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# Are the Male Body Dissatisfaction and Drive for Muscularity Scales reliable and valid instruments?

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## Abstract

The Drive for Muscularity Scale and Male Body Dissatisfaction Scale were developed for use with men and correspond to measures of drive for thinness and body dissatisfaction in women. The psychometric properties of these measures were evaluated in a sample of 655 Italian men, who completed other 11 measures also. Both scales demonstrated excellent internal consistency and temporal stability as well as criterion-related and concurrent validity. Both measures distinguished between men with high and low levels of disordered eating. Confirmatory factor analysis replicated the unidimensional factor structure of both scales. Directions for future research are discussed.

## Keywords

eating behavior, exercise and supplement consumption, male body image, men's health, validation

Historically, empirical research exploring body image concerns and their antecedents and consequences has primarily focused on females and their desire to control body weight and shape (Blashill, 2011; Calogero, 2009; Grogan, 2006; Liimakka, 2013). This focus reinforces society's erroneous belief that body and eating-related disorders are a "woman's" issue (Dakanalis et al., 2012; Strother et al., 2012) as men also have negative thoughts and feelings about their body and particular body sites (Dakanalis and Riva, 2013; McCabe et al., 2012; Penelo et al., 2012). As in women, body dissatisfaction in men usually involves a perceived discrepancy between their evaluation of their current body and their ideal body and is a risk factor for the behavioral symptomatology

of eating disorders in an attempt to modify one's appearance (Grogan, 2006; Penelo et al., 2012; Stanford and Lemberg, 2012). Indeed, according to meta-analytic data, body dissatisfaction is the most consistent and robust causal risk and maintenance factor of clinical or

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subclinical eating disordered behaviors in both genders (Blashill, 2011; Stice, 2002).

Although men are also under pressure to achieve the “perfect body,” men differ qualitatively from women in their perceptions of what an ideal body shape is and what their specific body areas of concern are (Dakanalis and Riva, 2013; Frederick et al., 2007; Yanover and Thompson, 2010). Visual media present a largely unattainable body ideal characterized by an extremely muscular v-shaped torso with well-developed upper body, flat stomach and narrow hips (Dakanalis et al., 2012)—a shape that is equivalent to the unattainable female thin ideal perpetuated by Barbie dolls (Olivardia et al., 2004). Whereas researchers have found that adult women and adolescent girls typically want to become thinner and are focused on losing body fat from the waist-down (Blashill, 2011; Mak et al., 2013; Penelo et al., 2012), men and boys idealize a body size on average 28 pounds more muscular than their current body, desire a shape marked by muscularity, and focus on gaining muscle from the waist-up (Chittester and Hausenblas, 2009; McCabe et al., 2011; Penelo et al., 2012; Pope et al., 2000). In women, the desire to lose weight and be thinner is generally referred to as “drive for thinness” and is most commonly measured with the drive for thinness scale of the Eating Disorder Inventory (EDI; Garner, 1991, 2004). In men, the desire to enhance one’s musculature is referred to as “drive for muscularity” (Dakanalis and Riva, 2013; McCreary et al., 2007). Both drive for thinness and drive for muscularity are considered to be distinct from, albeit related to, body dissatisfaction (Bergeron and Tylka, 2007; Garner, 2004).

In men, dissatisfaction with overall muscle size (in particular with the upper body) is moderately correlated with drive for muscularity, which is strongly associated with a number of potentially adverse outcomes, including disordered eating and other behavioral strategies (e.g. over-exercise and the use of anabolic-androgenic steroids and related performance-enhancing substances) to gain muscle mass and

reduce any body fat that can hide muscularity (Bergeron and Tylka, 2007; Chittester and Hausenblas, 2009; McCreary et al., 2007; Olivardia et al., 2004; Shomaker and Furman, 2010; Tod et al., 2012). The desire to increase muscularity is theorized to be a precursor to the development of reverse anorexia or muscle dysmorphia (McCreary et al., 2007; Pope et al., 2000), a psychiatric condition which, since its inception, has been closely linked to eating disorders (see Dakanalis and Riva, 2013).

