
Body weight, perceived weight stigma and mental health among women at the intersection of race/ethnicity and socioeconomic status: insights from the modified labelling approach

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Abstract With increasing rates of obesity in the United States, attention to life chances and psychological consequences associated with weight stigma and weight-based discrimination has also intensified. While research has demonstrated the negative effects of weight-based discrimination on mental health, little is known about whether different social groups are disproportionately vulnerable to these experiences. Drawing on the modified labelling theory, the focus of this paper is to investigate the psychological correlates of body weight and self-perceived weight-based discrimination among American women at the intersection of race/ethnicity and socioeconomic status (SES). Analyses use data from the National Health Measurement Study (NHMS), a national multi-stage probability sample of non-institutional, English-speaking adults, ages 35 to 89 in 2005–2006. Our findings demonstrate that the effect of weight-based discrimination on psychological well-being is highly contingent on social status. Specifically, the psychological consequences of discrimination on Hispanic women and women in the lowest household income group is significantly greater relative to White women and women with higher household income, controlling for obesity status and self-rated health. These results suggest that higher social status has a buffering effect of weight stigma on psychological well-being.

Keywords: obesity, weight stigma, mental health, race/ethnicity

Introduction

The prevalence of overweight and obesity has almost doubled in the past 30 years in the United States (Flegal *et al.* 2012). In 2011–2012, more than two thirds of American adults were either overweight or obese, with obesity being slightly more prevalent among women relative to men and Black American adults relative to other racial/ethnic groups (Ogden *et al.* 2014). Because physical health consequences of overweight and moderate obesity have recently been called into question (Flegal *et al.* 2012), researchers have become increasingly interested in psychological indicators of quality of life and well-being. Specifically, excess body weight has been linked to lower self-esteem, poor body image, eating disorders, depression and psychological distress (Faith *et al.* 2002, Graham and Felton 2005, Luppino *et al.* 2010, Stunkard *et al.* 2003).

A growing literature has demonstrated that overweight and obese individuals may experience psychological distress not because of their weight per se, but rather due to stress associated with weight stigma and weight-based discrimination (Carr and Friedman 2005, Muennig 2008, Puhl and Brownell, 2001, 2003). Negative stereotypes and media images associated with excess body weight have been prevalent in the United States for decades now. According to historical analyses, while fatness¹ was socially acceptable in the 19th century United States, it fell out of fashion as it became associated with poor Irish immigrants. A slender body not only became a way to demonstrate wealth, but also the moral virtues of willpower and self-restraint (Saguy 2013). Research suggests that in American culture, body fat is perceived to be associated with lack of personal control, gluttony, moral failure, laziness and stupidity (Brochu and Esses 2012, Puhl *et al.* 2008, Saguy 2013). According to the 2001 public survey results, individual failure was thought to be the dominant explanation for the prevalence of obesity (Oliver and Lee 2005).

In contemporary America, weight stigma is pervasive. It has been documented in diverse domains of social life, such as employment (Paul and Townsend 1995, Roehling 1999), health care (Berryman *et al.* 2006, Davis-Coelho *et al.* 2000, Kristeller and Hoerr 1997, Schwartz *et al.* 2003, Teachman and Brownell 2001), education (Greenleaf and Weiller 2005, Neumark-Sztainer *et al.* 1999, O'Brien *et al.* 2007) and social relationships (Boyes and Latner 2009). Negative weight-related attitudes and beliefs have been shown to take multiple forms and manifest in discriminatory behaviour, bullying, teasing and hostility, and derogatory humor towards overweight and obese individuals (Cossrow *et al.* 2001, Neumark-Sztainer *et al.* 1998, Puhl and Brownell 2006, Schafer and Ferraro 2011). Some evidence suggests that rates of weight-based discrimination are now similar to race-based discrimination, especially among women (Puhl *et al.* 2008). These scholars have also noted that although weight stigma ranges from around 5 per cent for men to 10 per cent for women, the risk is much higher among individuals with BMI higher than 35, peaking at about 40 per cent. Thus, despite the rise in rates of obesity, higher body weight has not become a 'normalised' trait; on the contrary, weight stigma has intensified (Latner and Stunkard 2003).

In addition, research on obesity stigma indicates that discriminatory experiences related to individual body weight are not equally distributed in society. In particular, women and people with larger bodies are more susceptible to stigmatisation (Puhl and Heuer 2009, Vartanian 2010). However, findings on the effects of socioeconomic status and race or ethnicity are weak and sometimes contradictory (Chamorro and Flores-Ortiz 2000, Cummings and Lehmann 2007, Jeffrey and French 1996, Lovejoy 2001), suggesting a need to model direct comparisons within and across racial or ethnic and socioeconomic groups. According to modified labelling theory, perceptions of stigma and discrimination should be most pronounced among less powerful groups with fewer social resources (Link *et al.* 1989). Likewise, because public discourses around obesity generally reflect broader racial and social class inequalities, groups at the intersection of multiple disadvantaged statuses (e.g. Black women) may be especially at risk for weight discrimination and its mental health consequences (Saguy 2013). In contrast, cultural variation in ideal body types and tight-knit social networks may protect marginalized groups (Lovejoy 2001).

Despite the important public health implications of these ideas, surprisingly little empirical research has addressed the relationship between body weight and weight-based discrimination at the intersection of multiple indicators of social status, such as gender, race and socioeconomic status (SES). This purpose of this research is to address this gap by revealing the complex relationship between body weight, perceived weight discrimination and negative mental health outcomes among women, and their unequal distribution in the American population.

