Body size dissatisfaction and avoidance behavior: How gender, age, ethnicity, and relative clothing size predict what some won't try

By: **Laura E. Maphis, Denise M. Martz, Shawn S. Bergman, Lisa A. Curtin , Rose Mary Webb**

Abstract

Sixty-eight percent of U.S. adults are overweight/obese, and this epidemic has physical, psychosocial, and behavioral consequences. An internet sample of adults (N = 2997) perceiving themselves as larger than ideal in clothing size reported their body mass index (BMI), relative clothing size (RS; discrepancy between current and ideal size), and avoidance behaviors. Exploratory factor analysis of 10 avoid-ance items produced social avoidance and body display avoidance factors. A relative importance analysis revealed RS as a better predictor than BMI for avoidance. A hierarchical multivariate analysis of covariance found RS to predict both avoidance constructs. The relationship between RS and both avoidance con-structs was stronger for women than men, and for younger as compared to older participants. Caucasians reported more body display avoidance than African Americans. This suggests that personal dissatisfac-tion with body size may deter involvement in varied life events and that women are especially avoidant of activities that entail displaying their bodies.

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Introduction

Body mass index (BMI) has increased by 1.1 kg/m^2 for men and 1.2 kg/m^2 for women per decade since 1980 in the U.S. (Finucane et al., 2011) yielding 68% of adults classified as either overweight or obese (Center for Disease Control [CDC], 2011). Heavy people are at risk for many serious health problems (e.g., heart disease, type II diabetes, stroke and disability; CDC, 2012; Ferraro, Su, Gretebeck, Black, & Badylak, 2002) and suffer psychosocial and behavioral consequences as a result of size. Overweight/obese women and men have more body dissatisfaction (Schwartz & Brownell, 2004), worse health-related quality of life (Ford, Moriarty, Zack, Mokdad, & Chapman, 2001), and poorer mental health statuses (Hassan, Joshi, Madhavan, & Amonkar, 2003) than normal and underweight individuals. They may also experience size-related stigma, including the perception of character defects and low self-control (Puhl & Heuer, 2009). Compared to normal weight individuals, Carr and Friedman (2005) found that obese women and men report lower levels of self-acceptance, although the relationship between weight status and self-acceptance was mediated by perceived weight-related discrimination. Such perceived stigmatization has been linked with avoidance (Myers & Rosen, 1999). Size-based avoidance is conceptualized as "avoid[ing] situations that provoke concern about physical appearance," such as social occasions, tight-fitting clothing, and physical intimacy (Rosen, Srebnik, Saltzber, & Wendt, 1991, p. 32).

Given previous research on the relationship between overweight/obesity status and avoidance with lower quality of life (Cash, Santos, & Williams, 2005), it is unclear if larger body size predicts avoidance behaviors or if body image perception (i.e., being larger than one wants to be) accounts for some of this avoidance. The present research investigated how BMI and clothing size dissatisfaction ("relative size;" Petroff, Martz, Webb, & Galloway, 2011) predict avoidance behaviors for a sample of mainly overweight/obese U.S. women and men and aimed to inform the literature about this potential psychosocial and behavioral consequence of large size.

Size and Avoidance

Avoidance of some situations may have a more direct negative impact on the individual (e.g., visiting the doctor) than avoidance of other situations (e.g., wearing tight-fitting clothing). Drury and Louis (2002) studied 216 healthy weight and overweight women and found a positive association between BMI and short- and long-term healthcare avoidance. Among morbidly obese individuals, 60% reported avoiding healthcare, in part, for fear of being told to lose weight; however, the most frequently cited reason for avoidance was fear of being undressed in front of the physician. Similarly, Ostbye, Taylor, Yancy, and Krause (2005) presented longitudinal evidence that women with a BMI of 40 or above are the least likely to receive preventative care such as pap smears, mammograms, and influenza vaccinations. Additionally, exercise may be avoided by overweight/obese individuals. Packer (1989) cited a number of social factors that preclude physical activity for heavier people including the cultural emphasis on dieting rather than exercise for optimal health, the importance of appearance over health, fear of ridicule, and fear of appearing awkward while working-out.

