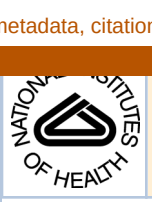

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Body Dissatisfaction in Women Across the Lifespan: Results of the UNC-*SELF* and Gender and Body Image (GABI) Studies

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Abstract

To explore age differences in current and preferred silhouette and body dissatisfaction (current - preferred silhouette discrepancy) in women aged 25-89 years using figural stimuli (range: 1-very small to 9-very large). Data were abstracted from two online convenience samples (N = 5,868). t-tests with permutation-adjusted p-values examined linear associations between mean silhouette scores (current, preferred, discrepancy score) and age with/without stratification by body mass index (BMI). Modal current silhouette was 5; modal preferred silhouette was 4; mean discrepancy score was 1.8. There was no significant association between current silhouette and age, but a positive linear association between preferred silhouette and age remained after stratification by BMI. A significant inverse linear association of silhouette discrepancy score and age was found only prior to stratification by BMI. Body dissatisfaction exists in women across the adult life span and is influenced by BMI.

Keywords

body dissatisfaction; body image; eating disorders; silhouette; women

Introduction

Body dissatisfaction is so pervasive among women that it was coined “normative discontent” by Rodin, Silberstein, and Striegel-Moore in 1984. In the United States, 69-84% of women exhibit body dissatisfaction, typically preferring a smaller figure than their present frame (Fallon & Rozin, 1985; Pruis & Janowsky, 2010). Body dissatisfaction is a risk factor for eating disorder behaviors (Ferreiro, Seoane, & Senra, 2011), depression (Brausch & Gutierrez, 2009; Ferreiro et al., 2011), and low self-esteem (Paxton, Neumark-Sztainer, Hannon, & Eisenburg, 2006). Understanding the nature and extent of body dissatisfaction across the lifespan could positively impact these domains by informing the development of age-appropriate interventions for women.

Importance of studying body dissatisfaction across the age spectrum

Women's body shapes and sizes change over the lifespan (Sheehan, DuBrava, DeChello, & Fang, 2003; Stevens & Tiggemann, 1998; Tiggemann & Lynch, 2001) and are affected by

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ageing, childbirth, hormonal fluctuations, and changes in diet and physical activity level (Peat, Peyerl, & Muehlenkamp, 2008; Polotsky & Polotsky, 2010; Roberts & Dallal, 2005; Slevec & Tiggemann, 2011). The increase in body size and BMI that occurs through middle age (Sheehan et al., 2003; Stevens & Tiggemann, 1998) widens the discrepancy between women's bodies and the Western thin body "ideal" (Lewis, Medvedev, & Seponski, 2011). Although this change may suggest increased susceptibility to body dissatisfaction with age (Swami et al., 2010), preferred body size has also been found to increase (Stevens & Tiggemann, 1998; Tiggemann & Lynch, 2001) and the importance of appearance to decrease across age (Liechty & Yarnal, 2010; Tiggemann, 2004), potentially reducing susceptibility to body dissatisfaction. It is plausible that these varying vulnerability and protective factors are both operative yielding a consistent degree of body dissatisfaction across age. However, the literature to date is inconclusive (Peat et al., 2008).

Examining body dissatisfaction across the lifespan using the figure rating scale

One of the most widely used measures of body dissatisfaction, particularly among large epidemiological investigations, is the figure rating scale (FRS; Stunkard, Sørenson, and Schlusinger, 1983; Bulik et al., 2001). On the FRS respondents select from a series of schematic silhouettes what they believe to be the best representation of their current silhouette and ideal silhouette. The degree of discrepancy between the two silhouettes is taken to be a measure of body dissatisfaction.

Stevens and Tiggemann (1998) were among the first to use figural stimuli to examine body dissatisfaction across a relatively wide age range. In an Australian population-based sample of 180 women between 18 and 59 years, both current and ideal figure selections increased across age groups, but the discrepancy score indexing the degree of body dissatisfaction did not differ. Findings were later replicated in an Australian sample of a wider age range (20 to 84 years; Tiggemann & Lynch, 2001). Similar research in female populations within the United States is less consistent (Altabe & Thompson, 1993; Cachelin, Monreal, & Juarez, 2006; Schuler et al., 2004; Pruis & Janowsky, 2010; Rozin & Fallon, 1988). Investigations have also been limited by a failure to control for BMI, small sample sizes, lack of statistical power, or bias to college populations. To our knowledge, no studies have examined body dissatisfaction across the *entire* adult age span in large datasets in the United States while accounting for BMI.