Despite the increased focus on men’s body image, very few instruments measuring body image concerns have been specifically developed for males or have been standardized and validated using samples of men and adolescent boys (Ochner et al., 2009; Penelo et al., 2012; Stanford and Lemberg, 2012). As the majority of available instruments focus on women and capture a desire to conform to the feminine body shape ideal, their use may lead to invalid or inaccurate assessment of male body concerns in both clinical and nonclinical contexts (Blashill, 2011; Cafri and Thompson, 2004; Dakanalis and Riva, 2013). Indeed, studies comparing men and women using the EDI-2 or EDI-3 (Garner, 1991, 2004) have consistently resulted in lower reliability in men than women. Furthermore, women and men differ significantly on the body dissatisfaction and drive for thinness scales of this inventory (e.g. Martin et al., 2012; Stanford and Lemberg, 2012). These differences are not surprising as the items of these scales were tailored to assess discontentment with weight, overall shape and body parts from the waist-down, and fear of gaining weight and desire to be thinner (Stanford and Lemberg, 2012). In order to be appropriate for men, body image assessment tools must contain several items that address attitudes toward muscularity as well as items exploring attitudes toward upper body parts (Cafri and Thompson, 2004). Based on these criteria, instruments such as the Yelland and Tiggemann’s Drive for Muscularity Scale (YT-DMS; Yelland and Tiggemann, 2003) and the Male Body Dissatisfaction Scale (MBDS; Hallsworth et al., 2005) may be useful

for evaluating men's drive for muscularity and body dissatisfaction, respectively (Dakanalis and Riva, 2013; Tod et al., 2012).

Although the YT-DMS and the MBDS were designed to match the EDI's drive for thinness and body dissatisfaction scale items (Garner, 1991), respectively, their development did not appear to follow standard scale development. Specifically, the authors did not create a large pool of items that was subsequently reduced via factor analysis, nor was their criterion-related, convergent, and divergent validity assessed (Kaplan and Saccuzzo, 2012). Rather, in developing both measures, the authors modified items of the original EDI in order to enhance the sensitivity of indexing male concerns and desire to increase muscularity. Research employing these measures in Australian and British men (Hallsworth et al., 2005; Martins et al., 2007; Tod et al., 2012; Yelland and Tiggemann, 2003) indicated that both had high internal consistency ( $\alpha > .86$ ); furthermore, young adult men and male bodybuilders obtained higher YT-DMS' and MBDS' scores than young adult women and psychology college men, respectively. However, the dimensionality structure and temporal stability of both scales were not evaluated. Although the differences described above provide initial support of the MBDS' and YT-DMS' construct validity, examining how they converge with, and discriminate from, other psychological measures will contribute to further knowledge about their construct validity (Kaplan and Saccuzzo, 2012).

The goal of this study was to evaluate the psychometric proprieties of the YT-DMS and MBDS in Italian male population. National data indicate that approximately half of Italian boys and young adult men are highly body-dissatisfied and desire to have a more muscular body (ISS, 2005). Therefore, the translation of YT-DMS and MBDS into Italian and evaluation of their psychometric proprieties offers the opportunity to study their construct validity in a Western/Mediterranean non-English country, where the body cult surrounding the muscular

ideal is deeply imbedded in the culture (Santaracchi and Dèttore, 2012). Translation and validation of these measures will facilitate further research on the antecedents and consequences of male body image in Italy, largely known for its fashion industry and "obsession" with the perfect body and aesthetic values (Dakanalis et al., in press-b).