Most avoidance research to date has employed clinical samples (e.g., individuals with binge eating disorder or individuals who are morbidly obese) and focused on avoidance of the body. For example, Reas, Grilo, Masheb, and Wilson (2005) examined body avoidance in 377 overweight and obese individuals (297 women, 80 men) with binge eating disorder. Body avoidance was assessed by a single item on the Body Shape Questionnaire (BSQ), "Have you avoided wearing clothes which make you particularly aware of the shape of your body?" where 60% of women and 31% of men responded *always*. Similarly, Latner (2008) used this BSQ item with a sample of 155 women and 30 men participating in a behavioral weight loss treatment program. Of the entire sample, 41.2% reported avoiding certain clothing *often*, *very often*, or *always*, though mean avoidance was significantly higher for women than men. Moreover, there was a link between avoidance of clothing that would make an individual more aware of her or his body and diminished weight loss. In another study involving a sample of women and men presenting for bariatric surgery, Grilo, Reas, Brody, Burke-Martindale, Rothschild, and Masheb (2005) found that women reported more avoidance of shapely clothing than men (50% and 36%, respectively). Although it was found that avoidance did not correlate with BMI in the Grilo et al. study, this was likely because of the restricted range of BMIs in bariatric surgery candidates.

A more comprehensive body image avoidance scale was developed by Rosen et al. (1991) that strongly correlated with the BSQ item used by Latner (2008) and Reas et al. (2005). A validation study among 400 undergraduate women revealed four factors: use of clothing to camouflage the body; avoidance of social activities that might emphasize appearance, food, or weight; eating restraint; and grooming and weighing. Despite the contribution of this scale to the assessment of body avoidance, the avoidance literature is sparse, includes only limited samples (usually undergraduate women or those seeking weight loss assistance), and tends to focus on one type of avoidance (i.e., body avoidance) to the exclusion of others. Because the existing literature has been health and body focused (e.g., avoidance of the doctor, avoidance of clothing that makes one aware of his/her shape) and per Rosen et al.'s finding of social avoidance in addition to body avoidance, the current study aimed to assess multiple areas of avoidance. In addition, the present study employed a mainly overweight and obese sample of U.S. women and men who were all larger in clothing size than they wanted to be in an effort to more comprehensively explore how self-perception of actual-ideal size discrepancy relates to avoidance.

Clothing Size

BMI is a frequently used measure of body adiposity (CDC, 2012); yet, Lean, Han, and Deurenberg (1996) assert that waist circumference, as measured by men's pant size, may be a better indicator of total body fat and more indicative of health risk. Using clothing size as a parsimonious perceptual body image variable might also be useful in the same way that clothing has been useful in predicting health risk. For instance, Morris, Heady, and Raffle (1956) examined the uniforms of 1276 men employed as bus drivers and 944 men employed as train conductors to assess if uniform size, as a reflection of body size, constituted a risk factor for coronary heart disease. Waist circumference was measured from uniform pant size, and chest measurements were taken from uniform jackets. An association was noted between increased risk for heart disease and larger uniform sizes.

In a more recent study, Han, Gates, Truscott, and Lean (2005) examined the relationship between waist circumference in men and dress size in women, BMI, and risks for ischemic heart disease, high blood pressure, and diabetes mellitus. Linear regression equations were used to identify clothing sizes corresponding to BMI cut-offs and found that a dress size of 16 corresponded with overweight (BMI = 25) and a dress size of 18 (BMI = 30) indicated obesity for women. For men, waist circumferences of 36 and 38 corresponded with BMI overweight and obesity cut-offs, respectively. Women with a dress size at or greater than 18 had a seven-fold chance, and men with a pants size at or greater than 38 in. had a 3.9-fold chance, of developing the aforementioned health conditions.

In addition to noted health risks, clothing size might also relate to degree of body image dissatisfaction. Both body image dissatisfaction and weight-related stigma have been associated with avoidance (Myers & Rosen, 1999). Due to perceived weight-related stigma and lower self-acceptance in obese individuals (Carr & Friedman, 2005), larger clothing sizes (indicative of overweight/obesity) and clothing size dissatisfaction could potentially predict avoidance behavior in adults. The present study used U.S. clothing size – dress size for women and pants/waist size for men – as an indicator of body size dissatisfaction via a discrepancy score deemed relative size (RS; current clothing size minus ideal size; Petroff et al., 2011). Because BMI is a well-established anthropometric measure and was used in previous clothing size comparison studies and in the avoidance literature, both BMI and RS were assessed in the current study. RS, as a perceptual measure that captures dissatisfaction with size, serves as our body image proxy variable, and we hypothesized that RS would add to the prediction of self-reported avoidance behaviors over BMI.

