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The Relationship Between Objectification Theory and Muscle
Dysmorphia Characteristics in Men

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Abstract

Objectification theory has yielded mixed results when utilized to explain male's body image concerns. This study investigated whether a revised model of objectification theory would represent the processes associated with male's engagement in muscle dysmorphia characteristics. Specifically the mediating role of body shame, which has previously been used to explain the psychological consequences of self-objectification among women, was substituted for muscular dissatisfaction to capture the male experience. A sample of 257 male ($M_{\text{age}} = 29.7$, $SD = 11.2$), the majority from Australia, completed an online questionnaire assessing measures of internalization of the mesomorphic ideal, body surveillance, self-objectification, muscular dissatisfaction, and muscle dysmorphia characteristics. Path analyses were used to investigate the relationships among these variables. Results indicated that internalization of the mesomorphic ideal mediated body surveillance through self-objectification; consistent with previous research on objectification theory. Muscular dissatisfaction mediated the link of body surveillance with muscle dysmorphia characteristics. Additionally, muscular dissatisfaction mediated the link between internalization of the mesomorphic ideal and muscle dysmorphia characteristics. Taken together, these findings support the utility of objectification theory in understanding the processes under which muscle dysmorphia characteristics are likely to emerge.

Keywords: muscle dysmorphia characteristics; objectification theory; male body image; self-objectification; muscular dissatisfaction.

The Relationship Between Objectification Theory and Muscle

Dysmorphia Characteristics in Males

Literature addressing body image disturbances has primarily focused on females (Grabe, Ward, & Hyde, 2008), with limited research investigating the male experience. Over the past decade there has been heightened interest in body image disturbances among males by researchers and clinicians (Arbour & Martin Ginis, 2006; Cafri, van den Berg, & Thompson, 2006; Grieve, 2007; Ricciardelli & McCabe, 2004). Specifically, research has shown that males are becoming more concerned with their muscularity, to the extent that some males are experiencing marked impairment in daily functioning, including at the extreme level employment disruptions, relationship breakdowns, and sexual difficulties (Pope, Phillips, & Olivardia, 2000). At less intense levels, males may still experience dissatisfaction, anxiety, and lowered self-worth and engage in excessive exercise and restrictive diets (Olivardia, 2007; Tylka, 2011). Evidence suggests that Western males' body image disturbances may stem from sociocultural pressures to adhere to the increasingly muscular and lean body ideal perpetuated in Western society (Dakanalis & Riva, 2013; Tod & Lavalley, 2010). Frederick et al. (2007) found that 90% of males would like to be more muscular; on average, desiring an additional 11 kg more muscle mass (Olivardia, Pope, Borowiecki, & Cohane, 2004). Furthermore, researchers have found that rates of anabolic androgenic steroid use among males are greater than or equal to the rates of anorexia and bulimia found among women (Spitzer, Henderson, & Zivian, 1999). These findings suggest that males are willing to engage in unhealthy behaviors aimed at increasing their muscularity, and underscore the importance of studying body image disturbances among males (McCreary & Sadava, 2001; Schooler & Ward, 2006). Although an increase in muscle mass can be healthy when pursued in moderation and is recommended by the American College of Sports Medicine (Garber et al., 2011), for a minority, the excessive pursuit of muscularity

accompanied by body image distortion can lead to the development of muscle dysmorphia (MD).

According to the Diagnostic and Statistical Manual of Mental Disorders-Fifth Edition (DSM-5), MD is classified as a subtype of body dysmorphic disorder (BDD; American Psychological Association [APA], 2013). The criteria for BDD has four main components: (a) a preoccupation with one or more slight or perceived defects in physical appearance (e.g., skin, hair, nose), (b) the performance of repetitive behaviors or mental acts in response to appearance concerns, (c) the preoccupation causes clinically significant impairment in social, occupational, or other important areas of functioning, and (d) the preoccupation is not better explained by the diagnostic criteria for an eating disorder (APA, 2013). In MD, this preoccupation relates to the idea that one's body is too small or insufficiently muscular (APA, 2013). Many males with this disorder have well-defined bodies; however they filter their body image through a negative lens, discounting any positive aspects of their muscularity (Olivardia, 2007; Olivardia, Pope, & Hudson, 2000). Behaviors commonly associated with this disorder include constant mirror checking, excessive hours spent lifting weights, adherence to strict diet plans, and use of anabolic androgenic steroids (Grieve & Helmick, 2008; Olivardia, 2001; Pope, Gruber, Choi, Olivardia, & Phillips, 1997).

To date, the research on MD is relatively underdeveloped and little is known about its etiology. The vast majority of studies have focused on examining the correlates of MD symptoms (e.g., internalization of the mesomorphic ideal, muscular dissatisfaction); however the underlying causes of the disorder remain unclear (Grieve, Truba, & Bowersox, 2009; Tod & Lavalley, 2010). One way to advance research is to adopt a theory-driven approach to examine how the correlates interact in predicting MD characteristics. Meta-analyses have indicated that media pressures to conform to the mesomorphic body ideal consistently predict male's body dissatisfaction (Barlett, Vowels, & Saucier, 2008), and subsequent engagement

in risky body change behaviors associated with MD (Karazsia & Crowther, 2010; Tylka, 2011). Therefore, a model that considers sociocultural influences and their internalization would be an appropriate framework to represent pathways under which MD characteristics are likely to develop.

One sociocultural model that has been studied extensively in body image research is objectification theory. Fredrickson and Roberts (1997) originally formulated objectification theory to explain a variety of psychological consequences (e.g., eating disorders, depression, sexual dysfunction) that women experience as a result of living in a culture that objectifies their bodies. Recently, researchers have used objectification theory to guide research with male participants as well as females (e.g., Daniel & Bridges, 2010; Parent & Moradi, 2011; Strelan & Hargreaves, 2005). Strelan and Hargreaves (2005), for example, applied objectification theory to males and females to investigate motivation for exercise and body esteem. They found that self-objectification and appearance motives for exercise were negatively correlated to body esteem in both genders. Further, researchers have found moderate support for the utility of objectification theory in understanding males' drive for muscularity and propensity to use anabolic androgenic steroids (Daniel & Bridges, 2010; Parent & Moradi, 2011). These findings provide preliminary evidence that objectification theory is applicable in understanding the processes that lead to males' body image concerns, yet no studies have investigated the relationships of this model to MD specifically.

