2020

Male figural rating scales: A critical review of the literature

Daniel Talbot
The University of Notre Dame Australia, daniel.talbot@nd.edu.au

John Cass

Evelyn Smith

This article was originally published as:
Talbot, D., Cass, J., & Smith, E. (2020). Male figural rating scales: A critical review of the literature. *Behaviour Change, Early View Online First*.

Original article available here:
10.1017/bec.2020.5

Talbot, D., Cass, J., and Smith, E. (2020) Male figural rating scales: A critical review of the literature. *Behaviour Change*, *Online First*. doi: 10.1017/bec.2020.5

This article was published in *Behaviour Change*, 17 April, 2020.

Published version available online at: -

https://doi.org/10.1017/bec.2020.5

Background

Body dissatisfaction is typically conceptualized as a female-centric issue, with male presentations inaccurately represented as atypical and rare (Murray et al., 2017). Contrary to this representation, research has shown consistently that body dissatisfaction in male populations is highly prevalent and increasing (del Mar Bibiloni, Coll, Pich, Pons, & Tur, 2017; Frederick et al., 2007; Murray et al., 2017; Watkins, Christie, & Chally, 2008). Body dissatisfaction can be defined as a negative subjective evaluation of one's body as a whole, or relating to specific aspects of one's body such as body size, shape, muscularity/muscle tone, and weight (Grogan, 2016). Prior research has found that body dissatisfaction is associated with elevated emotional distress, preoccupation with appearance, and cosmetic surgery (Hoffman & Brownell, 1997; J. K. Thompson, Heinberg, Altabe, & Tantleff-Dunn, 1999) and is a risk factor for developing disordered eating behaviors (Grilo, Masheb, & Wilson, 2001; Mayo & George, 2014), muscle dysmorphia (Murray, Rieger, Touyz, & De la Garza Garcia Lic, 2010), depression (McCreary & Sasse, 2000; Olivardia, Pope, Borowiecki III, & Cohane, 2004; Presnell, Bearman, & Stice, 2004). Additionally, body dissatisfaction has been associated with obesity (Mond, van den Berg, Boutelle, Hannan, & Neumark-Sztainer, 2011; Wardle & Cooke, 2005), poorer mental and physical health-related quality of life (Griffiths et al., 2016; Griffiths, Henshaw, McKay, & Dunn, 2017).

Although there is some commonality, body dissatisfaction manifests differently in males and females. This is largely due to the differences in shape and composition of body ideals between sexes. The majority of men tend to idealize what is known as a mesomorphic build. The mesomorphic build is defined by a low percentage of body fat, combined with a defined, visible, but not excessive muscle build. Specifically, well-developed muscles on the chest, shoulders, arms, and slim waist and hips, and a V-shaped torso (Cafri & Thompson, 2004; Grogan & Richards, 2002; Pope, Phillips, & Olivardia, 2000). In Western society most

women also idealize a low percentage of body fat and a thin waist, but strive for an hour-glass shape (as opposed to a mesomorphic shape). Women also aspire to a toned, muscular definition, however their muscular preference tends to be less than their male counterparts (Bozsik, Whisenhunt, Hudson, Bennett, & Lundgren, 2018; Swami et al., 2010). In this way, both sexes may be dissatisfied with their amount of body fat, with the size of their waist, and with their muscle tone. However, men's dissatisfaction is more characterized by muscle shape and size, whilst women's dissatisfaction traditionally has a greater focus on a slim build (Grogan, 2016).

Figural rating scales are a prominent method used to evaluate body dissatisfaction. Figural rating scales are typically comprised of a series of frontal view body images graded thin to obese (in men and women), and from thin to muscular (in men; Grogan, 2016). Once presented with these images, an individual is to indicate which of the figures best represents their current body (their *perceived body*), and which best represents the body that they would like to have (their *desired body*), respectively. The difference between an individual's *perceived* and *desired* body is referred to as perceived–desired body discrepancy. Perceived–desired body discrepancy has been conceptualized as an index of body dissatisfaction, with greater discrepancies indicating greater levels of body dissatisfaction (Fingeret, Gleaves, & Pearson, 2004; Gardner & Brown, 2010). However, this conceptualization is questionable. Conceivably, most individuals would desire a 'better' body (e.g., a skinnier or and/or more muscular body). However, it cannot be assumed for every individual that a failure to embody an idealized figure results in, or is directly related to, body dissatisfaction - it is possible for one to desire a particular body type without being clinically dissatisfied with one's own body. That said, discrepancy scores have been found to correlate highly with a number of measures related to body dissatisfaction, including eating disorder symptoms (Smith, Hawkeswood, Bodell, & Joiner, 2011), drive for muscularity (Gillen & Markey, 2015; Hildebrandt,

Langenbucher, & Schlundt, 2004; Novella, Gosselin, & Danowski, 2015), body appreciation (Mutale, Dunn, Stiller, & Larkin, 2016; Novella et al., 2015; Swami, Salem, Furnham, & Tovee, 2008), body mass index (BMI) and body fat percentage, and with direct measures of body dissatisfaction (Talbot, Cass, & Smith, 2019). Therefore, discrepancy scores provided by figural rating scales are a valuable screening tool for indicating body dissatisfaction and related psychological and physiological variables. Additionally, figural rating scales offer advantages over self-report measures of body dissatisfaction in that they are quick to administer (administration time is typically under one minute), they can be used by adolescents, allow for a visual depiction of an individual's perceived body image, and are not dependent on language or literacy skills (Grogan, 2016).

Figural rating scales have also been utilized in eating disorders samples to measure body image disturbance. Typically, results indicate that there is a significant difference in participants' selected *perceived* body, and their actual body composition (Cafri & Thompson, 2004). Moreover, eating disorder symptoms are significantly positively associated with figural rating scale index scores, meaning that greater differences between selected *perceived* and *desired* body selections are associated with greater eating disorder symptomatology (Baranowksi, Jorga, Djordjevic, Marinkovic, & Hetherington, 2003; Garner, Olmstead, & Polivy, 1983; Jung, Forbes, & Lee, 2009).