The present study examined self-reported avoidance behaviors using an archival online data set of women and men representative of mainly larger body sizes of the U.S. population. The aim of this study was to examine the relationship between BMI and RS with avoidance behavior. The avoidance scale included an array of face valid avoidance behaviors that were factor analyzed to identify avoidance themes. For both genders, it was hypothesized that RS, as an indicator of body image dissatisfaction, would predict avoidance behavior. Moreover, we expected greater avoidance endorsement among women compared to men, as seen in previous studies (e.g., Grilo et al., 2005; Latner, 2008; Reas et al., 2005). Age and ethnicity were added as exploratory demographic factors as predictors of avoidance.

Method

Participants

This study was part of the "Psychology of Size" large-scale cross-sectional descriptive marketing survey sponsored by Slim-Fast™ and conducted on the MyView Research site of the internet by a polling company named The Segmentation Company, a division of Yankelovich. Participants, who were legal U.S. citizens and 18+ years of age, were previously enrolled in an online research panel to serve as participants in a variety of polling activities. Between May 11 and May 18, 2007, email invitations to participate in a "Health and Wellness Survey" were sent to this group according to certain demographic quotas (e.g., age stratification; equal number of women and men). Consent to participate was inherent in the voluntary completion of the online survey, and all participants received a \$1 Pay-Pal™ reward for their time. Institutional Review Board approval for use of this archival data was received on January 23, 2009.

A total of 4014 participants completed the survey. Petroff et al. (2011) established that this sample, by comparing demographics to U.S. census data, approximated age, ethnicity, and income, and was representative of the U.S. population. However, 102 participants were excluded for either failure to report, or unreasonable reporting, of height, weight, or clothing size (e.g., a man with a BMI of 12 and pant size of 40; anatomically impossible size combinations). An additional 915 participants (23%) who reported wearing clothing of an ideal or smaller than ideal size were removed from subsequent analyses because the avoidance survey items would not apply to them due to the instructional prompt, "Which of these things are you likely to avoid when or if you feel that you are larger than your ideal?" The final sample ($N = 2997$) had an average age of 46.23 ($SD = 15.31$), was 54.6% female, and 85.6% Caucasian, 5.7% African American, 3.6% Asian/Pacific Islander, 3.4% Hispanic, and 1.7% Other/unknown. BMI ranged from 17.0 kg/m^2 to 65.7 kg/m^2 with a mean of 30.5 kg/m^2 ($SD = 7.1$).

Materials

The entire Psychology of Size survey consisted of 130 items aimed to assess demographic information, body image satisfaction, weight management behavior, avoidance behavior, clothing size, height, and weight. The current study used a portion of the available survey data.

Body mass index. Height and weight were self-reported by participants, then converted to BMI via kg/m^2 (World Health Organization, 2012). Though research demonstrates a strong correlation between self-reported and actual BMI (e.g., Spencer, Appleby, Vavey, & Key, 2002; Wada et al., 2005), a limitation of self-reported anthropometric data is that individuals tend to overestimate height and underestimate weight (Gorber, Tremblay, Moher, & Gorber 2007).

Relative size. The difference between current clothing size and ideal clothing size constitutes the discrepancy score of RS (current-ideal). Current clothing size for women was assessed with the question "What size of clothing do you usually wear?" and ideal clothing size was assessed with the question "And what size would you ideally like to be?" Data reflected the even-numbered sizing scheme typical of U.S. women's clothing. Conversely, men were asked about their current pants size and ideal pants size, and data reflected the sequential inch increments typical of U.S. menswear. The average dress size of women in this sample was between 14 and 16 (14.8; $SD = 5.8$). The average pants size for men in this sample was a waist size of 38.3 ($SD = 5.5$), which approximates Han et al.'s (2005) overweight and obesity cut-offs for women and men.

RS was classified into five different categories representing those one, two, three, four, or "five or more" sizes larger than ideal (recall that participants at a RS of "smaller than ideal" or "at one's ideal size" were removed). Of these, 30.3% of women and 43.9% of men were one size above ideal, 31% of women and 28.9% of men were two sizes above ideal, 17.7% of women and 11.8% of men were three sizes above ideal, 8.7% of women and 6.5% of men were four sizes above ideal, and 12.2% of women and 8.9% of men and were five or more sizes above ideal.

