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New Body Scales Reveal Body Dissatisfaction, Thin-Ideal, and Muscularity-Ideal in Males

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Abstract

The aim of the current study was to develop, test, and retest two new male body dissatisfaction scales: The *Male Body Scale* (MBS; consisting of emaciated to obese figures) and the *Male Fit Body Scale* (MFBS; consisting of emaciated to muscular figures). These scales were compared to the two most commonly used visually based indices of body dissatisfaction (Stunkard Figure Rating Scale, SFRS; and Somatomorphic Matrix, SM). Male participants rated which body figure on each scale most represented their current figure, then their ideal figure, and then rated which one of the three scales (MBS, MFBS, and SFRS) best represented their current and ideal body overall. Finally, they completed the Drive for Muscularity Scale (DMS), the Eating Disorder Examination Questionnaire (EDE-Q 6.0), and their actual body composition was calculated. This was followed by a retest and manipulation check 2 to 6 weeks later. Participants' actual body mass index, fat- and muscularity-percentage were all highly related to their current body figure choice, and both new scales were consistently valid and more reliable between test and retest than the SFRS and SM body dissatisfaction scores. Importantly, each scale was sensitive to different types of body dissatisfaction within males. Specifically, the MBS revealed that males' desire for the thin-ideal significantly corresponded to higher eating disorder tendencies as identified by EDE-Q 6.0 scores, while the MFBS revealed much higher body dissatisfaction toward the larger, muscularity-ideal, predicting higher drive for muscularity as identified by DMS scores. Results validated the new scales, and inform male-focused eating disorder research.

Keywords

male body dissatisfaction, thin-ideal, eating disorders, body image, muscularity

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It is often suggested that males report substantially less body dissatisfaction than females both on questionnaires and during clinical diagnostic interviews, even when they have comparable eating disorder levels (Darcy et al., 2012; Micali et al., 2015; Ricciardelli & McCabe, 2015). At the same time, male body dissatisfaction and the prevalence of extreme body-shape and weight control behaviors are reported to be increasing (e.g., Mitchison, Hay, Slewa-Younan, & Mond, 2014; Ricciardelli & McCabe, 2001). Reported low levels of male body dissatisfaction may be due to the majority of body dissatisfaction scales, such as the EDI-3 (Garner, 2004) or the Stunkard Figure Rating Scale (Stunkard, Sørensen, & Schulsinger, 1983) having been developed to focus on and measure fat-related concerns which are more commonly reported in females.

Figural rating scales are reported to be an accurate, robust method that quickly and effectively classifies males and females as thin or obese, and are highly correlated with self-reported BMI in very large, diverse populations (Bulik et al., 2001; Lo, Ho, Mak, & Lam, 2012). This method is also reported to accurately measure both attitudinal and perceptual aspects of body image distortions (Pallotti, Tubaro, Casilli, & Valente, 2017). Often, studies which investigate body-dissatisfaction or the influence of negative body image within a variety of research questions, use figure-rating scales within a battery of tests to quickly and robustly detect these body-related aspects (e.g., Schrimpf

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et al., 2017). In support of males' body concerns differing from those of females, Darcy and Lin (2012) reported that males with anorexia nervosa scored significantly lower on weight concern and shape concern subscales than females with anorexia nervosa during the clinical eating disorder examination interview (EDE; Cooper & Fairburn, 1987). Another study reported that it was body fat dissatisfaction but not muscularity dissatisfaction that predicted eating disorder tendencies in both heterosexual and homosexual men (Smith, Hawkeswood, Bodell, & Joiner, 2011).

The terms "thinness" and "leanness" have often been used interchangeably within the male body-related dissatisfaction literature (e.g., Brown, Forney, Pinner, & Keel, 2017; Smith et al., 2011). However, Smolak and Murnen (2008) reported the motivation to lose fat as two dimensions, the drive for thinness and the drive for leanness. The drive for thinness is reported as more focused on the fear of gaining any weight and determination to be thin, whereas the drive for leanness is focused on attitudes which are not directly pertaining to fat, but a desire to lose fat and gain a toned, muscular, and lean body. It may be that males tend to strive toward a lean, toned body (i.e., drive for leanness), rather than toward a larger more muscular body, or the thin-ideal (i.e., drive for thinness) that many females tend to strive towards (Ridgeway & Tylka, 2005).

For over three decades, the most commonly used figure scale has been the Stunkard Figure Rating Scale (SFRS; Stunkard et al., 1983). The SFRS is a quick and valid measure of body dissatisfaction in males and females with respect to thinness and obesity (Edman, Lynch, & Yates, 2014), and this nine-figure scale has been asserted to possess equal or better validity than dozens of other figure scales with respect to the relationship between the dissatisfaction score indicated by the scale, and the participant's BMI (Stunkard, 2000). There are a number of limitations to using the SFRS to measure male body dissatisfaction. The SFRS measures only the emaciated to obese-body dimension (i.e., drive for thinness), and therefore excludes muscularity or the drive for leanness (i.e., to be lean and toned), which may also be key dimensions of body dissatisfaction and eating disorder risk in males, along with the drive for thinness (Bergeron & Tylka, 2007; Mayo & George, 2014). Many of the body figures that make up the male scales are cartoonish in appearance, and thus not very representative of the male figure (Thompson & Gray, 1995), which is also problematic of more current measures, such as Gruber, Pope, Borowiecki and Cohane's (2000) Somatomorphic Matrix, and Hildebrandt, Langenbucher, and Schlundt's (2004) Body Builder Grid, which have incorporated indices of thinness-, fatness-, and muscularity-related body dissatisfaction simultaneously.