The specific objectives of this study were threefold: (a) to evaluate the unexplored factor of the YT-DMS and MBDS scales; (b) to present data on the internal consistency and test-retest reliability of the derived scores; (c) to examine their criterion-related, concurrent, and discriminant validity. Criterion-related validity was investigated by examining the association between scores on YT-DMS and other psychometrically sound indicators of the desire to increase body size and between scores on MBDS and other measures of dissatisfaction with overall muscle size and the upper body (Kaplan and Saccuzzo, 2012). In accordance with prior research mentioned above and with the concept that a negative view of oneself is a major component of body dissatisfaction and can lead to attempts to control body shape (i.e. disordered eating and muscle-oriented behaviors) in order to achieve a sense of self-worth (Bergeron and Tylka, 2007; Chittester and Hausenblas, 2009; McCreary et al., 2007; Olivardia et al., 2004; Pope et al., 2000; Stice, 2002), we expected that (a) scores on both scales would be related to self-esteem, internalization of sociocultural standards of attractiveness, and eating disorder symptomatology; and (b) YT-DMS scores would be associated with behavioral activities geared toward achieving or maintaining a muscular appearance (i.e. training frequency, fat-burning, and muscle-building supplement consumption). These relationships, if observed, would support the concurrent validity of the measures.

In order to examine the discriminant validity of the YT-DMS and MBDS, we examined the differences in scores on the YT-DMS and MBDS between males with elevated scores ( $\geq 20$ ) and those with non-elevated scores on the

Eating Attitudes Test–26 (Dotti and Lazzari, 1998). It was expected that men with elevated scores on the Eating Attitudes Test would have greater drive for muscularity and body dissatisfaction than those with lower scores on the Eating Attitudes Test. Finally, additional divergent validity of the scales would be demonstrated by non-significant associations between YT-DMS and MBDS and dispositional positive and negative affectivity. Dispositional affectivity reflects the extent to which a person feels negative or positive emotions across time and situations; these are two orthogonal constructs that represent distinct affective systems (Terracciano et al., 2003) and are not theoretically related to discrepancy between the current and ideal body and pursuit of muscularity (Ochner et al., 2009; Santarneckchi and Dèttore, 2012).

## Method

### *Participants and procedures*

Male volunteers from Northern, Central, and Southern Italy were recruited (between December 2011 and June 2012) to participate in an anonymous study on feelings, attitudes, and behaviors concerning physical appearance. The sample was composed of 667 Italian men with a mean age of 25.8 years (standard deviation (*SD*) = 9.3 years, range = 13–55 years). Adolescents ( $n = 179$ ) were included in the analyses to widen range of ages. Most participants were heterosexual (94%) and unmarried (70% single). Approximately half of the sample (46.1%) was from North Italy, whereas 28.3% and 25.6% of participants were from Central and South Italy, respectively. Of the 667 participants, 64.9% were students and 30.4% were employed full- or part-time. Body mass index (BMI,  $\text{kg}/\text{m}^2$ ) was calculated using self-reported weight and height ( $M = 22.94$ ,  $SD = 7.98$ ).

Participants were recruited via announcements posted in several locations (i.e. school, university, places of work, and entertainment). The research announcements directed interested

participants to a web page that provided details regarding informed consent and efforts taken to ensure anonymity. No particular inclusion/exclusion criteria for participation were used and no incentives were offered. After indicating their consent, participants were immediately redirected to the survey web page, where the study measures<sup>1</sup> were hosted. All measures were counterbalanced in an attempt to offset possible ordering effects and formatted so that participants could not skip individual items. Following Dakanalis et al.'s (in press-a) recommendations, a validity question was integrated into each of the measures in the survey to control for careless responding and/or inattentiveness; each validity question instructed participants to choose a certain response. In all, 12 participants answered at least one validity item incorrectly and were excluded from the analyses. In order to ensure there were no duplicate responses, the IP address of every participant was checked; no duplicate data were detected. After these procedures, data from 655 men and boys were analyzed. The study was approved by the Institutional Review Board affiliated with the first author's university.