Avoidance. Avoidance was assessed using 10 dichotomous (yes or no) items created for the Psychology of Size survey. Participants were asked "Which of these things are you likely to avoid when or if you feel that you are larger than your ideal?" in reference to the following activities: doctor, vacation, pool or beach, eating in public, clothes shopping, social events, sexual intimacy, challenges, spending time with others, and wearing revealing clothing. The items were scored from 0 and 1 with a score of 1 indicating that the participant would avoid that specific situation when feeling larger than ideal.

Table 1
Correlations across study variables and factors.

Variables	1	2	3	4	5	6
1. BMI	–					
2. RS	.70**	–				
3. Gender	.00	.13**	–			
4. Age	.09**	.01	−.02	–		
5. Social avoidance	.17**	.25**	.10	−13**	–	
6. Body display avoidance	.08*	.22**	.31**	−.15**	.49**	–
Mean	30.54	2.26		46.25	0.85	1.87
Standard deviation	7.12	1.31		15.31	1.38	1.38

Note: Gender is coded: male = 1, female = 2. Possible scores range 0–4 for social avoidance and 0–6 for body display avoidance, with higher scores indicating more avoidance behavior.
* $p < .05$.
** $p < .01$

Analytic Strategy

First, in an effort to assess whether gender differences in U.S. clothing size measurements (i.e., using waist circumference for men and dress size for women) affect the equivalence of the RS increments, a 2 (gender) by 5 (RS) analysis of variance (ANOVA) with BMI as the dependent variable was conducted. Second, in an effort to operationalize avoidance in the current study and to identify the criterion variables for subsequent regression analyses, we conducted a series of factor analyses to determine the underlying factor structure of the ten avoidance items. Specifically, the full sample was first randomly divided into two subsamples and an exploratory factor analysis (EFA) with oblique rotation (Ford, MacCallum, & Tait, 1986; Tabachnick & Fidell, 2007) was conducted on the initially created random subsample ($n = 1494$). The conclusions from the EFA were then confirmed using a confirmatory factor analysis (CFA) conducted on the remaining cases in a holdout sample ($n = 1503$). Tetrachoric correlations (see Muthén, 1984; Panter, Swygert, Dahlstrom, & Tanaka, 1997) were computed and used in all factor analyses because the ten avoidance items were dichotomously scored. Given the dichotomous, nonnormal nature of the data, these factor analyses employed a weighted least-squares estimator with mean and variance adjustment (WLSMV; Muthén, DuToit, & Spisic, 1997), which has been shown to yield accurate test model statistics under both normal and nonnormal latent response distributions (Flora & Curran, 2004) and provide superior model fit and precise factors loadings when used with dichotomously score items (Beauducel & Herzberg, 2006).

Due to a strong correlation noted between BMI and RS (.70; see Table 1), a relative importance analysis (RIA) was used to determine which variable would be used as a predictor variable for avoidance behavior, as inclusion of both may have led to the misrepresentation of regression results. Finally, to determine whether RS predicted avoidance and to examine potential gender differences in avoidance behaviors, we conducted a multivariate analysis of covariance (MANCOVA) using the criterion variables generated from the factor analyses as outcomes and including RS and gender as predictors. Age and race were also included in the MANCOVA as exploratory variables, and the interactions between RS and gender, age, and race were examined.

Finally, because of our large sample size, even nominal increases in explanatory power would result in statistically significant additions to the model. However, statistical significance is limited as an indicator of the importance of a relationship (Cumming, 2008; Schmidt, 1996, 2010). Therefore, we opted to require a meaningful substantive increase in the variance explained by the model, which we defined as a 1% increment of the total variance explained, before accepting each additional step as an improvement to the model.

Results

Validity Check on Relative Size

Results of the ANOVA revealed a meaningful main effect for RS: with each incremental increase of RS, a significant increase in BMI occurred, $F(4, 2987) = 741.29$, $p < .001$, $\eta_P^2 = .50$ (all post hoc tests between adjacent RS categories exhibited $p < .001$), for both men and women. BMI was found to be 25.96 for one size above ideal, 29.48 for 2 sizes greater than ideal, 32.78 for 3 sizes, 35.42 for 4 sizes, and 42.40 for those 5 or more sizes above ideal.

While a main effect for gender was found, $F(1, 2987) = 9.77$, $p < .01$, $\eta_P^2 < .01$, the difference between males and females was concluded not to be meaningful. Though the difference was statistically significant due the large sample size, this difference did not meet our criterion, described above, for recognition as a meaningful difference. The interaction between gender and RS, $F(4, 2987) = 5.66$, $p < .001$, $\eta_P^2 < .01$, also failed to meet our criterion. Hence, these results suggest that the incremental increases in RS and BMI were roughly equivalent for both men and women. The consistency in the RS and BMI relationship across gender lends construct validity support to RS.