According to several papers, figure scales often do not provide sufficiently large obese body sizes (Cafri & Thompson, 2004; Stewart, Williamson, Smeets, & Greenway, 2001), and consist of unbalanced body size. The SFRS was not developed with precise incremental graduations between each body figure, and displays irregularities between body area sizes within each figure (such as lower and upper arm). The more current and detailed Male Body Matrices (Frederick & Peplau, 2007) only includes four levels of body fat variability, but seven levels of muscularity variability. The Somatomorphic Matrix (Gruber et al., 2000) possesses reduced lower body (i.e., legs) size variance compared with upper body (i.e., chest, biceps) size variance (Olivardia, Pope, Borowiecki, & Cohane, 2004), and produced inconsistent results for males who have overestimated their body fat in several studies (Pope et al., 2000). Although there has been concern relating to the Somatomorphic Matrix having low test–retest reliability, this tool is still the most frequently used muscularity scale, as it assesses fat and muscularity as a single dimension (Cafri, Roehrig, & Thompson, 2004).

Restored body weight and reduced (or even extinguished) drive for thinness (key anorexia nervosa recovery markers) have been reported to mask the development and maintenance of muscularity-drive disordered eating behaviors in males (Murray, Griffiths, Mitchison, & Mond, 2017). This highlights the importance of assessing two distinct facets of body dissatisfaction; fat-related dissatisfaction and/or muscularity-related dissatisfaction. Incorporating Smolak and Murnen's (2008) report of the drive for thinness and the drive for leanness also as two separate dimensions, toward a thinner or a leaner, toned body, it may be important to assess fat-related dissatisfaction (i.e., thinness), and also muscularity-related (i.e., muscularity and/or leanness) body dissatisfaction. New evidence also points to fat-related and muscle-related body perception consisting of two independent neural mechanisms, as well as differing in psychological importance, making it essential to develop tools which address and assess these two features independently (Sturman, Stephen, Mond, Stevenson, & Brooks, 2017). Other key limitations of current figure scales are related to the figures, such as the size and complexity of the scales, which may consist of 32 to 100 cartoonish body drawings (e.g., Gruber et al., 2000; Hildebrandt et al., 2004), making them more time-consuming to complete. Further limitations include unnaturally positioned figures (i.e., flexing their bicep muscles which may cue males toward muscularity; Gruber et al., 2000), as well as headless figures (e.g., Frederick & Peplau, 2007), which may be disturbing (Minnebusch, Suchan, & Daum, 2009). Removing the head also excludes an important and frequent overall body shape concern, which is face fatness, such as: chubby cheeks, double chin, and neck rolls (Madsen, Bohner, & Feusner, 2013).

Taking everything into account, although the above tools may be useful in some aspects of research, there is

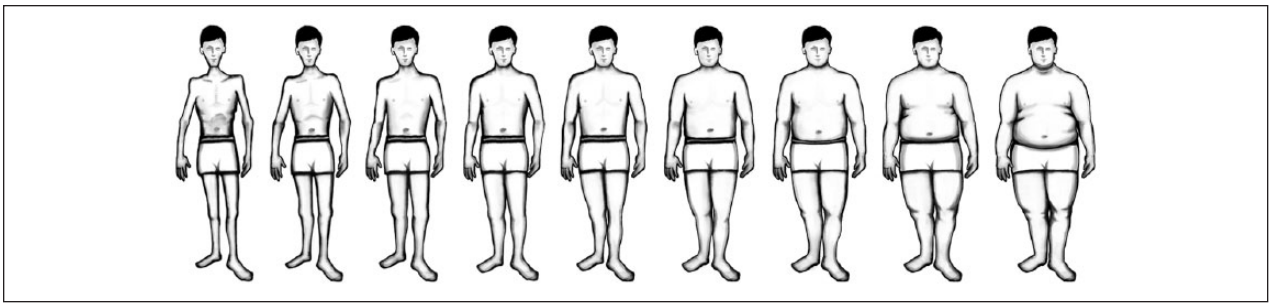

Figure 1. Male Body Scale.

still the need for new, brief, straightforward, holistic, visual, incrementally increasing male-specific body dissatisfaction measures which separately assess the muscularity-, and adipose-dimensions of body dissatisfaction. Unlike self-report questionnaires, figure rating scales are not heavily reliant on the literacy level of the participant, and also provide a more homologous measure with the participants' perception of their physical appearance. Quick and accurate detection of the two distinct male-related dimensions of body dissatisfaction, (fat- and muscularity-related), which significantly correspond to eating disorder level and/or drive for muscularity, would also provide important information to complement other collected self-reported information.