### *Instruments*

The YT-DMS was developed as a parallel to the drive for thinness scale of EDI-2 (Yelland and Tiggemann, 2003); each of the 7 items focuses on the pursuit of muscularity rather than of thinness. The MBDS (Hallsworth et al., 2005) consists of 9 items adapted to assess male body concerns: the body dissatisfaction items of EDI-2 were reversed in polarity, and references to body parts were adapted to incorporate the upper body in order to enhance the sensitivity of indexing male concerns. The items of both scales are rated on a 6-point Likert scale (1 = *always*, 6 = *never*) and are presented in Table 1. Higher YT-DMS and MBDS scores reflect a stronger drive for muscularity and higher body dissatisfaction, respectively. The original versions of both YT-DMS and MBDS were initially translated from English to Italian by two

**Table 1.** Inter-item correlations and factor loadings.

Items of the YT-DMS	C	FL	Items of the MBDS	C	FL
If I lose any muscle tone, I worry that I'll continue to become less muscular	.70	.86	I think my chest is just the right size	.72	.90
I am terrified of looking like I am not strong	.76	.90	I think my thighs are just the right size	.74	.71
I am preoccupied with the desire to be more muscular	.81	.97	I like the shape of my buttocks	.65	.69
I think about building up my muscles	.80	.88	I think my stomach is just the right size	.69	.84
I feel guilty if I don't work out	.85	.84	I think my chest is too small	.85	.94
I exaggerate or magnify the importance of muscles	.79	.95	I feel satisfied with the shape of my body	.77	.86
I lift weights to become more muscular	.66	.78	I think my biceps are just the right size	.86	.91
			I think my thighs are too small	.78	.75
			I think that my biceps are too small	.84	.88

C: item-total correlation; FL: factor loadings; MBDS: Male Body Dissatisfaction Scale (Hallsworth et al., 2005); YT-DMS: Yelland and Tiggemann's Drive for Muscularity Scale.

native speakers with experience in conducting translations for health surveys and then independently back-translated to ensure accuracy (Van de Vijver and Hambleton, 1996). No discrepancies in translation were observed.<sup>2</sup>

The 5-item Desire for Size subscale of the Italian version of the Muscle Dysmorphia Disorder Inventory (Santarnecchi and Dèttore, 2012) assesses the desire to increase muscularity (e.g. "I wish to be more muscular"). Participants respond to items using a 5-point Likert-type scale ranging from 1 (*never*) to 5 (*always*), with higher scores indicating a stronger drive.

The Body Uneasiness Test (Cuzzolaro et al., 2006) is an Italian multidimensional questionnaire for the clinical assessment of body uneasiness. In this study, the 15-item Upper Body subscale was used to assess intensity of dissatisfaction with upper body parts. Participants were rated on a 6-point scale (ranging from 0 (*never*) to 5 (*always*)), the extent to which they feel dissatisfied with a particular part of the upper body (i.e. arms), with higher scores indicating higher dissatisfaction.

The Muscle Silhouette Measure is a pictorial scale assessing perceptions of overall muscle body size/shape (Frederick et al., 2007). It consists of eight male images ranging from a slender—no musculature—to a very muscular individual, with scores ranging from 10 (slender—no musculature) to 80 (very muscular). Participants chose two figures: one that they believe matches their current size and one that matches their ideal size. The difference between the ratings is called the "self-ideal discrepancy score" and has been validated as a measure of muscle dissatisfaction (see Dakanalis and Riva, 2013). It has demonstrated good reliability in previous research with Italian male samples (Dakanalis and Riva, 2013).

The 9-item General Internalization and the 5-item Athletic Internalization Scales of the Italian male version of the Sociocultural Attitudes Toward Appearance Scale-3 (Nerini et al., 2011) were used to assess internalization of sociocultural standards of beauty, as these components are viewed as critical in defining internalization of media ideals among men

(Dakanalis and Riva, 2013). Their items (rated on a 5-point scale ranging from 1 (*definitely disagree*) to 5 (*definitely agree*)) assess the endorsement and acceptance of the norms for body shape and the degree to which men desire and strive to achieve the bodies of athletes portrayed in the media (e.g. "I would like my body to look like the people who are on TV" and "I wished I looked as athletic as sports stars"), respectively.

