



The effect of thin and muscular images on women's body satisfaction



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ABSTRACT

A substantial body of research documents that exposure to images depicting a “thin ideal” body figure effects women's state-oriented body satisfaction. However, there is evidence that the societal ideal body figure of females is evolving to be not just thin, but also muscular or toned. Therefore, the purpose of this research was to test the effect of exposure to ideal body figures that are both thin and muscular on female state body satisfaction. Researchers recruited female participants ($N=366$) from an online community (Amazon's Mechanical Turk) and randomly assigned them to view images in one of four conditions: thin, thin and muscular, thin and hypermuscular, and control (images of cars). Results indicated that state-oriented body satisfaction decreased in the thin condition and thin and muscular condition, but not the hypermuscular or control conditions. These findings have implications for clinical initiatives as well as future research.

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Introduction

Sociocultural pressures, including media influence, remain an important area of empirical investigation due to their link to a variety of health-related outcomes, including body dissatisfaction, low self-esteem, and eating pathology (Bissell & Rask, 2010; López-Guimerà, Levine, Sánchez-carracedo, & Fauquet, 2010). Dominant theories of sociocultural influence propose that media portrayals of ideal body figures are among the most antecedent constructs in the causal paths toward body image dissatisfaction and eating disorder symptomatology among girls and women (e.g., Fredrickson & Roberts, 1997; Karazsia, van Dulmen, Wong, & Crowther, 2013; Stice, 1994; Thompson, Heinberg, Altabe, & Tantleff-Dunn, 1999; Tylka & Subich, 2004). Although a large body of empirical research supports the notion that exposure to media that depicts the “thin ideal” increases women's body dissatisfaction (e.g., Levine & Murnen, 2009), little is known about the potential effects of media images that portray athletic, muscular figures of women, which are appearing more frequently in media sources (Homan, McHugh, Wells, Watson, & King, 2012).

The majority of studies investigating media influence on body satisfaction examined responses to images that depict varying degrees of adiposity (e.g., Groesz, Levine, & Murnen, 2002; Halliwell & Dittmar, 2004). However, there is evidence that the ideal female

body, as depicted in media, is shifting from a predominantly thin figure to one that is both thin and toned, or athletic (Thompson, van den Berg, Roehrig, Guarda, & Heinberg, 2004). The growing preference towards an athletic body is evidenced by an increasing emphasis in popular culture media on physical exercise, toneness, and muscularity, in addition to thinness (Grogan, 2008; Homan et al., 2012). The shifting trend in the ideal is producing a standard for attractiveness that is now dual-dimensional: unrealistically thin as well as toned. However, the combination of body change behaviors that women may use to achieve both thinness (e.g., caloric intake) and muscularity (e.g., physical exercise) could be particularly dangerous for women who attempt to attain it via unhealthy means. For example, extreme caloric restriction for thinness in the context intense muscle-building workouts to tone muscles may be extremely risky to girls' and women's health (Grogan, 2010; Homan et al., 2012).

To our knowledge, only one previous study experimentally evaluated the influence of athletic images on women's body dissatisfaction. Homan and colleagues (2012) exposed women to thin athletic-build models versus normal-weight athletic-build models. Results showed a decrease in body satisfaction in the thin-athletic condition, but not in the normal-weight athletic condition. A limitation to this body of literature is that the potential influence of muscularity, as depicted in media images, on women's body dissatisfaction remains unexplored. That is, previous investigations typically hold muscularity constant while adiposity in images is manipulated experimentally. While there has been a growth of research examining muscularity among men (e.g., Galioto & Crowther, 2013; Karazsia & Crowther, 2010), to our knowledge no

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studies with women have held adiposity constant while manipulating muscularity. Such a paradigm is necessary to begin elucidating potential causal influences of muscularity on women's experiences with body dissatisfaction.

The present study was designed to further examine the relationship between media exposure and body satisfaction by comparing body satisfaction pre-exposure to body satisfaction post-exposure. This was achieved via an experimental design in which participants were randomly assigned to view media images that were (a) thin, (b) thin and muscular, (c) thin and extremely muscular (hyper-muscular), or (d) a control condition (no body depicted). Assuming that the thin and thin and muscular conditions were representative of modern ideal body images (e.g., Grogan, 2008), we hypothesized that women exposed to images in either of these conditions would experience decreases in body satisfaction. We hypothesized no change in body satisfaction in the control condition. No a priori hypotheses were made with respect to exposure to the hypermuscular female images, although this condition was included to test whether extreme muscularity in models had the same impact as more moderate amounts of muscularity in models.