Historically, figural rating scales were produced depicting female bodies, and varying in terms of body fat percentage (Stunkard, 1983). However, due to evidence indicating a significant presence of body image issues and related disordered eating behaviors amongst the male population (Murray et al., 2017), there has been an increase in the development of figural rating scales for men (for review of hand-drawn silhouette figural rating scales, see (Gardner & Brown, 2010). Initially, male figural rating scales mirrored female scales, in that they typically depicted a series of male bodies systematically varying in body fat percentage

(e.g., Stunkard's male figural rating scale; Stunkard, 1983). Although useful, these scales fail to include muscularity as a factor. Given that muscularity is an important consideration in the manifestation of body dissatisfaction in men (Ridgeway & Tylka, 2005), the inclusion of variations in muscularity may be essential for capturing a true reflection of male body image (Drewnowski & Yee, 1987; Stunkard, Sorensen, & Schulsinger, 1983; M. A. Thompson & Gray, 1995). Lynch and Zellner (1999) produced the first figural rating scale which held body fat constant and graded increasing muscle mass. Both Stunkard (1983) and Lynch and Zellner (1999) employed uni-dimensional variation in their figural rating scales based on a single biometric variable (body fat and muscularity, respectively). Since the publication of Lynch and Zellner's scale, there have been many different male figural rating scales developed and published. However, many of these scales are still limited in psychometric evidence, design, and image quality.

Various male figural rating scales either fail to provide, or return poor validity and/or reliability, and as such may not provide valid or consistent indices of body dissatisfaction. In relation to scale design, the number of images comprising the figural rating scale is an important consideration. Too few images (i.e. representing discrete increments along the body dimension) results in a coarse scale – if there are not enough body type options for respondents to choose from then the scale cannot be as sensitive in determining differences in *perceived* and *desired* body selections between respondents. Too many images may cause problems for reliability (Cafri & Thompson, 2004). Ambrosi-Randic, Pokrajac-Bulian, and Taksic (2005) investigated the optimal number of figural rating scale stimuli for body size assessment, comparing unidimensional scales containing three, five, seven, and nine figures, respectively. The perceived-ideal discrepancy score for each of these four scales was calculated (n = 320), and then correlated with two measures of self-report body dissatisfaction. The authors found that discrepancy scores for scales containing five, seven,

and nine figures were highly, and equivalently correlated with each measure of body dissatisfaction, and thus concluded that the optimal number of images for a unidimensional figural rating scale was seven, plus or minus two. To the authors' knowledge, no study has examined the optimal number of figural rating scale stimuli for bi-dimensional figural rating scales.

Likewise, the representation of the images themselves is another important consideration. Prior studies have evidenced the significance of muscular shape and tone in male body image (Cho & Lee, 2013; Ridgeway & Tylka, 2005). Therefore, visual access to muscle groups such as the abdominal and pectoral muscles may be essential for making an informed decision about one's *perceived* and *desired* body. Many of the existing figural rating scales fail to grant access to these body areas, instead representing bodies covered by clothing.

Another important design consideration lies in whether figural rating scales are ordinal or interval measures. An ordinal figural rating scale presents with no regular change in body size between adjacent body images, as opposed to an interval scale in which body composition increases in regular intervals between figures. Interval figural rating scales are ideal as this allows for *perceived*, *desired* and discrepancy scores to be used in parametric statistical analyses (Gardner, 1975).

The medium for the body stimuli included in scales presents as another significant aspect in scale design. Hand-drawn body stimuli may pose problems for validity and reliability. The majority of hand-drawn body stimuli are asymmetric to varying, but not non-specified degrees. Previous research has demonstrated that bilateral body asymmetry can influence the ratings of bodies and faces, with asymmetrical bodies and faces being rated as less attractive (Rhodes & Simmons, 2007; Tovee, Tasker, & Benson, 2000). Therefore, it is essential that bodies included in figural rating scales do not vary in terms of extent of

symmetry, else this may influence *perceived* and *desired* body selections. Based on this premise, symmetrical figures such as computer-rendered figures and photograph figures should be employed. Additionally, these figures typically provide greater and more accurate anatomical detail (e.g., specific muscle groups), which is essential in order for respondents to make an accurate selection of their perceived and ideal bodies. The inclusion of muscular shape and tone is essential as prior studies have found for men, the muscular definition and leanness of the abdominal region, arms, and chest is key in defining the ideal male body (Grogan & Richards, 2002; Ridgeway & Tylka, 2005), and therefore would be key in selecting their ideal body from those presented in figural rating scales.

Given the parallel increase in recognition of male body image concerns and the development of figural rating scales for men, combined with the various limitations of these scales described above, this review aims to (i) examine the design of each figural rating scale, including whether body fat and/or muscularity is measured, the nature of the stimulus, number of dimensions, number of images, whether chest, arms and legs are displayed, and whether the scale is interval or ordinal. Additionally, the present study aims to: (ii) examine the psychometric properties of established figural rating scales for men; (iii) examine the ecological validity, that is, the stimuli quality of rating scales; and (iv) examine the relationship between figural rating scale scores and eating disorder symptoms.

A set of criteria were designed to review figural rating scales. These criteria were based on established threshold standards for scale psychometric properties, established design standards for self-report scales, and critiques and recommendations of figural rating scale design outlined in the extant literature (Gardner & Brown, 2010; Gardner, Friedman, & Jackson, 1998). Based on these criteria, it is recommended that a figural rating scale should be a bi-axial scale (i.e., representing variations in both body fat and muscularity in uni- or bi-dimensional format), with a minimum of seven realistic computer or photo generated images

of bare skinned bodies, on an interval scale. Psychometric properties evaluated include concurrent and convergent validity, and test-retest and internal reliability. Concurrent and convergent validity should demonstrate correlation coefficients greater than .50 with biometric measures of body composition (such as Body Mass Index and Fat Free Mass Index), and self-report measures of body dissatisfaction and related constructs such eating disorder symptoms, respectively. Test-retest and internal reliability should demonstrate correlations of .80 or greater (Carmines, 1990).

Procedure

A systematic review of the literature on male figural rating scales was conducted using PsycInfo, PubMed, and Google Scholar. This search was conducted on articles published from 1983 (Stunkard's first figural rating scale) until December 2018. The following search terms were used: "male figural rating scales" and "male figure rating scales", "male silhouette rating scales", or "male body dissatisfaction scales". The literature searches were restricted to articles focusing on adults that were written in English and published in peer-reviewed journals. After culling irrelevant articles from the initial search, 43 relevant articles were examined (for extensive literature search details, see Appendix A). For each article identified, the reference list was subsequently examined for relevant articles that were potentially omitted by the initial search. This resulted in the identification of four additional articles. After excluding seven duplicates, 40 articles were identified. Each article was then examined in line with the following criteria: (i) the article included the development and validation of an adult male figural rating scale; and (ii) psychometric properties for reliability and/or validity evidence were examined. Consequently, a total of 20 scales were excluded including 14 scales that utilized female-only stimuli, two scales utilizing child body stimuli, and four scales that did not report psychometric properties of reliability or validity.

This resulted in 20 articles being selected to include in the review. Figure 1 displays the process of article selection.