We use nationally representative data from female respondents in the National Health Measurement Survey (2005–2006) to answer the following questions: (1) What is the relationship between body weight and mental health when socio-demographic, socioeconomic factors and health status are taken into consideration?; (2) Does weight-based discrimination mediate the relationship between body weight and mental health?; and (3) Is the relationship between women's experiences of weight-based discrimination and mental health outcomes moderated by race or ethnicity and socioeconomic status?

Theoretical background

The modified labelling theory

Link and colleagues (1989) proposed the modified labelling theory framework to explain the negative consequences of being labelled 'mentally ill'. However, this theory has proven relevant for explaining social reactions to a number of stigmatised health statuses, including HIV/AIDS (Fife and Wright 2000), epilepsy (Jacoby *et al.* 2005), cancer (Gonzalez and Jacobsen 2012), aging (Ward 1977), and obesity (Lewis *et al.* 2011). According to the modified labelling theory, we are socialised to accept pervasive negative social attitudes and beliefs about people with a stigmatised health status, and understand that these people are devalued and marginalised. When individuals are labelled or self-label with that same status, social conceptions become personal and are internalised, constituting a salient aspect of one's own identity. Link *et al.* (1989) argued that this internalisation process may have adverse physical and psychological consequences that are above and beyond the experiences of the illness itself. Specifically, they suggest that some individuals who have been labelled may experience not only the direct effect of discrimination and rejection based on the societal perceptions about the particular label, but also feelings of self-loathing associated with the internalisation of the meanings linked with that label.

The modified labelling theory also posits that negative health outcomes may arise from attempts to protect oneself from negative aspects of labelling by adopting certain coping mechanisms, such as withdrawal, secrecy or educating others about the condition. However, these coping mechanisms may have unintended negative consequences, such as decreased social connectedness with individuals outside the household, increased reliance on social support from family members within the household and decreased self-esteem. Thus, the expectation of rejection from society may in turn increase vulnerability to rejection and impaired self-concept, leading to psychological distress and deterioration of mental health (Link *et al.* 1989).

Another critical component of the modified labelling theory is the role of status and power (Link and Phelan 2001). Specifically, individuals who are lower on the status hierarchy are typically stigmatised and labelled by those with more status. As Link and Phelan explain (2001: 367):

Stigmatisation is entirely contingent on access to social, economic, and political power that allows the identification of differentness, the construction of stereotypes, the separation of labeled persons into distinct categories, and the full execution of disapproval, rejection, exclusion, and discrimination. Thus, we apply the term stigma when elements of labeling, stereotyping, separation, status loss, and discrimination co-occur in a power situation that allows them to unfold.

Labelling can be a mechanism of social control and a means to achieving authority for more powerful groups, used to establish or reaffirm one's dominant position in society relative to

those with the label. In other words, stigmatised labels may be leveraged to remove power, legitimacy, and social worth, and are differentially and more easily applied to individuals and social groups that are already disadvantaged. People with status and power are able to avoid the labelling process, using social resources to deflect the label or its associated stigma, reducing their impact on health and well-being.

Finally, it is important to note that the conceptualisation of power within the modified labelling framework aligns with the intersectionality approach to health inequalities. Intersectionality emphasises the interacting dimensions of inequality, such as race or ethnicity, class, and gender, in producing and maintaining health disparities. As opposed to the traditional approaches to health inequalities, which have historically treated social categories as additive in their effects, the intersectionality approach recognises that individuals experience diverse health outcomes not only in terms of their gender, race or social class, but a joint composition of these attributes (Crenshaw 1991, Hill Collins 1990). Considering the intersections between experiences of weight discrimination with race/ethnicity and socioeconomic status, will allow us to examine the important differences in psychological well-being that exist not only between but also within social groups.

Modified labelling theory, obesity and mental health

Evidence suggests that patterns observed among people who are overweight or obese are consistent with the modified labelling theory expectations. Ample research has demonstrated that coping behaviours undertaken to mitigate weight discrimination may have negative implications for health and well-being. For instance, internalised perceptions of excess body weight have been shown to be harmful psychologically and physically if an individual is consistently trying to lose weight and fails; this pattern is often stressful, and may induce disturbed eating, avoidance of physical activity, and development of eating disorders or other physical health problems (Puhl *et al.* 2007). Moreover, experiencing discrimination in the medical system has been shown to stop people from utilising preventative care or seeking medical help for medical conditions unrelated to obesity, further delaying necessary treatments and compromising health (Amy *et al.* 2006, Drury *et al.* 2002). Finally, longitudinal research has demonstrated, paradoxically, that experience of weight discrimination may increase the odds of obesity among non-obese individuals and is associated with remaining obese among already-obese individuals (Sutin and Terraciano 2013).

Additionally, an extensive literature spanning several decades has addressed the relationship between obesity and mental health. This research has employed both community and treated samples, focusing largely on major depression and other psychiatric disorders (Faith *et al.* 2002). For example, Roberts and colleagues (2003), using data of the Alameda County Study, found that baseline obesity levels are significant predictors of depression. In work focusing on measures of general well-being, evidence suggests that obese individuals rate the quality of their life lower (Wadden *et al.* 2002), while individuals who seek treatment for obesity have reported greater levels of distress, disordered eating behaviour, and binge eating disorders (Fairburn 1995, Fitzgibbon *et al.* 1993).

