Is Body Dissatisfaction Changing Across Time?
A Cross-Temporal Meta-Analysis

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It remains unclear whether body dissatisfaction, a widely recognized predictor of eating-related pathologies and depressive symptomatology, is consistent across cohorts and time. This question is important to investigate because dominant theories propose that sociocultural influences, which may fluctuate, play an important role in the development of body dissatisfaction. Previous efforts for tracking body dissatisfaction across cohorts and time are limited by relying on data from a single institution or using assessments that lack psychometric support across genders. In this study, we utilized cross-temporal meta-analyses to examine changes in 2 dimensions of body dissatisfaction: thinness-oriented dissatisfaction as assessed with the Eating Disorder Inventory-Body Dissatisfaction subscale (data available across 31 years from 326 unique samples, \( n = 100,228 \) participants) and muscularity-oriented dissatisfaction as measured with the Drive for Muscularity Scale (data available across 14 years from 117 unique samples, \( n = 23,575 \) participants). Results revealed a significant interaction between year of study and gender in predicting thinness-oriented dissatisfaction: girls and women scored higher than boys and men consistently (\( ds = 0.51-1.17 \)), although only girls’ and women’s scores decreased gradually across time (\( d = 0.49 \)). Boys and men scored higher than girls and women on muscularity-oriented dissatisfaction (\( d = 1.72 \)), with no significant changes across time. These patterns remained when controlling for age and geographic location. Overall, these findings highlight the importance of considering multiple dimensions of body dissatisfaction in research and offer evidence that sociocultural shifts in body acceptance and diversity may be countering thinness-related pressures for girls and women.

**Keywords:** body dissatisfaction, Eating Disorder Inventory, Drive for Muscularity Scale, meta-analysis, gender

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Body image is a multidimensional construct that includes cognitive-affective, perceptual, and behavioral domains (Cash & Smolak, 2011). A well-researched phenomenon termed body dissatisfaction reflects the cognitive-affective component of the broader body image construct (Cash & Deagle, 1997; Kearney-Cooke & Tieger, 2015). Due to its importance as a clinical symptom of eating disorders (American Psychiatric Association, 2013) and an independent predictor of a variety of maladaptive outcomes (Stice, 2002), research attention on thinness-oriented body dissatisfaction has increased during the past few decades (Cash & Smolak, 2011; Thompson, Heinberg, Altabe, & Tantleff-Dunn, 1999). More recently, there is growing awareness and research attention on muscularity-oriented body dissatisfaction as a clinical symptom of body dysmorphic disorder (American Psychiatric Association, 2013) and its links to depression and lower well-being (Bergeron & Tylka, 2007; McCreary & Sasse, 2000). Importantly, research suggests that these unique dimensions of body dissatisfaction are heavily gendered, with women on average reporting more thinness-oriented dissatisfaction and men on average reporting more muscularity-oriented body dissatisfaction (McCreary, 2007; Murnen & Don, 2012; Tylka, Bergeron, & Schwarz, 2005). Moreover, femininity and masculinity correlate positively with thinness-oriented and muscularity-oriented dissatisfaction, respectively (Blashill, 2011; Tolman & Porche, 2000). However, little is known about how the levels of thinness-oriented or muscularity-oriented body dissatisfaction have changed among women and men over time.

**Body Dissatisfaction as a Clinical Construct**

Body dissatisfaction is a very important construct from a clinical perspective. First, clinically significant body dissatisfaction, or
overevaluation of weight and shape with regard to a person’s sense of self, is a necessary criterion for two primary disorders listed within the Feeding and Eating Disorders section of the DSM–5: anorexia nervosa and bulimia nervosa (American Psychiatric Association, 2013). The gendered nature of thickness-oriented body dissatisfaction is reflected in the imbalanced prevalence of eating disorders by gender, with women representing approximately 75% of individuals with anorexia or bulimia (Hudson, Hiripi, Pope, & Kessler, 2007). For both of these disorders, other necessary symptoms include maladaptive behaviors regarding eating (and in some cases purging) behaviors. According to cognitive–behavioral conceptualizations of these disorders, the primary function of these behaviors is to alleviate negative emotions that are linked directly to negative self-evaluations of body size and shape (e.g., Williamson, White, York-Crowe, & Stewart, 2004). Binge eating disorder differs from anorexia nervosa and bulimia nervosa in that clinically significant body dissatisfaction is not a required symptom of this disorder. Even so, body dissatisfaction among patients with binge eating disorder is common, and its presence is associated with more severe psychopathology and a more negative prognosis (Grilo, 2013).

In addition to being an important symptom of eating disorders, reducing body dissatisfaction, in particular thickness-oriented body dissatisfaction, is a core component of interventions to treat those with clinical eating disorders or who exhibit subclinical levels of eating pathology (Fairburn, 2008; Fursland & Byrne, 2015). Indeed, body image assessment and intervention are essential features of Fairburn, Cooper, and Shafran’s (2003) transdiagnostic approach to assessing and treating eating disorders. That is, regardless of the specific diagnosis, alleviating body dissatisfaction should be a focus of treatment for most individuals with a clinical eating disorder or subclinical symptomatology. Relatedly, targeting thickness-oriented body dissatisfaction is an important component of eating disorder prevention programs, and thus interventions that address body image by de-emphasizing the importance of thinness are useful even among samples without active symptoms of eating disorders (Becker, MacKenzie, & Stewart, 2015).

Emerging evidence indicates that muscularity-oriented body dissatisfaction is also an important clinical construct to address within treatment and prevention programs (e.g., Cafri et al., 2005; Parent, 2013). Among men, muscularity-oriented body dissatisfaction is a unique path through which sources of societal influence are associated with maladaptive body change behaviors (Tylka, 2011a). Furthermore, muscularity-oriented body dissatisfaction is a predictor of performance- and appearance-enhancing substance use (Karazsia, Crowther, & Galioto, 2013; Litt & Dodge, 2008).

Like eating disorders, there is an imbalanced gender ratio for muscularity-oriented body dissatisfaction. Unhealthy body change behaviors that enhance muscularity, such as steroid use, are far more common among men, reflecting the gendered nature of muscularity-oriented body dissatisfaction. For example, research on the lifetime prevalence of steroid use indicates that men are four to eight times more likely than women to use anabolic steroids (e.g., DuRant, Escobedo, & Heath, 1995; Yesalis, Bahlke, Kopstein, & Barsukiewicz, 2000). In response to growing awareness of the importance of muscularity-oriented body dissatisfaction, the DSM–5 now includes “with muscle dysmorphia” as a specifier for Body Dysmorphic Disorder (American Psychiatric Association, 2013). Muscle dysmorphia, which occurs much more frequently among men than women, is characterized by a preoccupation with a belief that one’s body is not muscular enough (e.g., Phillips et al., 2010).

Body Dissatisfaction as a Risk Factor

Beyond its role as a symptom of a disorder or target of an intervention, both thickness-oriented and muscularity-oriented body dissatisfaction also play a role as risk factors for developing disordered eating and depression (Smolak & Thompson, 2002), as well as decreased well-being, such as lower life satisfaction, self-esteem, self-compassion, optimism, secure attachment, and proactive coping (Albertson, Neff, & Dill-Shackleford, 2015; Avalos, Tylka, & Wood-Barcalow, 2005; Cash, Thériault, & Amis, 2004; Tylka & Subich, 2004). Thus, it is important to also study body dissatisfaction in nonclinical samples in order to capture how body dissatisfaction impacts the development of disorders and decreased well-being.

Within sociocultural theories of eating pathology (e.g., Stice, 1994; Thompson et al., 1999; Tylka, 2011a), thickness-oriented body dissatisfaction is uniformly included as a proximal risk factor for subsequent maladaptive eating or exercise behaviors. Indeed, many scholars argue that the function of behavioral components of eating disorders, in most cases, is to address underlying and preexisting body dissatisfaction (e.g., Williamson et al., 2004). The research evidence illustrating thickness-oriented body dissatisfaction as a key risk factor is so strong (Stice, 2002) that Smolak and Levine (2015) concluded “any etiological model (of eating disorders) needs to explain disturbances in body image . . .” (p. 5). In fact, thickness-oriented body dissatisfaction is considered the single strongest predictor of the development of eating-related pathology (Smolak & Levine, 2015).