[Insert Figure 1]

From the articles included in the review, the following data were collected: (i) the author(s) names, and year of publication of the study (the original author(s) of the scale are shown in bold, psychometric values provided from studies succeeding the original publication are shown in the row below the original study); (ii) the name of the figural rating scale; (iii) the number of participants included in the study; (iv) age range or mean of the validation sample in years; (v) the type of sample used when examining validity and/or reliability evidence of the measure; (vi) body dimensions of body fat and/or muscularity represented in the figural rating scale; (vii) stimulus type of figural rating scale, indicating whether the stimuli are hand-drawn, or computer rendered, silhouettes or detailed figures; (viii) whether the figural rating scales are uni- or bi-dimensional; (ix) the test-retest reliability values (test-retest timespan displayed in parentheses); (x) whether bodies in the figural rating scale have bare chest, arms, and legs displayed; (xi) whether the scales are ordinal or interval; (xii) the concurrent and convergent validity values; and (xiii) the correlations between the figural rating scale index score (index score = *perceived* body minus *desired* body) and eating disorder symptoms. Convergent validity was generally taken as the correlation between a figural rating scale index scores and other tools that measure body dissatisfaction. Concurrent validity was taken as the association between *perceived* body figural rating scale selection and body mass index (BMI), or fat free mass index (FFMI). In this way, concurrent validity described the ability of a responder to use a given figural rating scale to select a body that approximated their actual body composition (in terms of body fat and/or muscularity). Ecological validity is defined as the extent to which the materials used in a scale approximate the real-world material (Reis & Judd, 2000). For the present study, ecological validity

concerns the degree to which the male body stimuli used to construct a given figural rating scale accurately represents a human male body.

Where a range of values is presented for validity evidence, multiple measures of validity evidence were provided in the study. For example, if a study provided three correlational values for concurrent validity, r = .35, .45, .and .55, these values would be presented as .35-.55.

Results

Table 1 displays descriptive information relating to the validation and reliability assessment of included scales, and the psychometric properties of known male figural rating scales. Of note, each figural rating scale was assigned a number, displayed in the first column of Table 1.

Scale Design

Of the 20 figural rating scales, 10 measured body fat exclusively, one measured muscularity exclusively, and nine measured both body fat and muscularity. Seventeen of the scales were unidimensional, meaning that bodies were presented varying on one axis. Three scales were bi-dimensional, with bodies presented in grid form varying in different combinations of body fat and muscularity.

Figural rating scales differed in terms of number of images represented, ranging from 7-100. The average amount of images presented in figural rating scales (excluding one clear outlier - the Somatomorphic Matrix; (Pope, Borowiecki, & Cohane, 2000) for uni- and bi-dimensional scales was 9.81 and 29.5, respectively. Twelve scales included body stimuli that displayed exposed chest, arms and legs, whilst five scales included stimuli with chest, arms and legs covered by clothing, and three scales were hand-drawn silhouettes, and therefore displayed no body composition detail. Sixteen of the scales were interval (consistent distance

Table 1.
Descriptive and psychometric properties of male figural rating scales.

Descriptive Information and Design												Psychometric Properties		
Scale Number	Authors	Name of Scale	N	Age (years)	Type of Participant	Body Fat/Muscularity	Stimulus Description	Number of dimensions	Number of Images	Chest, arms and legs displayed	Interval or Ordinal	Test-Retest Reliability	Validity	Correlation with eating disorder symptoms
1	**Cohen et al., 2015**	Male Body Size Scale	82	NR	Community Sample Cameroon	BF	Photograph Figures	Uni	9	No	Interval	Per. = .60[a] Des. = .39[a] (2 weeks)	CC = .72[a]	NA
2	**de Castro et al., 2018**	Brazilian Photographic Figure Rating Scale for Men (BPFRS-M)	149	Mean = 22.4	Brazilian undergraduate students	BF	Photograph Figures	Uni	8	No	Interval	NA	CV = .86[b]	NA
3	**Dratva et al., 2016**	Self-report Figural Drawing Scale	769	20-44	NR	BF	Hand-drawn Figures	Uni	9	Yes	Ordinal	NA	CC = .70[a]	NA
4	**Frederick et al., 2007**	The Muscle and Fat Silhouette Measure	68	18-23	Male college volunteers	M and BF	Hand-drawn Figures	Uni	**M**: 8 **BF**: 8	Yes	Ordinal	**M** Per. = .83[b] Des. = .89[b] **BF** Per. = .83[b] Des. = .90[b] (28-31 days)	NA	NA
5	**Gardner et al., 2009**	Body Image Assessment Scale - BD	66	NR	Undergraduate students	BF	Hand-drawn Silhouettes	Uni	17	NA	Interval	Per. = .88[d] Des. = .75[d] (2 weeks)	CC = .80[d]	NA
6	**Gardner et al., 1999**	13-Card Discreet Scale	32	NR	Undergraduate students	BF	Hand-drawn Silhouettes	Uni	13	NA	Interval	Des. = .87[b] (3 weeks)	CC = .58[b]	NA
7	**Gillen & Markey, 2015**	Muscle Pictorial Measure	137	18-44	US Undergraduate Students	M	Hand-drawn Figures	Uni	9	Yes	Interval	Per. = .81[a] Des. = .23[a] (2 weeks)	CV = .23-.54[a]	NA
8	**Harris et al., 2008**	Body Size Guide (BSG)	65	19-77	Community sample	BF	Photograph Figures	Uni	10	No	Interval	NA	CC = .94[b]	NA
9	**Hildebrandt et al., 2004**	Bodybuilder Image Grid (BIG-O)	42; 245	18-44	Weightlifters	M and BF	Hand-drawn Figures	Bi	30	Yes	Interval	**BF** Per. = .86[b] Des. = .94[b] **M** Per. = .93[b] Des. = .89[b]	Body Fat CV = .34-.38[b] Muscle CV = .42-.57[b]	NA