In response to this need, the new *Male Body Scale* (MBS; depicting a series of nine male bodies ranging from emaciated to obese) and *Male Fit Body Scale* (MFBS; depicting a series of nine male bodies ranging from emaciated, lean, to very muscular) were developed. These two image-based tools reduce the effect of wording in identifying male body dissatisfaction, and provide standardized measures for two contrasting assessments of holistic male body dissatisfaction. This allows the researcher or practitioner to identify whether the majority of male body dissatisfaction is toward the thin-ideal, lean-ideal, or muscular-ideal trend. These measures may be used together, or separately, in order to rapidly identify more specific aspects of male body dissatisfaction, and to answer different questions related to male body satisfaction.

The main aim of the current study is to test and retest these two new male body dissatisfaction scales. Each scale was compared to the SFRS, as even though issues have been noted with this scale, it is still the thinness-related figure scale which has been the most widely used since the early 80s. Each scale was also compared to the published test–retest Somatomorphic Matrix results, which is the most commonly used index for measuring both adipose- and muscularity-related body dissatisfaction. In contrast to most scales, which use self-reported body weight and height, construct validity was assessed in relation to participants' actual body measurements (i.e., their body mass index), and actual body composition (i.e., fat- and muscularity-percentage). Both scales were assessed compared to participants' drive for muscularity (as measured by the Drive for Muscularity Scale; DMS), and eating disorder tendency (as assessed by the Eating Disorder Examination Questionnaire; EDE-Q 6.0). The aim was to assess whether the new scales are valid, reliable, and subjectively representative of males' current and ideal body physique, from which their two independent levels of body dissatisfaction (i.e., adiposity and muscularity) may be quickly assessed.

Method

Participants

This study was approved by the School of Psychology Ethics Review Board at the University of Nottingham. A local community sample of 103 native English-speaking males received a small inconvenience allowance for participating. Ages ranged from 18 to 50 years (M = 21.35, SD = 4.15), actual body mass index (BMI = kg/m^2) ranged from 15.60 (underweight) to 40.80 (obese; M = 24.43, SD = 4.50), actual body fat percentage ranged from 2.00% (essential fat) to 31.00% (obese; M = 12.74%, SD = 6.12), and actual body muscle percentage ranged from 35.10% to 50.80% (M = 44.43%, SD = 2.99).

Scale Development

The *Male Body Scale* and the *Male Fit Body Scale* were developed with help from a professional artist/graphic designer. First, the professional artist/graphic designer modeled the most emaciated, most obese and most muscular figures (figures 1 and 9 in each scale) from photographs of anorexic, obese, and weight-lifting males. The professional artist/graphic designer then drew graduated sizes, which increased 10% in width between each body figure, while continuing to model each increasing body figure and growth to photographs of actual males. Once the figures for each scale were precisely

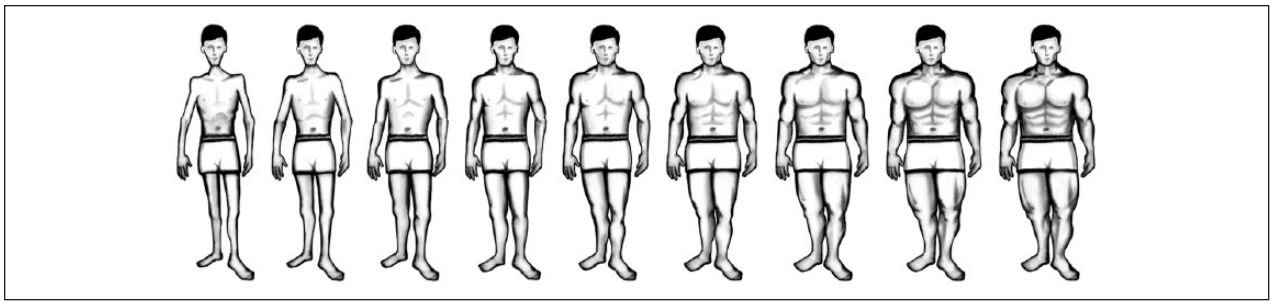

Figure 2. Male Fit Body Scale.

drawn and contoured to match actual body figures in 10% graduating width size increments, the figures were scanned into a computer, and the uniform increase between figures from most emaciated to largest figure in each scale was checked using Adobe Photoshop. By following this procedure, it was ensured that the figures accurately represent actual male body figures, which systematically increased in size across the nine different figures. The MBS was created to detect body dissatisfaction from the thin-ideal and adipose-related body dissatisfaction in males (emaciated to larger obese figures), while the MFBS was developed to detect the lean-ideal and muscle-related body dissatisfaction (emaciated to lean to larger muscular figures).

These male body figures for each scale then gave study participants the option to select their current body figure, and their ideal body figure, both in relation to their level of body fat (MBS) and their level of muscularity (MFBS) (see Figures 1 and 2).

Other Scales and Measurements

Actual body measurements. Participants were first asked to remove any heavy outer clothing layers, shoes, and socks. Actual height was measured using a Stabila 1607 Wooden Folding Rule. Body mass index was computed by measuring the actual height and weight (BMI = kg/m^2). This information, along with the gender and age, was then used to measure the actual fat percentage and muscularity percentage of each participant via an Ozeri Touch Digital Bioelectrical Impedance Analyzer. Of the 103 males, one participant's fat- and muscularity-percentage did not register.