While the mechanisms linking body weight to mental health outcomes are not completely clear, weight-based discrimination has been shown to be a powerful mediator in the BMI-mental health relationship (Major *et al.* 2014). For instance, Carr and Friedman (2005), using a multi-state nationally representative sample, found that obese individuals were more likely to experience institutional and day-to-day interpersonal discrimination. Further, obese individuals reported lower self-acceptance due to perceived inter-relational and major discrimination controlling for socio-demographic covariates. The adverse psychological effects of weight stigma have been supported in other research using clinical and community samples. Experiences of

weight discrimination have been linked to susceptibility to depression, anxiety, body dissatisfaction, decreased self-acceptance, and suicidality (Puhl and Brownell 2001, 2006, Puhl and Heuer 2009). Similar findings have been demonstrated in samples of obese individuals seeking weight loss surgeries (Rosenberger 2007, Sarwer *et al.* 2008). Research has also demonstrated that weight-based teasing is associated with distorted eating habits, such as binge eating or eating in secret as well, as decreased motivation to exercise, controlling for BMI and body dissatisfaction (Friedman *et al.* 2005, 2008, Jackson *et al.* 2000, Puhl and Brownell 2006, Vartanian and Novak 2011). Thus, the extent to which overweight or obesity is linked to discrimination experiences may be an important mechanism in physical and mental health.

Despite significant recent advances in research, the association between obesity and psychological well-being is not fully understood. While the studies reviewed above identified a significant relationship between overweight or obesity and poor mental health, earlier research found no significant link (Hällström *et al.* 1981, Kittel *et al.* 1978, Ross 1994). Faith and colleagues (2002) note that the discrepancies may be attributable to the demographic heterogeneity of the samples utilised for the analyses, and use of samples that are not nationally representative. The limited number of longitudinal analyses also makes the establishment of a causal link between obesity and mental health problematic. Moreover, research has increasingly demonstrated that body weight may affect psychological health to the degree that it is perceived as an undesirable social trait, but most existing studies do not allow for such contingencies. It is clear that the relationship between body weight and mental health is complex and multifaceted, and it is critical to examine the specific pathways through which experiences of weight-based stigma translate into adverse mental health outcomes.

Who is at risk?

The modified labelling approach is particularly relevant to experiences of weight-discrimination at the intersection of race, class and gender. Specifically, modified labelling theory conceptualises power as an essential element of the labelling process, and notes that social status affects the internalisation of prejudices, and in turn, mental health outcomes. Rates of obesity itself are not equally distributed in US society, and tend to disproportionately affect racial and ethnic minorities and women (Ogden *et al.* 2014). Although previous research has found that the effect of body weight on likelihood of discrimination do not differ significantly by gender, race, and SES (Carr and Friedman 2005), we expect discriminatory experiences to differentially shape the mental health of diverse social status groups. Health disparities research has documented that socially and economically marginalised groups have worse health due to their disadvantaged positions and lack of access to resources that can be leveraged to avoid health problems or reduce their impact (Link and Phelan 1995, Phelan *et al.* 2010). Therefore, lower-status individuals may be especially likely to experience weight-based discrimination and be disproportionately susceptible to the mental health consequences of overweight or obesity.

Gender and social class differences In the current research, we focus on differences between status groups within gender. Not only does this permit a simpler analysis and interpretation of intersectional group differences, but research reliably demonstrates that the adverse mental health effects of obesity are profoundly gendered. Consistent with the modified labelling theory's predictions regarding power and status, overweight and obese women are more likely to have mental health problems compared to men with larger bodies. Carpenter and colleagues (2000) found that among women, BMI is related to past year major depression, suicidal attempts, and suicidal ideation, while the relationship among men is actually reversed. Similarly, Onyike *et al.* (2003), using data from the National Health and Nutrition Evaluation Survey (NHANES) found a strong relationship between obesity and major depression, however

only among women and only among the morbidly obese. Simon *et al.* (2006) highlighted similar findings, and Wadsworth and Pendergast (2014) demonstrated that the effect of obesity on life satisfaction was stronger for women relative to men.

In addition, existing research indicates that women largely bear the burden of weight-based discrimination, and that this pattern may be exacerbated by higher socioeconomic status (Puhl and Heuer 2009). As an example, in the employment domain, obese women are less likely to be hired, they are treated more harshly on the job and earn less than their non-obese counterparts. In addition, women report discriminatory encounters in educational settings as well as romantic relationships. In contrast, men appear to suffer the penalty for their body weight less frequently and only at the high end of the weight distribution (Fikkan and Rothblum 2012). Experimental studies have shown that weight stigma develops at an early age (at about 3 or 4 years), and that girls are more likely to be both victims and perpetrators of it, reporting more pronounced dislike towards obese people (Puhl and Latner 2007). Furthermore, women of higher social status feel more pressure to maintain lower body weight as a marker of their superior position in US society (Bordo 2003, Saguy 2013). Women of higher SES have also demonstrated greater body dissatisfaction relative to their lower SES counterparts (McLaren and Kuh 2004, Ogden and Thomas 1999, Wardle and Griffith 2001).

American culture at large, puts more pressure on women rather than men to conform to narrowly defined beauty expectations and punishes them more harshly for deviating from the aesthetic ideals of slim bodies. Fashion industry and media promote thin female bodies, while also shaping normative understandings of body weight. Feminist theorists have continuously criticised the oppressive cultural promotion of slenderness arguing that it represents attempts at social control and a backlash against the social, political and economic advancements made as a result of second wave feminism (Bordo 2003, Wolf 1991). The established beauty ideas are attainable only to a minority of women, yet both men and women have scrutinised women's bodies to evaluate how closely they can approximate to these beauty standards; those who fail usually face demeaning characterisations and internalised body dissatisfaction. From this perspective, beauty standards serve as vehicles of female oppression. They mark women's inferior status relative to men by shifting focus from female empowerment and competence in multiple domains of social life to superficial markers of their appearance, and reduce them to objects of sexual attraction (Jeffreys 2005).