We addressed these limitations by exploring age differences in body dissatisfaction in two large cross-sectional samples of women in the United States aged 25 to 89 years and by examining the extent to which any observed differences were due to BMI. Based on the results of Stevens and Tiggemann (1998), we hypothesized that both current and preferred silhouette selection would increase with advancing age, but the discrepancy would remain constant. That is, while women's current silhouette selection would increase across age groups, preferred silhouettes would simultaneously increase, resulting in consistent body dissatisfaction across the age spectrum.

Method

Participants and procedures

Data were derived from two online cross-sectional studies, the UNC-*SELF* study and the Gender and Body Image Study (GABI), that together comprised 5,868 women aged 25-89 years residing in the United States. UNC-*SELF* investigated eating disorder behaviors and attitudes in 4,023 women aged 25-45 years who were recruited via quota sampling in 2006 and matched to 2006 United States Census proportions on age, race, and ethnicity (http://www.census.gov/acs/www/) via use of post-stratification weights. Information on body

image, eating behaviors, and weight and shape concerns was obtained via an online survey that included two figural stimuli questions abstracted from a previously fielded questionnaire (Neale, Mazzeo, & Bulik, 2003; Slof, Mazzeo, & Bulik, 2003; Wade, Bulik, Heath, Martin, & Eaves, 2001). UNC-*SELF* methodology, including exclusion criteria, is described in detail elsewhere (Reba-Harrelson et al., 2009). Four additional participants were excluded from the present study because of biologically implausible height values, yielding a final UNC-*SELF* sample of 4,019.

The UNC-*SELF* survey was adapted for use in the GABI study, which also explored eating, weight, and shape concerns, and attitudes about ageing in older women. GABI was a convenience, non-random sample of 1,849 United States women aged 50 years and over who were recruited between September 2010 and January 2011. Inclusion criteria for GABI included: (1) female sex, (2) 50+ years of age, (3) Internet access, and (4) English literacy. In total, 2,020 women completed the GABI study. A total of 171 participants were excluded for implausible, missing, or ineligible age values. Biologically implausible height ($n = 91$) and weight ($n = 1$) values were classified as "missing," and analyses that stratified on BMI excluded these participants as well as those with missing height/weight information (total excluded = 224).

GABI participants were recruited via a combination of online methods, including: University of North Carolina (UNC) student and employee listservs; LinkedIn (www.linkedin.com), a professional networking site; ResearchMatch (www.researchmatch.org), a national research study recruitment registry; Craigslist (www.craigslist.com); and emails to leaders of senior and recreation centers and women's health and aging non-profit agencies. Convenience sampling was used whereby participants were encouraged to forward the study invitation to acquaintances. An invitation email was sent with a brief description of the study and the online survey URL, which directed to the online consent form. The survey was administered via the electronic survey tool, Surveymonkey (www.surveymonkey.com), which allowed us to restrict participants to one response per computer. All data were de-identified, and participants were kept anonymous. No compensation was provided for participation.

UNC-*SELF* was judged to be exempt by the UNC at Chapel Hill (UNC-CH) Biomedical Institutional Review Board. GABI was approved by the UNC-CH Public Health-Nursing Institutional Review Board. The present study merged UNC-*SELF* data ($N = 4,019$) with GABI data ($N = 1,849$), resulting in a concatenated dataset including 5,868 women.

Measures

Sample characteristics

Participants in UNC-*SELF* and GABI reported their age, racial and ethnic identity, and height/weight without shoes. Following Centers for Disease Control and Prevention (CDC) statistics on aging (CDC, 2010), participants were classified into the following groups based on age in years: 25-34, 35-44, 45-54, 55-64, 65-74, and 75+. We used National Institutes of Health (NIH) criteria for reporting statistics on race and ethnicity (NIH, 2001). Racial categories included: (1) White, (2) Black or African American, (3) Asian, (4) Native Hawaiian or other Pacific Islander, (5) American Indian or Alaska Native, and (6) Other. Two or more responses were classified as "multiracial." UNC-*SELF* participants were restricted to the single best-fit answer format for racial identification. Therefore, we did not create a "multiracial" category for UNC-*SELF* data, as this would artificially deflate the prevalence of multiracial participants in our sample. Ethnicity was coded as Hispanic (Spanish, Hispanic, or Latina), non-White/non-Hispanic, or White/non-Hispanic. BMI (kg/m^2) was calculated to determine current weight status (< 18.5: underweight; 18.5 - 24.9:

normal; 25 - 29.9: overweight; ≥ 30: obese), as defined by the CDC (http://www.cdc.gov/healthyweight/assessing/bmi/adult_bmi/index.html). Because self-reported and measured height (r = .94 to .96) and weight (r = .93 to .98) are highly correlated, self-reported BMI data are considered reliable estimates of actual BMI (Bulik et al., 2001).