Factor Analyses

Initial calibration subsample. The Bartlett's test of sphericity (Bartlett, 1950) and the Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy (Kaiser, 1970) were examined to assess the adequacy of the tetrachoric correlation matrix of the initial random subsample ($n = 1494$) for being used in a data reduction analysis. Together, the sample's KMO (.89), which far exceeded the minimum recommended criteria, and the results of the Bartlett's test of sphericity, $\chi^2(45) = 9127.17$, $p < .001$, suggested that the correlations in the initial random subsample were appropriate for use in an EFA.

A WLSMV-EFA was then conducted in MPlus 6.12 (Muthén & Muthén, 2011) to determine if the ten avoidance items could be combined into a more parsimonious set of factors. Mplus produces goodness-of-fit (GOF) indices for each of the factor solutions to help users determine the number of factors to be retained. First, the WLSMV robust chi-square (WLSMV χ^2) was examined. Typically, chi-square statistics are used as an indicator of differences in fit between the hypothesized model and the data, with non-significant p-values indicating a good fit. However, the χ^2 GOF test often produces significant values due to the detection of trivial differences in large sample sizes, so additional fit indices were also used (Brown, 2006). Specifically, the Tucker–Lewis index (TLI) and the squared error of approximation (RMSEA) were consulted. TLI values between .90 and .95 were considered marginal and TLI values above .95 were considered good model fit. RMSEA values in the range of 0.00–0.05 indicate close fit, those between 0.05 and 0.08 indicate fair fit, and those between 0.08 and 0.10 indicate mediocre fit (Browne & Cudeck, 1993; Hu & Bentler, 1999; Steiger, 1989).

EFA results from the initial calibration subsample revealed two possible solutions with admissible results: the one-factor solution, WLSMV $\chi^2(35) = 237.67$, $p < .001$, TLI = .95, RMSEA = .06 (lower 90 CI = .05, upper 90 CI = .07), and the two-factor solution WLSMV $\chi^2(26) = 47.01$, $p = .007$, TLI = .99, RMSEA = .02 (lower 90 CI = .01, upper 90 CI = .03).The other factor solutions produced negative residuals variances for at least one of the items and, thus, were considered inadmissible and not reported. The WLSMV χ^2 of the one- and two-factor solutions were then compared using the Mplus DIFFTEST option (Muthén & Muthén, 2011). Results indicated that the two-factor solution provided a better fit to the data, ΔWLSMV $\chi^2(1) = 64.54$, $p < .001$. These resulted mirrored the comparison of the 90% confidence intervals of the RMSEA indices for the two solutions, which also indicated the two-factor solution provided better fit to the data.

The loadings from the oblique rotation solution were examined in an attempt to provide an interpretation of the two resulting factors (see Table 2) and provide guidance for the CFA in the holdout sample. Loadings .40 or higher were used to derive meaning from the two factor solution (Kline, 2002), and based on the themes highlighted therein, the first factor was labeled *social avoidance* and the second was called *body display avoidance*.

Cross-validation holdout subsample. In an effort to cross-validate the MLSMV EFA results from the initial calibration subsample, a MLSMV CFA was conducted that examined two MLSMV CFA models in the holdout sample. The first model had six items (i.e., Spending time with others, Social events, Vacation, Eating in public, Challenges, and Seeing the Doctor) loading on a Social Avoidance factor and four items (i.e., Wearing revealing clothing, Going to the pool or beach, Clothes shopping, and Sexual Intimacy) loading on a separate Body Display Avoidance factor. The second model had all ten items loading on a single factor.

Result indicated that the two-factor model provided excellent fit to the data, WLSMV $\chi^2(34) = 119.11$, $p < .001$, TLI = .98, RMSEA = .04 (lower 90 CI = .03, upper 90 CI = .05), with the one-factor solution providing marginal fit, WLSMV $\chi^2(35) = 277.99$, $p < .001$, TLI = .94, RMSEA = .07 (lower 90 CI = .06, upper 90 CI = .08). Comparing the 90% confidence intervals for the RMSEA values indicated that the two-factor solution provided better fit to the data. These results echoed the results of the WLSMV χ^2 DIFFTEST, ΔWLSMV $\chi^2(1) = 81.67$, p-value < .001, which also indicated the two-factor solution provided a better fit to the data. The factor loadings of the two-factor solution were all found to be positive and statistically significant (Table 2).