Aside from eating-related pathology, thickness-oriented body dissatisfaction is also associated with anxiety (Fitzsimmons-Craft & Bartone-Cone, 2012), depression (Stice, Hayward, Cameron, Killen, & Taylor, 2000), and sexual dysfunction (Seal, Bradford, & Meston, 2009). For example, in a 4-year longitudinal study, Stice, Hayward, Cameron, Killen, and Taylor (2000) demonstrated that thickness-oriented body dissatisfaction predicted subsequent depressive symptomatology, even after controlling for baseline levels of depression.

While the vast majority of this research concerns the domain of thickness-oriented body dissatisfaction, complementary lines of research reveal similar trends regarding muscularity-oriented body dissatisfaction and lower well-being. Etiological models of muscle dysmorphia include muscularity-oriented body dissatisfaction as a key component (e.g., Cafri et al., 2005; Parent & Moradi, 2011), and correspondingly, maladaptive muscle-building strategies serve a function of alleviating this dissatisfaction (Pope, Phillips, & Olivardia, 2000). Even in nonclinical samples, muscularity-oriented body dissatisfaction predicts engagement in maladaptive muscularity enhancement behaviors such as performance- and appearance-enhancing substance use (Karazsia & Crowther, 2010; Parent & Moradi, 2011; Tylka, 2011a; Tylka & Andorka, 2012).

Antecedents of Body Dissatisfaction

The predictors of thickness-oriented and muscularity-oriented body dissatisfaction are multifaceted. Influences of thickness-oriented body dissatisfaction span certain biological risk factors, such as higher body mass index (Bearman, Pressnell, Martinez, & Stice, 2006) and younger age of menarche among women (Menzel et al., 2010), as well as personality constructs such as perfection-
ism (Wade & Tiggemann, 2013), within cultures that stigmatize fat bodies (Brownell, Puhl, Schwartz, & Rudd, 2005). Additionally, substantial theoretical and empirical work supports sociocultural factors as critical antecedents to thinness-oriented and muscularity-oriented body dissatisfaction (e.g., Ata, Schaefer, & Thompson, 2015; Tiggemann, 2012).

Various theories of sociocultural influence exist, such as Stice’s dual-pathway model (Stice, 1994), the tripartite influence model (Thompson et al., 1999), objectification theory (Fredrickson & Roberts, 1997), the recently proposed elaborated sociocultural model (Fitzsimmons-Craft et al., 2014), and refinements of these models to make them applicable for men (Tylka, 2011a). Two of the commonalities across all of these models are (a) the most antecedent constructs in the models involve sociocultural influences (as well as the internalization of these influences); and (b) the primary mechanism through which sociocultural influences predict maladaptive body change behaviors is through body dissatisfaction (Karazsia, van Dulmen, Wong, & Crowther, 2013). Sociocultural influences can include proximal and interpersonal risk factors, such as teasing (Stice, 2002) and pressure or encouragement to change body size and shape (Galioto, Karazsia, & Crowther; 2012; Helfert & Warschburger, 2011), as well as more contextual and distal factors, such as mass media’s pervasiveness of body ideals as indicators of attractiveness (Grabe, Ward, & Hyde, 2008) and stigmatization of obesity (Schwartz & Brownell, 2004). Importantly, scholars demonstrated that the permissive body ideals in popular culture are unattainable for most healthy humans (e.g., Brownell & Napolitano, 1995), even though many individuals adopt these ideals as personal goals and standards (Karazsia & Crowther, 2008; Thompson & Stice, 2001). Individuals who internalize these societal and cultural influences often experience body dissatisfaction (Karazsia & Crowther, 2009; Keery, van den Berg, & Thompson, 2004; Rodgers, Chabrol, & Paxton, 2011; Tylka, 2011a).

Certainly, sociocultural influences change across time, and therefore scholars have hypothesized that shifting body ideals impact individuals’ experiences with their bodies (e.g., Pope, Olivardia, Gruber, & Borowiecki, 1999). Evidence that body ideals have shifted across time comes from a variety of sources. Contestants and winners of the Miss America Pageant became thinner across a 20-year period spanning 1959–1978 (Garner, Garfinkel, Schwartz, & Thompson, 1980). A follow-up to this analysis revealed that the trend of declining body weight among Miss America contestants continued from 1979 to 1988 (Wiseman, Gray, Mosimann, & Ahrens, 1992). Scholars have also observed increasing thinness among Playboy centerfold models between 1959 and 1978, and then maintenance of this thin ideal between 1979 and 1988 (Garner et al., 1980). A consistent increase in diet articles appearing in popular magazines that target girls and women also occurred during these periods (Garner et al., 1980; Wiseman et al., 1992). More recently, scholars noted that portrayals of the ideal body for girls and women maintain the emphasis on thinness while also displaying a degree of toneness or muscularity (e.g., Thompson, van den Berg, Roehrig, Guida, & Heinberg, 2004).

Evidence of an evolving ideal exists among depictions of bodies of men as well. For instance, parallelizing research findings that Playboy centerfolds align with cultural appearance ideals, Playgirl centerfold models became increasingly muscular across a 25-year period from 1973–1997 (Leit, Pope, & Gray, 2001). Additionally, popular action figures became more muscular across a similar timeframe (Pope et al., 1999). Thompson and Cafri (2007) argued that sociocultural influences regarding the muscular body specifically continued to increase exponentially throughout the 2000s.

In addition to this increased awareness of changing body ideals, efforts to combat the proliferation of unhealthy ideals date back several decades. These initiatives include clinical and self-help interventions to manage body dissatisfaction (Cash, 1997), as well as prevention programs designed to help girls and young adult women think critically about, and voice opposition against, thin body ideals that appear in media (Stice & Presnell, 2007). These programs are accruing substantial empirical support (e.g., Stice, Shaw, Burton, & Wade, 2006). An increasing amount of scholarship targets positive embodiment, such as body acceptance (Stice & Presnell, 2007) and body appreciation (Tylka, 2011b), and scholars have encouraged the integration of positive embodiment within prevention programming (Piran, 2015) and clinical treatment (Cook-Cottone, 2015). Media campaigns are also critiquing traditional standards of attractiveness, and they are promoting body diversity and acceptance (Unilever, 2015). Legislative actions in various countries are also addressing the ways in which bodies of girls and women are portrayed (Paxton, 2015). For example, ultrathin models were banned recently in France, Israel, Italy, and Spain (Stampler, 2015). In some countries, legislative efforts are also limiting times when certain products “that encourage the cult of the body” can be advertised (Law 7/2010, of March 31, General Audiovisual Communication). Thus, efforts toward the promotion of realistic and flexible body ideals, via the reduction of exclusively promoting an ultrathin ideal, are increasing and becoming more pervasive.

Could Body Dissatisfaction Be Changing Across Time?

As noted previously, sources of sociocultural influence are the most antecedent constructs in sociocultural theories that include body dissatisfaction. Thus, if the content of sociocultural influences change, then we may observe comparable changes in constructs later in the causal chain, namely body dissatisfaction. Correspondingly, common questions among researchers, clinicians, and media revolve around the extent to which body image has changed across cohorts and across time (Cash, Morrow, Hrabosky, & Perry, 2004), and there have been preliminary attempts to answer this question. For example, comparisons of three surveys conducted by a public press magazine (Psychology Today; Garner, 1997) in 1972, 1985, and 1996 are often cited as evidence that body dissatisfaction has increased across generations (Cash et al., 2004). As another example, Cash, Morrow, Hrabosky, and Perry (2004) compared scores on a standardized measure of multiple domains of body image across nearly 20 years of college students at a single university. Results from this analysis suggested that thinness-oriented body dissatisfaction increased until the early to-mid-1990s, after which body image concerns stabilized or decreased. In a review of literature on body image changes across the life span, Tiggemann (2004) concluded that body dissatisfaction is largely consistent across age ranges, due to the counterbalancing of (a) a body that develops away from appearance ideals with age and (b) a decrease in importance of body evaluations with age.