The present study aimed to address this gap in the literature by examining whether the relationships specified in objectification theory mediated males' engagement in MD characteristics. By identifying pathways under which MD characteristics are likely to emerge, researchers may be able to identify individuals at risk of the disorder and provide knowledge for the development of early intervention strategies. Such knowledge has significant implications for psychological practice as increasing numbers of males are

presenting to counselling centers and health services with manifestations of MD such as low self-esteem, decreased social functioning, depression, and appearance anxiety (Morgan, 2002; Olivardia, 2007). This development, in association with the increased risk of anabolic androgenic steroid use, is creating a growing need for clinicians to better understand the issues regarding males' muscularity-related body image concerns (Morgan, 2002; Parent & Moradi, 2011).

Objectification Theory Overview and Construct Definition

Objectification theory asserts that Western culture socializes girls and women to perceive themselves as aesthetic objects to be looked upon and evaluated on the basis of their appearance. Through constant exposure to other people's (specifically males') evaluation, girls and women learn that their looks matter, resulting in an increased preoccupation with their own physical appearance (Frederickson, Roberts, Noll, Quinn, & Twenge, 1998). As such, objectification theory shares parallels with social learning approaches to body image, in which people evaluate their own appearance through exposure to social messages about acceptable and unacceptable looking bodies (Tiggemann, 2011). This process, termed self-objectification (in objectification theory), manifests as persistent body surveillance involving habitual monitoring of one's body for adherence to internalized cultural ideals, and can in turn, result in feelings of body shame for failing to meet those unrealistic standards. This model is posited to underlie unhealthy efforts to alter one's appearance (e.g., excessive dieting and exercise) and can contribute to a subset of psychological disorders including eating disorders, unipolar depression, and sexual dysfunction (e.g., Calogero, Davis, & Thompson, 2005; Chen & Russo, 2010; Muehlenkamp, Swanson, & Brausch, 2005; Tiggemann & Williams, 2012). For example, Tiggemann and Williams (2012) found strong support for the mediated relationships of self-objectification through body surveillance and body shame to disordered eating in a sample of female undergraduate students.

Applicability of Objectification Theory to Males

Although objectification theory was originally developed to explain women's body image concerns, researchers contend that males are subject to the same overarching cultural system and restrictive body ideals promoted in the media (Hebl, King, & Lin, 2004; Martins, Tiggemann, & Kirkbride, 2007; Morry & Staska, 2001). An overwhelming majority of males in Western culture are exposed to media images that portray muscular bodies that exceed average proportions (Leit, Pope, & Gray, 2001). Research has suggested that males' bodies have become more muscular and prevalent in the media over the last 40 years, compared with similar images prior to the 1970s (Tod & Lavalley, 2010). These images are often tied to social messages about the benefits of being more, rather than less, muscular, and may encourage males to objectify and evaluate themselves (Baird & Grieve, 2006). Further, researchers have found that males who scored high on measures of self-objectification also indicated a higher drive for muscularity, more symptoms of MD (e.g., steroid use, excessive dieting, and impaired social functioning), greater internalization of muscular media ideals, and subscribe more strongly to appearance exercise motives compared to males who scored low on measures of self-objectification (Grieve & Helmick, 2008; Morry & Staska, 2001; Strelan & Hargreaves, 2005).

While these findings provide preliminary evidence for the utility of objectification theory in understanding males' body image concerns, several researchers have failed to find significant relationships among objectification theory variables and outcome variables in males (e.g., Fredrickson, Roberts, Noll, Quinn, & Twenge, 1998; Hallsworth, Wade, Tiggemann, 2005; Tiggemann & Kuring, 2004). In particular, researchers have found that self-objectification was unrelated to disordered eating and depression in males, as found in women. One possible explanation for these inconsistent findings is that the Self-Objectification Questionnaire (Fredrickson et al., 1998), which was originally developed for

use with women, may not fully capture the male experience of self-objectification because of the different body ideals across genders (e.g., thinness for women, muscularity for males).

Furthermore, when researchers moved beyond purely correlational analysis to investigate how objectification theory variables interact in predicting males' body image concerns, they have also found inconsistent results. In particular, Daniel and Bridges (2010) and Parent and Moradi (2011) found that body shame failed to mediate the relationship between objectification theory variables and the drive for muscularity in a North American sample of male college students. These findings highlight that body shame may be more salient to thinness-related body image concerns and may not fully capture the emotional experiences that underlie muscularity-related body image concerns.

Limitations of Objectification Theory's Application to Males

Given the mixed results of objectification theory's application to males, researchers are unable to determine whether it is a useful framework for explaining males' body image concerns. Although it is theoretically plausible, with evidence suggesting males' bodies are increasingly objectified in the media (Labre, 2005; Leit et al., 2001; Pope, Olivardia, Gruber, & Borowiecki, 1999), researchers have identified two primary limitations that appear to be impeding the application of objectification theory to males. These limitations include the use of the Self-Objectification Questionnaire and proposed mediating role of body shame.

The Self-Objectification Questionnaire was explicitly designed for use with women, and as such, the different observed pattern of correlations across genders may be a function of the measure tapping into different constructs in males and females (e.g., Daniel & Bridges, 2010; Daniel, Bridges, & Martens, 2014; Tiggemann & Kuring, 2004). For example, characteristics such as *strength* and *physical fitness* may have very different meanings for males and females because of the different body ideals across genders. On the Self-Objectification Questionnaire, however, both *strength* and *physical fitness* are conceptualized

as competence-related attributes, which when rated as more important result in lower self-objectification. With males' current focus on muscularity, some males may conceptualize *strength* as an appearance-related attribute, which may account for the inconsistent findings between self-objectification and outcome variables in males (Tiggemann & Kuring, 2004). Thus, it is possible that the Self-Objectification Questionnaire may be less valid and reliable when applied to males; a problem exacerbated by the rank ordered nature of this measure making it impossible to test its internal consistency (Daniel et al., 2014). Therefore, in order to determine whether self-objectification is applicable to males, the present study used the Male Assessment of Self-Objectification (Daniel et al., 2014), which has been modified from the original Self-Objectification Questionnaire to capture the male experience of this construct.