Drive for muscularity. The DMS (McCreary & Sasse, 2000) is a validated and reliable 15-item scale for determining drive for body muscularity, in which participants answer 1–*always* to 6–*never* (reverse scored) if they desire to perform behaviors geared toward muscularity (i.e., "I lift weights to build up muscle."), and desire for more muscularity (i.e., "I wish that I were more muscular."). Although there are two "lower order factors" which are reported for males but not females (called "muscularity-related attitudes" and "muscle-enhancing behaviors"), these two factors both load onto a single, global, higher-order "drive for muscularity" factor for males (McCreary, 2007). Therefore, a single, 15 items global score is the more common overall use of the DMS, and was implemented in the current study. Of the 103 males, four participants did not receive any of the DMS items, due to a technical problem. The DMS score was reliable as Cronbach's α was .90 (N = 99), 95% CI [.87, .93], $p < .001$. Participants' DMS scores ranged from 17 (low levels of drive for muscularity) to 85 (high levels of drive for muscularity; M = 39.97, SD = 14.20).

Eating disorder tendency. The EDE-Q 6.0 (Fairburn & Beglin, 2008) is a self-report measure based on the gold standard interview measure Eating Disorder Examination Edition-D 16.0, which is often utilized by clinicians to diagnose an eating disorder. The EDE-Q 6.0 consists of a global eating disorder score made up of 23 of the items which assess eating disorder–related behaviors and attitudes from the previous 4 weeks from 0 (*not at all*) to 6 (*markedly*), on a 7-point scale. The global score is the average of the sum of the four subscale scores; restraint behavior, preoccupation and negative feelings associated with eating, fear of gaining weight or concern over one's own body shape, and negative feelings associated with one's weight. The Global EDE-Q 6.0 score Cronbach's α was reliable at .90 (N = 103), 95% CI [.87, .93], $p < .001$. Participants' scores ranged from .00 (no eating disorder tendency) to 3.79 (over the eating disorder threshold; e.g., Smith et al., 2017) out of 6.0 (see Table 1).

Procedure. After written consent was given, three body scales (the MBS and MFBS along with the SFRS, for comparison) were presented to participants on a computer screen using Qualtrics software. Participants were asked to indicate which of the nine body figures on each scale best represented their current, and then their ideal body figure on a new screen. Participants were then asked

Table 1. EDE-Q 6.0 Male Mean Scores.

Facet	Actual range	Possible range	Mean	*SD*
EDE-Q global	.00 to 3.79	.00 to 6.0	1.00	.83
WC total	.00 to 5.60	.00 to 6.0	1.14	1.12
EC total	.00 to 2.60	.00 to 6.0	.34	.54
SC total	.00 to 5.88	.00 to 6.0	1.57	1.25
RC total	.00 to 4.60	.00 to 6.0	.95	1.23

Note. WC = weight concern; EC = eating concern; SC = shape concern; RC = restraint concern; *SD* = standard deviation.

to indicate which of the three scales best represented how they currently look, and why, and also which scale best represented how they would ideally like to look, and why. Participants then completed the DMS, the EDE-Q 6.0, and lastly their actual BMI, BFP, and BMP were measured and calculated using biometric impedance analysis, taking into account age, gender, height, and weight. Participants were then debriefed, and given a list of online and community eating disorder and counseling resources, along with a small inconvenience allowance.

This Time 1 test was followed by a retest and manipulation check in Time 2, 2 to 6 weeks later, in which all of the participants were emailed a link and original code to repeat the initial portion of the experiment. Of the 103 original participants, 55 also participated in Time 2, representing a response rate of 53.40%. These participants ranged from 18 to 36 years old ($M = 21.27$, $SD = 3.55$), BMI ranged from 15.60 to 40.80 ($M = 24.74$, $SD = 4.95$), BFP ranged from 2.00% (essential fat) to 30.20% (obese; $M = 13.20\%$, $SD = 6.43$), and BMP ranged from 35.10% to 50.80% ($M = 44.35\%$, $SD = 3.16$). Independent samples *t*-tests confirmed that there were no significant differences in terms of BMI, BFP, or BMP between drop-outs and retained sample, compared on baseline scores ($ts < .81$, $ps > .42$; see Figure 3).

As a manipulation check in Time 2, the order of the nine body figures on each of the two new body scales was randomized, and participants were instructed to correctly re-order them by clicking and dragging each of the figures up or down within the program in order to arrange them from thinnest to largest in each scale separately (MBS and MFBS).

Analysis. The range and mean for each of the three body scales (MBS, MFBS, and SFRS) were calculated both in Time 1 and Time 2. Results from the manipulation check are reported in terms of percentage of correctly positioned body sizes (from 1 [*emaciated figure*] to 9 [*obese figure*]; and 1 [*emaciated figure*] to 9 [*largest muscular figure*]).