These studies and others that have attempted to examine body dissatisfaction change across time are limited. The primary limitations include the reliance on data from a single institution (e.g.,
Cash et al., 2004) as well as the reliance on single-item measures of
body dissatisfaction (e.g., Feingold & Mazzella, 1998), which
are more likely to have inadequate psychometric properties in
comparison to multiple-item measures (Furr, 2011). There are also
no comprehensive reviews that include comparisons across women
and men that assess both thinness-oriented and muscularity-
oriented body dissatisfaction. As noted in the body image literature
(e.g., Cafri & Thompson, 2004), the ways in which body image
manifests in women and men is different, and thus many previous
comparisons across women and men are limited in scope. For
example, it is often reported that women are more dissatisfied with
their bodies than men (e.g., Bearman et al., 2006; Feingold &
Mazzella, 1998). However, these comparisons are often based solely
on measures designed to assess body dissatisfaction in a highly
gendered context (e.g., asking about dissatisfaction with hips, assessing
only thinness-oriented body dissatisfaction). Men are much less
likely than women to endorse attitudes of body dissatisfaction with
items such as these even when they are experiencing body dissatisfaction,
because men are much more likely to be concerned with the
size of their abdominal, back, chest, and arm muscles. Thus, when
muscularity is the central component of body image assessment, it is
typically concluded that men express more dissatisfaction than
women (McCreary, 2007). This gendered distinction speaks to the
relevance of and need for a cross-temporal meta-analysis of specific
dimensions of thinness-oriented and muscularity-oriented body dis-
satisfaction for girls/women and boys/men.

Yet another limitation is that previous attempts to answer this
question were published more than 10 years ago, and much has
changed over the past decade that could impact individuals’ body
image. As noted previously, campaigns and prevention programs
have attempted to cultivate greater acceptance of bodies, regardless of
size (e.g., Bacon & Aphramor, 2014; Stice, Mazotti, Weibel, & Agras,
2000; Stice & Presnell, 2007; Unilever, 2015; Wilksch & Wade,
2009a), which could reduce body dissatisfaction.

The Present Study

Therefore, the purpose of this review is to update and enhance the
empirical literature on the extent to which body dissatisfaction has
changed across time. The present study overcomes limitations of
previous analyses by relying on two measures that are well-validated
for both girls/women and boys/men and by adopting a dual-
dimensional approach to body dissatisfaction. More specifically, we
based our review on two of the most widely used measures of body
dissatisfaction in the history of body image research, and these mea-
sures tap two different and important domains of dissatisfaction:
thinness-oriented dissatisfaction (as measured with the Eating Disor-
der Inventory-Body Dissatisfaction subscale; EDI-BD; Garner, 1991)
and muscularity-oriented dissatisfaction (as measured with the Drive
for Muscularity Scale [DMS]; McCreary & Sasse, 2000). Importantly,
we selected these specific measures because they are both used very
widely, have consistently demonstrated very strong psychometric
properties by several independent research teams, and have demon-
strated utility across genders.

Hypotheses

Based on previous research (Feingold & Mazzella, 1998; McCreary & Sasse, 2000) and gender differences in media-promoted
appearance ideals for women and men (McCreary, 2007; Murnen & Karazsia, in press), we first hypothesized that women’s scores
on thinness-oriented body dissatisfaction would be consistently
higher than men’s (Hypothesis 1a), while men’s scores on
muscularity-oriented body dissatisfaction would be consistently
higher than women’s (Hypothesis 1b).

Second, we hypothesized that thinness-oriented body dissatisfaction
would decrease over time for women but not men (Hypothesis 2a). Dating back to the 1980s, feminist perspectives on body image
increased attention on the detrimental effects of unrealistic portrayals
of women’s bodies in popular media (e.g., Brownmiller, 1984; Murnen & Seabrook, 2012). For several decades, researchers and
clinicians have been developing techniques and prevention programs
to promote body acceptance and decrease thinness-oriented body
dissatisfaction, which have primarily targeted girls and women (e.g.,
Cash, 1997; Stice & Presnell, 2007). More recently, mass media
campaigns designed to cultivate body appreciation (e.g., body accep-
tance and honoring body size diversity) are targeting and women to
reduce their body dissatisfaction (Bissell & Rask, 2010). These soci-
etal trends may buffer girls and women somewhat from the widening
gap between their actual size and the size of women portrayed in
popular media, a gap created by three interrelated factors: (a) people
are becoming heavier due primarily to increased fat worldwide (e.g.,
World Health Organization, 2015); (b) the continued stigmatization of
fat in Western cultures (Brownwell et al., 2005); and (c) media depic-
tions of “ideal” women are most often thin (e.g., Buote, Wilson,
Indeed, women with high levels of body appreciation did not expe-
rience increased body dissatisfaction after exposure to thin women in
the media, whereas those with low body appreciation did experience
increased body dissatisfaction after exposure (Andrew, Tiggemann,
& Clark, 2015; Halliwell, 2013), illustrating the protective effect of body
appreciation and supporting our rationale for expecting girls’ and
women’s body dissatisfaction scores to decrease over time.

Given that societal trends to decrease thinness-oriented body
dissatisfaction have not been applied as frequently to boys and
men (Stice & Presnell, 2007), we did not expect that this protective
effect of body appreciation applied to their thinness-oriented body
dissatisfaction scores. Yet, we also did not expect their scores to
increase. While media images of boys and men do emphasize lean
muscularity (Pope et al., 1999), these images are not rigid, with
body type deviations from this lean muscular ideal being empha-
sized as attractive for men in media (Buote et al., 2011).

We did not expect to find significant changes in muscularity-
oriented body dissatisfaction across time for either girls/women or
boys/men. While images of tone women are being promoted and
idealized in the media, these images often feature women with
small body frames, illustrating that a muscular appearance is
valued when women do not develop large muscles (Benton &
Karazsia, 2015; Homan, McHugh, Wells, Watson, & King, 2012).
Moreover, society values boys and men more for their internal
characteristics and less so for their appearance (Fredrickson &
Roberts, 1997) and offers flexible body ideals that do not rigidly
conform to the mesomorphic ideal. Thus, men may not experience
increased muscularity-oriented body dissatisfaction over time. It is
also important to note that the assessment of muscularity-oriented
body dissatisfaction began in 2000 with the publication of the
DMS, shortening the range of time available to yield a meaningful
difference in muscularity-oriented body dissatisfaction scores for boys/men or girls/women.

**Method**

**Body Dissatisfaction Constructs and Measures**

**Thinness-oriented body dissatisfaction.** The Eating Disorder Inventory (EDI; Garner, 1991, 2004; Garner, Garfinkel, Schwartz, & Thompson, 1980) is among the most widely used measures for assessing domains of eating-related pathology (Anderson, Lundgren, Shapiro, & Paulosky, 2004; Gleaves, Pearson, Ambwani, & Morey, 2014; Williamson, Anderson, & Gleaves, 1996). Its body dissatisfaction subscale (EDI-BD) has been referred to as “one of the best available scales for assessing body dissatisfaction” (Smolak, 2004, p. 18). It is currently in its third edition. Although the nine-item EDI-BD is identical between the first and second versions, the third version contains the same nine items plus one additional item. EDI-BD items assess beliefs about specific parts of the body that are associated with adiposity, such as stomach, thighs, buttocks, and hips, as well as overall body shape. Participants respond with a 6-point Likert-type scale ranging from never to always, and higher scores indicate more body dissatisfaction. A substantial body of psychometric literature provides evidence for the reliability and validity of the EDI-BD subscale’s scores. Internal consistency has been reported in samples with a wide variety of demographics for more than three decades (e.g., Garner, 1991, 2004; Garner, Olmstead, & Polivy, 1983; Shore & Porter, 1990). Scores on the EDI-BD correlate significantly with other measures of body dissatisfaction, and research indicates that it distinguishes between those with clinical eating disorders and general samples (e.g., Anderson et al., 2004; Williamson et al., 1996). Additionally, the EDI-BD subscale has been shown to have utility among samples of both women and men. For example, Spillane, Boerner, Anderson, and Smith (2004) found that it demonstrated measurement invariance across women and men.