A second limitation identified in the application of objectification theory to males' body image concerns is the lack of support for the mediating role of body shame when males' drive for muscularity is the criterion variable. As previously reviewed, body shame has been linked with thinness-related body image concerns in both males and females (Calogero, Davis, & Thompson, 2005; Moradi & Huang, 2008), however studies have yielded non-significant results in its application to muscularity-related body image concerns in males (Daniel & Bridges, 2010; Parent & Moradi, 2011). These findings suggest that the role of body shame in the objectification theory framework may differ depending upon the body image criterion variable (e.g., thinness-related or muscularity-related concerns). Thus, males who want to achieve a more muscular physique may not necessarily feel ashamed of their bodies. This pattern fits with traditional gender norms that align physical attractiveness and self-worth more closely with females than for males, and highlights the importance of considering group-specific differences within the objectification theory framework (Parent & Moradi, 2011). For example, previous research examining the application of objectification

theory to women have considered other mediating variables that might fit the model such as the roles of appearance anxiety and awareness of internal bodily states in an attempt to understand the broader psychological consequences of self-objectification (Moradi & Huang, 2008). Similarly, it is anticipated that other mediating variables may more accurately reflect the psychological consequences of self-objectification in relation to muscularity-related body image concerns. Given that body shame is more salient to thinness-related body image concerns, the present study aimed to examine whether an alternative mediating variable (muscular dissatisfaction) may link objectification theory variables (internalization of cultural body ideals, self-objectification and body surveillance) with males' engagement in MD characteristics.

Previous research supports the role of muscular dissatisfaction as a mediator between internalization of the mesomorphic ideal and males' engagement in risky body change behaviors (Tylka, 2011; Tylka & Andorka, 2012). In particular, research suggests that males who are dissatisfied with their muscularity are more likely to engage in MD-related characteristics, such as consuming bodybuilding supplements and training despite injury (Cafri & Thompson, 2007; Cafri et al., 2005; Goldfield, Blouin, & Woodside, 2006; Karazsia & Crowther, 2010; Tylka, 2011). Therefore, the current study hypothesized that males who internalize the mesomorphic ideal as their personal standard and engage in persistent body surveillance to adhere to this standard may experience heightened muscular dissatisfaction rather than feelings of body shame.

Present Study

Based on these previous empirical findings, the present study tested a revised version of the objectification theory model to capture the male experience of these constructs. As shown in Figure 1, the basic tenets of objectification theory including internalization of the mesomorphic idea, self-objectification, and body surveillance were retained in the

hypothesized model, while the mediating role of body shame was replaced with muscular dissatisfaction in an attempt to capture the male experience of these constructs. The exploration of muscular dissatisfaction as a mediator in the hypothesized model will address questions posed by several researchers (Daniel & Bridges, 2010; Parent & Moradi, 2011) as to whether body shame was inhibiting the application of objectification theory to males' muscularity-related body image concerns. The present study extends previous research by (a) applying objectification theory to a new domain in MD characteristics, (b) exploring the mediating role of muscular dissatisfaction, and (c) using measurement tools that have been amended for use with males. By examining whether objectification theory variables mediate males' engagement in MD characteristics, the present study aimed to generate knowledge about the possible mechanisms that underpin the disorder's development. Such knowledge may inform the development of early intervention and preventative strategies to identify individuals at risk of the disorder and provide them with evidence-based interventions to reduce the likelihood of them developing a body image disorder or associated psychopathology. The present study tests the following hypotheses: first, there will be significant positive direct relationships among internalization of the mesomorphic ideal with self-objectification, body surveillance, muscular dissatisfaction, and MD characteristics; self-objectification with body surveillance; body surveillance with muscular dissatisfaction and MD characteristics; and muscular dissatisfaction with MD characteristics. Second, there will be significant positive indirect relationships between internalization of the mesomorphic ideal and MD characteristics, involving self-objectification, body surveillance, and muscular dissatisfaction as mediators. More specifically, (a) self-objectification will mediate the relationship of internalization of the mesomorphic ideal with body surveillance, (b) body surveillance will mediate the relationship of self-objectification with muscular dissatisfaction

and MD characteristics, and (c) muscular dissatisfaction will mediate the relationships of internalization of the mesomorphic ideal and body surveillance with MD characteristics.

Method

Participants

The final data set included responses from 257 males ($M_{age} = 29.7$, $SD_{age} = 11.2$). Of these participants, 83.1% identified as Australian, 1.2% as Indigenous Australian, 4.3% as New Zealanders, 4.3% as English, 2.4% as North American/Canadian, and 4.7% identified as 'Other'. The completion rate for the survey was 67%. Approximately one-third of the participants (36.2%) self-identified as university students while the remaining participants (63.8%) represented members of the general population. Based on participants' mean self-reported height of 1.81 m ($SD = .08$) and weight of 85.4 kg ($SD = 16.7$), their mean Body Mass Index (BMI) was 26.07 kg/m² which falls within the lower limit of the overweight range from 25-30 (World Health Organization, 2006). Participants regularly engaged in physical training ($M = 4.0$ sessions per week, $SD = 2.1$), with the majority (67.5%) of sessions focusing on training with weights ($M = 2.7$ sessions per week, $SD = 1.8$).

Procedure and Measures

Following institutional ethics approval and informed consent, participants completed an online questionnaire set on the SurveyMonkey platform. Online questionnaires have been shown to collect data of sufficient quality to answer psychological-focused research questions (Riva, Teruzzi, & Anolli, 2003). Participants were recruited through social networking sites (including Facebook and bodybuilder forums), notices on bulletin boards in local gyms, and via a snowballing technique, in which participants were asked to share the details of the study with other interested persons.