Method

Participants

The sample consisted of 366 participants recruited from Amazon's Mechanical Turk (MTurk). The sample size for this study was based on a power analysis, in which a moderate effect size of $d = 0.31$, as has been found in a meta-analysis of studies using similar designs (Groesz et al., 2002), was expected for within participant changes in body satisfaction. Assuming two-tailed analyses, 84 participants would be necessary in each condition to achieve power of 0.80 (total sample size of 336 across all four conditions). We decided to utilize the MTurk system because it yields data that are at least as reliable as data gathered via sampling from undergraduate populations, yet samples are relatively more diverse (Buhrmester, Kwang, & Gosling, 2011). Using MTurk, researchers are able to accumulate a large amount of data in relatively short amount of time at very little financial expense (Buhrmester et al., 2011). Importantly, MTurk offers "a viable method for collecting data on the perceptual and attitudinal aspects of body image" (Gardner, Brown, & Boice, 2012, p. 532). Eligibility requirements included criteria that the participant must be a female between the ages of 18 and 29 years, which are similar to characteristics of most studies in this area of literature (Groesz et al., 2002).

Based on previous research on MTurk, only participants residing in the United States of America were included in the study (Buhrmester, 2012). Researchers restricted participation to the United States to control for cultural differences in the societal ideal (i.e., non-Western societies). The majority of participants self-reported their sexual orientation as heterosexual (79.1%) and relationship status as single (55.3%). Ethnic composition of the sample was as follows: 71.9% Caucasian, 8.7% Asian, or 7.5% African American; 11.9% of the sample reported another ethnic background, mixed background, or chose not to respond to this item. Modal response for education level was some college or professional school (35.8%) followed by completion of a bachelor or associate degree (27.4%). The mean age of participants was 25.50 years ($SD = 3.21$). Based on self-reports of participant height and weight, the mean BMI for participants was 25.90 ($SD = 6.71$).

Materials

Visual stimuli. We gathered 52 visual stimuli from various online media sources, including popular women's fashion and

health magazines, exercise-oriented websites, and other online sources. To control for adiposity, only images depicting women with very low body fat were selected, and the females portrayed in the images were ethnically and racially diverse. Two experts in the field of body image reviewed the images with respect to two dimensions, thinness and muscularity. We used the qualitative feedback of these individuals to make preliminary categorizations of images into one of three categories: thin (high on thinness, low on muscularity), athletic (high on thinness, moderate on muscularity), or hyper-muscular (high on thinness, high on muscularity). Images were manipulated to control for facial attractiveness by digitally blurring the faces of the models using Adobe Photoshop CS3 software. All female models were front-facing with tight-fitting clothing that revealed arms, legs, and the abdomen (e.g., tight workout shorts and a sports bra, two-piece swimsuits). In addition to these 52 images of female figures, we decided to include a condition with images unrelated to body image. This condition provided researchers with a baseline to which all conditions could be compared. We selected images of cars for this condition because they were used frequently in similar studies published previously, as they do not have cues pertaining to body image (Bessenoff, 2006; Brown & Dittmar, 2005; Posavac, Posavac, & Posavac, 1998).

In order to select the final images to be used in the experiment, we conducted a pilot test with 10 raters recruited from the same population as participants in this study. That is, they were recruited via MTurk, with identical inclusion criteria. All pilot raters were independent of the study sample. These raters judged all human images and images of cars with regard to overall image quality. Images of humans were also rated with regard to thinness, muscularity, and overall image quality. For ratings of human images, the raters were initially shown a prototypical image for each human condition, with instructions that read as follows:

The above images represent examples of the range of models you will see in the remainder of this survey. You will be asked on a scale of 1 (*disagree*) to 10 (*agree*) to indicate how much you agree with each of the following statements: (a) "This person has no Body Fat (a rating of 1 indicates that the figure displays body fat and 10 indicates that the figure displays NO body fat)," (b) "This person is Muscular (a rating of 1 indicates that the person does NOT have much muscle and 10 indicates that the figure DOES have substantial muscles)." You will be asked a similar question about image quality, where a rating of 1 indicates that the image is of very poor quality and a 10 indicates that the image is of substantial quality. The rating of image quality should only refer to the quality of the image, not the attractiveness or any other aspect of the person in the image.

Images rated relatively low on overall image quality or relatively high on body fat, images with ratings that were the most dissimilar to mean ratings within conditions, or images with ratings that detracted from inter-rater reliability were removed. The 40 images that best represented study conditions were retained, with 10 images in each condition. Descriptive statistics of characteristics of human images in each condition are reported in Table 1. Inter-rater reliability across all 10 raters and all 30 human images was estimated with an intra-class correlation ($ICC = 0.91, p < .01$). As can be seen in Table 1, across all 40 retained images, ratings of image quality were comparable across the four conditions, as were ratings of perceived body fat across the three conditions depicting images of females. As expected, these three conditions differed significantly in muscularity ratings in the expected direction (i.e., lowest ratings in the thin condition, highest ratings in the hyper-muscular condition).

Body image measurements. In order to assess potential changes in state-oriented body satisfaction, researchers compared

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