Based on the results of the MLSMV EFA and CFA, the two-factor solution was judged to be the best representation of the underlying factor structure of the ten-item measure. Thus, two separate scales were created by summing the items six items for the *social avoidance* scale (Cronbach's alpha = .93) and the four items for the *body display avoidance* scale (Cronbach's alpha = .92). These scales then were used for the subsequent analyses. Table 1 shows mean, standard deviations, and correlations between these two avoidance scales and demographic variables in this study.

Relative Importance Analysis

To determine the relative importance of BMI and RS in explaining the variance of our avoidance variables, a relative importance analysis (RIA; Johnson, 2000) was conducted. RIA computes: (1) a raw relative weight for each predictor (RW), which sum to the overall model R^2, and (2) a relative importance (RI) score, which is the percentage of R^2 value accounted for by each predictor, which sum to 100%.

RS (RW = .05, RI = 75.2%) demonstrated substantially more predictive utility than BMI (RW = .02, RI = 24.8%) for social avoidance. For body display avoidance, RS (RW = .05, RI = 85.4%) explained a much higher portion of variance than BMI (RW = .01, RI = 14.6%). The results of these analyses suggest that RS, compared to BMI, is the

Table 2
Means, and standard deviations, and loadings from factor analyses.

Avoidance Item	Full sample (n = 2997)	Initial calibration subsample EFA factor loadings (n = 1494)		Holdout Cross-validation subsample CFA factor loadings (n = 1503)	
	Mean (SD)	Social avoidance	Body display avoidance	Social avoidance	Body display avoidance
Spending time with others	0.10 (0.30)	.98		.87	
Social events	0.22 (0.41)	.78		.90	
Vacation	0.13 (0.34)	.63		.75	
Eating in public	0.12 (0.32)	.65		.67	
Challenges	0.15 (0.36)	.64		.83	
Doctor	0.13 (0.34)	.54		.60	
Wearing revealing clothing	0.62 (0.49)		.88		.79
Pool or beach	0.60 (0.49)		.80		.71
Clothes shopping	0.35 (0.48)		.49		.81
Sexual Intimacy	0.32 (0.46)		.49		.71

Note: Factor loading from the MLSMV CFA are completely standardized.

Table 3
Hierarchical multivariate analysis of covariance of social and body display avoidance.

	Social avoidance			Body display avoidance		
	b^a	F	R^2	b^a	F	R^2
Step 1		**201.04***	**.06**		**151.74***	**.05**
RS	.26	201.04***		.23	151.74***	
Step 2		**36.18***	**.09**		**69.90***	**.16**†
RS	.26	190.84***		.20	118.78***	
Gender		14.32***			275.20***	
Age	−.01	58.30***		−.01	75.86***	
Race		1.79			6.61***	
Step 3		**21.15***	**.10**†		**37.70***	**.16**
RS	.10	10.14**		.10	10.76**	
Gender		13.00***			273.32***	
Age	−.01	57.73***		−.01	76.68***	
Race		1.83			6.62***	
RS by Gender		6.93**			1.79	
RS by Age	−.01	10.93**		.01	0.10	
RS by Race		1.32			1.06	

[a] Succinct unstandardized b-weights are only available for covariate predictors.
* $p < .05$.
** $p < .01$.
*** $p < .001$.
† Denotes the model of best fit; further models failed to increase the R^2 by more than 1%.

more important predictor of weight-related avoidance. Hence, we chose to include RS and exclude BMI from subsequent regression analyses.

Multivariate Analysis of Covariance

Two hierarchical MANCOVAs were performed using social avoidance and body display avoidance as the criterion variables. The predictor variables were entered in the following steps: (1) RS, (2) gender, age, and race, and (3) RS by gender, RS by age, and RS by race interactions. Relative size and age were entered into the MANCOVA as covariate predictors, while gender and race were entered as categorical predictors. This hierarchical sequence was utilized to gauge the predictive utility of each step above and beyond the previous step. To test which model exhibited the best fit, we first examined the statistical significance followed by the incremental validity (using the 1% criterion) of each additional step.

Social avoidance. When looking at the prediction of the social avoidance scale, Step 3 was deemed to be the best model because each step added a meaningful amount of explained variance to the previous step (see Table 3). The MANCOVA model with all three main effects and interactions predicting social avoidance explained 9.6% of the total variance in these avoidance behaviors. The RS, gender, and age main effects and the RS by gender and RS by age interactions were found to be statistically significant.