Demographic questionnaire. A short demographic questionnaire was used to record participants' age, gender, national identity, self-reported height and weight, education, and

exercise habits. Participants indicated how many times they physically trained per week, detailing how many of these sessions specifically focused on lifting weights or endurance-based activities. These data were used to describe the sample.

Internalization of the mesomorphic ideal. The 11-item internalization subscale of the male version of the Sociocultural Attitudes Toward Appearance Questionnaire-Revised (SATAQ-I-R; Heinberg, Thompson, & Stormer, 1995) measures the degree to which males have adopted the societal mesomorphic ideal (e.g., muscular and lean body ideal) as their personal standard (sample item: “I would like my body to look like the males who appear in TV shows and movies”). Item responses are rated on a 5-point Likert scale (1 = *completely disagree* to 5 = *completely agree*). After specified items are reverse-coded, items are averaged with higher scores indicating greater internalization of the mesomorphic ideal. Among college males, this subscale was found to yield acceptable internal consistency ($\alpha = .91$) and was correlated to males’ dissatisfaction with their muscularity ($r = .56$) and body fat ($r = .47$; Tylka, 2011). In the present study, the Cronbach’s alpha was .84 (95% Confidence Intervals [CI] = .81, .87).

Self-objectification. The Male Assessment of Self-Objectification (MASO; Daniel et al., 2014) was developed to assess the experience of self-objectification in males. The MASO consists of 18 body attributes that load on two subscales, with 11 items on the appearance-based attributes (sample item: “Upper arm diameter”) and seven items of the competency-based attributes (sample item: “Coordination”). Participants responded on a 7-point Likert scale, rating each body attribute according to how important it is in the way they view their body and its abilities (0 = *not at all important* to 6 = *very important*). The MASO obtains three separate scores: a mean appearance-based score, a mean competence-based score, and a total self-objectification score. The total self-objectification score is derived from subtracting the mean competency-based score from the mean appearance-based score.

Daniel et al. (2014) found acceptable internal consistency (.90) and 1 week test-retest reliability ($r = .79$). In the present study, internal consistency estimates were .85 (95% CI = .82, .87) for the appearance-based subscale and .88 (95% CI = .85, .90) for the competency-based subscale. The MASO differs from the SOQ by focusing on attributes more likely to be relevant to males (muscularity) rather than females (adiposity; Daniel et al., 2014).

Body surveillance. The 8-item body surveillance subscale of the Objectified Body Consciousness Scale (OBCS-Surv; McKinley & Hyde, 1996) measures the extent to which participants view their bodies from an outsider observer's perspective (sample item: "During the day, I think about how I look many times"). Responses are rated on a 7-point Likert scale (1 = *strongly disagree* to 7 = *strongly agree*), with an additional option to select *not applicable* (NA) if an item does not apply to the participant. Following McKinley and Hyde's (1996) scoring procedures, appropriate items are reverse scored and ratings of applicable items are averaged, with higher scores indicating greater body surveillance. Among male bodybuilders, weight trainers, and non-athletes, this subscale was found to yield acceptable internal consistency ($\alpha = .81$) and demonstrated validity through positive relations with males' appearance anxiety and body dissatisfaction (Hallsworth et al., 2005). In the present study, the Cronbach's alpha was .82 (95% CI = .78, .85).

Muscular dissatisfaction. The 10-item muscularity subscale of the Male Body Attitudes Scale (MBAS; Tylka, Bergeron, & Schwartz, 2005) measures males' attitude towards their muscularity (sample item: "I think my arms should be larger"). Responses are rated on a 6-point Likert scale (1 = *never* to 6 = *always*). After reverse-coding specified items, subscale items are averaged with higher scores indicating a greater level of muscular dissatisfaction. Tylka et al. (2005) found acceptable internal consistency (.91) and 2 week test-retest reliability ($r = .88$). In the present study, the Cronbach's alpha was .91 (95% CI = .89, .92).

Muscle dysmorphia characteristics. Muscle dysmorphia characteristics were assessed using the Muscle Appearance Satisfaction Scale (MASS; Mayville, Williamson, White, Netemeyer, & Drab, 2002). The MASS is a 19-item questionnaire that measures behavioral and psychological characteristics associated with MD (sample item: “If my schedule forces me to miss a day of working out with weights, I feel very upset”). This self-report questionnaire generates a total score and contains five subscales: bodybuilding dependence, muscle checking, substance use, injury risk, and muscle satisfaction. In order to keep the same direction for each subscale, the muscle satisfaction subscale is reverse-coded to measure muscle dissatisfaction; with higher scores reflecting less satisfaction with body muscle. Responses are rated on a 5-point Likert scale (1 = *definitely disagree* to 5 = *definitely agree*). Scores range from 19 to 95, with higher scores reflecting a tendency towards MD. Mayville et al. (2002) found acceptable internal consistency and test-retest reliability (bodybuilding dependence $\alpha = .80$, $r = .76$; checking $\alpha = .79$, $r = .89$; substance use $\alpha = .75$, $r = .88$; injury $\alpha = .76$, $r = .84$; satisfaction $\alpha = .73$, $r = .86$; total $\alpha = .82$, $r = .87$). In the present study, the Cronbach’s alpha for the total MASS score and each subscale were: .90 (95% CI = .88, .92) for global MD characteristics, .83 (95% CI = .80, .86) for bodybuilding dependence, .80 (95% CI = .75, .84) for muscle checking, .75 (95% CI = .70, .80) for substance use, .78 (95% CI = .73, .82) for injury risk, and .82 (95% CI = .78, .85) for muscle satisfaction. The total MASS score, which relates to the complete construct of MD characteristics, was used as the dependent measure in the present study.

Results

Data screening was conducted to ensure that appropriate assumptions were met. Examination of Pearson’s correlation coefficients revealed that the bivariate correlations among variables were not excessive (r ’s range = .33 - .55), indicating that multicollinearity was not of concern (see Table 1). Path analysis for manifest variables was conducted to test

the hypothesized model using the Analysis of Moment Structures 21 (AMOS) program (Arbuckle, 2012), which is compatible with SPSS (version, 21, IBM, New York, US).