Current silhouette and preferred silhouette

Body size perception and dissatisfaction were estimated using silhouettes adapted from the Stunkard et al. (1983) figural stimuli presented and fielded in previous large population-based investigations (Kronenfeld, Reba-Harrelson, Von Holle, Reyes, & Bulik, 2010; Reba-Harrelson et al., 2009). Responses to two questions provide scores for *current* body size and *preferred* body size: (1) "Which silhouette is closest to what you *currently* look like?" and (2) "Which silhouette would you most *prefer* to look like?" Participants selected one of nine silhouettes ranging from very small (1) to very large (9) for each question. Current and preferred silhouette scores were classified as ordinal variables in the dataset. There is good concurrent validity between current silhouette score and BMI (r = 70 to .81; Bulik et al., 2001; Patt, Lane, Finney, Yanek, & Becker, 2002), and good test-retest reliability for current (r = .74 to .89) and preferred silhouette scores (r = .70 to .83; Banasiak, Wertheim, Koerner, & Voudouris, 2001; Beebe, Holmbeck, & Grzeskiewicz, 1999; J. K. Thompson & Altabe, 1991; M. A. Thompson & Gray, 1995). Current silhouette score is a sensitive approach to the detection of obesity (BMI > 30) and thinness (BMI < 20; Bulik et al., 2001; Cardinal, Kaciroti, & Lumeng, 2006).

Body dissatisfaction

Body dissatisfaction is determined by the silhouette discrepancy score (Fallon & Rozin, 1985; Rozin & Fallon, 1988), calculated as the absolute value of the difference between current and preferred silhouette scores (current - preferred = discrepancy). Larger values signify greater body dissatisfaction. This discrepancy score has convergent validity with other body dissatisfaction measures (Altabe & Thompson, 1992; Beebe et al., 1999; J. K. Thompson & Altabe, 1991) and acceptable two-week test-retest reliability (r = .67 to .79; Beebe et al., 1999).

Statistical Analyses

Range and value checking was performed to examine missing data or implausible values. Demographic and descriptive statistics included percent tabulations for categorical variables and means and standard deviations for continuous variables. The statistical tests included age as the predictor variable and silhouette scores (current, preferred, discrepancy) as response variables. A permutation test of mean silhouette scores was conducted specifying one linear contrast with equal one unit spacing across the age groups. GABI is a convenience sample representing data points collected non-randomly from a population. The permutation test requires the exchangeability assumption in which any one distribution is just as likely as another across the permuted samples. We will assume exchangeability holds in this sample. However, even small p-values can be useful to determine if replication is worthwhile (Zieffler, Harring, & Long, 2011). To perform a permutation test, the data vectors of three observations (current silhouette, preferred silhouette, and silhouette discrepancy) per person were resampled 20,000 times without replacement. A t-statistic was formed for each replication testing for a linear slope in mean BMI across the six age groups. The adjusted p-value was obtained by calculating the probability that the p-values for the replicated tests were more extreme than the observed p-value under the assumption of no association between age groups and mean silhouette score. As prior studies have documented associations with BMI and both age (e.g., Ålgars et al., 2009) and discrepancy scores (e.g., Bulik et al., 2001; Pruis & Janowsky, 2010; Swami et al., 2010), analyses were

also conducted with stratification on BMI to adjust for BMI levels grouped according to the CDC cutpoints previously described.

We conducted post-hoc pairwise comparisons of mean silhouette scores by age groups using permutation *t*-tests with adjustment for multiple comparisons. Each group of comparisons was adjusted using the Benjamini-Hochberg false discovery rate (FDR) method with each outcome as a separate family (Benjamini & Hochberg, 1995). All analyses were performed using SAS/STAT® software, Version 9.2 of the SAS System for Windows (SAS Institute Inc., 2008).

Results

Sample characteristics

Table 1 presents the sample characteristics of the overall dataset and constituent samples (UNC-*SELF*, GABI). Data from 5,868 women aged 25-89 years ($M = 42.7$, $SD = 12.7$) were analyzed. The majority of participants were Caucasian (89.3%) and of White/non-Hispanic descent (86.7%). The mean BMI was 28.6 ($SD = 7.9$), with 37.1% of women falling in the normal weight range. The current silhouette mode was 5, preferred silhouette mode was 4, and mean discrepancy score was 1.8 ($SD = 1.2$). The majority (87.0%) of the sample preferred a smaller silhouette than their current silhouette; only 3.8% preferred a larger silhouette than their current silhouette. At the extremes, 0.6% preferred to look like the smallest silhouette (1) and 0.1% preferred to look like the largest silhouette (9; data not shown).

