

Research report

Weighing discomfort in college age American females: Incidence and causes

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Received 23 July 2007; received in revised form 26 January 2008; accepted 7 February 2008

Abstract

We report that undergraduate females, unlike males, indicate a high degree of discomfort at the prospect of being weighed in the presence of male or female acquaintances. This discomfort is surprising, in that the other people present already have a good sense of the weight of the female by virtue of being able to see her. An analysis of this discomfort and sex-difference, in the form of response to variations of this situation, presented in mini-scenarios in a questionnaire, suggests that it is neither due to generally greater embarrassment sensitivity in the females, nor greater sensitivity in females to public display of personal information. Furthermore, the weighing discomfort is not about the process of being weighed, but rather the revealing of the weight. Part of the discomfort comes from the participants' sense that they are overweight, and part of it comes simply from calling attention to the fact that weight itself is an unflattering personal attribute, independent of the actual value of the weight.

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Keywords: Bodyimage; Weighing; Gender differences

Introduction

It is widely known that most American post-pubescent females feel overweight and are concerned about their weight status (e.g., Rodin, Silberstein, & Striegel-Moore, 1984; Rozin, Bauer, & Catanese, 2003). In this paper, we document and explore a previously unstudied manifestation or correlate of this reported concern: female reluctance or discomfort at being weighed in the presence of others. This discomfort is of particular interest because its cause is unclear. That is, once a female has been observed by others, an impression/estimate of her weight status has been formed. Under these conditions, the process of weighing and its result (the knowledge of the weight) should be redundant information, and hence not worthy of a negative reaction.

In a previous experimental study, normal weight participants (men and women) were weighed and sequentially allocated to the 'average weight', the 'underweight' or the 'overweight group' according to a fictional height/weight chart (Ogden &

Evans, 1996). The results indicated that participants who were told that they were overweight showed deterioration in mood and self-esteem but no change in body image. In another study, the repeated weighing of females resulted in increases in both anxiety and depression and lowered self-esteem (Ogden & Whyman, 1997). These studies suggest that weighing may not be the benign intervention it is often assumed to be.

At the beginning of the study being reported here, we document a large degree of discomfort in undergraduate females about being weighed in the presence of either male or female acquaintances, and show that this discomfort (averaging in the range of 50–60 on a 0–100 discomfort scale) is much larger than male discomfort at being weighed in the presence of others (averaging in the range of 20–30). We consider and empirically evaluate six hypotheses to account for both the absolutely high female discomfort, and the much higher discomfort in females as opposed to males.

1. Weighing or knowledge of weight by others is embarrassing, and females are generally more embarrassment sensitive than males.
2. Females are more sensitive (embarrassable) than males about knowledge by others of any personal information about themselves.

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3. It is not primarily the process of being weighed, but rather the public knowledge of weight that is the principal cause of discomfort.
4. In addition to 3, a second source of discomfort is simply calling attention to weight as a generally undesirable attribute of a female.
5. The more dissatisfied a female is with her weight/figure, the higher will be her weighing discomfort.
6. The revelation of weight in the face of an already present impression from public assessment of the body figure results, in part, from the fact that most women think they weigh more than other people think they do. That is, that their actual weight is higher than others' estimates of their weight and they are benefiting from the underestimation of their weight by others.

Methods

A brief anonymous questionnaire on attitudes to weight and being weighed was administered to all students in two introductory psychology classes at the University of Pennsylvania, in December of 2004. Respondents were 292 females and 190 males. Principal racial groups were white (170 females, 114 males) and Asian or Asian/American (67 females, 40 males).