Correlations, means, and standard deviations of the variables are presented in Table 1. The results indicated that all variables correlated significantly with one another in the expected directions, providing support for the variables selected in the hypothesized model.

Adequacy of model fit was determined by four indices recommended by Hu and Bentler (1999): the χ^2 statistic, the comparative fit index (CFI), the standardized root mean square residual (SRMR), and the root mean square error of approximation (RMSEA) including the associated 90% confidence interval (90% CI). Results indicated that the hypothesized model fit the data well, $\chi^2(2, N = 257) = 7.51, p = .023, CFI = .99, SRMR = .04, RMSEA = .10, 90\% CI [.03, .19]$. As is occasionally the case, the fit indices contradict each other (Weston & Gore, 2006). The CFI, SRMR, and RMSEA indicated the model provides an acceptable fit to the sample data, however, the significant χ^2 suggests the model may be a poor fit. It is important to note that large sample sizes increase the power of the χ^2 statistic, resulting in significance with small effect sizes (Henson, 2006). As such, a significant χ^2 may occur even when the model is a close fit to the sample data. Based on an examination of the fit indices and standardized parameter estimates reported in Figure 2, evidence suggests that the model fits the data well. Specifically, the model accounted for 13% of the variance in self-objectification, 40% of the variance in body surveillance, 29% of the variance in muscular dissatisfaction, and 36% of the variance in MD characteristics.

As a point of comparison, a model without muscular dissatisfaction was tested and the fit indices indicated a poor fit ($\chi^2(1, N = 257) = 8.83, p = .003, CFI = .96, SRMR = .54, RMSEA = .18, 90\% CI [.08, .29]$). Based on the change in fit indices, the results indicate that the inclusion of muscle dissatisfaction substantially improved the model.

As shown in Figure 2, all pathways in the hypothesized model were significant at the .05 level. Consistent with Hypothesis 1, internalization of the mesomorphic ideal had significant positive direct effects on self-objectification ($\beta = .36, p < .001$), body surveillance ($\beta = .43, p < .001$), muscular dissatisfaction ($\beta = .35, p < .001$), and MD characteristics ($\beta = .16, p < .05$). Self-objectification had a significant positive direct effect on body surveillance ($\beta = .33, p < .001$). Body surveillance had significant positive direct effects on muscular dissatisfaction ($\beta = .25, p < .001$) and MD characteristics ($\beta = .16, p < .05$). Finally, muscular dissatisfaction had a significant positive direct effect on MD characteristics ($\beta = .40, p < .001$).

To test for mediation, the hypothesized model was run with 10,000 bootstrap samples from the data set to generate indirect effects and bias-corrected confidence intervals (CIs; Shrout & Bolger, 2002). Indirect pathways are significant and indicate mediation if the 95% CIs do not include zero. In structural models using AMOS, the indirect pathway from X to Y represents the sum of all mediated effects between the source of variable X and the final outcome variable Y (Macho & Ledermann, 2011). Therefore, in order to test the specific indirect pathway within the hypothesized model, visual basic syntax was written in the Custom Estimands function of AMOS. This function allows the researcher to examine a specific pathway from X to Y that is mediated by a subclass of the intervening variables (Arbuckle, 2012), such as the indirect pathway of internalization of the mesomorphic ideal on MD characteristics that is mediated through muscular dissatisfaction only. As shown in Table 2, all indirect pathways examined were significant and the 95% CIs did not include zero, suggesting mediation for all indirect pathways in the hypothesized model. According to Hayes (2013) both direct and indirect pathways may coexist and we tested to see if both direct and indirect pathways emerged in the results. Consistent with hypothesis 2, self-objectification mediated the positive relationship of internalization of the mesomorphic ideal

with body surveillance. Body surveillance, in turn, mediated the positive relationship of self-objectification with muscular dissatisfaction and MD characteristics. Finally, muscular dissatisfaction mediated the relationships of internalization of the mesomorphic ideal and body surveillance with MD characteristics.

Discussion

The present study further examined the role of objectification theory in understanding the processes that lead to males' body image concerns, with a specific focus on males' experience of MD characteristics. Previous research using path models have implicated the role of objectification theory in understanding the processes that lead to women's body image concerns (Moradi & Huang, 2008); however, few researchers have attempted to explain males' body image concerns in this way. Recently, researchers have found moderate support for the utility of objectification theory in explaining males' drive for muscularity (Daniel & Bridges, 2010; Martins et al., 2007; Parent & Moradi, 2011) and propensity to use anabolic androgenic steroids (Parent & Moradi, 2011). These studies, however, found that body shame consistently failed to mediate the relationships of self-objectification and body surveillance with males' drive for muscularity. Building upon these previous investigations, the present study tested a revised model of objectification theory by substituting the mediating role of body shame with muscular dissatisfaction in an attempt to capture the psychological consequences of self-objectification among males with muscularity-related concerns.

These results indicate objectification processes may operate for both males and females, but the emotional and body image variables involved may differ for the genders. These results and available research may indicate that each gender is associated with a specific version of self-objectification theory, signaling an avenue of future work. A rival hypothesis, however, might be that it is individuals' desired ideal physiques and not gender

that distinguishes how objectification processes operate. Some males desire a slender, as opposed to a muscular physique (Hildebrandt et al., 2006) and some females want a muscular, rather than a slender, body (Gruber, 2007). Comparing the two hypotheses will advance knowledge and may have implications for clinical practice; for example, treating individuals on the basis of their body image desires rather than gender per se.

In the present study, path models were used to examine the relationships among objectification theory variables, muscular dissatisfaction, and MD characteristics in Australian males. Consistent with Hypotheses 1 and 2, all direct and indirect relationships in the hypothesized model were significant and positively influenced the development of MD characteristics. These findings support the utility of objectification theory in explaining the processes under which MD is likely to emerge when muscular dissatisfaction is used as a mediating variable rather than body shame. Given that the etiology of MD is complex and extensive, understanding the way these etiological variables interrelate in predicting MD characteristics will provide insight into the development and maintenance of the condition.