BMI and age

Table 2 presents the means and standard deviations of BMI and silhouette scores (current, preferred, discrepancy) by age group. Posthoc linear trend analyses showed a significant association between BMI and age ($p < .001$). Aside from an initial increase in mean BMI across the two youngest age groups (25-34 to 35-44), BMI generally decreased across older age groups.

Current silhouette

Mean current silhouette score ranged from 5.34 to 5.79 across age groups (Table 2). Linear trend analysis revealed no significant association between mean current silhouette score and age ($p = .20$). However, similar to trends in BMI, there was a slight decrease in score following the 35-44 age group. Post-hoc pairwise comparisons found that the 35-44 age group had a significantly higher current silhouette score than the 25-34 ($p < .001$), 55-64 ($p < .006$), and 65-74 ($p < .001$) age groups. All other pairwise comparisons were non-significant (results not shown).

When stratifying by BMI, results remained non-significant ($p = .26$; Table 3). Figure 1 (left panel) shows the pattern of scores across age for each BMI group. Generally, an undulating pattern was observed for each weight category except underweight, which showed a fairly consistent trend of lower mean current silhouette score across increasing age groups. Of all weight categories, the obese group had the highest mean current silhouette scores ($M = 7.10$ to 8.00 across age groups), while the underweight group had the lowest mean scores ($M = 2.50$ to 3.13 across age groups).

Preferred silhouettes

Mean preferred silhouette scores ranged from 3.82 to 4.17 across age groups (Table 2). Linear trend analysis revealed a statistically significant relation between preferred silhouette score and age ($p < .001$), with a slight increase in score across older age groups. Post-hoc

testing revealed no significant pairwise differences in preferred silhouette score between age groups (results not shown).

Results were significant even after stratifying by BMI ($p = .03$; Table 3). All BMI groups, except the underweight group, had similar trends to that of the total sample (increasing preferred silhouettes scores across age; Figure 1, middle panel). In contrast, in the underweight group, older women (45-54, 55-64, 65-74) had preferred silhouette scores that, while increasing across age, were lower than the scores of their younger counterparts (25-34, 35-44). Of all weight categories, the obese group had the highest mean preferred silhouette scores ($M = 4.24$ to 4.49 across age groups), while the underweight group had the lowest scores ($M = 2.73$ to 3.31 across age groups).

Body dissatisfaction (current silhouette ≠ preferred silhouette)

Body dissatisfaction was present in the majority of participants in each age group: 90.0% in the 25-34 group, 93.2% in the 35-44 group, 88.9% in the 45-54 group, 89.0% in the 55-54 group, 88.2% in the 65-74 group, and 71.9% in the 75+ group. Of the total sample, 9.2% ($n = 539$) of women had no discrepancy between their current and preferred silhouette. Linear trend analysis revealed a significant association between discrepancy score and age ($p < .001$; Table 2), signifying decreased body dissatisfaction across older age. The 35-44 age group had a significantly higher discrepancy score than the 25-34 ($p < .001$), 45-54 ($p < .004$), 55-64 ($p < .001$), 65-74 ($p < .001$), and 75+ ($p < .02$) age groups. Pairwise comparisons also revealed that the 25-34 and 45-54 age groups had higher discrepancy scores than the 65-74 age group (both $p < .001$). All other pairwise comparisons were non-significant (results not shown).

After stratifying by BMI, the association between age and silhouette discrepancy score was no longer significant ($p = .94$). However, examination of Figure 1 (right panel) suggests that stratification by BMI attenuates, but does not completely reduce, the negative association between mean silhouette discrepancy score and age for all but one (obese) BMI group. Because there was a marked deviation in discrepancy score at the 75+ cohort of obese women, we conducted a sensitivity analysis excluding the 75+ cohort to determine the impact of this score on results. Without the 75+ age group, the silhouette discrepancy is significant even after stratifying by BMI groups ($p < .001$).

Discussion

Through exploration of age differences in current and preferred silhouette and their discrepancy, we were able to evaluate differences in current and preferred body size as well as body dissatisfaction while accounting for BMI. Our observation of a spike in BMI at 35-44 years and significant decrease across age thereafter is partially consistent with United States census data (Flegal & Troiano, 2000; Ogden, Fryar, Carroll, & Flegal, 2004), which show BMI continues to increase past 35-44 years and stabilize or decrease in older age (around 54 to 60 years). Although our sample may have differed slightly from the general population, this study is one of the largest to date to examine age differences in body dissatisfaction among women in the United States and to extrapolate the percentage of women with body dissatisfaction in varying BMI groups. Our study adds to the small but growing body of literature on body image in mature women.