Construct validity was then determined in three ways. The degree of correspondence between participants' actual body measurements (i.e., their BMI, BFP, and BMP), and their current body rating in each of the three scales were examined. Construct validity pertaining to

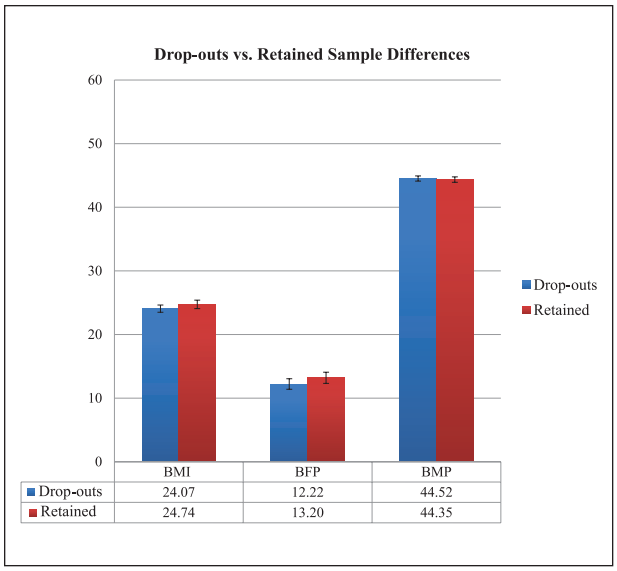

Figure 3. BMI, BFP, BMP drop-outs and retained sample differences (compared on baseline scores). BMI = body mass index; BFP = body fat percentage; BMP = body muscularity percentage. Error bars represent standard errors.

the desire for muscularity was measured by the degree of correspondence between each scale's body dissatisfaction ratings (calculated in terms of participants' ideal body figure choice minus their current body figure choice in each scale) and the DMS (McCreary & Sasse, 2000). The degree of correspondence between each participant's current and ideal body figure choice and body dissatisfaction score (ideal score minus current score) on each scale, and their eating disorder tendencies, displayed by the EDE-Q 6.0 (Fairburn & Beglin, 2008) scores was examined. The test–retest reliability over a 2- to 6-week period was measured and calculated for all initial validated items above.[1] Bonferroni correction ($p < .008$) was used for all tests to correct for multiple comparisons.

Results and Discussion

Manipulation Check

Results from the manipulation check identified that 90.50% of participants ordered every one of the nine body figures in the correct order in the MBS and 87.88% ordered every one of the nine body figures in the correct order in the MFBS overall. Therefore, the order of the increase of body size in each scale was consistent.

Current Figure Choices, Ideal Figure Choices, and Body Dissatisfaction Scores

Males in both Time 1 ($N = 103$) and Time 2 ($N = 55$) chose a larger ideal body figure when given the option of

Table 2. Descriptive Statistics for Time 1 Self-Rating Selections.

Scale	Figure choice	Actual range	Possible range	Mean	*SE*	*N*
SFRS	Current	1 to 8	1 to 9	3.60	.16	103
MBS	Current	1 to 8	1 to 9	4.09	.16	103
MFBS	Current	1 to 8	1 to 9	3.71	.14	103
SFRS	Ideal	2 to 6	1 to 9	3.72	.08	103
MBS	Ideal	2 to 6	1 to 9	3.88	.08	103
MFBS	Ideal	2 to 9	1 to 9	5.51	.16	103
SFRS	BD score	−3 to 3	−8 to 8	.12	.16	103
MBS	BD score	−3 to 3	−8 to 8	−.20	.13	103
MFBS	BD score	−2 to 6	−8 to 8	1.81	.14	103

Note. BD score = body dissatisfaction score (ideal figure minus current figure); SFRS = Stunkard Figure Rating Scale; MBS = Male Body Scale; MFBS = Male Fit Body Scale; SE = standard error.

Table 3. Descriptive Statistics for Time 2 Self-Rating Selections.

Scale	Figure choice	Actual range	Possible range	Mean	*SE*	*N*
SFRS	Current	1 to 7	1 to 9	3.85	.19	55
MBS	Current	2 to 7	1 to 9	4.31	.18	55
MFBS	Current	2 to 7	1 to 9	4.00	.16	55
SFRS	Ideal	2 to 6	1 to 9	3.73	.12	55
MBS	Ideal	2 to 6	1 to 9	4.22	.12	55
MFBS	Ideal	3 to 9	1 to 9	5.62	.21	55
SFRS	BD score	2 to 5	−8 to 8	3.65	.09	55
MBS	BD score	−3 to 2	−8 to 8	−.09	.14	55
MFBS	BD score	−1 to 5	−8 to 8	1.62	.17	55

Note. BD score = body dissatisfaction score (ideal figure minus current figure); SFRS = Stunkard Figure Rating Scale; MBS = Male Body Scale; MFBS = Male Fit Body Scale; SE = standard error.

a larger/muscular ideal choice on the MFBS, rather than larger/obese choice on the SFRS and MBS (see Tables 2 and 3). This reveals that the male body ideal is often larger/more muscular, which would not be observable if using a scale that only depicts emaciated to obese figures.

Which Scale Best Represents Current and Ideal Body Sizes Overall?