The questionnaire dealt with 'attitude to being weighed' in various social contexts, plus a set of variants on this designed to isolate causes of aversion to being weighed. These items will be described with the presentation of results, and are indicated in the first column of [Table 1](#). We used a composite measure of weight dissatisfaction, including: (1) the difference between current and ideal weight; (2) the difference between current and ideal figures (based on the commonly used set of nine figures of increasing fatness (Rozin & Fallon, 1988; Stunkard, Sorenson, & Schlusinger, 1980)). (3) Three measures of the frequency of concern about weight, answered on a scale: 1 = never, 2 = rarely, 3 = sometimes, 4 = often, and 5 = almost always. The three items were "I am dieting", "I consciously hold back

meal time to not gain weight" and "I am concerned about being overweight" z -scores were computed for the first two measures, and the mean of three frequency measures, and the mean of these three z -scores was used as a total measure of weight dissatisfaction. Cronbach's $\alpha = .79$ for this composite score. We also collected self-reported weight and height, and computed the BMI.

Results

Because we are carrying out multiple t -tests, we adopt a significance level of $p < .01$ one-tailed.

General weight dissatisfaction in females and males

Females scored significantly more dissatisfied ($p < .001$ in all cases by independent t -test) on all five of the component measures, and the difference in the composite mean z -scores (females .32 [S.D. = 68] and males $-.51$ [S.D. = 81] was highly significant ($t[480] = 12.02, p < .001, d = 1.11$).

Discomfort at being weighed

The critical measure for this study is discomfort at being weighed. It is the presumption of this study that there would be a substantial female aversion on this item, since most of the measures to be reported are designed to explain this effect. We asked three questions to assess this discomfort, as follows (see [Table 1](#), lines 1–3): "Indicate how uncomfortable you would feel in each of the situations described below (0 = NOT UNCOMFORTABLE AT ALL to 100 = EXTREMELY UNCOMFORTABLE).

- Getting on a scale to get your weight while alone.
- Getting on a scale to get your weight in front of some male acquaintances.
- Getting on a scale to get your weight in front of some female acquaintances.

Table 1
Degree of discomfort experienced in a range of activities, including weighing

Item	Discomfort score ^a	
	Females mean (S.D.)	Males mean (S.D.)
1. Getting on a scale to get your weight while alone	19.4 (30.0)	12.5 (29.9) n.s.
2. Getting on a scale to get your weight in front of female acquaintances	53.7 (33.1)	26.5 (29.9)***
3. Getting on a scale to get your weight in front of male acquaintances	59.8 (35.0)	21.1 (31.0)***
4. Dropping a notebook with loose pages on the sidewalk in front of a few strangers	40.4 (26.7)	36.2 (27.1) n.s.
5. Getting your height measured in front of some female acquaintances	12.6 (28.0)	18.3 (30.9) n.s.
6. Announcing how many hours you sleep in a typical night in front of some female acquaintances	10.4 (27.0)	12.4 (29.0) n.s.
7. Wearing a button that displays your accurate weight while hanging around with some female acquaintances	59.8 (32.7)	33.0 (31.1)***
8. Wearing a button that displays your accurate height while hanging around with some female acquaintances	20.8 (32.6)	22.7 (30.8) n.s.
9. Wearing a button that simply says "weight" (no numerical value is on the button) while hanging around with some female acquaintances	29.8 (30.8)	23.9 (30.9) n.s.
10. Wearing a button that just simply says "height" (no numerical value is on the button) while hanging around with some female acquaintances	18.2 (28.9)	21.6 (29.9) n.s.

n.s.: non-significant, *** $p < .001$; the asterisks represent the difference between the male and female scores. $N = 293$ females and 198 males.

^a Discomfort score rated on a 0–100 scale, where 0 = not uncomfortable at all and 100 = extremely uncomfortable.

There are modest levels of discomfort for weighing oneself alone ($M = 19.4$ female, $M = 12.5$ male), with females marginally higher ($t[470] = 2.41$, $p < .05$; Table 1, line 1, $d = .23$). The discomfort jumps substantially in the presence of others, to a level about three times higher for the females, and about two times higher for the males (Table 1, lines 2 and 3). Discomfort is substantially greater for females than males in the presence of either male ($t[469] = 12.21$, $p < .001$, $d = 1.17$) or female acquaintances ($t[469] = 8.82$, $p < .001$, $d = .84$). The discomfort difference between being weighed in front of female or male acquaintances is relatively small, compared to the difference between either and being weighed alone. However, females are more concerned (by 6.2 points, $S.D. = 18.5$) about being weighed in front of male as opposed to female acquaintances ($t[287] = 5.65$, $p < .001$, $d = .34$), while males show more discomfort (by 5.4 points, $S.D. = 14.5$) in being weighed in front of female as opposed to male acquaintances ($t[182] = 5.00$, $p < .001$, $d = .37$).