10	**Mutale et al., 2016**	Body Dissatisfaction Scale	60	NR	UK Undergraduate Students	BF	Computer Rendered Figures	Uni	9	No	Interval	Per. = .96[d] Des. = .88[d] (1 week)	NA	NA
11	**Novella et al., 2015**	Presentation of Images on a Continuum Scale (PICS)	71	Mean = 20	US Undergraduate Students	M and BF	Computer Rendered Figures	Uni	**M** = 8 **BF** = 8	Yes	Interval	NA	**BF** CV = .81[b] CC = .07-.29[b] **M** CC = .44[b]	NA
12	**Pope et al., 2000** Cafri et al., 2004	Somatomorphic Matrix	31	18-35	US Undergraduate Students	M and BF	Hand-drawn Figures	Bi	100	Yes	Interval	**BF** Per. = .64[b] Des. = .79[b] Index =.57[b] **M** Per. = .78[b] Des. = .55[b] Index = .34[b] (7-10 days)	NA	NA
13	**Pulvers et al., 2004**	Male Body Image Instrument	71	Mean = 44	African-American public housing residents,	BF	Hand-drawn Figures	Uni	9	Yes	Interval	NA	CC = .58–.62[a] CV = .51–.61[a]	NA
14	**Ralph-Nearman & Filik, 2018**	Male Body Scale (MBS) and Male Fit Body Scale (MFBS)	103	18-50	UK Community sample	M and BF	Hand-drawn Figures	Uni	**M** = 9 **BF** = 9	Yes	Interval	**BF** Per. = .77[d] Des. = .54[d] Index = .62[d] **M** Per. = .76[d] Des. = .69[d] Index = .49[d] (2-6 weeks)	**BF** CC = .39-.47[d] CV = .63-.75[d] **M** CC = .39-.41[d] CV = .35-54[d]	**BF** Des. = < .01[d] Index = .39-.47[d] **M** Des. = .23-.49[d] Index = .05-.22[d]
15	**Stunkard et al., 1983** Ralph-Nearman & Filik, 2018	Figural Rating Scale	91	17-25	Undergraduate students	BF	Hand-drawn Figures	Uni	9	Yes	Ordinal	Per. = .92[d] Des. = .82[d] (2-6 weeks)	CC = .05–.34[d]	Des. = < .01[d] Index = .01-.49[d]
16	**Talbot et al., 2018**	Visual Body Scale for Men (VBSM)	133; 36	17-40	Undergraduate Students	M and BF	Computer Rendered Figures	Uni	M: 10 BF: 10	Yes	Interval	**BF** Per. = .95[c] Des. =.74[c] Index = .91[c] **M** Per. = .75[c] Des. =.88[c] (1 week)	**BF** CC = .25-.44[b] CV = .81[b] **M** CC = .43[b] CV = .43[b]	**BF** Per. = .41-.55[b] Des. = .01-.17[b] Index = .25-.49[b] **M** Per. = .01-.13[b] Des. = .09-.10[b]

											17Index =.83[c]		Index = .01-.12[b]
17	**Talbot et al., 2019**	New Somatomorphic Matrix-Male (NSM-M)	2,733; 38	18-75	Sexual minority males	M and BF	Computer Rendered Figures	Bi	34	Yes	Interval	**BF** Per. = .93[c] Des. =.91[c] Index = .86[c] **M** Per. = .78[c] Des. = .95[c] Index = .84[c] (1-2 weeks)	**BF** CC = .48-.66[a] CV = .56[a] **M** CC = .44[a] CV = .23[a]	**BF** Index = .48[a] **M** Index = .01[a]
18	**Thompson & Gray, 1995**	Contour Drawing Scale	51	18-23	Undergraduate students	BF	Hand-drawn Figures	Uni	9	Yes	Interval	Per. = .78[b] (1 week)	CC = .59–.71[b]	NA
19	**Tucker, 1982** Gardner & Brown, 2010	Perceived Somatotype Scale	88	NR	Undergraduate students	M	Hand-drawn Figures	Uni	7	No	Ordinal	Per. = .94–.96[d] (NA)	CV = .45–.48[d]	NA
20	**Williamson et al., 2000**	Body Image Assessment for Obesity (BIO-O)	466	17-86	US Community sample	BF	Hand-drawn Silhouettes	Uni	18	No	Interval	Per. = .77[b] Des. = .81[b] (2 weeks)	CV = .45–.48[b]	NA

Note: NR = Not reported; NA = Not applicable; BF = Body Fat; M = Muscularity; Uni = Uni-dimensional figural rating scale; Bi = Bi-dimensional figural rating scale; Per. = Figural rating scale *perceived* body; Des. = Figural rating scale *desired* body; Index = Figural rating scale perceived-desired discrepancy score; CC = Concurrent validity; CV = Convergent validity; [a] = Spearman's correlation coefficient; [b] = Pearson's correlation coefficient; [c] = Intraclass correlation; [d] = correlation coefficient not stated.

between each body reported) in nature, whilst the remaining four were ordinal scales (bodies are shown in order of magnitude but there is no standard of measurement of differences).

Ecological Validity

Ecological validity was conceptualized as the extent to which the figural rating scale stimuli represents the human male form, as appraised by the authors of the present study. Of all the figural rating scales included in the present study, 10 included hand-drawn figures (scales from studies 3, 4, 7, 9, 12, 13, 14, 15, 18, 19), four included hand-drawn silhouettes (scales from studies 5, 6, 16, and 20) four included computer rendered figures (scales from studies 10 11, 16, and 17), and three included photograph figures (scales 1, 2, and 8; Table 1). Photograph figures present as the most representative of real male bodies, followed by computer rendered figures, hand-drawn figures, and then finally hand-drawn silhouette figures.

Test-Retest Reliability

Fifteen out of 20 studies reported test-retest reliability evidence, which included 48 individual tests of reliability across all included studies. However, of these 48 individual tests, only 27 (57%) of these measures returned acceptable test-retest reliability as decreed by 0.80 recommended standard for test–retest reliability (Carmines, 1990). Only five studies reported that both *perceived* and *desired* body ratings were above the recommended standard (scales from studies 4, 9, 10, 15, and 19; Table 1).

Concurrent and Convergent Validity

Out of the 20 figural rating scales included in this study, 17 reported some measure of convergent or concurrent validity evidence for male samples. A range of self-report body

dissatisfaction questionnaires were used to provide convergent validity, including the Male Body Attitudes Scale (Tylka, Bergeron, & Schwartz, 2005), the revised Male Body Attitudes Scale (Ryan, Morrison, Roddy, & McCutcheon, 2011), the Drive for Muscularity Scale (McCreary & Sasse, 2000), the Body Dissatisfaction subscale of the Eating Disorder Inventory (Garner et al., 1983), and the Multidimensional Body-Self Relations Questionnaire–Appearance Scales (Brown, Cash, & Mikulka, 1990). Convergent validity was assessed through Body Mass Index, body fat percentage, and/or Fat Free Mass Index. Of note, 11 studies reported convergent validity evidence (scales from studies 2, 7, 8, 9, 11, 13, 14, 16, 17, 19, and 20) and 11 reported concurrent validity evidence (scales from studies 1, 3, 5, 6, 11, 13, 14, 15, 16, 17, and 18; Table 1).