Consistent with objectification theory and previous research among women (e.g., Moradi & Huang, 2008; Tiggemann and Kuring, 2004; Tiggemann and Williams, 2012), self-objectification mediated the relationship of internalization of the mesomorphic ideal with body surveillance. These findings suggest that males who adopt societal body ideals have a greater tendency to view themselves as an aesthetic object to be looked upon and evaluated, and in turn, monitor their outward appearance for adherence to these internalized ideals. One explanation for these findings is that Western culture positions appearance, particularly a muscular physique, as central to males' sense of self (Olivardia, 2007). Therefore, some males believe they need to monitor their outward appearance in order to ensure their bodies comply with cultural standards of attractiveness (Frederick, Forbes, Grigorian, & Jacho, 2007; McKinley & Hyde, 1996). This trend towards an increasingly muscular male ideal is

exemplified by action figures and *Playgirl* male centerfold models who over the past few decades have become progressively more muscular and lean (Leit et al., 2001; Pope et al., 1999). Thus, continued attention to the relationships among internalization of the mesomorphic ideal, self-objectification, and body surveillance is warranted in research on males' body image concerns.

The results of the present study also indicated that internalization of the mesomorphic ideal directly, and indirectly through the mediation of muscular dissatisfaction, predicted MD characteristics. The direct relationship suggests that simply internalizing the mesomorphic ideal may promote MD characteristics in males. From a social learning perspective, males in Western societies may learn from the media that muscularity is associated with various rewards, such as increasing social status and appearing more physically attractive to potential sexual partners (Tod & Lavalley, 2010). As such, males who are susceptible to sociocultural pressures might attempt to fit this ideal in order to obtain the perceived and varied sociocultural rewards. For most males the mesomorphic ideal portrayed in Western culture is unattainable and, therefore, some males may minimize the dangers of engaging in MD characteristics (e.g., bodybuilding dependence, steroid use) to reduce the discrepancy between their actual and ideal bodies (Pope, Phillips, & Olivardia, 2000). This finding is consistent with evidence by Moyers (2005), who found that the greater the discrepancy between males' actual and ideal bodies, the more likely males endorsed symptoms of MD. Therefore, efforts to reduce males' internalization of the mesomorphic ideal portrayed in the media may be important for prevention and intervention strategies to reduce males' risk of developing MD. Muscular dissatisfaction also mediated the relationship of internalization of the mesomorphic ideal with MD characteristics. This finding suggests that males who are sensitive to sociocultural influences (e.g., media, magazine images) about their appearance and are unable to obtain the culturally prescribed muscular ideal may become dissatisfied

with their own muscularity. This dissatisfaction, in turn, increases the likelihood of males engaging in unhealthy behaviors to improve their perceived physical appearance and to reduce the negative affect associated with the discrepancy.

Another notable relationship revealed in the present study was the indirect effect of self-objectification on MD characteristics mediated through body surveillance. This finding suggests that males who place a greater emphasis on their physical attributes and monitor their outward appearance may engage in MD characteristics, even if they are not dissatisfied with their current level of muscularity. Empirical support for this relationship comes from a study by Grieve and Helmick (2008) who found that self-objectification was unrelated to body dissatisfaction, however, positively correlated with MD characteristics in males from the United States. One explanation for these findings is that self-objectification does not characterize the way males feel about themselves, but rather the manner in which they make judgements about their bodies (Fredrickson & Roberts, 1997; Grieve & Helmick, 2008). Therefore, it is possible that males who view and value themselves in terms of their physical appearance may engage in MD characteristics, without necessarily feeling dissatisfied with their muscularity. Given the behavioral manifestations of MD (e.g., lifting weights, taking supplements, dieting) are ego syntonic and do not necessarily cause distress, perhaps it is only when these behaviors begin to interfere with other social and occupational commitments that some males may experience clinically significant distress related to the condition.

Further, the results of the present study indicated that muscular dissatisfaction mediated the relationship between body surveillance and MD characteristics. These findings suggest that body surveillance might elicit selective and self-focused attention on males' current level of muscularity, promoting muscular dissatisfaction in those individuals whose body does not match their internalized ideal. This dissatisfaction may be a source of distress that leads males to engage in various mental and physical behaviors associated with MD.

These findings are congruent with previous research that found body checking behaviors were significantly correlated with symptoms of MD (Walker et al., 2009) as well as weight and shape concerns in males (Grilo et al., 2005; Reas, Grilo, Masheb, & Wilson, 2005). However, body surveillance also had a unique direct effect on MD characteristics. This finding suggests that simply monitoring one's outward appearance increases males' risk of developing MD characteristics.

Finally, the inclusion of muscular dissatisfaction as a mediator in the hypothesized model addressed questions posed by several researchers as to whether body shame was inhibiting the relationship of objectification theory variables with muscularity-related body image concerns (e.g., Parent & Moradi, 2011). In previous research with males, support for the posited mediating role of body shame has varied depending upon the body image criterion variable being measured (e.g., muscularity-related or thinness-related concerns). In particular, researchers have found that body shame is consistently unrelated to males' drive for muscularity (Daniel & Bridges, 2010; Martins et al., 2007; Parent & Moradi, 2011) suggesting that the psychological consequences of self-objectification may differ in males with muscularity-related concerns. The results of the present study found that body surveillance, a behavioral manifestation of self-objectification, directly predicted both muscular dissatisfaction and MD characteristics in males. These findings point to the importance of considering group-specific experiences within the objectification theory framework and contributes to the understanding of self-objectification from the dominant male perspective regarding muscularity-related appearance concerns.

Overall, the results of the present study indicate that objectification theory provides a useful framework for understanding the processes associated with males' MD characteristics when muscular dissatisfaction is included as a mediating variable. According to Fredrickson and Roberts (1997), self-objectification occurs through the internalization of cultural

messages that emphasize the importance of body appearance. The present study provides further evidence that males are susceptible to experiences of self-objectification relative to the mesomorphic body ideal perpetuated in Western culture. Given that these muscular body ideals are largely unachievable for the average male, some males may engage in MD behaviors (e.g., excessive exercise, steroid use) to achieve and maintain this perceived ideal. This maladaptive self-evaluation may be a source of distress that contributes to the development of MD and, potentially, for some males this dysmorphia may reach a severity level that warrants a clinical diagnosis of body dysmorphic disorder. Indeed, when males with MD present for treatment, it is often for other issues such as depression or anxiety (Olivardia, 2007), which highlights the importance of clinicians screening male clients for potential body image concerns.