Main effect results revealed that RS had positive relationship with social avoidance, such that as perceptions of RS increased so did engagement in social avoidance. The opposite pattern was found for the main effect of age. This relationship was negative indicating that as the age of the participants increased, they were less likely to engage in social avoidance. Finally, the main effect for gender indicated that females reported engaging in more social avoidance behaviors compared with males, d-value = .20 (see Table 4).

Table 4
Means and standard deviations of social and body display avoidance.

	Social avoidance		Body display avoidance	
	Mean	SD	Mean	SD
Gender				
Female	0.97	1.49	2.26	1.35
Male	0.70	1.21	1.40	1.28
Race				
Caucasian	0.86	1.38	1.91	1.39
African American	0.66	1.17	1.57	1.34
Asian/Pacific Islander	0.93	1.55	1.73	1.26
Hispanic	0.83	1.21	1.83	1.37

The two significant interactions revealed that the relationship between RS and social avoidance was modified by both gender and age. Specifically, the RS by gender interaction showed that the relationship between RS and social avoidance was stronger for females ($b_{\text{Females}} = .30$) compared with males ($b_{\text{Males}} = .20$). The RS by age interaction was interpreted by examining relationship between RS and social avoidance one standard deviation above and below the mean of age. Results revealed that the RS-social avoidance relationship was stronger for younger participants ($b_{\text{1SD Below}} = .21$) compared with older participants ($b_{\text{1SD Above}} = .08$).

Body display avoidance. In predicting body display avoidance, Step 2 was determined to be the best model because the three interactions in Step 3 both failed to be statistically significant, $p > .05$, and did not explain a meaningful amount of additional variance (see Table 3). The Step 2 model explained 15.8% of the variance in body display avoidance with the RS, gender, age, and race main effects all being statistically significant.

Results indicated that RS had a significant positive relationship with body display avoidance; as perceptions of RS increased so did engagement in body display avoidance. The reverse pattern was found for age: this relationship was negative indicating that older participants reported engaging in less body display avoidance. The main effect for gender indicated that women reported engaging in more body display avoidance behaviors than men, $d = .61$ (see Table 4). Finally, the main effect for race was found to be significant with the Bonferroni-corrected post hoc analysis revealing that Caucasian participants reported engaging in more body display avoidance behaviors than African American participants, $d = .25$ (see Table 4).

Discussion

Previous research has suggested that body image avoidance, especially for women, is related to lower quality of life (Cash et al., 2005), greater health risk, and decreased involvement in a variety of life events (Feingold & Mazzella, 1998; Ferrante, Ohman-Strickland, Hudson, Hahn, Scott, & Crabtree, 2006; Latner, 2008; Ostbye et al., 2005). Data for the current study was extracted from a large-scale, internet-based survey on how size and body image predict avoidance behaviors in mainly overweight and obese, adult age-representative U.S. women and men of varying ethnicities. This research went beyond previous studies because we assessed not only size and avoidance, but introduced a practical body image metric known as relative clothing size (RS) and examined how gender, age, and ethnicity affected both social avoidance (i.e., spending time with others, social events, vacation, eating in public, challenges, and going to the doctor) and more specific body display avoidance (i.e., wearing revealing clothing, pool or beach, clothes shopping, and sexual intimacy). Overall, self-reported body display avoidance was greater than social avoidance and women reported greater avoidance than men.

For both types of avoidance, and consistent with our first hypothesis, RS was a stronger predictor than actual body mass of weight-related avoidance behavior (i.e., "being large" may not be as salient and emotionally detrimental to a person as "being larger than one wants to be"). This may be specifically true for individuals who have gained weight in adulthood needing larger clothing sizes over time, especially if they were once closer to or at an ideal clothing size (i.e., having lived as both), although we did not have information on weight history. It is also likely that some of the avoidance is driven by a sense of stigma felt by larger Americans (Puhl & Heuer, 2009) as well as other variables not assessed in the current study.