The Italian version of the Eating Attitudes Test-26 (Dotti and Lazzari, 1998) contains 26 items that assess characteristics and symptoms of eating disorders and has been validated as both a dimensional and categorical measure. Individuals who score 20 or higher on this measure are considered to be at risk of or likely to have clinical levels of eating disorder symptoms. Participants indicate the extent to which they endorse each item along a 6-point scale that ranges from 1 (*never*) to (*always*), with higher scores reflective of more severe symptomatology (e.g. "Particularly avoid food with a high carbohydrate content" and "Have gone on eating binges where I feel I may not be able to stop"). Consistent with scoring criteria, the choices ("often," "usually," and "always") were recoded as 1, 2, and 3, whereas the remaining three choices were recoded as 0. Within the sample ( $N = 655$ ), 5.2% of men ( $n = 34$ ) scored 20 or above.

The Italian version of Rosenberg Self-Esteem Scale (Prezza et al., 1997) is a reliable and valid self-report measure of global self-esteem. It consists of 10 items (e.g. "I feel that I'm a person of worth, at least on an equal plane with others") rated on a 4-point scale ranging from 1 (*strongly agree*) to 4 (*strongly disagree*), with higher scores indicating higher self-esteem.

The Italian version of the Positive and Negative Affect Schedule (Terracciano et al., 2003) consists of two 10-item scales, one to assess dispositional negative affectivity and the other to assess dispositional positive affectivity. These scales contain terms such as "afraid," "guilty," "hostile," "enthusiastic," "energetic,"

and "active." The participants were asked to "indicate to what extent you generally feel this way, that is, how you feel on the average," with reference to a 5-point scale (1 = *not at all*, 5 = *very much*), possible scores on each scale range from 10 to 50.

A total of 6 items were used to assess participants' fat-burning and muscle-building supplement consumption to reduce body fat and to increase muscularity (e.g. "I take supplements such as protein and amino acids, etc. for the purpose of building muscle mass"). Regarding training frequency, 2 items were used to assess the frequency of training to reduce body fat and to increase muscle mass. All items are rated on a 6-point scale, ranging from 0 (*never*) to 5 (*always*) with higher scores denoting more frequent training and supplement consumption. Previous research using these measures indicated that both were significantly associated with drive for muscularity (Morrison and Morrison, 2006; Tod et al., 2012).

Cronbach's  $\alpha$  for each scale or subscale used in this study was estimated and is reported in Table 2.

### Data analysis

To evaluate the dimensional structure of the YT-DMS and MBDS by means of cross-validation, the total sample was randomly divided into two subsamples (Kaplan and Saccuzzo, 2012). Given that the structure of both scales was unexplored in prior research and the novel sample, an exploratory factor analysis was first conducted on the first subsample ( $n = 327$ ). The suitability of the data for this analysis was assessed using the Kaiser-Meyer-Olkin measure of sampling adequacy and Bartlett's test of sphericity. Following Costello and Osborne's (2005) recommendations, principal axis factoring was used, with parallel analysis in conjunction with the scree plot assisting in factor retention. If multiple factors emerged, we used oblimin rotation as factors were likely to be correlated (Morrison and Morrison, 2006). Only items with factor

**Table 2.** Descriptive statistics and correlations for men ( $N = 655$ ).

Measure	<i>M</i>	<i>SD</i>	Minimum– maximum	$\alpha$	Correlation with MBDS	Correlation with YT-DMS
MBDS	28.05	16.04	14–51	.92	–	.39*
YT-DMS	21.33	12.78	11–40	.93	.39*	–
DFS-MDDI	11.61	5.56	6–22	.90	.35*	.67*
UB-BUT	36.86	17.17	17–58	.91	.66*	.37*
MSM	38.90	12.56	15–70	–	.69*	.38*
GI/SATAQ3	19.87	9.63	13–39	.87	.53*	.50*
AI/SATAQ3	14.19	8.89	6–23	.90	.49*	.51*
EAT-26	14.76	7.90	0–33	.93	.59*	.52*
RSES	28.92	10.44	10–32	.89	–.44*	–.40*
TF	4.41	1.56	1–9	.82	.14	.57*
SC	10.89	4.32	1–22	.84	.13	.59*
PAS	27.27	14.44	10–44	.90	–.12	–.10
NAS	28.04	15.11	9–41	.91	.11	.09