Current silhouette

The silhouette most commonly selected to represent current body size was 5, one silhouette larger than 2001 published norms for Caucasian women (Bulik et al., 2001). This difference could be a reflection of the increasing BMI of women in the United States over the past

decade (Flegal, Carroll, Ogden, & Curtin, 2010). Alternatively, the difference could be accounted for by the fact that we used a slightly modified version of the figural stimuli (Stunkard's FRS) used in the 2001 study.

Trends in current silhouette selection across age paralleled trends of actual self-reported BMI. There was a slight, although not statistically significant, decrease in current silhouette selection that occurred after middle age. These findings are generally consistent with those of studies with narrower age ranges, in which larger current silhouette choices were found across early adulthood (Altabe & Thompson, 1993; Cachelin et al., 2006), but smaller current silhouette choices were found across later adulthood (Schuler et al., 2004). A peak in current silhouette selection was observed at 35-44 years of age, suggesting this age group perceived themselves to be a significantly larger size than all other women. Reasons for a larger body size at age 35-44 years are not entirely clear, but could reflect the fact that these are near the prime reproductive years for women (Liu et al., 2011; Martin et al., 2010). Even samples that exclude pregnant women may include a large percentage of post-partum or inter-partum women whose size is increased at this age secondary to childbearing. The increase in body size could also reflect the onset of and initial adjustment to physiological (e.g., decreased metabolism) and lifestyle changes (e.g., reduced exercise) that occur in aging women and impact weight and shape (Peat et al., 2008; Polotsky & Polotsky, 2010; Roberts & Dallal, 2005).

Preferred silhouette

Our findings relative to preferred silhouette suggest that most women have a preferred body size (silhouette 4) that is one figure smaller than their current body size (silhouette 5), a finding consistent with Bulik et al. (2001). Larger preferred body sizes were observed across older age, even after stratification by BMI. This result contradicts some research (Altabe & Thompson, 1993; Schuler et al., 2004), but is in line with our hypothesis and Australian-based findings (Stevens & Tiggemann, 1998; Tiggemann & Lynch, 2001). Methodological differences across studies challenge our ability to interpret discrepant results. Larger body size preferences across age may reflect age or cohort-related differences in sociocultural influences involved in the formation of body “ideals” for women. However, we have little understanding of how body ideals develop for older women, as the extant research on this topic is limited and focuses almost exclusively on young adults or college populations (Slevec & Tiggemann, 2011).

Body dissatisfaction (discrepancy score)

About 91% of women evidenced a discrepancy between their current and preferred silhouettes, signifying a high prevalence of body dissatisfaction in adult American women that is supported by prior research (Fallon & Rozin, 1985; Pruis & Janowsky, 2010). Body dissatisfaction was found to significantly decrease across older age, but the association was attenuated and no longer significant after stratifying by BMI. Women aged 75+ appear to be a unique group. The post-hoc sensitivity analyses suggest that it might be worthwhile analyzing this age group separately or considering potential confounders associated with this age in future studies. It is possible that an alternative model not constrained by a test for linear slope and better fitting the observed data would yield a significant association between the silhouette discrepancy and age even after adjusting for BMI. Importantly, it is clear that there is a substantial degree of body dissatisfaction in adult women of all ages with no evidence for decline in a linear fashion over the entire specified age range after adjusting for BMI.

Our findings point to two groups of women who may be especially vulnerable to body dissatisfaction: 1) middle-aged women and 2) obese women. Of our total sample, 35-44 year

old women had the highest degree of body dissatisfaction of all age groups—an unexpected finding that to our knowledge has not yet been documented in the literature. The obese women had the highest degree of body dissatisfaction of all weight groups, which supports prior research (e.g., Pruis & Janowsky, 2010; Swami et al., 2010).

Explanations exist for why body dissatisfaction persists across age. A comprehensive review (Slevec & Tiggemann, 2011) documented universal (e.g., media exposure) and unique age-related risk and protective factors implicated in the etiology of body dissatisfaction in women that together may explain the persistence of body dissatisfaction across adulthood. For example, in older women, the change in body shape (fat redistribution from legs to trunk) that initiates around middle age may serve as a unique risk factor (Wells, Griffin, & Treleaven, 2010), while the reduced importance of physical appearance may serve a protective function (Tiggemann, 2004; Tiggemann & Lynch, 2001). Presumably, the varying risk and protective factors that differentially occur across age cancel out, resulting in a similar degree of body dissatisfaction in women of all ages. Additional research is needed to clarify the underlying mechanisms, including mediators and moderators, of body dissatisfaction in women of different ages (young, middle, old, elderly).