Implications for Practice

The results of the present study may inform clinical practice for males presenting with muscularity-related body image concerns including manifestations of MD. Support for the relationships between internalization of the mesomorphic ideal, self-objectification, and body surveillance are consistent with the cognitive behavioral model for BDD (Veale, 2004); consequently interventions consistent with this model will likely benefit male clients with MD based on this study's findings. For example, mirror re-training exercises to develop or restore adaptive mirror use, as well as, the reduction of self-focused attention are important components in cognitive behavioral therapy for BDD (Veale & Neziroglu, 2010; Veale & Riley, 2001).

Cognitive behavioral techniques may also help identify and reduce males' internalization of the mesomorphic ideal. In these interventions, therapists could have clients explore body image concerns via expressive writing and self-monitoring exercises (Cash, 2008). To this end, it might be useful to explore the clients' values that contribute to the

adoption of societal body ideals (Parent & Moradi, 2011). For example, exploring what benefits obtaining the ideal male physique may achieve (e.g., physical health, attractiveness to potential intimate partners); and how these benefits might be gained without adopting unrealistic body ideals. Addressing these questions could help males adopt the perspective of taking care of their bodies for health reasons rather than for appearance concerns.

Limitations and Future Directions

The results of the present study must be interpreted in the context of its limitations. The first limitation is that the sample's characteristics outline the boundaries of generalizability for the findings. Although the present study offers needed data about the development of MD characteristics in primarily Australian males who had access to the internet, future research is needed to examine the applicability of the hypothesized model to males of different ethnicities, sexual orientation, age, and other identity dimensions (e.g., bodybuilding and weightlifting populations, those without internet access). In addition, future research examining self-objectification among males should consider using the Male Assessment of Self-Objectification (Daniel et al., 2014), as it has been adapted from the original Self-Objectification Questionnaire to capture the male experience of this construct, and yielded acceptable internal consistency in the present study.

Another limitation is that the direction of causality cannot be inferred from the present cross-sectional design. Given that it would be unethical to adopt an experimental design that increases males' preoccupation with their own muscularity due to the known negative consequences (e.g., steroid use, appearance anxiety, and excessive exercise), descriptive research offers the best evidence available to guide theory development. As such, the present study lays the groundwork for longitudinal and experimental research designs to further explore the underlying processes involved in MD using the objectification theory framework. Additionally, it would be beneficial to consider the inclusion of possible protective factors in

the hypothesized model. For example, research has shown that increasing self-esteem acts as a buffer between body dissatisfaction and eating disorder symptomatology in males (Dakanalis & Riva, 2013). The inclusion of potential protective factors such as high self-esteem in the path analysis may contribute to the development of effective prevention and intervention programs.

Finally, measurement limitations of the Muscle Appearance Satisfaction Scale (Mayville et al., 2002) need to be considered in the present study and broader literature addressing MD. Typically MD measurement tools are interpreted by summing the item scores for each subscale, with higher scores indicating higher characteristics associated with MD. However, it is unclear how many characteristics an individual must possess to develop the condition of MD (Olivardia, 2001). Further validation using a clinical sample is required to establish appropriate cut-off scores to guide interpretation of these measures (Lantz, Rhea, & Cornelius, 2002). These cut-off scores could be used to identify individuals at risk of developing MD, as well as, identifying ranges of severity from mild through to a clinical diagnosis of body dysmorphic disorder with MD.

Currently few studies exist on which to base MD prevalence reliably. Although Pope et al. (2000) estimated that 100,000 US males experienced clinical MD levels, with greater numbers experiencing subclinical levels, more data are needed (Tod & Lavalley, 2010). It has been demonstrated that the majority of Western young adult males want to increase their muscularity and this desire is linked with negative health behaviors, thoughts, and emotions (Edwards et al., 2014). Identifying prevalence represents a pressing research need. Similarly, it is unclear the degree to which other variables, such as culture or age influence MD prevalence. Additional research avenues include examining males from across the lifecycle, investigating a wider range of cultures, and the inclusion of acculturation measures in studies.

A limitation with theories based on a social learning paradigm, like objectification theory, is that they do not explain why some people seem resistant to social messages (Tiggemann, 2011). All males in Western societies are exposed, for example, to the muscular ideal physique, but not all develop muscular dysmorphia or other body image issues. Future research could examine individual differences to help address variation. As one possibility, perhaps the psychological needs (autonomy, relatedness, and competence) posited by self-determination theory (Deci & Ryan, 2000) may have explanatory power. Men whose needs for relatedness, autonomy, and competence are being satisfied in other ways do not feel pressured to strive for a muscular physique. Additionally, factors consistent with cognitive behavioral models of BDD such as effortful cognitive processing (rumination) and metacognitive beliefs about self-focused attention may explain why some individuals are more vulnerable to social messages and muscle dysmorphia (Neziroglu, Khemlani-Patel, & Veale, 2008).

Conclusion

The present findings support the utility of objectification theory in understanding the processes that lead to males' engagement in MD characteristics. These findings demonstrate that the relationships specified in the hypothesized model influence the development of MD characteristics in predominately Australian male sample. Furthermore, the inclusion of muscular dissatisfaction as a psychological consequence of body surveillance is novel and adds to knowledge regarding the process of self-objectification from the dominant male perspective. These findings have significant treatment implications (e.g., the potential harm caused from viewing one's body as an aesthetic object) for males' muscularity-related body image concerns. Given that treatment efficacy is enhanced through understanding the processes that lead to a disorder, an increased understanding of how objectification theory relates to males' body image concerns is a noteworthy endeavor for future research. In this

regard, the present findings highlight the need to attend to males' pathological pursuit of muscularity, and objectification theory provides a useful framework for such exploration.