Consistent with Latner (2008) and Grilo et al. (2005), we also found that women reported more social avoidance and body display avoidance compared to men, and that the relationship between relative clothing size and both types of avoidance was stronger for women than men. This adds to a growing body of literature suggesting that women in the U.S. have poorer body image than men (Feingold & Mazzella, 1998), and our results suggest this may have more of an adverse impact on what women choose not to do in life because of how they feel about their body size. Age had an intuitive relationship with avoidance in that there was a stronger relationship between relative clothing size and social avoidance and body display avoidance for younger versus older participants. Similarly, Feingold and Mazzella (1998) found that younger women compared to older women tended to have more body image concerns. Again, our research suggests that these size concerns have more of an adverse impact on the lives of younger women. Race appeared to have no notable association with social avoidance, yet we found that Caucasian participants, compared to African American individuals, reported more body display avoidance. This relationship is consistent with Grabe and Hyde (2006) who found worse body image for Caucasian versus African American women. Hence, body image, as captured by self-perceived clothing size dissatisfaction, predicted reported avoidance behavior with gender, age, and ethnic patterns evident in extant body image literature.

Additionally, the success of RS as a predictor lends some credibility toward the use of clothing size as an anthropometric measure of body image dissatisfaction. Past research has utilized two-dimensional silhouette drawings of both men and women ranging in appearance from emaciation to overweight to gauge participants' perceptions of which silhouette one currently identifies with and which silhouette would one ideally like to look like (e.g., Stunkard, Sorenson, & Schulsinger, 1983; Thompson & Gray, 1995). Using clothing size to demonstrate the discrepancy between current and ideal size is a much more practical and personalized way to examine body image dissatisfaction.

Future research should examine the convergent validity between RS and other body image measures, and subsequently examine the feasibility and clinical utility of RS in weight loss and treatment settings. Overall social avoidance, including going to the doctor, was infrequently reported by participants in the present study, suggesting that other factors such as health/symptoms/disease might be better predictors of health-care utilization. Further living location, transportation, and even personality factors like introversion/extroversion could be better predictors of social approach/avoidance behaviors. Though not assessed in the current study, little is known about the impact of size-related avoidance on quality of life, which could also be an area for future research.

Since perceived weight-related discrimination has been found to affect self-acceptance in larger individuals (Carr & Friedman, 2005), future research should include measures of stigma to identify its relationship with RS and avoidance of activities. Future research may also wish to examine if those who internalize a thin cultural ideal are more likely to identify as larger than ideal in clothing size compared to those individuals who are just large. Similarly, inclusion of individuals who are smaller than their ideal would also inform the understanding of size-based avoidance behavior, but perhaps in different ways (e.g., boys/men who want to look more muscular; smaller women who want to look curvier).

Future research warrants comparing the validity of our novel avoidance scales, created by Yankelovich for product marketing, with the previously developed body image avoidance scale (Rosen et al., 1991) or the single avoidance item used by Latner (2008) and Reas et al. (2005). Due to the archival nature of the scale, we did not assess other behaviors, such as exercise, that tend to be avoided by larger individuals (e.g., Packer, 1989). We were also unable to capture individuals' responses to items in a continuous manner, and the available dichotomous data precluded the examination of frequency of avoidance. However, we found that our 10-item avoidance scale clearly fell into categories of social avoidance and body display avoidance, similar to results of the body image avoidance scale developed by Rosen et al. (1991), and it demonstrated adequate internal consistency. Yet another limitation of the avoidance scale is the unidirectional assessment of dissatisfaction; participants who indicated that they were smaller than or equal to ideal were not included in this study.

Other limitations based on the use of this archival data include the use of self-reported height and weight. Gorber et al. (2007) found that individuals tend to under-report current weight and over-report height; therefore, such self-reported data is less accurate than directly obtained anthropometric data. In addition, the assessment of clothing size, like BMI, has limitations. For instance, sizing practices or metrics may differ across the clothing industry (i.e., designers, manufacturers, and retailers; Kinley, 2010). Sizes may also have decreased over time (i.e., "vanity sizing") in an effort to make consumers feel good about themselves in retailer's clothing (Han et al., 2005). In addition, the use of clothing size as an anthropometric measure is relatively new in the literature (Petroff et al., 2011); thus, its validity is not yet well established.

The results of this study suggest that larger individuals who are size-dissatisfied experience heightened avoidance in varied life events, most notably body display avoidance. Our results are commensurate with previous body image literature in that younger, Caucasian women, compared to men and individuals in older age and ethnicity categories, demonstrate more size-related avoidance. The current study suggests that RS is a simple and practical way to assess for degree of body size satisfaction and perhaps as a screening gage of health risk, though more research regarding RS and size-based avoidance and overall health is warranted.

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