Correlations with Eating Disorder Symptoms

Four of the 20 scales (scales from studies 14, 15, 16, and 17) included a correlational analysis between *perceived*, *desired*, and/or index scores (index scores = difference score between *perceived* and *desired* body selection), and eating disorder symptoms. Results showed moderate to high positive correlations between eating disorder symptoms (measured via the Eating Disorders Examination Questionnaire; EDE-Q; (Fairburn & Beglin, 1994), or the EDE-Q short; EDE-QS; (Gideon et al., 2016) and body *perceived* and index scores. No significant correlations were found between eating disorder symptomatology and muscularity index scores. Only Ralph-Nearman and Filik (2018) reported a significant association between participants' *desired* body (as selected on the Male Fit Body Scale, a unidimensional muscularity rating scale) and the EDE-Q Global score.

Discussion

From this review it is evident that there is a vast number of male figural rating scales available in the extant literature. Scales vary in terms of scale design, stimulus quality and medium, and psychometric soundness.

Scale Design

Over half of the reviewed figural rating scales failed to measure both body fat and muscularity. As discussed above, it is essential to examine both body fat and muscular bulk to adequately capture two critical aspects of male body image (Ridgeway & Tylka, 2005). Additionally, a number of scales presented clothed bodies, or bodies without detail of muscular tone and shape. If body stimuli are presented wearing clothes certain features of the male body will be not visible to the individual making the selection (Cho & Lee, 2013; Ridgeway & Tylka, 2005). Effectively, this means less visual information to inform body selection, possibly resulting in a less reliable decision. This is particularly problematic when considering decisions around muscularity.

The number of images comprising reviewed scales varied significantly, with the number of images on a single dimension ranging between seven and 100. All scales presented at least seven figures, thus complying to the minimum optimal number of figures outlined by Ambrosi-Randić and colleagues (2005). However, it is difficult to apply the results of this study to the present review given that Ambrosi-Randić and colleagues (2005) did not examine figural rating scales with greater than nine figures or bi-dimensional scales.

Results showed that four of the existing figural rating scales are ordinal measures, in that there is not a regular change in body size between adjacent body images. Thus, the validity of the perceived-desired discrepancy index as a measure is compromised. Ideally, figural rating scales should be interval scales, with a regular change in body size between adjacent body images. This would also ensure that *perceived*, *desired*, and index scores could

be included in parametric statistical analyses. Based only on the above, we recommend scales from studies 9, 11, 12, 14, 16, and 17, as they best fit the design criteria described above (i.e. measure both body fat and muscularity, allow for visual access to chest, arm, and leg regions, and are interval scales; Table 1).

Ecological Validity

Ecological validity refers to the extent to which the figural rating scale stimuli accurately represents the human male form. Results show that the majority of figural rating scales are constructed using hand-drawn stimuli. Only scales from studies 1, 2, and 8 included photograph figures, and scales from studies 10, 11, 16, and 17 included computer rendered figures (Table 1). Due to the risk of asymmetry, the use of hand-drawn body stimuli is not ideal as it may compromise validity and reliability of the scale (Rhodes & Simmons, 2007; Tovee et al., 2000).

Test-Retest Reliability

Results showed that approximately three-quarters of studies reviewed reported test-retest reliability evidence, which included 48 individual tests of reliability across all included studies. However, around half of these measures returned acceptable test-retest reliability as decreed by 0.80 recommended standard for test-retest reliability (Carmines, 1990). Only scales from studies 4, 9, 10, 15, and 19 reported that both *perceived* and *desired* body ratings were above the recommended standard (Table 1). It is essential for figural rating scales to demonstrate reliability, particularly in a clinical setting (e.g., to track the progress of body perception disturbances).

Concurrent and Convergent Validity

Approximately one quarter of studies failed to report concurrent and convergent validity evidence. Concurrent validity indicates the extent to which figural rating scale index scores indicate body dissatisfaction. Without an assessment of concurrent validity, index scores cannot be interpreted beyond an indication of discrepancy in *perceived* and *desired* body image. Therefore, it is essential that index scores are assessed for their sensitivity to indicate body dissatisfaction, as this is a primary use of figural rating scales.

Amongst all articles examined in the present review, convergent validity was typically assessed by examining associations between figural rating scales *perceived* body and biometric measures of body composition. Although this approach appears to be theoretically sound, many of the studies used BMI, a problematic measure of body composition in males as muscular bulk (as opposed to body fat) can often be the driving factor behind BMI (Burkhauser & Cawley, 2008; Rothman, 2008). Further, many studies reported biometric measures relied were self-report estimates of height and weight. This is problematic as prior studies indicate that participants are relatively poor at estimating these constructs, and many partake in deception (Bowman & Delucia, 1992). Based on these criteria, scales from studies 9, 11, 13, 14, 16, and 17 provided the best validity evidence (Table 1).

Eating Disorder Symptoms

The consideration of the utility of figural rating scales to predict eating disorder symptoms is important given that, despite a historical underrepresentation in the peer-reviewed literature, a significant proportion of men suffer with eating disorders or cope with a significant portion of eating disorder symptoms (Coffino, Udo, & Grilo, 2019; Duncan, Ziobrowski, & Nicol, 2017; Limbers, Cohen, & Gray, 2018). Results showed that only scales from studies 14, 15, 16, and 17 examined the relationship between eating disorder symptoms and figural rating scale scores (Table 1). Amongst these studies, participants' *perceived* body

fat percentage and body fat index scores positively correlated with eating disorder symptoms. However, apart from the Male Fit Body Scale (Ralph-Nearman & Filik, 2018), there were no significant associations between muscle figural rating scales and eating disorder symptoms. This could potentially be explained by considering the sensitivity (or lack thereof) of the EDE-Q for detecting muscularity-related body concern in males. Prior research comparing male and female norms on the EDE-Q have found that males have significantly lower scores across all EDE-Q subscales compared to females (Lavender, De Young, & Anderson, 2010; Reas, Overas, & Ro, 2012), which could be accounted for by a lack of muscle-related items.

Recommendations

It is recommended that this review be utilized by researchers and clinicians to aide in their decision when selecting a male figural rating scale. Second, as a general rule, figural rating scales with no validity and/or reliability evidence should not be used. Ideally, validity evidence should return correlations of greater than .50, denoting a large effect size for a correlation coefficient, and reliability evidence should return interclass correlations of .80 or greater (Carmines, 1990). Third, figural rating scales that encompass variations in body fat and muscularity should be prioritized so that both dimensions of male body image can be assessed, unless the researcher/clinician only requires one of the two dimensions. Fourth, the quality of the body image stimuli comprising the figural rating scale should be considered. Figural rating scales that present photographic or realistic computer-rendered figures, such as the Presentation of Images on a Continuum Scale (Novella et al., 2015) and the New Somatomorphic Matrix-Male (Talbot, Smith, Cass, & Griffiths, 2019), should be utilized. Fifth, figural rating scales should be constructed as interval scales with regular differences between adjacent bodies. This will ensure that *perceived* body scores, *desired* body scores,

perceived-desired index scores can be included in parametric statistical analysis. Consequently, no single study met all four recommendations.