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Table 1

Summary of Correlations, Means, Standard Deviations for Variables in the Hypothesized Model

	<i>M</i>	<i>SD</i>	1	2	3	4	5
1. Internalisation	3.06	.75	-				
2. Self-objectification	-.66	1.24	.36**	-			
3. Body Surveillance	3.90	1.13	.55**	.48**	-		
4. Muscular Dissatisfaction	3.05	1.00	.49**	.36**	.45**	-	
5. MD Characteristics	38.12	12.21	.45**	.33**	.43**	.55**	-

Note. ** $p < .01$ (2-tailed), MD – Muscle Dysmorphia

Table 2

Test of Mediation: Examination of Indirect Effects and Bias-Corrected 95% Confidence Intervals (CIs)

Indirect Path	Standardized Indirect	Unstandardized		95% CI	
	Effect	Bootstrap Estimate		Lower	Upper
	β	<i>B</i>	<i>SE</i>		
IMI → SO → BS	.12**	.177	.039	.110	.261
IMI → MD → MDC	.14**	2.301	.634	1.227	3.746
SO → BS → MDC	.05**	.514	.227	.126	1.021
SO → BS → MD	.08**	.068	.023	.029	.120
BS → MD → MDC	.10**	1.101	.313	.551	1.798

Note. IMI = internalization of the mesomorphic ideal; SO = self-objectification; BS = body surveillance; MD = muscular dissatisfaction; MDC = muscle dysmorphia characteristics; ** $p < .01$.

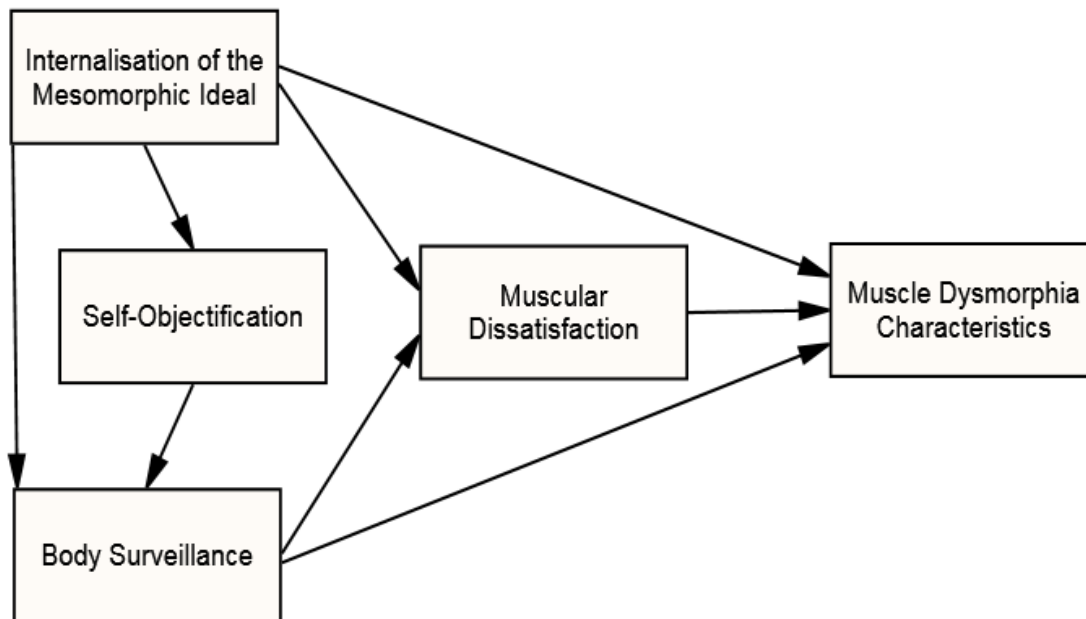


Figure 1. Hypothesized model of the relationships between objectification theory variables, muscular dissatisfaction, and muscle dysmorphia characteristics in men

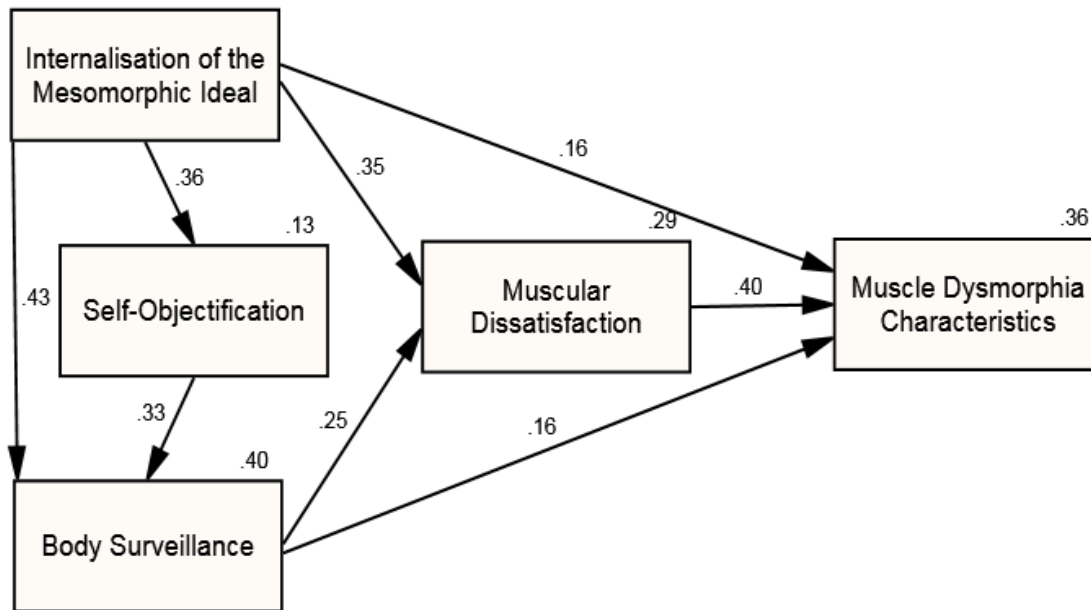


Figure 2. Observed path model among objectification variables, muscular dissatisfaction, and muscle dysmorphia characteristics in Australian men. All pathways were significant at the .05 level.