With respect to social class more broadly, some research suggests that people with lower SES are less likely to hold stigmatising attitudes and beliefs about obesity, and are less concerned about weight loss and maintaining the thin ideal (Jeffrey and French 1996). This is consistent with research suggesting that the relationship between obesity and mood disorders is strongest among college graduates (Ross 1994, Simon *et al.* 2006). However, despite that, beauty norms promoting ultra-thin bodies circulate largely among middle and upper-class women, this group also has access to social and economic resources that might buffer the negative effects of weight discrimination experiences on mental health (Hesse-Biber 1996). Little research has specifically examined whether the link between discrimination and mental health among obese individuals is moderated by gender and social class.

Racial and ethnic differences Though little direct evidence has accumulated, findings on the link between race or ethnicity and mental health among overweight or obese individuals are largely inconsistent with labelling theory expectations. Specifically, obese non-Hispanic Whites are disproportionately likely to have depression relative to obese people of colour (Graham and Felton 2005, Simon *et al.* 2006), but this may be related to the racial paradox in mental illness more broadly (i.e. despite higher social status, White Americans have higher rates of

mental illness than Black Americans). Black women tend to have more positive perceptions of their bodies and even prefer heavier bodies relative to White women, due largely to a different beauty aesthetic and cultural constructions of femininity in racial communities (Lovejoy 2001). For instance, research has demonstrated that Black women who closely identify with their ethnicity, are less likely to internalise the mainstream beauty ideals of thinness (Rogers Wood and Petrie 2010), exhibit lower levels of disordered eating (Shuttlesworth and Zotter 2011) and have greater body satisfaction (Oney *et al.* 2011).

In contrast, Black women may be particularly vulnerable to weight-based stigma because public discourses about obesity generally reflect racial and class inequalities. In particular, in the media and popular culture, Black women are often portrayed as having a lack of self-control, insatiable appetites, and being prone to making poor dietary and lifestyle choices. That is, they are frequently depicted as compromising their own health and the health of their children. Such representations are consistent with theories of intersectionality (Collins 2000, Crenshaw 1991, Saguy 2013), potentially placing Black women in a unique position of disadvantage vis-à-vis other race/gender groups. Black women may experience elevated levels of obesity-related discrimination and excess psychological consequences of stigma because of the multiplicative effects of racial bias.

Less is known about the relationship between body weight and weight stigma among Hispanic Americans. The majority of studies that do exist have focused on other weight-related topics, such as disturbed body perceptions or eating disorders, while weight bias and discriminatory experiences have received very little scholarly attention. For instance, Chamorro and Flores-Ortiz (2000) found that second-generation Hispanic women were more likely to engage in disordered eating patterns and show bulimic symptoms relative to first-generation immigrants. Similarly, Pepper and Ruiz (2007) demonstrated that high acculturated Hispanic women reported significantly higher anti-fat attitudes relative to low acculturated Hispanic women. In contrast, some evidence suggests that obese Hispanic women, like Black women, tend to misclassify their body weight category as normal using the BMI metric (Dorsey *et al.* 2009). Such inconsistencies in quantitative research findings could to some degree be explained by the Latinas' Paradoxical Body Images (LAPABI), or a concept referring to the tensions that Latina women experience due to conflicting paradigms concerning body weight in the US vis-à-vis their culture of origin. Specifically, using a mixed-methods approach Viladrich and colleagues (2009) documented the co-existence of conflicting body ideals – that of fit and thin White woman and the curvy Latina – among Latina women, underscoring the importance of divergent cultural values and ideals on ethnic minority women's body image and body weight concerns.

Given the increase in obesity and weight stigma over the past several decades (Puhl and Heuer 2010), it is critical to more fully understand the excess psychological burden of weight-based stigma and discrimination on overweight and obese individuals. Moreover, the unequal distribution of obesity, related forms of discrimination, and mental health consequences across status groups in American society suggests a need to adopt an intersectional lens, making direct comparisons within and across groups. Drawing on the modified labelling theory, the current study examines the association between body weight, weight discrimination, and psychological distress, focusing on unique experiences at the intersection of race, class, and gender. We theorise that disparities in the psychological distress associated with weight-based discrimination reflect the allocation of flexible and multi-purpose coping resources, as well as cultural values around women's bodies. These can then be leveraged to avoid the adverse social consequences of obesity on psychological distress for some groups relative to others for avoiding the health effects of psychological distress.

Methods

Sample

The National Health Measurement Study (NHMS) is a national multi-stage probability sample of non-institutional, English-speaking adults, ages 35 to 89. The project was a random-digit dial telephone survey of 3,844 US (1,641 males and 2,203 females, 1,086 Black Americans) adults primarily designed to collect information on health-related quality of life using different measurement tools, including the SF-36, the EuroQol EQ-5D, the Quality of Well-being Scale (QWB-SA), the Health and Activity Limitation Index (HALex), and the Health Utilities Index (HUI2/3). Disproportionate stratified sampling was used to survey large numbers of Black Americans and older adults in order to gather more information about these social groups. The survey was conducted between June 2005 and August 2006 with a response rate of 56 per cent (Fryback *et al.* 2007). Approximately 40 per cent of telephone numbers were associated with street addresses and an introductory letter with cash was sent as pre-incentive before the household was contacted by surveyors. Respondents were offered \$25 for completing the survey.

Because existing research clearly demonstrates that mental health effects of obesity and weight discrimination are largely experienced by women, as reviewed above, we restricted our sample to female respondents (N = 2,203). (Table 1 presents descriptive statistics on independent and dependent variables for the analysis sample.) With respect to other socio-demographic variables, the majority of respondents are white (70.23%), currently married or living together (51.30%), and the mean age in this sample is about 60 years old.