Figural rating scales from studies 9, 11, 14, 16, and 17 were the closest to satisfying criteria relating to scale design, validity, and reliability. The scales in these studies satisfied all criteria, except what is described below. Study 9 provided a validation for the Bodybuilder Image Grid (Hildebrandt et al., 2004). This scale was only limited by the quality of the stimuli (hand-drawn figures) and moderate convergent validity for body fat selection scores. Study 11 used the Presentation of Images on a Continuum Scale (Novella et al., 2015), which only failed to assess test-retest reliability evidence, and reported moderate to low concurrent validity evidence for body fat rating scores. Study 14 used the Male Body Scale and Male Fit Body Scale (Ralph-Nearman & Filik, 2018). These scales were limited in the use of hand-drawn body stimuli, and low test-retest reliability scores across all measures. Study 16 utilized the Visual Body Scale for Men (Talbot et al., 2018), which was limited in that two out of six measures returned test-retest reliability evidence below the recommended cut-off, and moderate concurrent validity evidence. Study 17 provided a validation for the New Somatomorphic Matrix-Male (Talbot et al., 2019). This scale was only limited by one score returning low test-retest reliability evidence, small convergent validity evidence for muscularity, and moderate concurrent validity evidence for some measures.

Limitations of this review are noted. First, the generalizability of the validity and reliability evidence provided is limited to men aged 17 and older. Notably, there were no child or adolescent samples included in studies within this review. The utility of included figural rating scales for these populations is, therefore unknown. Second, a large portion of studies utilized samples of undergraduate students, non-clinical samples, and/or Western samples. This further limits the generalizability of presented psychometrics.

In sum, the majority of existing male figural rating scales fell short of our established criteria. Generally, scales were limited by a lack of reliability and validity evidence, poor quality of body stimuli, a failure to represent both dimensions of male body image, poor visual access to key body areas, and/or non-interval scale designs. However, there are several male figural rating scales that meet the majority of our criteria. This included three uni-dimensional ratings scales: the Presentation of Images on a Continuum Scale (Novella et al., 2015), the Male Body Scale and Male Fit Body Scale (Ralph-Nearman & Filik, 2018), and Visual Body Scale for Men (Talbot et al., 2018), and two bi-dimensional rating scales: the Bodybuilder Image Grid (Hildebrandt et al., 2004) and the New Somatomorphic Matrix-Male (Talbot et al., 2019).

References

Ambrosi-Randic, N., Pokrajac-Bulian, A., & Taksic, V. (2005). Nine, seven, five, or three: how many figures do we need for assessing body image? *Percept Mot Skills, 100*(2), 488-492. doi: 10.2466/pms.100.2.488-492

Baranowksi, M. J., Jorga, J., Djordjevic, I., Marinkovic, J., & Hetherington, M. M. (2003). Evaluation of adolescent body satisfaction and associated eating disorder pathology in two communities. *European Eating Disorders Review : The Professional Journal of the Eating Disorders Association, 11*(6), 478-495.

Bowman, R. L., & Delucia, J. L. (1992). Accuracy of Self-Reported Weight - a Metaanalysis. *Behav Ther, 23*(4), 637-655. doi: Doi 10.1016/S0005-7894(05)80226-6

Bozsik, F., Whisenhunt, B. L., Hudson, D. L., Bennett, B., & Lundgren, J. D. (2018). Thin is in? Think again: The rising importance of muscularity in the thin ideal female body. *Sex Roles, 79*(9-10), 609-615.

Brown, T. A., Cash, T. F., & Mikulka, P. J. (1990). Attitudinal body-image assessment: factor analysis of the Body-Self Relations Questionnaire. *J Pers Assess, 55*(1-2), 135-144. doi: 10.1080/00223891.1990.9674053

Burkhauser, R. V., & Cawley, J. (2008). Beyond BMI: The value of more accurate measures of fatness and obesity in social science research. *Journal of Health Economics, 27*(2), 519-529. doi: 10.1016/j.jhealeco.2007.05.005

Cafri, G., Roehrig, M., & Thompson, J. K. (2004). Reliability assessment of the somatomorphic matrix. *International Journal of Eating Disorders*, *35*(4), 597-600.

Cafri, G., & Thompson, J. K. (2004). Measuring Male Body Image: A Review of the Current Methodology. *Psychology of Men & Masculinity, 5*(1), 18.

Carmines, E. G. (1990). The Statistical-Analysis of Overidentified Linear Recursive Models. *Quality & Quantity, 24*(1), 65-85.

Cho, A., & Lee, J. H. (2013). Body dissatisfaction levels and gender differences in attentional biases toward idealized bodies. *Body Image, 10*(1), 95-102. doi: 10.1016/j.bodyim.2012.09.005

Coffino, J. A., Udo, T., & Grilo, C. M. (2019). Rates of help-seeking in US adults with lifetime DSM-5 eating disorders: prevalence across diagnoses and differences by sex and ethnicity/race. In *Mayo Clinic Proceedings* (Vol. 94, No. 8, pp. 1415-1426). Elsevier.

de Castro, M. R., Morgado, F. F., & Freitas Jr, I. F. (2018). Brazilian Photographic Figure Rating Scale for Men: Psychometric Investigation. *Perceptual and Motor Skills*, *125*(3), 493-506.

del Mar Bibiloni, M., Coll, J. L., Pich, J., Pons, A., & Tur, J. A. (2017). Body image satisfaction and weight concerns among a Mediterranean adult population. *BMC Public Health, 17*(1), 39.

Dratva, J., Bertelsen, R., Janson, C., Johannessen, A., Benediktsdóttir, B., Bråbäck, L., ... & Jogi, R. (2016). Validation of self-reported figural drawing scales against anthropometric measurements in adults. *Public Health Nutrition*, *19*(11), 1944-1951.

Drewnowski, A., & Yee, D. K. (1987). Men and body image: are males satisfied with their body weight? *Psychosom Med, 49*(6), 626-634.

Duncan, A. E., Ziobrowski, H. N., & Nicol, G. (2017). The prevalence of past 12-month and lifetime DSM-IV eating disorders by BMI category in US men and women. *European Eating Disorders Review*, *25*(3), 165-171.

Fairburn, C. G., & Beglin, S. J. (1994). Assessment of eating disorders: interview or self-report questionnaire? *Int J Eat Disord, 16*(4), 363-370.