**Muscularity-oriented body dissatisfaction.** As a construct, drive for muscularity refers to the perception that one is not muscular enough (McCreary, 2007). Items on the DMS (McCreary & Sasse, 2000) refer to both the general notion that individuals would like to look more muscular, as well as how they evaluate specific body parts associated with muscularity (e.g., arms, chest). The DMS contains 15 items, which were generated following extensive interviewing with individuals who engage in weight-training. Responses are made on a 6-point Likert-type scale ranging from 1 (always) to 6 (never). Total scores are reverse scored so that higher scores indicate a greater drive for muscularity. Although the scale can be scored to produce an attitudinal scale score and a behavioral scale score, substantial research on the factorial validity of the DMS indicated that a total score is a reliable measure for both men and women (McCreary, Sasse, Saucier, & Dorsch, 2004). Although measurement invariance has yet to be examined in the DMS, McCreary, Sasse, Saucier, and Dorsch (2004) examined factor structures of the scale separately by gender and found support for a higher-order DMS factor that emerged consistently across genders. Thus, the authors recommended that cross-gender comparisons are based on this total score rather than the lower-order, two-subscale version of the DMS that did not replicate across genders (McCreary et al., 2004). Scores on the DMS have been found to be internally consistent among samples of women and men (Bergeron & Tylka, 2007; McCreary & Sasse, 2000; McCreary et al., 2004) and predict performance-enhancing substance use and weight lifting behavior across a 6-week time period for men in adolescence and early adulthood, even after controlling for previous substance use and exercise behavior (e.g., Litt & Dodge, 2008).

**Data Collection and Selection Criteria**

For the EDI-BD subscale portion of the study, we identified relevant articles for inclusion by using the keywords “Eating Disorder(s) Inventory” and “Body Dissatisfaction” in English-language searches of PubMed, PsycINFO, and Google Scholar. We included Google Scholar because it can yield results that do not appear in academic search engines (Shultz, 2007). We also used the references of identified papers to search for additional articles. The same approach was used for the DMS portion of the study, albeit with a different keyword: “Drive for Muscularity Scale.”

Because the dependent variable of metaregression models was operationalized as mean body dissatisfaction scores, we recorded the mean and standard deviations of the EDI-BD subscale and the DMS from published studies. When the mean or standard deviation was not reported for a study that otherwise met inclusion criteria, we attempted to contact corresponding authors to solicit this information (see Figures 1 and 2). If year of data collection was not reported, we adopted a convention from previous meta-analyses (Oliver & Hyde, 1993; Twenge, Konrath, Foster, Campbell, & Bushman, 2008) to code the data collection year as 2 years prior to publication.

**Inclusion Criteria**

**Eating disorder inventory-body dissatisfaction subscale.** We applied four inclusion criteria for all EDI-BD articles considered for this meta-analysis. First, the authors needed to have included and reported the mean and standard deviation of a standardized version of the EDI-BD, including any of the three versions of the subscale: the original EDI-BD (Garner et al., 1983), EDI-2-BD (Garner, 1991), or EDI-3-BD (Garner, 2004), in a peer-reviewed journal article or doctoral dissertation. We included translated versions of the scale when there was evidence that the translated scale was comparable to the original, standardized version (e.g., translation-back translation by independent translators, psychometric data available on the translated scale). Some studies were excluded because the response format was altered, such as changing the number of response options on the Likert scale, which precluded accurate comparisons with other studies.

Second, means and standard deviations needed to have been reported separately for men and women. When this information was not reported, or if means and standard deviations reported were based on combined samples, we solicited this information from corresponding authors. Third, and consistent with previous cross-temporal meta-analyses (Twenge et al., 2008), we included only data from unselected samples (i.e., means reported for general samples, not those scoring high or low on the EDI-BD) and nonclinical samples. For this study, we considered any medical...
condition (e.g., obesity, eating disorders) as a specialized or clinical sample, and we only included such articles if data were reported on a control sample, in which case only data from the control sample were included. Fourth, we included only articles with samples of ages 11 years or older. Even though the EDI manual states that the measure should be used with participants ages 13 years and older (Garner, 2004), empirical data support its use among participants of ages 11 years and older (Shore & Porter, 1990). Fifth, to avoid redundancy, only independent samples were included in this review. That is, when it was evident that a sample was utilized in multiple studies, only data based on the earliest study were included. If data from multiple independent samples were available from a single article, then data from all subsamples were included (e.g., men and women from one study, multiple studies within one article).

Drive for Muscularity Scale. To be included in this meta-analysis, studies needed to utilize the full version of the DMS so that a total score could be calculated. Some studies utilized a 14-item version, and some utilized a 15-item version, which is consistent with the developer’s suggestion of making one item about steroid use optional (McCreary, 2007). We included all studies because the total score is a mean across all 14 or 15 items, and one item should have minimal impact on this overall mean. Both the 14- and 15-item versions have very similar and strong psychometric properties (McCreary, 2007).

Studies Included

Applying these criteria, we identified a total of 253 studies that used the EDI-BD subscale and met inclusion criteria ($k_{means} = 253; n_{participants} = 100,228$; see Figure 1), and 81 studies that used the DMS and met inclusion criteria ($k_{means} = 117; n_{participants} = 23,575$; see Figure 2). These studies were based on a combined sample size of 123,803 participants. Characteristics of each study included in the review are documented in supplemental tables.

Analysis Plan

Data transformations. When independent nonclinical subsamples were reported within a particular gender in a given study, we pooled data across these subsamples to calculate a pooled mean and pooled standard deviation. The most common example of this was when a control group was separated into two or more comparison groups, such as nonclinical athletes and a nonclinical
general population. While it could be argued that athletes as a group may score differently than nonathletes, our view is that if all subsamples are nonclinical, then they should all be represented in the population of nonclinical individuals. If such subsamples were not pooled together, then the between sample variance would be artificially inflated due solely to a single general sample being divided into subsamples (such as athletes vs. nonathletes). To perform these computations, we utilized an equation presented in Headrick (2010; equation 5.38, p. 137).

No additional data transformations were necessary for the DMS, outside of those specified above. However, we needed to utilize data transformations for the EDI-BD subscale due to differences in the scoring of the EDI-BD between studies. Although we only included studies that used standardized versions of the EDI-BD subscale, it became apparent during the review that there is still heterogeneity in the way in which EDI-BD subscale scores were scored, even when administered in the standardized format. In terms of recording, some authors utilized a 6-point scale ranging from 0 to 5, while others utilized a 6-point scale ranging from 1 to 6. While these differences have minimal impact on psychometric properties, they can yield vastly different scores when summed across the nine-item EDI-BD subscale, and direct comparisons across such untransformed responses using the different scales are therefore not valid. Additionally, instructions in the EDI manuals (Garner, 1991, 2004; Garner et al., 1983) call for scores to be transformed post hoc to a 4-point scale, ranging from 0 to 3. However, nontransformed scores have been found to yield better psychometric properties in nonclinical samples, likely due to preservation of variability in such groups (Schoemaker, van Strien, & van der Staak, 1994).