In both Time 1 and Time 2, males reported that the MFBS best represented their overall current body figure (52.40%; 49.10%), slightly more than the MBS (42.70%; 43.60%), but much more so than the SFRS (4.90%; 7.30%). Males reported that the MFBS best represented their overall ideal body figure (90.30%; 92.70%), rather than the MBS (8.70%; 5.50%) or the SFRS (1.00%; 1.80%). Paired samples *t*-tests revealed that the overall current scale preferred in Time 1 and Time 2, and the overall ideal scale preferred in Time 1 and Time 2 were not significantly different between test and retest (ts < .44, ps > .66). As expected, the overall current and ideal preferred scale were different both in Time 1 $t\,(102) = -7.94$, $p < .001$ and Time 2 $t\,(54) = -6.02$, $p < .001$. These results point to consistency in selection of the overall most representative scale for both the current and the ideal male body type, and also that approximately half of males chose the MFBS (with most of the other half choosing the MBS) as their current body scale preference, in contrast to nearly all males choosing the MFBS as their ideal body scale preference overall in both Time 1 and Time 2. The MFBS, which has a scale from emaciated to very muscular is the most representative scale for males, with the MBS also being important as the current body selection that many males identified with.

Construct Validity in Relation to Actual Body Measures

It is important to test the correspondence between the participants' perceived current body size that they indicated by choosing one of the nine figures on the three scales, and their actual size as measured. Results identified that there was a strong correlation between an individual's actual BMI, BFP, and BMP and current body size self-ratings for the total sample at both Time 1 and Time 2, on

Table 4. Time 1 and 2 Correlations Between Current Figure Body Scale Choice and Measures.

	Time 1			Time 2		
Body Scale	BMI $N = 103$	BFP $N = 102$	BMP $N = 102$	BMI $N = 55$	BFP $N = 54$	BMP $N = 54$
SFRS current figure	$r = .63$*	$r = .72$*	$r = -.60$*	$r = .67$*	$r = .76$*	$r = -.77$*
MBS current figure	$r = .63$*	$r = .75$*	$r = -.63$*	$r = .69$*	$r = .79$*	$r = -.78$*
MFBS current figure	$r = .45$*	$r = .49$*	$r = -.35$*	$r = .58$*	$r = .62$*	$r = -.54$*

Note. *$p < .001$; BMI = body mass index; BFP = body fat percentage; BMP = body muscularity percentage; SFRS = Stunkard Figure Rating Scale; MBS = Male Body Scale; MFBS = Male Fit Body Scale.

the SFRS, MBS, and MFBS (see Table 4). Specifically, males with lower BMI or lower BFP chose thinner perceived current bodies on all scales at Time 1 and Time 2, while males with higher BMP also chose thinner perceived current bodies on all scales at Time 1 and Time 2.

Construct Validity in Relation to Drive for Muscularity

Construct validity was also examined by the degree of correspondence between the DMS (McCreary & Sasse, 2000) and the ideal and body dissatisfaction score (ideal figure minus current figure) obtained on each of the three scales. Results from these bivariate correlations confirmed a significant relationship between an individual's DMS scores and ideal self-ratings for the total sample at Time 1 for ideal body figure choice with the MFBS ($r = .53$, $p < .001$, $N = 99$), but not for the MBS ($r = .21$, $p = .04$, $N = 99$), or the SFRS ($r = .20$, $p = .05$, $N = 99$). In terms of body dissatisfaction scores (ideal score minus current score), only the MFBS body dissatisfaction score had a strong significant correspondence with the DMS scores in Time 1 ($r = .41$, $p < .001$, $N = 99$), and in Time 2 ($r = .39$, $p = .003$, $N = 55$), unlike the SFRS or MBS ($rs < .14$, $ps > .16$). Therefore, these results suggest that the MFBS ideal and body dissatisfaction scores may accurately identify body dissatisfaction related to the desire for a larger, more muscular male body figure.

In support of the MFBS detecting muscularity-ideal-related body dissatisfaction in males, multiple regression was undertaken with the three scales' body dissatisfaction scores as the predictor variables, and the DMS as the dependent variable. The overall model was significant in both Time 1 ($F(3, 95) = 6.61$, $p < .001$, with an R^2 of .17, sr^2 of .17) and Time 2 ($F(3, 51) = 3.40$, $p = .025$, with an R^2 of .17, sr^2 of .17). The regression revealed that only the MFBS greater body dissatisfaction scores, in the more muscular-ideal direction, significantly predicted greater levels of drive for muscularity. This was identified by the DMS scores in both Time 1 and Time 2 for MFBS ($b = .41$, $t(95) = 4.18$, $sr^2 = .15$, $p < .001$; $b = .39$, $t(51) = 2.88$, $sr^2 = .14$, $p = .006$), unlike SFRS or MBS ($bs < .13$, $ts < .84$, $sr^2s < .01$, $ps > .40$). Tests to see if the data met the assumption of collinearity indicated that multicollinearity was not a concern (Variance inflation factors < 5) in Time 1 or Time 2 (SFRS = 2.77/1.13; MBS = 2.71/1.12; MFBS = 1.08/1.10).