Clinical implications

Negative ramifications of body dissatisfaction occur regardless of age (Peat et al., 2008). Body dissatisfaction is a predictor and maintenance factor for eating disturbances (Stice, 2002), and is associated with a variety of psychosocial problems, including social anxiety (Cash, Phillips, Santos, & Hrabosky, 2004), reduced quality of life (Haraldstad, Christophersen, Eide, Nativg, & Helseth, 2011), low self-esteem (Paxton et al., 2006), and depressive symptoms (Brausch & Gutierrez, 2009; Ferreiro et al., 2011). Development of appropriately age-tailored interventions may positively impact all the above domains (e.g., help prevent eating disorders). Identifying and studying age groups (e.g., middle-aged women) at particular risk for body dissatisfaction may shed light on *where* and *how* to best target our efforts.

Limitations

Findings should be considered in light of several limitations. First, analyses were based on permutation test methodology in which findings relate only to the sample and are not generalizable. We lacked racial and ethnic diversity (89.3% Caucasian) and caution must be exercised with applying findings to non-Caucasians. This is especially relevant given the known differences in body dissatisfaction between varying racial and ethnic groups (Kronenfeld et al., 2010; Millstein et al., 2008). Moreover, 46 to 49 year old women were not represented in our data, as neither UNC-*SELF* nor GABI recruited that age group. Second, data were collected via online surveys by use of convenience sampling with methodology that differed across the two studies (UNC-*SELF*, GABI). While online surveys and convenience sampling offer time-efficient and cost-effective means for large data collection efforts (Kraut et al., 2004), the sample may be biased to women with Internet access and more affluent populations (U.S. Census Bureau, 2009). Further, the two samples were collected at different time points (UNC-*SELF*: 2006, GABI: 2010-2011) and although there likely has been little change in the socio-cultural influences on body image over this four to five year period, potential temporal trends may have confounded results. Third, as with all online self-report studies, the accuracy of data could not be verified through clinical interview or objective measurement. Over- or under-reporting may be an issue, particularly for anthropometric data (Engstrom, Paterson, Doherty, Trabulsi, & Speer, 2003), despite evidence that self-reported and measured BMI are highly correlated (e.g., Bulik et al., 2001) and that the anonymity of online studies may render participants more willing to disclose sensitive information honestly. Fourth, concatenating two datasets may result in spurious

findings across age groups in which differences attributed to age actually derive from other characteristics inherent in each sample. Fifth, this was a cross-sectional study, and we cannot delineate whether differences were due to changes with age or cohort effects. Longitudinal studies are needed to answer the question of how body dissatisfaction changes as women mature. Sixth, it is feasible that differences between silhouette scores and age are underpowered and either an alternate sort of parametric analysis or increased sample size could yield a significant relationship between age and silhouette scores adjusting for BMI. Robust parametric models would also allow for adjustment of other important variables, such as illness or medical conditions, that could affect current and preferred body sizes and body dissatisfaction at different ages. Lastly, the silhouette method has been criticized (Gardner, Friedman, & Jackson, 1998) for limited response options and an inability to capture nuances in body dissatisfaction and the extremity of obesity in our society. Despite these limitations, the silhouette method is most appropriate for large investigations given its simplicity and methodological superiority over other body dissatisfaction measures (Sands, 2000; Bulik et al., 2001).

Conclusions

Body dissatisfaction is omnipresent in women of all ages in the United States. There may be a slight, and potentially clinically meaningful, decrease in body dissatisfaction after middle age. Rigorous qualitative and quantitative approaches are needed to enrich our understanding of the nature, extent, and impact of body dissatisfaction in women. Delineating factors that protect against body dissatisfaction differentially across age may aid in the creation of developmentally tailored interventions for weight and body image concerns among women.