This heterogeneity complicated direct comparisons across EDI-BD subscale scores for our meta-analysis. To overcome these issues, we analyzed data separately for transformed versus untransformed subscale scores. We arrived at this decision after exploring alternative approaches for combining scores. For example, we considered using z-scores to standardize and then aggregate untransformed and transformed scores. This approach would have made means comparable across scoring formats, but standard deviations would have remained incomparable. We also considered alternative transformations, but these would have required access to all raw data so that the transformations could occur at the individual level. In terms of different scoring formats for response scales, this became a nonissue for transformed scores because they are transformed to a scale that always ranges from 0 to 3. For untransformed scores, we added a constant (9) to all untransformed means when the response format was 0–5. This

---

**Figure 2.** Flow diagram for search pertaining to the Drive for Muscularity Scale.

- Records identified through database searching (n = 414)
- Additional records identified through other sources (n = 15)
- Titles and abstracts screened (n = 429)
- Papers excluded based on initial screen (n = 301)
- Full-text articles assessed for eligibility (n = 128)
- Excluded due to:
  - Incomplete Information (33)
  - Specialized Sample (3)
  - Not eligible (5)
  - Redundant sample (2)
  - Not primary article or dissertation (4)
- Studies included in quantitative synthesis (meta-analysis):
  \[ \bar{k}_{\text{means}} = 81; \bar{k}_{\text{pooled}} = 117; n_{\text{participants}} = 23,575 \]
- Women: \[ \bar{k}_{\text{means}} = 34; n_{\text{participants}} = 6,347 \]
- Men: \[ \bar{k}_{\text{means}} = 83; n_{\text{participants}} = 17,228 \]
linear transformation had no effect on the standard deviations, and thus original standard deviations could be retained (Stockburger, 1998).

Some studies in our meta-analysis included the EDI-3 (Garner, 2004) version of the BD subscale. In this newest revision, a tenth item was added, as previously mentioned. Thus, raw scores were not directly comparable to previous versions. To overcome this issue, we divided all mean scores by 10 to calculate the average response to any single item in a sample. We then multiplied this value by 9 to convert the mean score to a value that could be compared to the previous nine-item version. We made comparable adjustments to standard deviations to ensure that SD units were in the same scale as mean scores.

**Data analysis strategy.** To analyze whether sample means on the EDI-BD subscale and DMS total scale changed over time, we conducted metaregression analyses using Comprehensive Meta-Analysis-Version 3 (Borenstein, Hedges, Higgins, & Rothstein, n.d.). Metaregression analyses enabled us to weigh each data point according to sample size and variability (operationalized as squared sample standard deviations). In all analyses, year was entered as the predictor, and respective scale scores were the criterion. Given that there were a variety of subgroups in our analyses that could potentially have differing true effect sizes, all results reported are based on random effects models, which allow the true effect size to vary across studies (Borenstein, Hedges, & Rothstein, 2007). In order to provide standardized effect size measures for interpretation of metaregression results, we first calculated a weighted-average of within sample SDs. This approach is consistent with other cross-temporal meta-analyses (e.g., Twenge et al., 2008), and it enabled us to calculate effect sizes for differences between men and women in predicted mean levels of body dissatisfaction, and for changes in body dissatisfaction across time. Note that basing the calculation of the average SD on within-sample SDs avoided the ecological fallacy (Rosenthal & Rosnow, 2008), which can exaggerate the magnitude of effect by contextualizing scores on between-sample SDs that do not reflect true variation across individuals.

To adjust for the possibility that any observed changes across time could be explained by research being conducted with more diverse samples in more geographic locations, we included several control variables and moderators in the various models that we tested. Gender was coded as a categorical moderator. We also coded for country of the study, which was then recoded in two ways: geographic region (continental region, adjusted to account for the Middle East as a stand-alone region, and to include the islands surrounding Australia: Oceania), and Human Development Index (HDI). The HDI is a composite index, created by the United Nations Development Program (Malik, 2014), comprised of measurements of longevity, health, knowledge, and overall standard of living. Values range from 0 (low) to 1 (high). While the HDI changes annually and its indicators have changed over the past three decades, the general HDI rankings are fairly stable. Because observed changes in body dissatisfaction could vary by inclusion of countries with more diverse HDI values, we included recent HDI values for specific countries as a control variable. Age was categorized as early adolescent (11 years to 15 years), late adolescent (15.01–17.99 years), young adult (18–25 years), and adult (>25 years). Descriptive statistics of the control variables are presented in Table 1. In addition to the results presented below, we also examined all models using robust variance estimation methods (e.g., Hedges, Tipton, & Johnson, 2010), and we tested for the potential of curvilinear associations between time and criterion scores. We conducted these analyses using STATA version 14.1 (StataCorp., 2015), and they are summarized in supplemental tables.

**Results**

**EDI-BD Subscale Scores**

We tested several models, and results are displayed in Tables 2 and 3 for transformed scores, whereby items were scored on a 0–3 scale, and Tables 4 and 5 for untransformed scores, whereby items were scored along a 1–6 scale. The association

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Descriptive Statistics of Independent Variables for Each Dependent Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variables</td>
<td>EDI-BD-Transformed</td>
</tr>
<tr>
<td>Gender</td>
<td>M</td>
</tr>
<tr>
<td>Women</td>
<td>—</td>
</tr>
<tr>
<td>Male</td>
<td>—</td>
</tr>
<tr>
<td>Participant age</td>
<td></td>
</tr>
<tr>
<td>Early adolescent</td>
<td></td>
</tr>
<tr>
<td>Late adolescent</td>
<td></td>
</tr>
<tr>
<td>Young adult</td>
<td></td>
</tr>
<tr>
<td>Adult</td>
<td></td>
</tr>
<tr>
<td>Geographic region</td>
<td></td>
</tr>
<tr>
<td>North America</td>
<td></td>
</tr>
<tr>
<td>Europe</td>
<td></td>
</tr>
<tr>
<td>Australia/Oceania</td>
<td></td>
</tr>
<tr>
<td>Asia</td>
<td></td>
</tr>
<tr>
<td>Middle East</td>
<td></td>
</tr>
<tr>
<td>HDI</td>
<td>.91</td>
</tr>
</tbody>
</table>

*Note.* EDI-BD = Eating Disorder Inventory-Body Dissatisfaction subscale; DMS = Drive for Muscularity Scale; HDI = Human Development Index.
between year and EDI-BD scores was statistically significant, as was the association between gender and EDI-BD. The weighted average of $SD$ across all included studies was 6.61, and using this $SD$, the between groups effect sizes for the main effect of gender were $d = 1.17$ for the year 1981, and $d = 0.51$ for the year 2012. There was also a significant interaction between time and gender, and this interaction is depicted visually in Figure 3. As can be seen, there was a decreasing trend for EDI-BD transformed scores among women. A weighted within-sample $SD$ for samples of women only was calculated as 6.95.

This value was used to compute the within-groups effect size for the change in transformed EDI-BD scores from the year 1981 to 2012, which was $d = 0.49$.

As illustrated in Tables 4 and 5, a very similar pattern of results emerged for untransformed EDI-BD scores. However, the sample size for studies with men using untransformed scores was very small ($k = 8$), with restricted range. Because extending the regression line beyond the observed time points can yield untrustworthy results (this is known as extrapolation; Montgomery, Peck, & Vining, 2015), we report only a within-subjects effect size representing change in women’s untransformed EDI-BD scores from 1992 to 2012. The weighted average of $SD$ scores for the studies with women was 10.56, and the within-groups effect size for the change in women’s EDI-BD scores was $d = 0.29$.

As illustrated in Tables 3 and 5, these patterns of results remained even when controlling for participant ages, geographic

<table>
<thead>
<tr>
<th>Table 2</th>
<th>Summary of Metaregression Analyses for Variables Predicting Transformed EDI-BD Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable</td>
<td>Coefficients</td>
</tr>
<tr>
<td></td>
<td>$B$</td>
</tr>
<tr>
<td>Time</td>
<td>.03</td>
</tr>
<tr>
<td>Gender</td>
<td>7.73***</td>
</tr>
<tr>
<td>Gender $\times$ Time</td>
<td>$-2.14^*$</td>
</tr>
<tr>
<td>Overall model</td>
<td>$Q(3) = 123.91^{***}$</td>
</tr>
<tr>
<td>$\tau^2$</td>
<td>8.46</td>
</tr>
<tr>
<td>$I^2$</td>
<td>99.43%</td>
</tr>
</tbody>
</table>

Note. EDI-BD = Eating Disorder Inventory-Body Dissatisfaction subscale. The null hypothesis of the $Q$ test is that all coefficients in the respective model are zero. Gender coded as Male = 0, Female = 1. $^*$ $p < .05$. $^{**}p < .01$. $^{***}p < .001$.

