might affect the dependent variable

[10]Cuzick test (comparing all medians): $z = 1.96$ ($p = 0.051$), Mann-Whitney test (comparing *obesity*=4 with *obesity*=5): $z = 2.28$ ($p = 0.020$), Mann-Whitney test (comparing *obesity*=4 with *obesity*=6): $z = 2.24$ ($p = 0.020$).

[11]Although they were specifically instructed not to influence subjects' answers, we cannot ignore that subjects may have been recruited from the interviewer's proximate environment. A Kruskal-

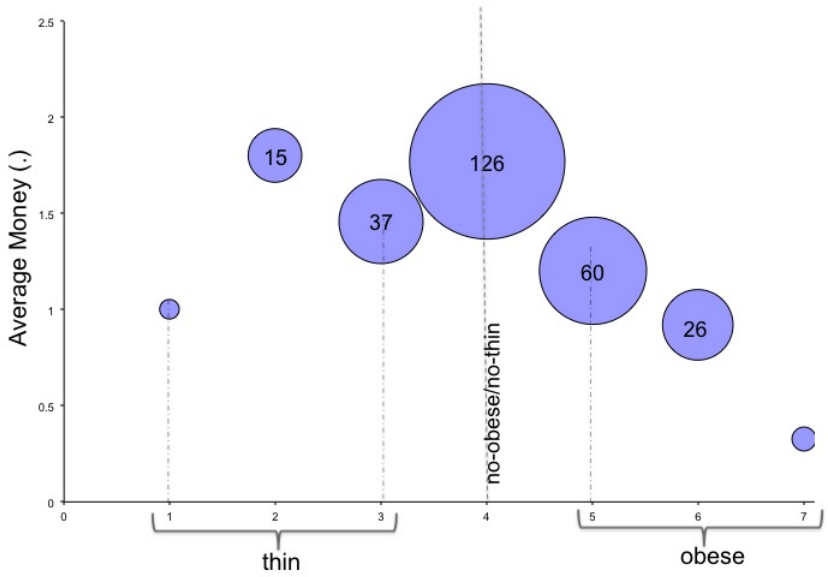


Figure 1: **Average** *money* **requested by** *obesity* **level**. *Legend*: The size of the bubble is proportional to the number of individuals in that category. The number within represents the exact number of individuals. The Y-axis shows the average *money*(.) requested in each category.

correlation and relax the usual requirement that the observations be independent. That is, the observations are independent across groups (27 clusters for different monitors), but not necessarily within groups. This kind of analysis affects the standard errors and variance-covariance matrix of the estimators, but not the estimated coeffcients.

Table 4 reports the coefficients and the standard errors (in parenthesis) for a series of regressions with the aforementioned cluster specification:

- two ordered probit regressions –columns 1(a) and 1(b)– on the dependent variable *money*(.) and,
- two probit regressions –columns 2(a) and 2(b)– on the binary variable *money*(1/0).

Wallis test on the variable *money*(.) for significant differences among groups of people dealing with different mediators confirms this claim ($p < 0.001$).

Table 4

Probit Regressions

Variable	*money*(.)		*money*(1/0)	
	1(a)	1(b)	2(a)	2(b)
APPEARANCE				
obesity	$-.109^{+}$		-.054	
	(.063)		(.077)	
dobese		-.422**		-.340*
		(.124)		(.150)
dthin		-.230		-.347
		(.212)		(.253)
beauty	.087	.073	$.125^{+}$	.110
	(.077)	(.347)	(.077)	(.081)
PERSONALITY				
ambition	.095	.098	.061	.060
	(.063)	(.063)	(.073)	(.073)
self-est.	.025	.027	.041	.042
	(.060)	(.060)	(.065)	(.065)
SOCIOECON				
female	-.003	.000	.044	.055
	(.167)	(.170)	(.200)	(.200)
age	-.129*	-.128*	-.134*	-.133*
	(.059)	(.057)	(.062)	(.060)
age^2	$.001^{+}$	$.001^{+}$	$.001^{+}$	$.001^{+}$
	(.001)	(.0007)	(.001)	(.0007)
wage	-.000	-.000	$-.0001^{+}$	$-.0002^{+}$
	(.0001)	(.000)	(.0001)	(.0001)
constant			2.042^{+}	2.06^{+}
			(1.128)	(1.107)
N	269	269	269	269
$Pr > chi2$	0.001	0.0000	0.0004	0.0001