Fingeret, M. C., Gleaves, D. H., & Pearson, C. A. (2004). On the methodology of body image assessment: the use of figural rating scales to evaluate body dissatisfaction and the ideal body standards of women. *Body Image, 1*(2), 207-212.

Frederick, D. A., Buchanan, G. M., Sadehgi-Azar, L., Peplau, L. A., Haselton, M. G., Berezovskaya, A., & Lipinski, R. E. (2007). Desiring the muscular ideal: Men's body satisfaction in the United States, Ukraine, and Ghana. *Psychology of Men & Masculinity, 8*(2), 103.

Gardner, P. L. (1975). Scales and statistics. *Review of Educational Research*, *45*(1), 43-57.

Gardner, R. M., & Brown, D. L. (2010). Body image assessment: A review of figural drawing scales. *48*(2), 107-111.

Gardner, R. M., Jappe, L. M., & Gardner, L. (2009). Development and validation of a new figural drawing scale for body-image assessment: the BIAS-BD. *Journal of Clinical Psychology*, *65*(1), 113-122.

Garner, D. M., Olmstead, M. P., & Polivy, J. (1983). Development and validation of a multidimensional eating disorder inventory for anorexia nervosa and bulimia. *International journal of eating disorders, 2*(2), 15-34.

Gardner, R. M., Stark, K. I. M., Jackson, N. A., & Friedman, B. N. (1999). Development and validation of two new scales for assessment of body-image. *Perceptual and Motor Skills*, *89*(3), 981-993.

Gideon, N., Hawkes, N., Mond, J., Saunders, R., Tchanturia, K., & Serpell, L. (2016). Development and Psychometric Validation of the EDE-QS, a 12 Item Short Form of the Eating Disorder Examination Questionnaire (EDE-Q). *PLoS One, 11*(5), e0152744. doi: 10.1371/journal.pone.0152744

Gillen, M., & Markey, C. N. (2015). Development and validation of the muscle pictorial measure. *Archives of Assessment Psychology, 5*(1), 11-22.

Griffiths, S., Hay, P., Mitchison, D., Mond, J. M., McLean, S. A., Rodgers, B., . . . Paxton, S. J. (2016). Sex differences in the relationships between body dissatisfaction, quality of life and psychological distress. *Aust N Z J Public Health, 40*(6), 518-522. doi: 10.1111/1753-6405.12538

Griffiths, S., Henshaw, R., McKay, F. H., & Dunn, M. (2017). Post-cycle therapy for performance and image enhancing drug users: A qualitative investigation. *Performance Enhancement & Health, 5*(3), 103-107.

Grilo, C. M., Masheb, R. M., & Wilson, G. T. (2001). A comparison of different methods for assessing the features of eating disorders in patients with binge eating disorder. *J Consult Clin Psychol, 69*(2), 317-322.

Grogan, S. (2016). *Body Image: Understanding body dissatisfaction in men, women and children*. Taylor & Francis.

Grogan, S., & Richards, H. (2002). Body image: Focus groups with boys and men. *Men and Masculinities, 4*(3), 219-232.

Harris, C. V., Bradlyn, A. S., Coffman, J., Gunel, E., & Cottrell, L. (2008). BMI-based body size guides for women and men: development and validation of a novel pictorial method to assess weight-related concepts. *International Journal of Obesity*, *32*(2), 336.

Hildebrandt, T., Langenbucher, J., & Schlundt, D. G. (2004). Muscularity concerns among men: development of attitudinal and perceptual measures. *Body Image, 1*(2), 169-181. doi: 10.1016/j.bodyim.2004.01.001

Hoffman, J. M., & Brownell, K. D. (1997). Sex differences in the relationship of body fat distribution with psychosocial variables. *Int J Eat Disord, 22*(2), 139-145.

Jung, J., Forbes, G. B., & Lee, Y. J. (2009). Body dissatisfaction and disordered eating among early adolescents from Korea and the US. *Sex Roles, 61*(1-2), 42-54.

Lavender, J. M., De Young, K. P., & Anderson, D. A. (2010). Eating Disorder Examination Questionnaire (EDE-Q): Norms for undergraduate men. *Eat Behav, 11*(2), 119-121. doi: 10.1016/j.eatbeh.2009.09.005

Limbers, C. A., Cohen, L. A., & Gray, B. A. (2018). Eating disorders in adolescent and young adult males: prevalence, diagnosis, and treatment strategies. *Adolescent Health, Medicine and Therapeutics*, *9*, 111.

Lynch, S. M., & Zellner, D. A. (1999). Figure preferences in two generations of men: The use of figure drawings illustrating differences in muscle mass. *Sex Roles, 40*(9-10), 833-843.

Mayo, C., & George, V. (2014). Eating disorder risk and body dissatisfaction based on muscularity and body fat in male university students. *J Am Coll Health, 62*(6), 407-415. doi: 10.1080/07448481.2014.917649

McCreary, D. R., & Sasse, D. K. (2000). An exploration of the drive for muscularity in adolescent boys and girls. *J Am Coll Health, 48*(6), 297-304. doi: 10.1080/07448480009596271

Mond, J., van den Berg, P., Boutelle, K., Hannan, P., & Neumark-Sztainer, D. (2011). Obesity, body dissatisfaction, and emotional well-being in early and late adolescence: findings from the project EAT study. *J Adolesc Health, 48*(4), 373-378. doi: 10.1016/j.jadohealth.2010.07.022

Murray, S. B., Nagata, J. M., Griffiths, S., Calzo, J. P., Brown, T. A., Mitchison, D., . . . Mond, J. M. (2017). The enigma of male eating disorders: A critical review and synthesis. *Clin Psychol Rev, 57*, 1-11. doi: 10.1016/j.cpr.2017.08.001

Murray, S. B., Rieger, E., Touyz, S. W., & De la Garza Garcia Lic, Y. (2010). Muscle dysmorphia and the DSM-V conundrum: where does it belong? A review paper. *Int J Eat Disord, 43*(6), 483-491. doi: 10.1002/eat.20828

Mutale, G. J., Dunn, A. K., Stiller, J., & Larkin, R. (2016). Development of a body dissatisfaction scale assessment tool. *The New School Psychology Bulletin, 13*(2), 47-57.

Novella, J., Gosselin, J. T., & Danowski, D. (2015). One Size Doesn't Fit All: New Continua of Figure Drawings and Their Relation to Ideal Body Image. *J Am Coll Health, 63*(6), 353-360. doi: 10.1080/07448481.2015.1040410

Olivardia, R., Pope, H. G., Borowiecki III, J. J., & Cohane, G. H. (2004). Biceps and body image: the relationship between muscularity and self-esteem, depression, and eating disorder symptoms. *Psychology of Men & Masculinity, 5*(2), 112.