<table>
<thead>
<tr>
<th>Table 4</th>
<th>Summary of Metaregression Analyses for Variables Predicting Untransformed EDI-BD Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable</td>
<td>Coefficients</td>
</tr>
<tr>
<td></td>
<td>$B$</td>
</tr>
<tr>
<td>Time</td>
<td>.49</td>
</tr>
<tr>
<td>Gender</td>
<td>18.28***</td>
</tr>
<tr>
<td>Gender $\times$ Time</td>
<td>$-2.54^*$</td>
</tr>
<tr>
<td>Overall model</td>
<td>$Q(3) = 70.68^{***}$</td>
</tr>
<tr>
<td>$\tau^2$</td>
<td>14.20</td>
</tr>
<tr>
<td>$I^2$</td>
<td>97.12%</td>
</tr>
</tbody>
</table>

Note. EDI-BD = Eating Disorder Inventory-Body Dissatisfaction subscale. The null hypothesis of the $Q$ test is that all coefficients in the respective model are zero. Time is centered on the year 1992, the first year of available data for this scale.

$p < .05$. $^{**}p < .01$. $^{***}p < .001$.

---

![Table 3: Summary of Metaregression Analyses With Various Controls Included: Transformed EDI-BD Scores](#)
Table 5
Summary of Metaregression Analyses With Various Controls Included: Untransformed EDI-BD Scores

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$B$</td>
<td>$SE$</td>
<td>$B$</td>
<td>$SE$</td>
</tr>
<tr>
<td>Age group$^a$</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Early adolescent</td>
<td>3.98</td>
<td>1.97</td>
<td>5.96$^{**}$</td>
<td>2.16</td>
</tr>
<tr>
<td>Late adolescent</td>
<td>2.14</td>
<td>1.48</td>
<td>3.30$^*$</td>
<td>1.61</td>
</tr>
<tr>
<td>Adult</td>
<td>4.54</td>
<td>2.03</td>
<td>5.04$^*$</td>
<td>2.12</td>
</tr>
<tr>
<td>Geographic region$^b$</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Europe</td>
<td>−1.35</td>
<td>1.73</td>
<td>−3.04</td>
<td>2.20</td>
</tr>
<tr>
<td>Australia/Oceania</td>
<td>1.02</td>
<td>1.11</td>
<td>2.54</td>
<td>2.95</td>
</tr>
<tr>
<td>Asia</td>
<td>3.45</td>
<td>4.04</td>
<td>−2.87</td>
<td>26.67</td>
</tr>
<tr>
<td>Middle East</td>
<td>−1.10</td>
<td>2.86</td>
<td>−2.43</td>
<td>4.40</td>
</tr>
<tr>
<td>Human development index</td>
<td></td>
<td></td>
<td>−2.65</td>
<td>17.73</td>
</tr>
<tr>
<td>Time</td>
<td>.45</td>
<td>.27</td>
<td>.46</td>
<td>.29</td>
</tr>
<tr>
<td>Gender</td>
<td>18.28$^{***}$</td>
<td>3.32</td>
<td>18.38$^{***}$</td>
<td>3.44</td>
</tr>
<tr>
<td>Gender × Time</td>
<td>−.57$^*$</td>
<td>.29</td>
<td>−.64$^*$</td>
<td>.30</td>
</tr>
<tr>
<td>Model statistics</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall model</td>
<td>Q(6) = 78.65$^{***}$</td>
<td>Q(7) = 69.19$^{***}$</td>
<td>Q(4) = 70.29$^{***}$</td>
<td>Q(11) = 144.42$^{***}$</td>
</tr>
<tr>
<td>Covariate set: Age group</td>
<td>Q(3) = 6.60</td>
<td>—</td>
<td>—</td>
<td>Q(3) = 9.44$^*$</td>
</tr>
<tr>
<td>Covariate set: Region</td>
<td>—</td>
<td>Q(4) = 2.82</td>
<td>—</td>
<td>Q(4) = 5.37</td>
</tr>
<tr>
<td>Tau$^2$</td>
<td>13.92</td>
<td>15.17</td>
<td>26.79</td>
<td>13.33</td>
</tr>
<tr>
<td>$I^2$</td>
<td>97.01%</td>
<td>97.26%</td>
<td>98.47%</td>
<td>96.86%</td>
</tr>
</tbody>
</table>

Note. EDI-BD = Eating Disorder Inventory-Body Dissatisfaction subscale. The $p$-values for the set of age group predictors and geographic region predictors were .08 and .59, respectively. The null hypothesis of the Q test is that all coefficients in the respective model are zero. Time is centered on the year 1992, the first year of available data for this scale. Gender coded as Male = 0, Female = 1.

$^a$The reference group for the age group covariate was young adult. $^b$One geographic region, Africa, only had one study for this analysis, so it could not be included in the analysis for geographic region. The reference group for the geographic region covariate was North America.

**Discussion**

In this review, measurements of two dimensions of body dissatisfaction were explored across 31-year (for the EDI-BD subscale, assessing thinness-oriented dissatisfaction) and 14-year (for the DMS, assessing muscularity-oriented dissatisfaction) periods. As hypothesized, girls’/women’s reports of thinness-oriented body dissatisfaction were consistently higher than those of boys/men, while boys’/men’s reports of muscularity-oriented body dissatisfaction were consistently higher than those of girls/women. Results also revealed that across the 31-year time span, thinness-oriented body dissatisfaction decreased for girls and women only. Importantly, girls’/women’s thinness-oriented body dissatisfaction scores did not vary significantly as a function of geographic region, quantitative assessments of human development within countries, or participant age (with an exception that untransformed EDI-BD scales did differ by age, but the slope did not interact with...
Even though the EDI-BD subscale was used less frequently with boys and men during this 31-year period, the available evidence is still based on a substantial sample size, and it indicates that there was no significant change in thinness-oriented body dissatisfaction among boys and men. Similarly, boys’/men’s thinness-oriented body dissatisfaction scores did not vary as a function of geographic region, a human development index, or participant age. Additionally, the present study revealed that there were no significant changes across time on scores for either gender in muscularity-oriented body dissatisfaction as measured with the DMS scale across time. Findings from this study have important implications for the current status of research on body dissatisfaction, including measurement, intervention, and prevention. Here, we discuss the results for each gender separately, followed by their implications.

**Girls and Women**

Overall, for girls and women, scores on the EDI-BD decreased across time, and scores on the DMS remained constant across time.

In terms of scores on the transformed version of the EDI-BD, which was the most commonly used version across this 31-year period, scores decreased from approximately 11.59 in 1981 to approximately 8.29 in 2011. This difference is greater than 3 points on the transformed version of the EDI-BD. To offer some perspective on these scores, consider that Garner, Olmstead, and Polivy (1983) reported means of 14.2 and 17.4 for this subscale among patients with anorexia nervosa, restricting and bulimic subgroups, respectively, and a mean of 10.2 for the comparison group. Comparable means of clinical samples were reported more recently (Brewin, Baggott, Dugard, & Arcelus, 2014).