Measures

Dependent variables Psychological well-being was measured using the Mental Health Component of the 12-Item Short Form Health Survey (SF-12), which has validated and tested for reliability in the US population (Ware *et al.* 1998). Eight subscales were computed according to standard published algorithms, including physical functioning, role limitations due to physical health problems, bodily pain, general health perceptions, vitality, social functioning, role limitations because of emotional problems, and general mental health. The SF-12 asked respondents to rate their general health in these different health domains, which were then aggregated to overall physical and mental health scores, based on proprietary formulas that can be used to compare across different populations. The Mental Health Component scores were standardised to the general US population with a mean of 50 and a standard deviation of 10 (Ware *et al.* 1996, 1998). The continuous aggregate mental health score was used as an indicator of psychological well-being.

Independent variables *Body Mass Index (BMI)* was one of the key independent variables in this analysis. All NHMS participants were asked to report their weight and height. BMI was calculated by dividing kilograms by metres squared. Continuous BMI measure was then recoded into five weight categories: *underweight/normal weight* (BMI between 18.5 and 24.9), *overweight* (BMI between 25 and 29.9), *grade I obese* (BMI between 30 and 34.9), *grade II obese* (BMI between 35 and 39.9), and *grade III obese* (BMI higher than 40). In the analyses underweight and normal weight was used as a reference category.

Socio-demographic characteristics were included in all models because they are important confounders and predictors of obesity (Flegal *et al.* 2012). Demographic variables included *age* (continuous measure ranging from 35 to 89), *gender* (1 = female and 0 = male), *race* (1 = White, 2 = Black American, and 3 = Hispanic) with White being a reference category, and *marital status* (0 = never married, divorced, separated or widowed and 1 = married or living

Table 1 *Descriptive sample characteristics (National Health Measurement Study: N = 2,203)*

Variable	Female sample
Age	53.55 (13.19)
Race/ethnicity:	
White	80.65%
Black American	11.50%
Hispanic	3.60%
Marital status:	
Married/Living together	63.91%
Other	36.09%
Highest grade of school completed:	
High School or less	37.05%
College or more	62.95%
Annual household income:	
Bellow \$25,000	18.64%
\$25,000 – \$49,999	24.43%
\$50,000 – \$74,999	20.13%
Above \$75,000	36.0%
Subjective health rating:	
Excellent/very good/good	83.63%
Poor/fair	16.37%
BMI categories:	
Underweight/normal	39.44%
Overweight	32.45%
Grade I obese	16.39%
Grade II obese	6.64%
Grade III obese	5.08%
Ever experienced weight-based discrimination	4.01%
SF-12 aggregate mental health score	53.33 (9.31)
N	2,203

together). Socioeconomic status variables included *highest educational attainment* and *annual household income*. Educational attainment was recoded into a binary variable with 0 = less than high school, high school or GED and 1 = some college, college and graduate degree). Having high school education or less was used as a reference category in the analyses. Annual household income was measured by asking the respondents to report the total combined income for all of the people in the household over the age of 15 in the last 12 months and are recoded into the following categories: 1 = less than \$20,000; 2 = \$20,000 to \$49,999, 3 = \$50,000 to \$74,999 and 4 = more than \$75,000. *Employment status* was measured by a binary variable asking respondents to indicate whether they work for a living with 1 = employed and 0 = not employed (women who were not working due to pregnancy or those who were staying at home to take care of the family, were included in the ‘unemployed’ category). *General physical health status* was controlled for in the models predicting psychological well-being as it is associated with obesity as well as mental health. General health status was evaluated with the question ‘In general, would you say your health is excellent, very good, good, fair or poor?’. Responses were recoded into a binary variable with 0 = poor/fair and 1 = good/very good.

Weight-based discrimination was also used as a key independent variable in these analyses. In the survey, individuals who reported day-to-day or major discrimination, were asked, ‘What

was the reason for the discrimination you experienced? Response categories were: (1) your age; (2) your gender; (3) your race; (4) your ethnicity or nationality; (5) your religion; (6) your height; (7) your weight; (8) some other aspect of your appearance; and (9) your sexual orientation. A dichotomous indicator of weight-based discrimination was created by combining two response categories: (1) whether one has experienced discrimination due to their weight and (2) whether one has experience discrimination due some other aspect of their appearance. The reference category included individuals who had never experienced discrimination due to their weight or due to other aspects of their body. In order to avoid the small cell issue, the strategy of combining the two response categories has been adopted by other scholars investigating the relationship between weight stigma and health (e.g. Carr and Friedman 2005).

Analytic strategy

To test the relationship between levels of obesity, weight-based discrimination and mental health, a series of multivariate ordinary least squares regressions were estimated with a continuous aggregate mental health score as a dependent variable. Due to complex stratification of the data, *svy* prefix in Stata 13 was used in all the analyses, and sample weights were specified as suggested by the NHMS. All the analyses were completed for female sample only. A total of six models were estimated. In the first model, levels of obesity and socio-demographic characteristics were used as predictors of mental health. In the second model, indicators of socioeconomic status, household income, education and employment status were added. Weight-based discrimination was introduced in the third model to test whether it mediated the relationship between obesity and mental health. Finally, in the each of the last three models, interaction terms between weight-based discrimination and race, education and income were added to test whether the effects of weight-based discrimination on mental health were conditioned by respondent's race or ethnicity and socioeconomic status. As the interaction term between weight-based discrimination and education did not reach significance, the results were not included in the table or discussed in text.