The major result that we will base the rest of our analysis on is the high mean discomfort value of 53.7 for females being weighed in the presence of female acquaintances (Table 1).

Causes/correlates of weighing sensitivity: hypothesis testing

Higher general embarrassment sensitivity in females

In support of this supposition, concern about being weighed when alone (Table 1, line 1) is much lower (19.4 for females vs. 53.7 in front of female acquaintances, 12.5 for males vs. 26.5 in front of female acquaintances).

We asked one question to indicate general level of embarrassment: how uncomfortable one would feel “Dropping a notebook with loose pages on the sidewalk in front of a few strangers.” These numbers are much lower than the weighing discomfort, and unlike the case for weighing, there is not a significant difference between males and females (Table 1, line 4; $M_{\text{diff}} = 4.2$; $t[469] = 1.65$). This suggests that general embarrassment sensitivity is not a major cause of weighing aversion.

Specific higher embarrassment in females at public disclosure of any private and personal information

Females are marginally less averse than males to having their height measured in front of female acquaintances (female $M = 12.6$ [$S.D. = 28.0$]; male $M = 18.3$ [$S.D. = 30.9$]; $t[470] = 2.04$, $p < .05$; Table 1, line 5), and, for females in front of females, the level of aversion is less than one fourth of the aversion to being weighed in front of females. Similarly, level of aversion to announcing other personal information, such as how many hours one sleeps in a typical night (Table 1, line 6) is low, and shows no significant difference between males and females ($t[470] = .76$, *n.s.*). We conclude that neither general embarrassment sensitivity nor concern about revealing of personal information plays a major role in either female

weighing aversion in general or the much greater aversion in females than in males.

Weighing discomfort is principally related to knowledge by others of one’s weight, as opposed to the process of being weighed

We have two comparisons that indicate that it is weight rather than weighing that is critical. First, females score a mean of 53.7 discomfort (Table 1, line 2) about being weighed in front of female acquaintances, but only 19.4 (Table 1, line 1) about being weighed alone ($M_{\text{diff}} = 34.2$, $S.D. = 36.8$; $t[287] = 15.80$, $p < .001$, $d = 2.16$). Second, we asked participants to rate their discomfort at “Wearing a button that displays your accurate weight while hanging around with some female acquaintances” (Table 1, line 7). These values are slightly but significantly higher than being weighed in the presence of females for both females ($M_{\text{diff}} = 6.1$ [$S.D. = 22.6$], $t[286] = 4.65$, $p < .001$, $d = .27$) and males ($M_{\text{diff}} = 6.5$ [$S.D. = 22.7$], $t[182] = 3.89$, $p < .001$, $d = .29$). This finding suggests that it is revealing weight, rather than the process of being weighed, that is aversive. The discomfort with wearing a button that reveals weight is substantially and significantly higher for females (59.8) than for males (33.0: Table 1, line 7; $M_{\text{diff}} = 26.8$, $t[469] = 8.84$, $p < .001$, $d = .84$).

Of course, a contributing factor may be discomfort at the unusual situation of wearing a button that indicates any personal information. However, “Wearing a button that displays your accurate height while hanging around with some female acquaintances” achieves a discomfort score that is about one third the level of the weight button, for females (Table 1, line 8). Also, there is no significant difference on this measure between females and males, with males actually slightly higher ($M_{\text{diff}} = 2.9$, $t[470] = .94$, *n.s.*, $d = .01$).