Although we intentionally included only nonclinical samples in this meta-analysis, research indicates that thinness-oriented body dissatisfaction lies on a continuum of degree, with the highest levels among clinical samples (Stice, Killen, Hayward, & Taylor, 1998). Therefore, it is worth noting that our results are somewhat consistent with analyses of eating disorder incidence rates across time. Namely, results from several independent investigations indicate that rates of most eating disorders are not increasing (e.g.,...
Table 6
Summary of Metaregression Analyses for Variables Predicting DMS Total Scores

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
<th>Model 5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>SE</td>
<td>B</td>
<td>SE</td>
<td>B</td>
</tr>
<tr>
<td>Gender</td>
<td>−.01</td>
<td>.02</td>
<td>−.05</td>
<td>.03</td>
<td>−.84</td>
</tr>
<tr>
<td>Overall model</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Q(3) = 47.18***</td>
</tr>
<tr>
<td>Tau2</td>
<td>.92</td>
<td>.13</td>
<td>.90</td>
<td>.13</td>
<td></td>
</tr>
<tr>
<td>F2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>47.72</td>
</tr>
</tbody>
</table>

Note. DMS = Drive for Muscularity Scale. The null hypothesis of the Q test is that all coefficients in the respective model are zero. Time is centered on the year 1998, the first year of available data for this scale. Gender coded as Male = 0, Female = 1.

*p < .05. *** p < .001.

Crowther, Arney, Luce, Dalton, & Leahey, 2008; Keel, Heatherton, Dorer, Joiner, & Zalta, 2006; Smink, van Hoeken, & Hoek, 2012. Smink, van Hoeken, and Hoek (2012) reported that across all eating disorders, there was no change across approximately 2 decades in incidence rates, and that rates of bulimia nervosa may have decreased since the 1990s. These authors did note, however, that the incidence of eating disorders was increasing among young girls between ages 14 and 19 years of age. That trend did not emerge in our current analysis of thinness-oriented body dissatisfaction in this age group. Thus, it is possible that the increase in eating disorder incidence is not associated with changes in thinness-oriented body dissatisfaction across time, at least not as measured with the EDI-BD subscale. The difference between our analysis of body dissatisfaction across time and Smink et al.’s (2012) analysis of eating disorder incidence rates across time highlights the importance of multivariate and multiplicative (moderating) influences in etiological models of eating-related pathologies (e.g., Fitzsimmons-Craft, 2011). Additionally, Cash et al. (2004) reported that body dissatisfaction decreased across time in an analysis that was based on a single institution. Findings from this study support, broaden, and build upon these previous results.

To the extent that these results reflect true parameters of the population of girls and women, a logical question is: What could explain a decrease in EDI-BD subscale scores across time, while DMS scores remained constant? We speculate here on a possibility that fits well within a sociocultural framework: The patterns of change appear to co-occur with changes in sociocultural ideals. The last two decades have witnessed increasing attention and awareness on a body acceptance movement aimed primarily at girls and women (e.g., Bacon & Aphramor, 2014; Sobal & Maurer, 1999; Stice et al., 2000; Stice, Rohde, Gau, & Shaw, 2012), coupled with an increased frequency of models of women that counter the previous trends toward increasing thinness (Czerniawski, 2015). Empirical research indicates that viewing bodies in media that are not reflective of the thin ideal can lead to decreases in body dissatisfaction among women viewers (Owen & Spencer, 2013). There is also additional evidence emerging on ways parents, and particularly mother–daughter dyads, are able to effectively combat negative thinness-oriented media appearance ideals to promote body acceptance and positive body image (e.g., Maor & Cwikel, 2016). Indeed, high levels of body appreciation mitigate thin-ideal media images from increasing women’s body dissatisfaction (Andrew et al., 2015; Halliwell, 2013). Furthermore, cultural trends overall may be shifting to emphasize body acceptance and appreciate body diversity for girls and women. Importantly, these shifts include more contextual influences (e.g., reducing thinness-related pressures, displaying more curvaceous ideals), as well as processes that are more proximal to girls and women (e.g.,

Table 7
Summary of Metaregression Results With Various Controls Included: DMS Total Scores

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
<th>Model 5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>SE</td>
<td>B</td>
<td>SE</td>
<td>B</td>
</tr>
<tr>
<td>Age groupa</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Early adolescent</td>
<td>−.47</td>
<td>.27</td>
<td>−.52</td>
<td>.28</td>
<td>−.45</td>
</tr>
<tr>
<td>Late adolescent</td>
<td>−.10</td>
<td>.19</td>
<td>−.24</td>
<td>.21</td>
<td>−.10</td>
</tr>
<tr>
<td>Adult</td>
<td>.08</td>
<td>.17</td>
<td>.29</td>
<td>.18</td>
<td>.24</td>
</tr>
<tr>
<td>Geographic regionb</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Europe</td>
<td>−.36</td>
<td>.16</td>
<td>−.39</td>
<td>.17*</td>
<td>−.45</td>
</tr>
<tr>
<td>Australia/Oceania</td>
<td>−.45</td>
<td>.23</td>
<td>−.69</td>
<td>.25**</td>
<td></td>
</tr>
<tr>
<td>Middle East</td>
<td>−.09</td>
<td>.47</td>
<td>.24</td>
<td>.18</td>
<td>−.10</td>
</tr>
<tr>
<td>Africa</td>
<td>−.23</td>
<td>.66</td>
<td>.89</td>
<td>1.10</td>
<td>−.10</td>
</tr>
<tr>
<td>Human development index</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time</td>
<td>−.01</td>
<td>.02</td>
<td>−.01</td>
<td>.02</td>
<td>−.01</td>
</tr>
<tr>
<td>Gender</td>
<td>−.90</td>
<td>.13</td>
<td>−.90</td>
<td>.13</td>
<td>−.90</td>
</tr>
<tr>
<td>Model statistics</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall model</td>
<td>Q(2) = 47.72</td>
<td>Q(5) = 52.25***</td>
<td>Q(6) = 53.04***</td>
<td>Q(3) = 46.85***</td>
<td>Q(10) = 63.07***</td>
</tr>
<tr>
<td>Covariate set: Age group</td>
<td></td>
<td>Q(3) = 3.67</td>
<td></td>
<td>Q(3) = 6.61</td>
<td></td>
</tr>
<tr>
<td>Covariate set: Geographic</td>
<td></td>
<td></td>
<td>Q(4) = 7.64</td>
<td></td>
<td>Q(4) = 11.67*</td>
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<td>Tau2</td>
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<td>F2</td>
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<td>63.07**</td>
</tr>
</tbody>
</table>

Note. DMS = Drive for Muscularity Scale. Time is centered on the year 1998, the first year of available data for this scale. Gender coded as Male = 0, Female = 1.

*p < .05. ** p < .01. *** p < .001.

a The reference group for the age group covariate was young adult. b The reference group for the geographic region covariate was North America.
targeting and reducing thin-ideal internalization), and these factors are emphasized within sociocultural theories (Keery et al., 2004). As a result, the distance between girls’ and women’s perceived body and ideal body should be lessened, resulting in a decrease in their thinness-oriented body dissatisfaction, a trend that scholars adopting a sociocultural framework would predict.

Of course, sociocultural explanations in the form of cultural body acceptance alone may be insufficient to account for the current findings. If sociocultural constructs were the only determinants of girls’ and women’s experiences of body dissatisfaction, then we likely would have found moderation by geographic region (e.g., Swami & Tovée, 2007), yet there was no evidence of such moderation.

Three alternatives that could explain thinness-oriented body dissatisfaction fluctuations across time are shifts in body mass, personality constructs and the nature of body image across time. In terms of body mass, there is evidence that humans increased in size during the period represented in this study (Centers for Disease Control & Prevention, 2003; World Health Organization, 2015). Body mass correlates in a linear fashion for women, such that women with more body mass are more likely to report more body dissatisfaction (Calzo et al., 2012). From this perspective, we would expect body dissatisfaction to increase across time, a pattern opposite of what was found in the present study. Therefore, although body mass was not included as a predictor in this study, it is highly unlikely that changes in body mass explain the observed findings. Alternatively, one could argue that changes in body mass across time are serving to enhance acceptance of body diversity, widening the social norms of which body types are considered acceptable. If so, then it actually reinforces the sociocultural framework would predict.