MBDS: Male Body Dissatisfaction Scale; YT-DMS: Yelland and Tiggemann's Drive for Muscularity Scale; DFS-MDDI: Desire For Size subscale of the Muscle Dysmorphia Disorder Inventory; UB-BUT: Upper Body subscale of Body Uneasiness Test; MSM: Muscle Silhouette Measure; GI/SATAQ3: General Internalization scale of the male version of the Sociocultural Attitudes Toward Appearance Scale–3; AI/SATAQ3: Athletic Internalization scale of the male version of the Sociocultural Attitudes Toward Appearance Scale–3; EAT-26: Eating Attitudes Test–26; RSES: Rosenberg Self-Esteem Scale; TF: training frequency; SC: fat-burning and muscle-building supplement consumption; PAS, NAS: Positive Affectivity and Negative Affectivity scales of the Positive and Negative Affect Schedule.

\* $p < .004$ .

loading  $> .32$  and no cross-loadings were interpreted (Tabachnick and Fidell, 2007). Then a confirmatory factor analysis was performed on the second subsample ( $n = 328$ ) using the Mplus 6.1 program (Muthén and Muthén, 2010). Criteria for good model fit were as follows: comparative fit index (CFI) and Tucker–Lewis index (TLI) values  $\geq .95$ , standardized root mean square residual (SRMR) values  $\leq .08$ , and root mean square error of approximation (RMSEA) values  $\leq .06$  (Hu and Bentler, 1999).

Internal consistency reliability was assessed using Cronbach's  $\alpha$  coefficient. Pearson's product–moment correlation was used to determine the 1-month test–retest reliability of both scales ( $M_{\text{days}} = 31.4$ ,  $SD = 6.6$ , range = 22–39) with a subset of 125 participants<sup>3</sup> from the initial sample ( $N = 655$ ).

Bivariate correlations were utilized to examine the criterion-related, concurrent, and discriminant validity of the scales through comparison

with the measures of upper body and muscle dissatisfaction, desire for an increased size, eating disorder symptomatology, self-esteem, internalization of the general and athletic ideals, training frequency, fat-burning and muscle-building supplement consumption, and dispositional positive and negative affectivity. Correlations of .20, .40, and .60 were respectively considered small, moderate, and large (Tabachnick and Fidell, 2007). Given the number of correlations,  $p$ -values were subjected to the Bonferroni adjustment to control for experiment-wise error; therefore, an initial  $\alpha$  of .05 was divided by the number of measures (i.e.  $.05/13 = .004$ ).

Finally, an independent samples  $t$ -test was used to examine differences in scores on the YT-DMS and MBDS between males ( $\geq 20$ ) and men with non-elevated scores ( $< 20$ ) on the Eating Attitudes Test–26 (Dotti and Lazzari, 1998).



## Results

### *Dimensionality, internal consistency, and test–retest reliability*

Kaiser–Meyer–Olkin measure of sampling adequacy (.90) and Bartlett’s test of sphericity ( $p < .001$ ) revealed that the data were suitable for an exploratory factor analysis (Tabachnick and Fidell, 2007) conducted with the first randomly extracted subsample ( $n = 327$ ). An initial analysis was performed to obtain eigenvalues; one factor with eigenvalues  $> 1$  was identified for both the YT-DMS and the MBDS, explaining 72.4% and 69.9% of the variance, respectively. In both cases, the one-factor solution was confirmed by parallel analysis and visual inspection of the scree plot. All factor loadings were  $> .32$  (Tabachnick and Fidell, 2007), and the inter-item correlations are within Costello and Osborne’s (2005) recommended range of .30–.90. Inter-item correlations and factor loadings of each scale are presented in Table 1.