Weighing aversion arises because weight is made a salient attribute, rather than the specifics of a particular weight

Revealing one’s weight on a button (or being weighed) both provides specific information, and calls attention to the fact that weight is a person’s attribute. Insofar as weight is an attribute that one does not consider positive or flattering, calling attention to it can be aversive. We approached this possibility by asking for rated discomfort at “Wearing a button that simply says ‘weight’ (no numerical value is on the button) while hanging around with some female acquaintances.” This discomfort (Table 1, line 9) is about half the level of the button which actually displays the weight for females (59.8 vs. 29.8), representing a very significant drop in aversiveness for females ($M_{\text{diff}} = 30.0$ [$S.D. = 36.3$], $t[286] = 14.00$, $p < .001$, $d = .83$, and a much less substantial drop from about 33.0 to 23.9 for males ($M_{\text{diff}} = 9.1$ [$S.D. = 24.5$], $t[182] = 5.04$, $p < .001$, $d = .37$). Although the button simply displaying the word “weight” is less discomforting than the button with the actual weight for females, it still achieves a substantial discomfort level of 29.8 for females. This level of discomfort is at least partly due to the hypothesized concern about making an undesirable attribute salient, since, for females, it is significantly higher than the discomfort at wearing a button that

simply says “height” ($M_{\text{diff}} = 11.6$ [S.D. = 24.0], $t[286] = 8.29$, $p < .001$, $d = .49$, Table 1, line 10). There was a less impressive drop of 2.4 points in males (S.D. = 15.3, $t[181] = 2.14$, $p < .05$, $d = .16$). The female discomfort at wearing a button that just says weight is absolutely higher (mean = 29.8) than the male value (mean = 23.9), but this difference is not significant at $p < .01$ ($t[468] = 2.022$, $p < .05$). We conclude that at least part of weighing discomfort in females is attributable to just calling attention to the weight attribute.

Weighing discomfort is related to the dissatisfaction a person has with his or her weight, so that it calls attention to an attribute of particular concern in the individual

Our data already indicate the well known fact (see “General weight dissatisfaction in females and males” section) that women are more dissatisfied with their weight than are males, and this may be responsible in full or part for the greater discomfort at weighing in females. The correlation between weighing discomfort (score on discomfort at being weighed in the presence of female acquaintances) and our composite measure of weight dissatisfaction is .39 ($p < .001$) for females and .25 ($p < .01$) for males. The correlation between weighing discomfort and BMI is .25 ($p < .001$) for females and .15 (n.s.) for males.

There were 15 females in the sample who showed the minimum average weight concern of 1 (the lowest possible score on dieting, holding back, and concern). These 15 showed a weight discomfort score (in front of female acquaintances) of 19.7 (S.D. = 27.9), well and significantly below the mean of 55.5 (S.D. = 32.4) for the remaining 273 females ($t[286] = 4.20$, $p < .001$, $d = 1.18$).

Weighing discomfort is enhanced by the belief that others will underestimate one’s weight, so that the actual weight result will be “disappointing”

This reasonable hypothesis cannot explain, of course, the discomfort at wearing a button that just says the word “weight”, but it could account for the greater discomfort at the button that actually displays the weight. We asked all respondents: “If women your age looked at you normally clothed and guessed your weight, do you think that they would: U = underestimate it A = be accurate O = overestimate it ? = I have no idea.” The question was repeated for “men your age.” For females, 137 believe other females will underestimate their weight, 111 believe they will be accurate, and 32 believe they will overestimate their weight. Comparable figures for females’ judgments of male estimates of their weight are 176, 52, and 34, respectively. It is notable that most females think others will underestimate their weight.