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A third possibility that could account for fluctuations in girls and women’s thinness-oriented body dissatisfaction is that the nature of sociocultural pressures is changing. While we hope that pressures toward thinness as a cultural standard for women are decreasing (perhaps due to enhanced cultural body awareness and acceptance of body diversity in terms of sizes, shapes, and colors), this decrease may be contextualized by corresponding increases in other forms of appearance-related pressures. For instance, the “sexualized curvaceous” ideal (i.e., an hourglass figure with large breasts and buttocks) as well as the “strong, lean, and fit” ideal may be replacing, or at least providing another option to, the “ultra-thin” ideal (Benton & Karazsia, 2015; Smolak & Murnen, 2008). Thus, thinness-oriented body dissatisfaction may decrease alongside the prevalence of the ultrathin ideal within society. We attempted to capture some of these changes in the present study by investigating both thinness-oriented and muscularity-oriented body dissatisfaction.

**Boys/Men**

Over the past two decades, research and awareness on the importance of men’s body dissatisfaction has burgeoned (e.g., Thompson & Cafri, 2007). Perhaps one of the most important findings from this research is that men place much more emphasis, on average, on a muscular appearance than women...
(McCreary, 2007; Murnen & Karazsia, in press). Nevertheless, sociocultural models originally designed to explain the development of body dissatisfaction and maladaptive body change strategies among women apply to men well, sometimes with minor refinements, when the constructs are assessed in manners meaningful to men (Karazsia & Crowther, 2010; Tylka, 2011a). That sociocultural models apply to both men and women, however, does not imply that no differences exist between men and women on mean levels of thinness-oriented and muscularity-oriented body dissatisfaction, and the main effects of gender that emerged in this study for both types of body dissatisfaction are consistent with previous findings from single-sample studies (McCreary et al., 2004; Shore & Porter, 1990). The similarity between these sociocultural models for men and women does suggest that comparable influences would explain the change, or lack of change, across time.

Some scholars may be inclined to think that the increased attention on men in this research is due to a simultaneous increase in body dissatisfaction among men. Indeed, there is evidence that men are portrayed as increasingly lean and muscular in popular media (e.g., Thompson & Cafri, 2007). Evidence also suggests that exposure to mesomorphic ideals can induce body dissatisfaction among men (e.g., Barlett, Vowels, & Saucier, 2008). Despite these findings, our results indicate that, on average, men represented by the samples included in this meta-analysis are neither increasing nor decreasing in their reports of thinness-oriented or muscularity-oriented body dissatisfaction across time. To our knowledge, DMS scores are not available from purely clinical samples to offer context for scores predicted in the present models. Given that appearance ideals for men promoted by the media remain more heterogeneous, diverse, and flexible than appearance ideals for women (Buote et al., 2011), and men are valued more so than women for internal characteristics at a societal level (Fredrickson & Roberts, 1997), men who do not conform to the mesomorphic ideal may not experience increased muscularity-oriented body dissatisfaction over time. Hence, having alternative images to the mesomorphic ideal present in media and being valued for more than their appearance may protect boys’ and men’s levels of muscularity-oriented body dissatisfaction from decreasing over time.

Limitations and Directions for Future Research

To our knowledge, this study is the first to investigate changes in body dissatisfaction across cohorts via cross-temporal meta-analytic analyses using samples that were not limited to single sites and containing only well-validated assessments. Given the large number of studies included and corresponding large number of participants in this study, the results are likely quite robust. However, as with any meta-analysis, our results are only as strong as the original studies that were included. We learned when contacting authors to request data not reported in published papers that some data were no longer available for some studies. It is also important to note that $I^2$, which reflects the percentage of total variation across studies not due to chance, was quite large (>95%). Thus, there is substantial variability in effect sizes, which may have resulted from the following: (a) our review spanned more than 3 decades of research, (b) our review included data from many laboratories, and (c) there may be constructs other than time that predict observed scores. Additionally, we were unable to examine the potential influence of body mass index, ethnicity, or other potentially relevant variables as moderators on body dissatisfaction scores, given that EDI-BD and DMS scores were rarely reported by ethnicity or BMI categories in the original studies. Furthermore, it is important to acknowledge that one control variable in our study, the HDI, changes annually, with different indicators having been used to calculate HDI over the last three decades. Thus, while general ranks of the HDI are fairly stable, the HDI is not without its limitations.

Perhaps the most important limitation of our review and the current status of this literature is the overreliance on samples of convenience for empirical investigations (Smolak & Levine, 2015). Use of such convenience samples has been justified on the grounds that girls and young adult women who are White and attend college represent an important risk group for eating disorders (Smolak & Levine, 2015). Unfortunately, many other groups of women and girls and women experience body dissatisfaction (Anderson-Fye, McClure, & Wilson, 2015), yet relatively little is known about the extent to which leading theories of body dissatisfaction and eating disorders apply to them. As a result, our finding that body dissatisfaction scores did not correlate significantly with geographic location or the human development index could be a byproduct of relatively small samples from diverse regions.

This same limitation and critique of existing literature applies to our analysis of boys and men. Comparably little is known about their drive for muscularity in underrepresented ethnicities or developmental periods. From a developmental perspective, it is quite logical that the common samples of convenience, undergraduate men, are in a developmental stage that is protective—the men are nearing the end of a developmental period in which they approach societal ideals of attractiveness for men (broader shoulders, increased muscularity, etc.). Thus, age of risk may be later for men than for women, as most men approach the ideal during high school and early college, and it is not until later ages that natural development no longer promotes desirable features (Murnen & Karazsia, in press), yet we currently know very little about men’s experience with body dissatisfaction during subsequent developmental periods.

An additional limitation also highlights an important path for future research. We only considered body dissatisfaction in this meta-analysis. Therefore, our consideration of potential influences on change and lack of change on body dissatisfaction was only speculative. An interesting and important direction for future research will be to examine temporal changes in known risk factors for eating disorders, such as internalization of body ideals (Thompson & Stice, 2001). Such investigations would offer unique opportunities to test competing theories of body dissatisfaction development. For example, most sociocultural theories posit that internalization precedes and predicts subsequent changes in body dissatisfaction (e.g., Thompson et al., 1999). If this is true, then we would expect temporal changes in internalization (e.g., from widespread dissemination of cognitive dissonance-based secondary prevention programs such as the Body Project) to correlate substantially with the changes in body dissatisfaction observed in our present investigation.
Conclusion

Our findings enhance professionals’ understanding of how the gendered phenomena of body dissatisfaction is changing, and not changing, across time. Nearly 20 years ago, Feingold and Mazzella (1998) reported results from a meta-analysis indicating that gender differences in body satisfaction were increasing, with women becoming increasingly less satisfied with their bodies, relative to men. However, at that time, virtually no assessments had been developed to assess body dissatisfaction in ways that are more meaningful and relevant to men. Since then, the DMS has become one of the most effective and widely used measures of masculinity-oriented body dissatisfaction (Cafri & Thompson, 2004; McCreary, 2007). Results from our analysis reveal that men are reporting higher scores on this measure than are women, and the difference between men’s and women’s scores of masculinity-oriented body dissatisfaction have not changed since the measure was developed. In terms of thinness-oriented body dissatisfaction, women continue to report more dissatisfaction than men, as they did 30 years ago, although the current results indicate that the gender gap on this domain may be decreasing.

Even though humans in many societies are becoming larger (Centers for Disease Control & Prevention, 2003), our results revealed that neither thinness-oriented nor masculinity-oriented body dissatisfaction has changed significantly for men, and thinness-oriented body dissatisfaction has decreased for women across a 30-year period. These findings may reflect gradual shifts toward body appreciation and diversity in media portrayals of attractiveness. Future research on body dissatisfaction is needed on underrepresented groups in this field of research—namely older men and women, and women from minority backgrounds, and men and women in non-Western societies.

References

* References marked with an asterisk indicate studies included in the meta-analysis.


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