Results

Table 1 provides descriptive statistics for the female and male samples. The mean age of the female sample is 53.55 years with a standard deviation 13.19. The sample is fairly racially homogeneous (80.65%) and the majority of women are currently married (63.91%). Regarding educational attainment, about a third of the respondents are high school graduates (37.05%) and 62.95 per cent have received college of higher education. In addition, about one third of the sample report household income above \$75,000, while 18.64 per cent of the household belong to the lowest income category (less than \$25,000). With respect to subjective health rating, the majority of the sample (83.63%) report having excellent, very good or good health. Furthermore, while more than one third of the sample (39.44%) are underweight or normal weight, about 32 per cent of the women are overweight. A smaller proportion of women meet criteria for Grade I obesity (16.39%) and only a minority of them are Grade II or Grade III obese (about 5% respectively). Despite the presence of these risk factors, only about 5 per cent of the women have reported having been discriminated due to their weight or physical appearance. Finally, the mean aggregate mental health score is 55.33, which is close to the mean national average.

Table 2 presents results from ordinary least squares regression models examining the effects of obesity, socio-demographic characteristics, socioeconomic status and weight-based discrimination on mental health in the female sample. According to model 1, the baseline model, being

Table 2. Ordinary least squares regression of aggregate mental health on Body Mass Index, perceived weight discrimination, and socioeconomic characteristics (N = 2,203)

Variables	Model 1 b (S.E.)	Model 2 b (S.E.)	Model 3 b (S.E.)	Model 4 b (S.E.)	Model 5 b (S.E.)
Body Mass Index (BMI) category					
Overweight ^d	0.39 (0.75)	2.55 (0.73)	0.28 (0.73)	0.27 (0.73)	-0.16 (0.74)
Grade I obese	-1.68* (0.88)	-1.36 (0.93)	-1.29 (0.93)	-1.30 (0.93)	-1.45 (0.91)
Grade II obese	-1.19 (1.15)	0.51 (1.12)	0.74 (1.12)	0.98 (1.11)	0.62 (1.08)
Grade III obese	-1.13 (1.33)	1.16 (1.37)	1.42 (1.40)	1.37 (1.42)	1.61 (1.39)
Demographic characteristics					
Age	0.07*** (0.02)	0.18*** (0.03)	0.18*** (0.03)	0.18*** (0.03)	0.17*** (0.03)
Black American	-1.87* (0.95)	-0.21 (0.94)	-0.23 (0.94)	-0.33 (0.99)	-0.32 (0.95)
Hispanic	-1.52 (1.60)	-1.07 (1.98)	-1.08 (1.97)	-0.46 (2.03)	0.98 (1.96)
Married/living together	3.39*** (0.66)	1.91* (0.78)	1.86* (0.78)	1.83* (0.78)	1.82* (0.78)
Socioeconomic status					
College or higher		0.74 (0.71)	0.78 (0.71)	0.73 (0.71)	0.77 (0.71)
Work for a living (1 = yes)		1.80* (0.79)	1.85* (0.79)	1.77* (0.79)	1.81 (0.79)
Less than \$25,000		-3.50*** (1.24)	-3.50*** (1.24)	-3.43*** (1.24)	-3.20* (1.28)
\$25,000 – \$49,999		-1.76 (1.01)	-1.79 (1.01)	-1.79 (1.01)	-1.77 (1.03)
\$50,000 – \$74,999 ^e		-1.40* (0.71)	1.35 (0.71)	1.34 (0.72)	1.48* (0.73)
Self-rated health (1 = excellent/very good/good) ^f		4.73*** (1.09)	4.73*** (1.09)	4.85*** (1.09)	4.78*** (1.09)
Perceived weight discrimination (1 = yes)			-1.53 (1.23)	-1.18 (1.36)	0.54 (1.20)
Race x weight discrimination					
Black x weight discrimination				0.81 (2.43)	
Hispanic x weight discrimination				-10.51*** (2.67)	
Income x weight discrimination					
\$50,000 – \$74,999 x weight discrimination					-5.05 (3.82)
\$25,000 – \$49,999 x weight discrimination					-0.15 (3.06)
Less than \$25,000 x weight discrimination					-5.29* (2.72)
Constant	47.96***	37.84***	38.06***	38.16***	38.07***
R ²	0.05	0.15	0.14	0.15	0.14

***p < 0.001 **p < 0.01 *p < 0.05 (two-tailed tests)

^aOmitted category: underweight/normal

^bOmitted category: White

^cOmitted category: never married/widowed/divorced/separated ^fOmitted category: poor/fair

^dOmitted category: high school or less

^eOmitted category: more than \$75,000

Grade I obese is associated with a significant decrease in aggregate mental health score ($b = -1.68$, $p < 0.05$), relative to being underweight or normal weight. Also, age is associated with an increase in the aggregate mental health score by 0.7 units, on average ($p < 0.001$). We tested if age had a non-linear association with mental health, but the relationship did not reach statistical significance. Black American women are estimated to have a lower mean mental health score by 1.87 relative to their White counterparts ($p < 0.05$). Finally, being married or living together has a positive association with aggregate mental health ($b = 3.39$, $p < 0.001$).

Model 2 adds measures of socioeconomic status. In this model, the relationship between obesity and mental health does not achieve statistical significance. Also, the significant effect of race on mental health disappears, suggesting that socioeconomic factors may explain the link between race and mental health. Women who are employed score 1.89 units higher on the aggregate mental health measure ($p < 0.05$) relative to women who are not currently employed. Also, women who report household income below \$25,000 and between \$50,000 and \$75,000 have aggregate mental health scores that are 3.50 and 1.40 units lower, respectively, relative to those who report household income higher than \$75,000 ($p < 0.01$ and $p < 0.05$).