The hypothesis predicts that the group who believe others will underestimate their weight will show the greatest weighing discomfort. Using the discomfort at being weighed in front of female acquaintances as the measure, 137 females who believed their weight would be underestimated showed a mean discomfort at being weighed in front of female acquaintances score of 56.7 (S.D. = 32.2) in comparison to 151 other women (including those who responded “I have no idea”), with a mean

discomfort score of 50.9 (S.D. = 33.7). This difference is in the predicted direction, but is not significant ($t[286] = 1.49$, n.s., $d = .18$). Using the discomfort at being weighed in front of male acquaintances as the measure, 176 females who believed their weight would be underestimated by males showed a mean discomfort at being weighed in the presence of male acquaintances score of 62.5 (S.D. = 34.0) in comparison to 112 other women (including those who responded “I have no idea”, with a mean discomfort score of 55.7 (S.D. = 36.3). This difference is in the predicted direction, but is not significant ($t[286] = 1.61$, n.s., $d = .19$). These findings leave open the possibility that perceived weight underestimation is a factor in weighing discomfort, but certainly do not establish it.

Discussion

Our results clearly document substantial anticipated discomfort for females being weighed in front of others. There is a much smaller, but still significant (compared to being weighed alone) discomfort in males. In both groups, there is slightly more discomfort about being weighed in the presence of opposite sex acquaintances.

The analysis of the cause of the discomfort, and the reasons for the much higher female discomfort, makes a number of possible explanations unlikely and supports others. Our results suggest that this female–male difference cannot be attributed to either a higher degree of general embarrassment in females, or a higher degree of specific embarrassment related to communicating any personal information. The phenomenon is weight-specific.

It is not being weighed, but the public disclosure of weight that is critical. Our observation is that wearing a button displaying one’s weight is at least as uncomfortable as being weighed. Furthermore, in the pilot study that preceded the study reported here, using a smaller class sample, we found minimal discomfort ($M = 9.5$ for 38 females on the same 100 point scale used in this study) for being weighed in front of female acquaintances on a broken scale whose dial did not read any value. While significantly higher than discomfort at being weighed on the same scale when alone ($M = 3.8$, $t[37] = 2.926$, $p < .01$), this effect is tiny in comparison to the discomfort at being weighed on the same scale with an accurate readout in front of female acquaintances ($M = 45.5$).

We have evidence for two components to the weighing discomfort. The smaller component has to do with calling attention to the fact that weight is an attribute (the button that just says “weight” on it). This is presumably caused by the same forces that produce a small but significant discomfort at being weighed on a broken scale, as indicated in the paragraph above. The larger component of discomfort is the communication to others of the actual weight. Here, we present evidence that suggests, as would be expected, that the more a woman is dissatisfied with her weight and figure, the greater will be her discomfort at being weighed in the presence of others.

As we noted in the introduction, the puzzling aspect of weighing discomfort is that observers can already guess one’s

weight, and one's plumpness, by seeing a person normally dressed, so that communication of a weight value should not be additionally discomfoting. We proposed that the additional discomfort might result from the belief that others will underestimate one's weight, and hence the actual weight will be "disappointing." We confirm in our results that 48% of women do believe that other women will underestimate their weight, and 61% of women do believe that men will underestimate their weight. However, our results provide only weak, suggestive evidence that beliefs about others' estimates of one's weight are significant determinants of aversion to weighing or revelation of one's weight.

The purpose of this study was to highlight a particular aspect of female weight concern, and to begin an analysis of the cause of weighing discomfort. Our results highlight some possible causes, and make it likely that other causes are not operative. This is a first study on weighing discomfort. It is based on a sample of University undergraduates, and surely needs to be extended to students at a wider range of schools, and other adult females. Our prior research (Rozin et al., 2003) strongly suggests that our findings can be generalized to American undergraduates, in general. Our study is also in the form of self-report, and does not actually examine real situations in which weighing occurs, or is expected to occur. In addition, we used a small set of weighing scenarios to test a set of hypotheses; surely, additional questions could be posed to confirm and clarify our findings. Finally, we selected "acquaintances" as the audience for weight information. It is possible that other audiences (e.g., strangers or close friends) might produce

somewhat different results, particularly with respect to whether males or females are a more upsetting audience. Nonetheless, we feel we have revealed an interesting and somewhat puzzling feature of female weight concern, and clarified its causation. We believe that this female concern contributes to body image related stress in American women. At health clinic appointments, women are typically weighed. Weighing concern may make these women, particularly those who are overweight, reluctant to visit their doctors.

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