Pope, H. G., Borowiecki, J., & Cohane, G. (2000). The development of the somatomorphic matrix: A bi-axial instrument for measuring body image in men and women. *Kinanthropometry, 4*, 217-231.

Pope, H. G., Phillips, K. A., & Olivardia, R. (2000). *The Adonis complex: The secret crisis of male body obsession*: Simon and Schuster.

Presnell, K., Bearman, S. K., & Stice, E. (2004). Risk factors for body dissatisfaction in adolescent boys and girls: a prospective study. *Int J Eat Disord, 36*(4), 389-401. doi: 10.1002/eat.20045

Pulvers, K. M., Lee, R. E., Kaur, H., Mayo, M. S., Fitzgibbon, M. L., Jeffries, S. K., ... & Ahluwalia, J. S. (2004). Development of a culturally relevant body image instrument among urban African Americans. *Obesity Research*, *12*(10), 1641-1651.

Ralph-Nearman, C., & Filik, R. (2018). New Body Scales Reveal Body Dissatisfaction, Thin-Ideal, and Muscularity-Ideal in Males. *Am J Mens Health, 12*(4), 740-750. doi: 10.1177/1557988318763516

Reas, D. L., Overas, M., & Ro, O. (2012). Norms for the Eating Disorder Examination Questionnaire (EDE-Q) Among High School and University Men. *Eat Disord, 20*(5), 437-443. doi: 10.1080/10640266.2012.715523

Reis, H. T., & Judd, C. M. (2000). Handbook of research methods in social and personality psychology. *Cambridge University Press*.

Rhodes, G., & Simmons, L. W. (2007). Symmetry, attractiveness and sexual selection. *The Oxford handbook of evolutionary psychology*, 222-264.

Ridgeway, R. T., & Tylka, T. L. (2005). College Men's Perceptions of Ideal Body Composition and Shape. *Psychology of Men & Masculinity, 6*(3), 209.

Rothman, K. J. (2008). BMI-related errors in the measurement of obesity. *Int J Obes, 32*, S56-S59. doi: 10.1038/ijo.2008.87

Ryan, T. A., Morrison, T. G., Roddy, S., & McCutcheon, J. (2011). Psychometric properties of the revised Male Body Attitudes Scale among Irish men. *Body Image, 8*(1), 64-69.

Smith, A. R., Hawkeswood, S. E., Bodell, L. P., & Joiner, T. E. (2011). Muscularity versus leanness: an examination of body ideals and predictors of disordered eating in heterosexual and gay college students. *Body Image, 8*(3), 232-236. doi: 10.1016/j.bodyim.2011.03.005

Stunkard, A. J. (1983). Use of the Danish Adoption Register for the study of obesity and thinness. *Association for Research in Nervous and Mental Disease, 60*, 115-120.

Stunkard, A. J., Sorensen, T., & Schulsinger, F. (1983). Use of the Danish Adoption Register for the study of obesity and thinness. *Res Publ Assoc Res Nerv Ment Dis, 60*, 115-120.

Swami, V., Frederick, D. A., Aavik, T., Alcalay, L., Allik, J., Anderson, D., . . . Zivcic-Becirevic, I. (2010). The attractive female body weight and female body dissatisfaction in 26 countries across 10 world regions: results of the international

body project I. *Pers Soc Psychol Bull, 36*(3), 309-325. doi: 10.1177/0146167209359702

Swami, V., Salem, N., Furnham, A., & Tovee, M. J. (2008). The influence of feminist ascription on judgements of women's physical attractiveness. *Body Image, 5*(2), 224-229. doi: 10.1016/j.bodyim.2007.10.003

Talbot, D., Cass, J., & Smith, E. (2018). Visual Body Scale for Men (VBSM): Validation of a new figural rating scale to measure perceived-desired body discrepancy in men. *J Clin Psychol, 75*(3), 462-480. doi: 10.1002/jclp.22710

Talbot, D., Smith, E., Cass, J., & Griffiths, S. (2019). Development and validation of the New Somatomorphic Matrix–Male: A figural rating scale for measuring male actual–ideal body discrepancy. Psychology of Men & Masculinity. *Psychology of Men & Masculinity, 20*(3), 356-367. doi: 10.1037/men0000165

Thompson, J. K., Heinberg, L. J., Altabe, M., & Tantleff-Dunn, S. (1999). Exacting beauty: Theory, assessment, and treatment of body image disturbance. *American Psychological Association*.

Thompson, M. A., & Gray, J. J. (1995). Development and validation of a new body-image assessment scale. *J Pers Assess, 64*(2), 258-269. doi: 10.1207/s15327752jpa6402_6

Tovee, M. J., Tasker, K., & Benson, P. J. (2000). Is symmetry a visual cue to attractiveness in the human female body? *Evol Hum Behav, 21*(3), 191-200.

Tucker, L. A. (1982). Relationship between perceived somatotype and body cathexis of college males. *Psychological Reports*, *50*(3), 983-989.

Tylka, T. L., Bergeron, D., & Schwartz, J. P. (2005). Development and psychometric evaluation of the Male Body Attitudes Scale (MBAS). *Body Image, 2*(2), 161-175. doi: 10.1016/j.bodyim.2005.03.001

Wardle, J., & Cooke, L. (2005). The impact of obesity on psychological well-being. *Best Pract Res Clin Endocrinol Metab, 19*(3), 421-440. doi: 10.1016/j.beem.2005.04.006

Watkins, J. A., Christie, C., & Chally, P. (2008). Relationship between body image and body mass index in college men. *J Am Coll Health, 57*(1), 95-100. doi: 10.3200/JACH.57.1.95-100

Williamson, D. A., Womble, L. G., Zucker, N. L., Reas, D. L., White, M. A., Blouin, D. C., & Greenway, F. (2000). Body image assessment for obesity (BIA-O): development of a new procedure. *International Journal of Obesity*, *24*(10), 132

Appendix A

Name of Database	Search term	Initial search results (17/12/2018)
PsychInfo	Male figural rating scales	724
	Male figure rating scales	89,269
	Male silhouette rating scales	922
	Male body dissatisfaction scales	16,395
PubMed	Male figural rating scales	19
	Male figure rating scales	170
	Male silhouette rating scales	4
	Male body dissatisfaction scales	163
Google Scholar	Male figural rating scales	9,520
	Male figure rating scales	17,800
	Male silhouette rating scales	12,300
	Male body dissatisfaction scales	19,900

Note: No articles beyond the first 20 pages of PsychInfo and Google Scholar searches were examined; Google Scholar search results are approximate values.