Notes: Standard errors (adjusted for 27 clusters in interviewers) of parameter estimates in parentheses. $^{+}p < 0.10$, $^{*}p < 0.05$, $^{**}p < 0.01$

The difference between regressions of type (a) and (b) is that while the original 7-level *obesity* is used in the first one as the main explanatory variable, the dummies *dobese* and *dthin* are engaged in the second ones in order to disentangle the effect. We control for the continuous variables *age*, age^2 and *wage* and for the ordinal variables

beauty, *ambition* and $self - esteem$ in all the regressions. No multicollinearity problem was observed in our regression models.[12].

Regressions 1(a) and 2(a) confirm the negative association of the dependent variables –*money*(.) and *money*(> 0)– with obesity. However the association is marginally significant. When disentangling obesity in regressions 1(b) and 2(b), we find that the variable *dobese* is negatively associated (1% and 5% significant level, respectively) in both models, while *dthin* is not. Therefore, the negative sign of 1(a) and 2(a) is due to the lower requests by obese subjects (level 5, 6 and 7), rather than the higher requests of thin subjects. The results are summarized below.

Result 1: In comparison to "non-obese", (*i*) "obese" subjects request significantly less money and (*ii*) are more prone not to request any money at all.

In other words, when free to state the amount they would like to accept for completing the survey, "obese" individuals ask for a significantly less amount compared to "non-obese" individuals.

No clear cut results are obtained when we study the self reported measure of *beauty* with the corresponding dependent variables of models 1(a) to 2(b). We do not find any significant association between *beauty* and requested money at any reasonable significance levels[13].

The following general remarks can be made for the rest of the variables used as controls in the regression: *i*) *Age* is negatively associated with the dependent variable in regressions 1(a) to 2(b) *ii*) Though we conjectured that $self - esteem$ may reenforce self discrimination, we do not find it to be significant in any regression; *iv*) Finally, *wage* shows a marginal effect.

Now we look at gender effects. Figure 2 gives a very good representation of this result by illustrating the average money requests by obesity level and gender.

Althought we did not find the variable $female$ significant in any of the regressions (with or without controls), figure 2 suggests a negative trend. This is also corroborated by a series of non-parametric analysis[14]. Figure 2 clearly shows that the negative trend between money requests and *obesity* (or *dobese*) is confirmed only in the female subsample.

[12]In addition to the above illustrated models, we repeated the whole set of regressions using the continuos variable *money* (the original variable) tobit regression methods. The results are very similar to those obtained from the ordered probit model (1(a) and 1(b)). The results are identical in terms of significance in the case of the main variable, *obesity*.

[13]The only exception is regression 2(a) in which *beauty* is weakly (10%) and positively associated with *money*(1/0), that is, those who consider themselves "good-looking" are more likely to ask for money.

[14]Available upon request.