The model obtained in the explanatory factor analysis was validated using the second subsample of participants<sup>4</sup> ( $n = 328$ ). For the 7-item YT-DMS, a one-factor model fit the sample very well (CFI = .98, TLI = .97, SRMR = .05, RMSEA = .04). Each item was associated with a large and statistically significant factor loading (all  $ps < .001$ ) ranging from .85 to .96. For the 9-item MBDS, a one-factor model fit the data of the sample very well (CFI = .96, TLI = .96, SRMR = .06, RMSEA = .05), with each item showing a strong factor loading (all  $ps < .001$ ); the loadings ranged from .81 to .93. These results confirm the unidimensional structure of both scales. As shown in Table 1, both scales demonstrated excellent internal consistency. The MBDS and the YT-DMS also demonstrated very good 1-month test–retest reliability:  $r = .88$  and  $r = .89$ .

### *Validity*

The means, SDs, and correlations of the YT-DMS and MBDS with each variable are

presented in Table 2. The MBDS score was strongly related to upper body and muscle dissatisfaction, and the YT-DMS was strongly related to desire for an increase in size, thus providing evidence for criterion-related validity of the YT-DMS and MBDS. The YT-DMS and MBDS scores were moderately related to self-esteem, both general and athletic internalization, and eating disorder symptomatology. Although the YT-DMS and MBDS were significantly correlated, only the YT-DMS score was strongly related to training frequency and supplement consumption, thus providing evidence for concurrent validity of the YT-DMS and the MBDS.

Both YT-DMS and MBDS scales were not significantly associated with measures of dispositional positive and negative affectivity. Moreover, scores on the YT-DMS were significantly higher ( $M = 27.9$ ,  $SD = 13.2$ ) in men with elevated scores on the Eating Attitudes Test–26 than in those with lower scores ( $M = 17.2$ ,  $SD = 12.5$ ;  $t(654) = 4.85$ ,  $p < .001$ , Cohen’s  $d = .83$ ). Similarly, scores on the MBDS were also significantly higher ( $M = 38.1$ ,  $SD = 17.2$ ) for men with elevated scores on the Eating Attitudes Test–26 compared to men with lower scores ( $M = 24.9$ ,  $SD = 12.9$ ;  $t(654) = 5.69$ ,  $p < .001$ , Cohen’s  $d = .86$ ), thus providing additional evidence for discriminant validity of the YT-DMS and MBDS.

## Discussion

Despite the documented qualitative gender differences in the perceptions of overall ideal body shape and specific body areas of concern (e.g. Bergeron and Tylka, 2007; Blashill, 2011; Dakanalis and Riva, 2013; Yanover and Thompson, 2010), the majority of available instruments have been specifically developed for women and are not valid for men (Cafri and Thompson, 2004; Dakanalis and Riva, 2013). Until more attention is paid to the accurate assessment of male body experiences through psychometrically sound instruments, men will continue to be misunderstood, underdiagnosed,

and undertreated (Stanford and Lemberg, 2012; Strother et al., 2012).

The purpose of this study was to examine the factor structure, reliability, and validity of the YT-DMS (Yelland and Tiggemann, 2003) and MBDS (Hallsworth et al., 2005) in Italian men. Both measures were designed to match the drive for thinness and body dissatisfaction scales of the EDI-2 (Garner, 1991) and meet the criteria outlined by Cafri and Thompson (2004) for adequate male body image instruments.

Our results indicated that both scales have a stable unidimensional factor with high test-retest reliability and internal consistency. Regarding concurrent validity, the pattern of results generally revealed that scores on both scales correlated, as expected, negatively with self-esteem, positively with general and athletic internalization, and positively with eating disorder symptomatology. Results, therefore, support the scales' ability to assess male body image and pursuit of muscularity. The pattern of their relationships to other well-established measures of similar constructs supports the hypothesis that endorsement of the norms for body shape portrayed in the media and poor self-esteem are related to male body dissatisfaction and pursuit of muscularity. The latter are, in turn, strongly associated with maladaptive eating behaviors (e.g. Blashill, 2011; Dakanalis et al., 2012; Olivardia et al., 2004; Penelo et al., 2012). It is important to note that the pattern of these relationships is characteristic of men living in cultures where the male body shape ideal is highly associated with muscularity, since some ethnic groups prefer larger body sizes (Barroso et al., 2010; McCabe et al., 2012).