Construct Validity in Relation to the EDE-Q 6.0

Construct validity was examined by the degree of correspondence between participants' ideal figure choice and body dissatisfaction score (ideal minus current figure) on each scale and their eating disorder tendencies as indicated by scores on the EDE-Q 6.0 (Fairburn & Beglin, 2008). For ideal figure choices, only the MFBS ideal figure choice was significantly (positively) correlated with the EDE-Q 6.0 Score ($r = .23$, $p = .020$, $N = 103$; $r = .49$, $p < .001$, $N = 55$), which indicated that the larger, more muscular ideal body figure that was chosen, the higher the male's eating disorder symptomology, (for the other two scales, $rs < .10$, $ps > .33$). It is important to note that although Time 1 was statistically significant, the more conservative correction for multiple comparisons Bonferroni p value ($p < .008$) was not achieved. For body dissatisfaction scores, the MBS body dissatisfaction score ($r = -.47$, $p < .001$, $N = 103$; $r = -.39$, $p = .004$, $N = 55$), as well as the SFRS score only in Time 1 ($r = -.49$, $p < .001$, $N = 103$; $r = -.01$, $p = .93$, $N = 55$), significantly negatively correlated with the EDE-Q global score in Time 1 and Time 2, but the MFBS body dissatisfaction scores did not ($r = .05$, $p = .61$, $N = 103$; $r = .22$, $p = .11$, $N = 55$). These results indicate that those males who chose thinner ideal body figures than their current body figure choice (rather than fatter ideal body figures than their perceived current body size) in both the MBS and SFRS indicated higher levels of eating disorder behavior as measured on the EDE-Q 6.0, such as "desire to lose weight" and "fear of weight."

Table 5. Test–Retest Correlations Between MFBS, MBS, and Somatomorphic Matrix (Cafri et al., 2004).

Muscularity	MFBS 2–6 weeks	Somatomorphic Matrix 7–10 days
Current	$r = .76$*	$r = .78$
Ideal	$r = .69$*	$r = .55$
Dissatisfaction	$r = .49$*	$r = .35$
Fatness	**MBS 2–6 weeks**	**Somatomorphic Matrix 7–10 days**
Current	$r = .77$*	$r = .64$
Ideal	$r = .54$*	$r = .78$
Dissatisfaction	$r = .62$*	$r = .57$
Fatness	**SFRS 2–6 weeks**	**Somatomorphic Matrix 7–10 days**
Current	$r = .69$*	$r = .64$
Ideal	$r = .48$*	$r = .78$
Dissatisfaction	$r = -.26$	$r = .57$

Note. MFBS = Male Fit Body Scale; MBS = Male Body Scale; SFRS = Stunkard Figure Rating Scale; *$p < .001$ (the p-values for Cafri et al.'s 2004 data are not known).

Further Test–Retest Reliabilities

Test–retest reliabilities for each scale were further confirmed by examining the bivariate correlations between current and ideal body size ratings, and body dissatisfaction scores between Time 1 and Time 2 (2 to 6 weeks later). Importantly, all correlations were "moderate" to "strong" for current body size, ideal body size, and body dissatisfaction scores between the Time 1 and Time 2 for the MBS, the MFBS, and the SFRS, except for SFRS body dissatisfaction scores (see left column of Table 5). Therefore, both MBS and MFBS were more reliable in assessing body dissatisfaction than the SFRS in the 2- to 6-week test–retest.

As the Somatomorphic Matrix measures both muscularity and fatness and has been proposed as a current common visual method used to assess male body image (Cafri & Thompson, 2004), the test-retest correlations of the MBS and MFBS were compared with the published Somatomorphic Matrix muscularity and body fat test–retest correlations. Although the 2 to 6 weeks period of time between the MFBS and MBS test and the retest was substantially longer than the 7- to 10-day Somatomorphic Matrix test–retest, and the MFBS dissatisfaction test–retest correlation was moderate (on the verge of strong at .49; Cohen, 1988), the overall dissatisfaction scores still exceeded the Somatomorphic Matrix's published test–retest correlations (Cafri et al., 2004) both for measuring muscularity and fatness body ratings. Table 5 compares the MFBS (muscularity), MBS (fatness), and SFRS (fatness) 2- to 6-week test–retest correlations individually to the 7- to 10-day Somatomorphic Matrix test–retest correlations.

Together, these results suggest that both new scales, the MFBS and the MBS, were more reliable than both the SFRS and Somatomorphic Matrix concerning body dissatisfaction scores, each scale assessing a distinct dimension of male body dissatisfaction (adipose and muscularity).