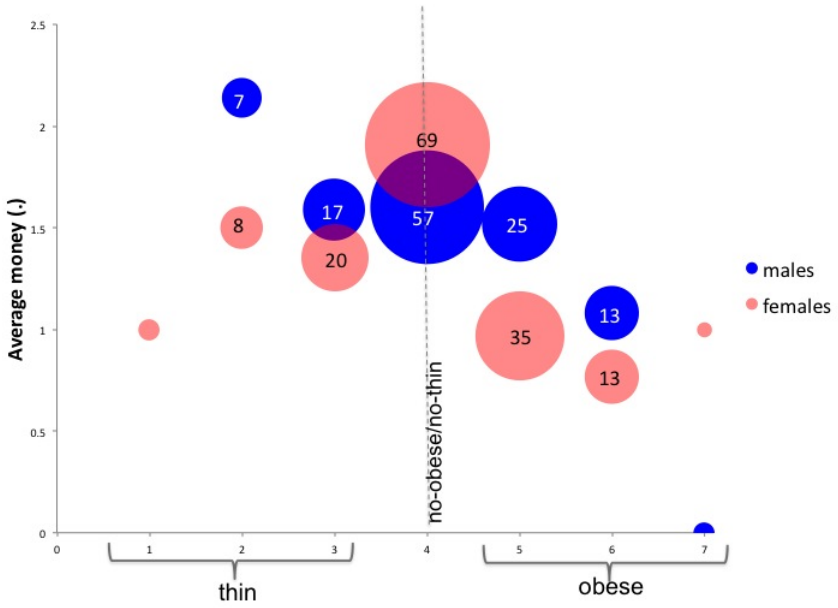


Figure 2: **Average** *money* **requested by** *obesity* **level: Gender differences**. *Legend*: Light bubbles correspond to females and dark ones refer to males. The size of the bubble is proportional to the number of individuals in that category. The number within each bubble represents the exact number of individuals. Y-axis shows the average amount of *money*(.) requested in each category.

Table 5 repeats the analysis done in Table 4 for the sample of females and males separately. One can clearly see that females that self report to be obese (level 5, 6 and 7) request significantly less money than non-obese females (level 4).

Comparing the results of Table 5 with the corresponding results in Table 4, we see that obesity is negatively and significantly associated with money requests only for the female subsample. Result 2 summarizes our results.

Result 2: The negative association between *money*(.) and *money*(1/0) and *dobese* is mainly due to female participation in the sample.

In other words, females who perceive themselves as obese request significantly less money compared to females who perceive themselves as neither obese nor thin. This effect does not appear for males.

Table 5

Probit Regressions by Gender

Variable	*money*(.)				*money*(1/0)			
	1(a)		1(b)		2(a)		2(b)	
	Fem.	Male	Fem.	Male	Fem.	Male	Fem.	Male
APPEARANCE								
obesity	-.117	-.093			-.044	-.064		
	(.094)	(.096)			(.114)	(.140)		
dobese			-.685**	-.163			-.624*	-.111
			(.208)	(.193)			(.266)	(.225)
dthin			-.415	-.059			-.566	-.192
			(.315)	(.273)			(.341)	(.360)
beauty	.077	.130	.068	.121	.102	.250^{+}	.089	.241^{+}
	(.106)	(.131)	(.102)	(.132)	(.109)	(.134)	(.105)	(.136)
PERSONALITY								
ambition	.089	.091	.094	.090	.077	-.031	.081	-.036
	(.080)	(.106)	(.081)	(.107)	(.095)	(.123)	(.098)	(.123)
self-est.	.006	.045	-.017	.050	-.038	.189^{+}	-.071	.196^{+}
	(.084)	(.095)	(0.83)	(.099)	(.084)	(.110)	(.081)	(.116)
SOCIOECON								
age	-.088	-.192**	-.077	-.196**	-.076	-.228**	-.061	-.235**
	(.070)	(.076)	(.063)	(.077)	(.080)	(.076)	(.073)	(.080)
age^2	.001	.002*	.001	.002*	.001	.002**	.001	.003**
	(.001)	(.001)	(.001)	(.001)	(.001)	(.001)	(.001)	(.001)
wage	-.000	-.000	-.000	.000	-.0001	-.0001	-.0002	-.0002
	(.0001)	(.0001)	(.000)	(.000)	(.0001)	(.0001)	(.0001)	(.0001)
constant					1.321	2.959*	1.42	2.951^{+}
					(1.558)	(1.509)	(1.408)	(1.665)
N	148	121	148	121	148	121	148	121
$Pr > chi^2$	.057	0.002	.0500	0.00	.0805	0.000	.000	0.0001

Notes: Standard errors (adjusted for 27 clusters in interviewers) of parameter estimates in parentheses. $^{+}p < 0.10$, $^{*}p < 0.05$, $^{**}p < 0.01$

5 Self-reported vs. monitor data

In the absence of any objective measure of obesity, it is important to check the discrepancy between self, and monitor, reported obesity. In Figure 3 we compare both measures. To facilitate a visual comparison we merge obesity levels 1, 2 and 3 into the *thin* category and levels 5, 6 and 7 into the *obese* category. Figure 3 shows that for each category the fraction

of people who report *below* (self-report<monitor's report), *match* (self-report=monitor's report) or *above* (self-report>monitor's report) their own obesity level relative to the monitor's evaluation.