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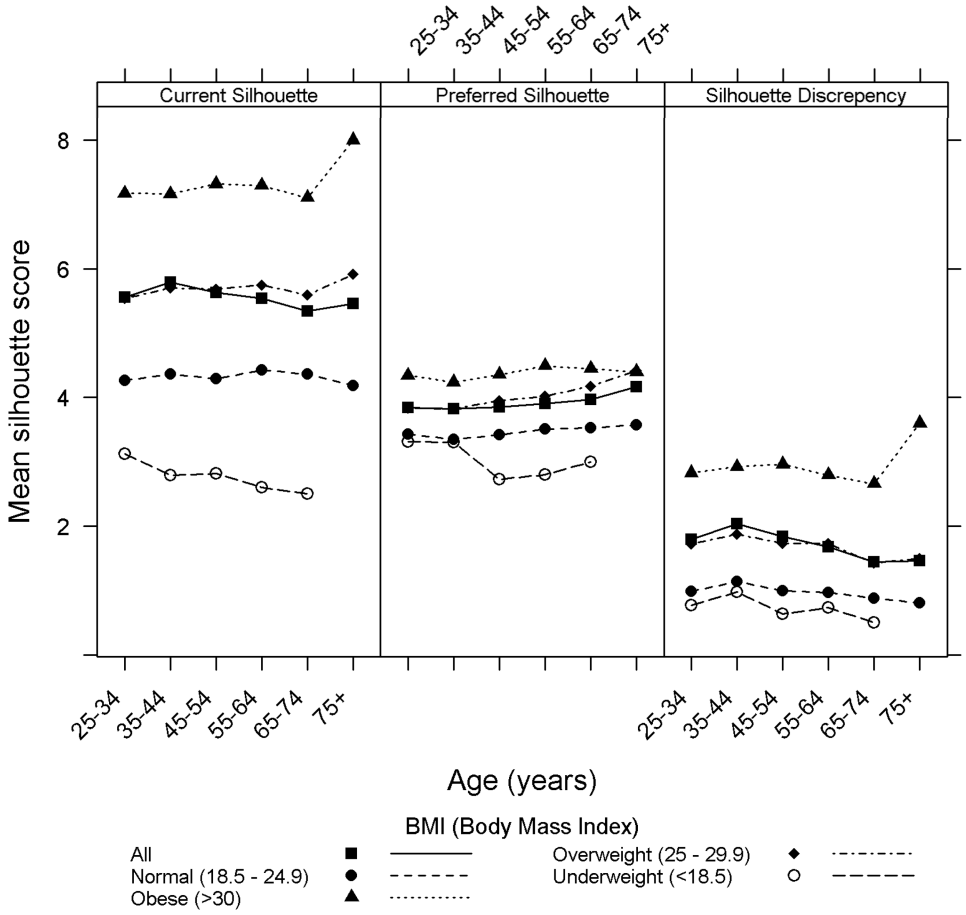

Figure 1. Comparison of mean Silhouette scores and age stratified by BMI group

Table 1

Sample characteristics of the overall dataset and constituent samples (UNC-*SELF* and GABI)

		Constituent Datasets	
	Total Group (*N* = 5,868)	**UNC-*SELF*[1] (*N* = 4,019)**	**GABI[2] (*N* = 1,849)**
Variables	**n (%)**	**n (%)**	**n (%)**
Age (years)			
25-34	1,873 (31.9)	1,873 (46.6)	n/a
35-44	1,943 (33.1)	1,943 (48.3)	n/a
45-54[3]	758 (12.9)	203 (5.1)	555 (30.0)
55-64	947 (16.1)	n/a	947 (51.2)
65-74	290 (4.9)	n/a	290 (15.7)
75+	57 (1.0)	n/a	57 (3.1)
Race			
White	5,225 (89.3)	3,359 (88.1)	1,685 (92.1)
Black or African American	342 (5.8)	258 (6.4)	84 (4.6)
Asian	95 (1.6)	80 (2.0)	15 (0.8)
American Indian, Alaska native	36 (0.6)	34 (0.8)	2 (0.1)
Native Hawaiian or Pacific Islander	15 (0.3)	14 (0.3)	1 (0.1)
Other	116 (2.0)	94 (2.3)	22 (1.2)
Multiracial	21 (0.4)	n/a[4]	21 (1.1)
Ethnicity			
Hispanic	237 (4.1)	187 (4.7)	50 (2.8)
Non-White/non-Hispanic	539 (9.3)	409 (10.2)	130 (7.2)
White/non-Hispanic	5,048 (86.7)	3,423 (85.2)	1,625 (90.0)
Weight Group (BMI)			
Underweight (<18.5)	116 (2.1)	90 (2.2)	26 (1.6)
Normal (18.5-24.9)	2,096 (37.1)	1,403 (35.1)	693 (42.2)
Overweight (25-29.9)	1,499 (26.6)	1,018 (25.4)	481 (29.3)
Obese (≥30)	1,933 (34.2)	1,491 (37.3)	442 (26.9)

Abbreviations: BMI, body mass index; n/a, not applicable. Note: Percentages may not sum to 100 percent due to rounding error.