Conclusion

In conclusion, both the new MBS and MFBS were valid and reliable, as well as being the scales that males indicated they would choose to best represent their current and ideal body figure. Each of these scales asks different questions pertaining to male body ideals, and male body dissatisfaction. With each providing a proportionally systematically increasing figure scale, the MFBS measured the lean-ideal and muscularity-related body dissatisfaction, whereas the MBS, measured the thin-ideal and fat-related body dissatisfaction in males. Results identified that the two newly developed scales are complementary. These scales may be utilized together or separately, depending on the investigation, to make a very quick assessment of body dissatisfaction in males. While other technological or computerized measures of body dissatisfaction are currently being developed and fill a need for particular aspects of investigation, it is important to consider that in many settings there is also a need to reduce test-duration, such as in clinical assessments, where often many assessments are given at one time. Within a very brief duration of testing, these new visually based scales are able to identify and predict specific dimensions of body dissatisfaction, which is imperative according to recent male-related ED findings (Murray et al., 2017; Sturman et al., 2017). The new scales were both identified to be more reliable in the test–retest than the body dissatisfaction score correlations for the SFRS and also the Somatomorphic Matrix, even though the time gap between Time 1 and Time 2 was substantially longer for MBS and MFBS than for the Somatomorphic Matrix. As there are many more images that participants would need to choose from (100 images for Somatomorphic Matrix; 32 images for the Body Matrices, versus 18 for both MBS and MFBS scales combined), it is logical that these new assessments would be faster to assess two independent aspects of body dissatisfaction. Also, the head, and therefore body size factors important to clinical populations, such as cheek-, chin-, and neck-fat or size, were included in MBS and MFBS, unlike those scales which exclude the head (such as the Body Matrices; Frederick & Peplau, 2007).

As predicted, only the MFBS body dissatisfaction scores strongly predicted the drive for muscularity in males, as identified on the DMS, and also revealed body dissatisfaction that was not identified on the SFRS or

MBS. Of the two new scales only the MBS body dissatisfaction scores (toward the thin-ideal) displayed a strong relationship with greater levels of eating disorder tendencies identified on the EDE-Q 6.0 global scores in both Time 1 and Time 2. This may be because the majority of eating disorder tendencies which are measured on the EDE-Q 6.0 may focus more on the fear of fat and the avoidance of food and weight gain (i.e., "food avoidance," "fear of weight gain," "avoidance of eating," "desire to lose weight," "eating in secret"), detecting a drive for thinness, rather than on the drive for muscularity and desire for a larger, more muscular body. The MFBS revealed much higher body dissatisfaction than the scales with larger, obese figures (i.e., MBS or SFRS) indicated, with most males desiring to have a larger, more muscular body than their current perceived body figure, detecting a drive for muscularity. Interestingly, males who had a higher actual body-muscle percentage still perceived their body as toward the leaner/muscular body figures rather than the larger more bulky muscular body figures. Males with a higher body muscle percentage still desired to be larger and more muscular than their currently perceived body, instead of the drive for thinness or drive for leanness. These assessments, which independently measure male body dissatisfaction in two-dimensions (adipose vs. muscularity), are likely more quickly assessed and less complex than the existing measures which combine adipose and muscularity dimensions.

Some limitations include the need for scales which may appeal to more ethnically diverse populations, as well as the minor detail of the facial features (i.e., eyes, nose, lips, and hair), which are not important to the assessment of the overall body-size dissatisfaction. It is also important to note that even though the MBS and MFBS scales were identified to have more reliable body dissatisfaction scores in the test–retest correlations than the two most commonly used figure rating scales (i.e., the SFRS and the Somatomorphic Matrix), some of the correlations were moderate rather than strong. It may be that body image and dissatisfaction fluctuates quite frequently, and therefore had changed within the time that participants were assessed for the second time. More testing would need to be performed in order to determine what an appropriate or expected level of reliability should be for visual scales. Although the most commonly utilized visually and linguistically based scales were used as comparison and for construct validity for this study, with the aim of examining whether these scales may be valid and reliable, in the future the MBS and MFBS could also be directly compared with many of the various visually based scales. One such study could use eye-tracking to evaluate whether extremely detailed computerized images, the removal of the head from the body, or the lack of body-size balance in many of the current scales may promote even more hyper-detailed focus and greater processing difficulty in clinical populations compared with the overall body representation of the MBS and MFBS. The current results point to the importance of investigating male body dissatisfaction and eating disorder tendencies. This under-examined line of investigation is crucially important, since muscle dissatisfaction in males has been reported to be related to overall low levels of well-being, including: depression, life dissatisfaction, and poor self-esteem (Cafri, Strauss, & Thompson, 2002).

The current study provides evidence to suggest that both the MBS and MFBS are online, visually driven, valid and reliable measures that straightforwardly and quickly assess male body dissatisfaction more reliably than the most commonly used visual tools for males at this time (SFRS and Somatomorphic Matrix). Unlike some of the current scales, the MBS and MFBS scales were created in a way that precisely graduate in size incrementally, in a balanced and proportional manner by a professional designer (both in overall size between figures and overall size within each figure), and were developed with actual male bodies as templates. Both scales corresponded to the actual body composition of the males (i.e., BMI, fat, and muscularity percentage). In the current study, the MBS detected larger, more adipose-related body dissatisfaction (i.e., the drive for thinness), related to EDE-Q level, whereas the MFBS revealed muscularity-ideal male body dissatisfaction (i.e., the drive for muscularity) predicting their drive for muscularity level in the normal male population. Used together, these scales quickly and robustly identify thin-, lean-, and/or muscularity-ideal in males, importantly measuring distinct adipose- and muscularity-related body dissatisfaction independently.

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Note

1. Bivariate correlations were performed between difference in body dissatisfaction scores between Time 1 and Time 2 for each scale, and the number of days between Time 1 and Time 2. Results indicated that there were no significant relationships between the difference in time between Time 1 and Time 2 and the difference in body dissatisfaction score (rs < .20, ps > .15, N = 55).

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