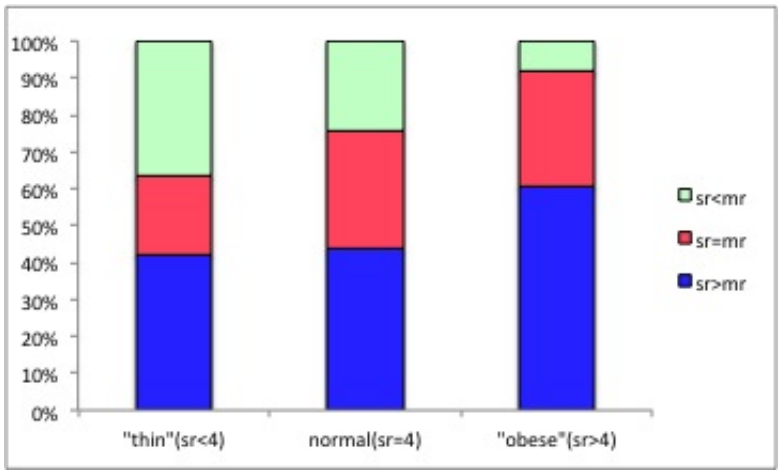


Figure 3: **Subject's reports compare to monitor's reports**. *Legend*: *sr* stands for self-reported obesity; *mr* stands for monitor reported obesity. The category "thin" merge all the subjects with $sr < 4$ while the "obese" category refers to those with $sr > 4$. For each category its shown the percentage of people who underestimate ($sr < mr$), accurately-estimate ($sr = mr$) or overestimate ($sr > mr$) their own self-reported obesity level compared to the monitors' reported evaluation.

Interestingly, the percentage of individuals who report above the monitors evaluation in the obese category (62%) is significantly[15] higher than those who report below (42%) or match (44%) the monitors evaluation ($p = 0.028$ and $p = 0.010$ respectively). Hence, among the obese group, there is a larger fraction of subjects who consider themselves more obese than the monitor's evaluation. As an additional robustness check, we repeat the regressions of Table 4 using the monitor reported obesity variables (instead of the self-reported measurements) and we find no significant effect. This indicates that money requests by subjects are only affected by their own perception regarding their obesity level.

Now we combine self-reported and monitor information in the same regressions. In Table 6, we repeat type-b (where the dummy variable *dobese* is used instead of the ordinal variable *obesity*) regressions on *money*(.) and *money*(1/0) by including two new variables:

over an ordinal variable [0, 5] indicating the magnitude of over-statement of self-reports

[15]In order to perform the test, we use the binary variable *overestimation* which takes value = 1 if $self - report > monitor's\ report$ and = 0 otherwise.

relative to monitors' reports on obesity: $over = self\text{-}report - monitor's$ only if $over > 0$ and 0 otherwise.[16]

overob captures the interaction between *dobese* and *over*, that is, selects subjects who consider themselves *obese* and overstate (relative to what was stated by the monitors).

Table 6

Probit Regressions by Gender including Obesity overestimation

Variable	*money*(.)				*money*(1/0)			
	1(c)		1(d)		2(c)		2(d)	
	Fem	Male	Fem	Male	Fem	Male	Fem	Male
dobese	-.698*	-.107	-.310	$-.372^{+}$	-.696**	-.025	-.070	-.367
	(.202)	(.190)	(.292)	(.221)	(.263)	(.230)	(.332)	(.330)
over	.069	.169	.228*	-.336*	.177	-.293*	.569**	-.490**
	(.084)	(.107)	(.103)	(.164)	(.127)	(.116)	(.190)	(.172)
overob			-.408*	.321			-.760**	.391
			(.192)	(.241)			(.287)	(.266)
N	147	121	147	121	147	121	147	121
$Pr > chi^2$	.000	.0052	.0000	.0014	.0006	.0000	.0025	.0000

Notes: Standard errors (adjusted for 27 clusters in interviewers) of parameter estimates in parentheses. $^{+}p < 0.10$, $^{*}p < 0.05$, $^{**}p < 0.01$

Table 6 provides new insights to our discussion. We first look at the regressions that refer to the subsample of females.