[1] UNC-*SELF* numbers correspond to raw, unweighted numbers. UNC-*SELF* included women aged 25 to 45 years.

[2] GABI included women aged 50+.

[3] Missing data for women aged 46-49 years; neither UNC-*SELF* nor GABI recruited women in this age range.

[4] UNC-*SELF* restricted participants to one response for race; unable to determine multiracial status.

Table 2

Means and standard deviations of body mass index and silhouette scores (current, preferred, discrepancy) by age group

	BMI	Current[1]	Preferred[2]	Discrepancy[3]
Age group	**M (SD)**	**M (SD)**	**M (SD)**	**M (SD)**
25-34	28.7 (8.4)	5.55 (1.62)	3.85 (0.79)	1.80 (1.17)
35-44	29.4 (8.2)	5.79 (1.65)	3.82 (0.83)	2.04 (1.22)
45-54[4]	28.5 (7.7)	5.63 (1.69)	3.85 (0.83)	1.84 (1.25)
55-64	27.5 (6.6)	5.54 (1.58)	3.90 (0.81)	1.68 (1.11)
65-74	26.8 (5.2)	5.34 (1.47)	3.97 (0.86)	1.45 (1.00)
75+	26.1 (6.2)	5.45 (1.69)	4.17 (1.16)	1.46 (1.14)
TOTAL	****28.6 (7.9)**	**5.6 (1.6)**	****3.9 (0.8)**	****1.8 (1.2)**

Abbreviations: BMI, body mass index.

[1,2] Silhouette scores range from (1) smallest to (9) largest.

[3] Absolute value of the resulting difference of current and preferred scores (current - preferred = discrepancy).

[4] Missing data for women aged 46-49 years; neither UNC-*SELF* nor GABI recruited women in this age range. Linear trend analysis results:

** $p < .001$

Table 3

Means and standard deviations of silhouette scores (current, preferred, discrepancy) for each age group by BMI group

BMI Group[1]	Age groups						
	25-34 (*n* = 1873)	35-44 (*n* = 1943)	45-54[2] (*n* = 758)	55-54 (*n* = 947)	65-74 (*n* = 290)	75+ (*n* = 57)	Linear trend analysis
	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	p-value
Current Silhouette							
Underweight	3.13 (0.70)	2.79 (1.10)	2.82 (0.75)	2.60 (1.24)	2.50 (0.71)	n/a	.26
Normal	4.26 (0.91)	4.37 (0.99)	4.29 (1.02)	4.42 (1.01)	4.36 (0.97)	4.18 (1.18)	
Overweight	5.54 (0.83)	5.70 (0.98)	5.68 (0.94)	5.75 (0.86)	5.60 (0.87)	5.92 (1.00)	
Obese	7.17 (1.15)	7.16 (1.12)	7.32 (1.10)	7.29 (1.07)	7.10 (1.17)	8.00 (1.41)	
Preferred Silhouette							
Underweight	3.31 (0.72)	3.31 (0.89)	2.73 (0.65)	2.80 (0.94)	3.00 (<0.01)	n/a	.03
Normal	3.43 (0.66)	3.35 (0.75)	3.42 (0.75)	3.51 (0.66)	3.53 (0.72)	3.57 (0.68)	
Overweight	3.84 (0.60)	3.82 (0.71)	3.95 (0.60)	4.02 (0.61)	4.17 (0.74)	4.42 (1.44)	
Obese	4.34 (0.74)	4.24 (0.74)	4.36 (0.78)	4.49 (0.73)	4.45 (0.65)	4.40 (1.14)	
Discrepancy Score							
Underweight	0.77 (0.75)	0.97 (0.87)	0.64 (0.50)	0.73 (0.70)	0.50 (0.71)	n/a	.94
Normal	0.99 (0.66)	1.14 (0.81)	1.00 (0.80)	0.97 (0.73)	0.88 (0.67)	0.81 (0.68)	
Overweight	1.72 (0.77)	1.88 (0.84)	1.73 (0.79)	1.73 (0.69)	1.43 (0.68)	1.50 (0.90)	
Obese	2.83 (1.10)	2.92 (1.08)	2.96 (1.11)	2.79 (1.03)	2.66 (1.13)	3.60 (1.34)	

Abbreviation: BMI, body mass index; n/a, not applicable.

[1] BMI groups defined by the CDC: < 18.5 underweight; 18.5-24.9 normal weight; 25-29.9 overweight; ≥ 30 obese.

[2] Missing data for women aged 46-49 years; neither UNC-*SELF* nor GABI recruited women in this age range.