A measure of weight-based discrimination is added in model 3. Surprisingly, there is no evidence for direct or indirect effects of weight-based discrimination on mental health. Weight-based discrimination also does not diminish the effects of variables included in models 1 and 2, suggesting that there is no direct mediation of the link between obesity and mental health by discrimination.

Model 4 presents results from interactions between weight-based discrimination and race or ethnicity. Interestingly, while the effect of weight-based discrimination for Black women does not differ significantly from the effect among White women, there is a significant interaction between Hispanic ethnicity and discrimination. Specifically, among Hispanic women, discriminatory experiences are associated with a significant decrease in aggregate mental health score ($p < 0.001$). A figure of changes in predicted mean aggregate mental health score as a function of race/ethnicity is presented in Figure 1. The estimated mean aggregate mental health score among White women remains at around 53 regardless of experiences of weight discrimination. In contrast, while Hispanic women who have not reported weight-based discrimination have an estimated mean mental health score similar to that of White women, but it decreases to 41.80 if they have reported discriminatory experiences.

Finally, as shown in model 5, we find that household income also moderates the relationship between weight-based discrimination and mental health ($p < 0.05$). Specifically, women who report the lowest levels of household income are particularly vulnerable to the mental health effects of experiences of weight-based discrimination. While the estimated mean mental health score for women in the highest income category stays at around 54 despite discriminatory experiences, the mean mental health score drops from around 51 to 46 for women in the lowest income categories (See Figure 2). That is, the negative effect of discriminatory experiences due to body weight are buffered by higher household income. Finally, education did not significantly moderate the relationship between discrimination experiences and mental health outcomes.

Discussion

Drawing on both modified labelling theory and the intersectionality perspective, this research sought to understand the mental health consequences of weight-based discrimination across diverse social groups. Sociological research suggests that health disparities in the US are

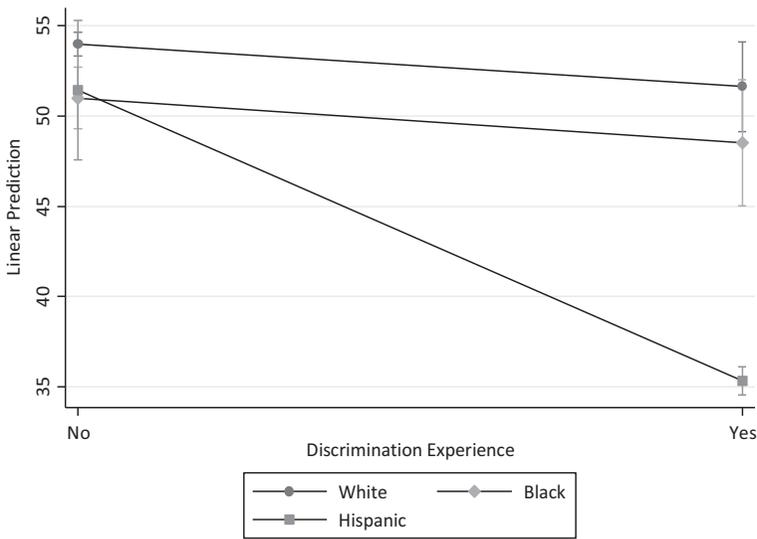


Figure 1 Predicted mean aggregate mental health score as a function of weight-based discrimination and race/ethnicity

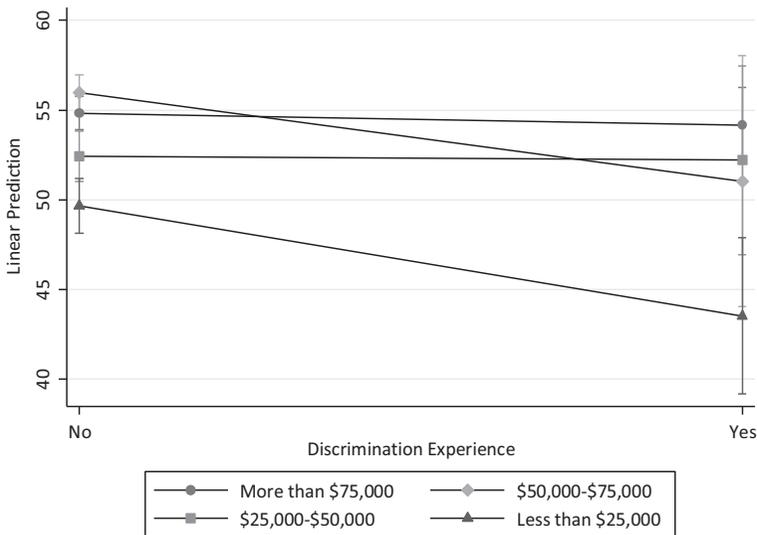


Figure 2 Predicted mean aggregate mental health score as a function of weight-based discrimination and household income

largely attributable to the organisation of social life, systems of oppression, and opportunities and resources available to members of different status groups. A combination of intersecting statuses results in patterned experiences and identities, which increase or decrease vulnerability to a range of risk and protective factors. Though these ideas are not new, relatively little sociological research has examined the consequences of weight stigma at the intersection of two or more social statuses; differences in power and their interaction with stigma experiences are commonly unquestioned and seen as unproblematic. However, a consideration of status

hierarchies is essential, as they may exacerbate or buffer against obese persons' experiences of discrimination.