In the $female$ subsample, when regressing *money*(.) or *money*(1/0) the inclusion of the interaction term *overob* has a definitive impact:

- The variable *over* is positively and significantly associated to both *money*(.) and *money*(1/0) (5% and 1% respectively). This implies that (monitor reported) *thin* women who overestimate their own obesity level and self-report as *normal* (control group, obese=4) request for more money. In words, thin females who see themselves normal claim more money.

- The sum of the coeffcients of *dobese* + *overob* is negative and significant at the 1% level (Wald test) for all positive overestimation levels but not for $over = 0$ in both 1(d) and 2(d) regressions. This means that the negative effect of obesity on money requests is true only for those females who overestimate their obesity levels. Hence only those women who overstimate claim less money.

[16]We also considered another alternative specification of *over* including the negative values. Results are less robust but consistent with the results showed along this section.

We therefore conclude,

Result 3: The more an obese female overstates her own obesity level the more severe is the negative effect on her money requests.

In the *male* subsample everything is different. The variable *over* is always negative and significant (at 5% and 1% respectively) when the interaction term, *overob*, is included in the regressions. This means that the more a self-reported *normal* male overestimates his own obesity[17] level the less money he requests. However, when the interaction term is not included in the regression, the variable *over* is negative and significant (at 5% level) only for $money(1/0)$, indicating that males (of all obesity levels) who overestimate their obesity level are less likely to request any money.

Result 4: Males who overstates their own obesity level, regarless of their objetive size, are willing to accept less money.

Concluding, we find that the two dimensions of obesity: "objective" -reported by monitors- and "subjective" -self-reported- have an additional impact on money requests which is asymmetric for females and males.

6 Conclusions

The main conclusion of the present study is that self-reported obese individuals, and especially females who overstate their obesity levels, demand less or nothing when faced with the opportunity to earn a certain amount of money. We think that this result contributes towards explaining the well-established wage gap for obese individuals. Our results suggest that this could be another channel by which the wage gap for self perceived obese individuals is exacerbated.

Moreover, our experimental results show that the negative association between obesity and money is stronger among females. This result is supported by many socio-psychological studies on attractiveness (Zebrowitz 1997, Hatfield and Sprecher 1986). Interestingly, it is only self-perception that matters. The negative effect of obesity effect is not confirmed, for females or males, when using monitor reported estimation of subjects' obesity. Moreover, although monitor reports on obesity are not significant for money requests, its difference with subjects' self-reported levels is shown to have an impact on subject behavior. The more a female overstates her obesity level the stronger is the negative effect of obesity on her money requests. As regards the behavior of non-obese and $normal - thin$ subjects (self-reported *normal*, *thin* according to their monitors) is concerned, the effect of over stating obesity is asymmetric across gender: female $normal - thins$ request more, while

[17] If a self-reported *normal* male overestimates it is because he is *thin* for the monitor

male $normal - thins$ request less compared with individuals who do not overstate their obesity level.

A possible explanation for this gender specific result may be the different appearance characteristics influencing males and females. A self-reported *normal* male, who is seen by others as *thin*, would probably feel "weak" when confronted with the masculinity ideal while a $normal-thin$ female would probably feel "pretty" when exempted from the weight restrictions imposed by the beauty ideal. Following the reasoning of the self-fulfilling prophecy theory, a male perceived and treated as *thin*-weak should develop an inferiority complex while a female perceived and treated as *thin*-pretty would react in the opposite manner.

Such a generalization of course has its limitations. As with the vast body of experimental studies, standard criticisms of the representativeness of our subject pool apply. Furthermore, monitor influence on subject answers could only be controlled statistically. Another important caveat is that we model a one-shot interaction between subjects and monitors while in real life the salary negotiation process may last for longer, leaving time for both employers and candidates to readjust their strategies. Regardless, our results establish that self perception of ones physical appearance biases money requests downwards and the effect is stronger for females who perceived themselves as being obese.

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