The results also supported the discriminant validity of the YT-DMS and MBDS, as non-significant relationships were found between both scales and measures of dispositional negative (i.e. hostility, guilt, and fear) and positive (i.e. energy and enthusiasm) affectivity (e.g. Ochner et al., 2009). The significant difference between men with and without clinically significant scores on the Eating Attitudes Test-26 on both scales provides further evidence for

their discriminant validity. Finally, the low correlation between YT-DMS and MBDS scores combined with the significant associations between the YT-DMS score and behaviors geared toward increasing muscularity (i.e. training frequency and supplement consumption) suggests that men's body dissatisfaction and drive for muscularity are two distinct, albeit related, constructs (Bergeron and Tylka, 2007; Shomaker and Furman, 2010). Clinicians and researchers could administer both scales in order to obtain a more comprehensive description of male body image (Dakanalis and Riva, 2013).

Collectively, our results support the factor structure, internal consistency, temporal stability, and validity of the YT-DMS and MBDS in an Italian male sample. Our findings provide additional evidence for the reliability and construct validity of both scales (Hallsworth et al., 2005; Martins et al., 2007; Tod et al., 2012; Yelland and Tiggemann, 2003)—an essential step needed to meet the assumptions of many statistical designs used to examine antecedents and consequences of male body disturbance. Validation of these measures is a key step in research designed to develop and evaluate effective preventive strategies (Dakanalis and Riva, 2013; Penelo et al., 2012).

There are limitations to this study that are important to acknowledge. The psychometric properties of the Italian versions of both scales were examined by using a convenience sample consisting primarily of young adult men. Future research needs to determine whether both measures are reliable and valid with other samples of men (i.e. pre-adolescent boys, male athletes, and men in outpatient and inpatient eating disorder or muscle dysmorphia programs) and across sexual minorities and ethnic groups, since there is evidence of sexual orientation and ethnic differences in body image attitudes and behaviors (Barroso et al., 2010; Dakanalis et al., 2012). Future research should also compare men's scores on the drive for thinness and body dissatisfaction scales of the EDI to their scores on the YT-DMS and MBDS in order to further

substantiate the appropriateness of the latter measures. If future research continues to reveal that the YT-DMS and MBDS are high-quality tools, then these can be valuable screening tools for assessing and identifying males at risk of developing an eating disorder or muscle dysmorphia as dissatisfaction and preoccupation with enhancing musculature are the core constructs of both conditions in men (see Dakanalis and Riva, 2013; Stanford and Lemberg, 2012). Research employing these measures in clinical samples is, therefore, essential. Specifically, the YT-DMS and MBDS should be evaluated for predictive validity in terms of the development and maintenance of muscle dysmorphic symptoms and eating disturbances. Future research should also establish whether these measures are sensitive to change over the course of treatment.

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### Notes

1. Research indicates that presentation format of self-report questionnaires (paper-and-pencil vs online) does not change the quality of results (e.g. Epstein et al., 2001).
2. The Italian translation of both scales (i.e. Yelland and Tiggemann's Drive for Muscularity Scale (YT-DMS) and Male Body Dissatisfaction Scale (MBDS)) is available from the authors upon request.
3. A subset of 135 participants ( $M_{\text{age}} = 24.4$ ,  $SD = 8.4$ ) randomly selected from the total sample ( $N = 655$ ,  $M_{\text{age}} = 25.8$ ,  $SD = 9.3$ ) was contacted via email to complete the YT-DMS and MBDS online again 1 month later (Time 2). Age ( $t = 1.61$ ,  $p > .05$ ) did not differ across samples. Of the initial 135 participants, data were obtained for 92.5% at T2. However, attrition analyses indicated that participants who were missing data at Time 2 ( $n = 10$ ) did not differ significantly from the remaining 125 participants on demographic factors or any of the study's variables.
4. The confirmatory factor analysis tested the one-factor model where 7 YT-DMS items and 9 MBDS items were loaded on drive for muscularity and male body dissatisfaction factors, respectively.

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