Our analyses cast doubt on some previously identified relationships between body size, discrimination, and mental health. First, we demonstrated that increasing body size is negatively associated with mental health; however, the relationship was only significant for obese women and was not robust once socioeconomic indicators are controlled. This finding is important because the majority of studies examining the relationship between obesity and mental health, which have been published in epidemiology and public health journals, have restricted their analyses to bivariate relationships. Failure to include important controls may greatly overstate the significance of the obesity-mental health link. It is not to say that obesity is not an important risk factor for decreased psychological well-being, but this relationship should be interpreted with caution as it is mediated by a number of other potential factors. Second, we found that weight-based discrimination is not a significant predictor of mental health for most social groups, and does not mediate the relationship between body weight and mental health. The reason for this finding is unclear and should be the focus of future research.

When we examined the more complex relationships, analyses revealed some interesting findings. Specifically, we demonstrated that the negative effect of weight-based discrimination on psychological well-being was larger among Hispanic women relative to their White counterparts. These findings are consistent with some of the existing research suggesting that Hispanic women, especially those who have been highly acculturated in the United States, experience changes in anti-fat attitudes and perceptions about ideal body weight, potentially leading to struggles with body image and disordered eating (Chamorro and Flores-Ortiz 2000, Lopez *et al.* 1995, Pepper and Ruiz 2007).

These results are also important because they shed some light on the complexities of the Hispanic 'health paradox', especially when gender is taken into consideration (Read and Gorman 2006). While some Hispanic groups report better health than their White counterparts controlling for SES, this study underscores the necessity to better understand the mechanisms through which certain risk factors, such as stigma experiences, may amplify negative health outcomes. Our research also challenges the perception that eating disordered eating behaviour and body image are an issue of White upper class women. Our results have been corroborated by the more recent research demonstrating that idealisation of thinness has been increasingly endorsed by ethnic minorities, particularly those, who are subjected to the pressures of and identify with the mainstream White culture (Keel and Forney 2013). Additionally, research has shown that body image distortion syndrome and eating disorders have been consistently under-diagnosed and under-treated among ethnic minorities due to display of symptoms, other than those of anorexia nervosa, and the use of different language regarding ideal body image (Cachelin *et al.* 2006). An increase in prevalence of eating disorders has also been noted among men and individuals from lower-income households (Mitchison *et al.* 2014).

Furthermore, our moderation analyses suggest that higher household income serves as a protective factor against the mental health effects of weight-based discrimination experiences. Particularly, the negative effects of stigma were amplified for women in the lowest household income categories. The findings from the moderation analyses underscore Link and Phelan's (2001) claim that stigma is inherently a social process and the extent to which it negatively affects an individual, varies across social groups and contexts. Particularly, those who have more resources may be protected from the detrimental effects of stigma because they may also adhere to beliefs that obesity is a marker of 'laziness' or 'stupidity' among those with less resources and opportunities. Our results also underscore that the impact of stigma is a matter of degree – some groups are stigmatised more than others even if the same label is applied. This is usually overlooked in stigma research, suggesting that more scholars should frame their

research using the modified labelling theory in conjunction with intersectionality approach, and question the differences in stigma experiences among diverse social groups.

While our findings support the main ideas of modified labelling theory, they suggest some important caveats. For instance, we discovered that some disadvantaged groups may possess resources buffering the negative outcomes associated with labelling, in contrast with the predictions of the modified labelling theory. In particular, we demonstrated that weight-based discrimination is not associated with adverse mental health outcomes among African American women. This finding may be attributable to the tendency to report less body dissatisfaction and to view larger bodies more positively in the African American communities. However, it pushes us to rethink the modified labelling approach, and especially the extent to which stigmatising attitudes are culturally-specific. This finding could also suggest that women in Black communities and low acculturated Hispanic women may reject the conventional values about obesity to protect themselves from potentially being labelled and stigmatised due to their race/ethnicity and body weight. Alternatively, given the research documenting that Black American women suffer from pervasive racial discrimination, these experiences may mask the additional effects of weight-based discrimination.

Despite the importance of these results, this study has several limitations that should be addressed in future research. First, only a small minority of women reported experiences of weight-based discrimination or discrimination due to any other aspect of physical appearance (about 4%). Second, the sample of Hispanic women was very small, further problematising the reproducibility of significant moderation effects. With respect to weight stigma among Hispanic women, we were not able to control for the length of time they have lived in the United States, and therefore adjust for acculturation effects. Third, because we used cross-sectional data, we could not consider reverse causality. Therefore, our findings should be interpreted with caution, as some researchers have demonstrated that this relationship may be bi-directional. Depression, in particular, may lead to unhealthy eating habits and lack of physical activity, both of which are associated with weight increase (Pine *et al.* 1997, 2001). Finally, the NHMS did not include women under the age of 35, who are most likely to be affected by weight discrimination (Puhl *et al.* 2008).

Considering these limitations, this study adds to the growing evidence showing that stigma is a major source of stress and underscores the role of social statuses and their moderating effect in weight stigma-mental health relationship. With the increasing rates of obesity, it is becoming increasingly important to address the detrimental health effects of obesity stigma and better understand which social contexts may exacerbate or minimise its consequences on physical and mental health. The findings of this study also offer new directions for the obesity and health scholarship. As it would be naive to expect the weight bias to disappear, sociologists and social scientists more broadly should continuously investigate the irreducibility of social factors and their dynamic effect on stigma experiences and health in contemporary society.

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Note

- 1 We use the term 'fatness' to refer to body weight as a neutral trait, whereas the terms 'overweight' and 'obesity' are used with reference to the biomedical/medicalised approach to body weight that relies on the Body Mass Index (BMI) to classify larger bodies.

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