

# Health Communication

## Boost Your Body: Self-Improvement Magazine Messages Increase Body Satisfaction in Young Adults --Manuscript Draft--

<b>Manuscript Number:</b>	HC-D-15-00096R4
<b>Full Title:</b>	Boost Your Body: Self-Improvement Magazine Messages Increase Body Satisfaction in Young Adults
<b>Article Type:</b>	Original Article
<b>Corresponding Author:</b>	Silvia Knobloch-Westerwick, Ph.D. The Ohio State University Columbus, Ohio UNITED STATES
<b>Corresponding Author Secondary Information:</b>	
<b>Corresponding Author's Institution:</b>	The Ohio State University
<b>Corresponding Author's Secondary Institution:</b>	
<b>First Author:</b>	Jolanda Veldhuis, PhD
<b>First Author Secondary Information:</b>	
<b>Order of Authors:</b>	Jolanda Veldhuis, PhD Elly A. Konijn, PhD Silvia Knobloch-Westerwick, Ph.D.
<b>Order of Authors Secondary Information:</b>	
<b>Abstract:</b>	<p>The verbal messages that contextualize exposure to idealized body imagery may moderate exposure impacts on body satisfaction, which in turn affects important body image-related health issues (e.g., depression and unhealthy weight). Such contextualizing verbal messages in magazines often reference social comparison motives. Hence, the present study induced social comparison motives through magazine cover messages. Hypotheses were tested in an experimental design with social comparison motives (self-improvement vs. self-evaluation vs. control) and recipient gender as between-subjects factors, and with body satisfaction as within-subjects factor (N = 150). Results showed that self-improvement messages accompanying ideal body media models increased body satisfaction, compared to control messages and baseline measures. In contrast, the self-evaluation messages did not impact body satisfaction. Results imply that inconsistencies regarding effects from exposure to idealized body imagery are explained by the context in which media images are portrayed, evoking differential social comparison motives. Moreover, the findings imply that health communication interventions can use verbal messages on body improvement as helpful tools, if they draw on social comparison motives effectively.</p>

Running Head: BOOST YOUR BODY

**Boost Your Body: Self-Improvement Magazine Messages**

**Increase Body Satisfaction in Young Adults**

Jolanda Veldhuis, Elly A. Konijn, and Silvia Knobloch-Westerwick

Jolanda Veldhuis, Ph.D.<sup>a</sup>, Elly A. Konijn, Ph.D.<sup>a</sup>, and Silvia Knobloch-Westerwick, Ph.D.<sup>b\*</sup>

<sup>a</sup>VU University Amsterdam, Department of Communication Science, De Boelelaan 1081,  
1081 HV, Amsterdam, the Netherlands; E-mail: j.veldhuis@vu.nl and e.a.konijn@vu.nl

<sup>b</sup>Ohio State University, School of Communication, 3036 Derby Hall, 154 N. Oval Mall,  
Columbus, U.S.A.; E-mail: knobloch-westerwick.1@osu.edu

*\* Corresponding author:*

Silvia Knobloch-Westerwick, Ph.D.

Ohio State University

School of Communication

3036 Derby Hall

154 N. Oval Mall

Columbus (OH), U.S.A.

Phone: +614 247-6801

E-mail: knobloch-westerwick.1@osu.edu

**Boost Your Body: Self-Improvement Magazine Messages Increase  
Body Satisfaction in Young Adults**

**Abstract**

The verbal messages that contextualize exposure to idealized body imagery may moderate media users' body satisfaction. Such contextualizing verbal messages often take the form of social comparison motives in fashion magazines, while body dissatisfaction is an important mechanism underlying various body image-related health issues like depression and unbalanced weight status. Hence, the present study applied social comparison motives as induced through magazine cover messages. Hypotheses were tested in an experimental design with social comparison motives (self-improvement vs. self-evaluation vs. control) and recipient gender as between-subjects factors, and body satisfaction as within-subjects factor ( $N = 150$ ). Results showed that self-improvement messages accompanying ideal body media models increased body satisfaction, compared to control messages and baseline measures. In contrast, the self-evaluation messages did not impact body satisfaction. Results imply that inconsistencies regarding effects from exposure to idealized body imagery are explained by the context in which media images are portrayed, evoking differential social comparison motives. Moreover, the findings imply that health communication interventions can use verbal messages on body improvement as helpful tools, if they draw on social comparison motives effectively.

*Key words:* social comparison motives, body satisfaction, idealized body imagery, young adults, magazines

## **Boost Your Body: Self-Improvement Magazine Messages Increase**

### **Body Satisfaction in Young Adults**

Despite ample evidence that exposure to idealized body imagery in the media lowers body satisfaction (see meta-analyses, e.g., Grabe, Ward & Hyde, 2008; Barlett, Vowels, & Saucier, 2008), large audiences attend to media outlets featuring abundant imagery of idealized body shapes with super-thin women and super-muscular men. The present work aims to tackle this paradox by considering the verbal messages in which idealized body imagery is embedded.

Indeed, ample research has shown that internalization of ideal-body representations leads to body dissatisfaction and other psychosocial responses such as lowered self-esteem, especially among adolescents and younger adults (e.g., see reviews by Groesz, Levine & Murnen, 2002; López-Guimerà, Levine, Sánchez-Carracedo, & Fauquet, 2010). More specifically, body dissatisfaction entails negative and dysfunctional beliefs about one's own body weight and shape (Garner, 2002) and is very common amongst women of various body weight, varying from overweight to normal weight as well as underweight women (Paeratakul, White, Williamson, Ryan, & Bray, 2002). Body dissatisfaction often results in unbalanced and unhealthy weight-control strategies such as excessive dieting and purging, and is thereby considered as one of the most important underlying mechanisms in body image-related health issues, varying from depression to eating disorder symptomatology (e.g., Spettigue & Henderson, 2004, Neumark-Sztainer, Paxton, Hannon, Haines, & Story, 2006). Moreover, disturbed eating patterns are predictive of weight gain (rather than weight control) and being overweight in later stages of life (Neumark-Sztainer et al., 2006). The prevalence of overweight and obesity has reached an epidemic increase in recent decades, according to the WHO (2015). Hence, body image is closely connected to the key health outcome of a healthy body weight and therefore of great interest to health communication science.

Body image research is predominantly guided by social comparison theory. The impacts of social comparisons on the body perceptions of those viewing attractive media models with idealized body imagery seem two-fold. Abundant research yields that recipients' comparisons of their own bodies with media models' bodies instigates body dissatisfaction (e.g., Cattarin, Thompson, Thomas, & Williams, 2000; Hargreaves & Tiggemann, 2009; Want, 2009). However, a few empirical studies showed that social comparison with models with idealized bodies can enhance body perceptions (e.g., Knobloch-Westerwick & Crane, 2011; Mills, Polivy, Herman, & Tiggemann, 2002). Although most studies included social comparison as a uniform concept (e.g., Dittmar & Howard, 2004; Tiggemann & McGill, 2004), some scholars suggested that the inconsistency in impacts of such body comparison results from different viewers' *motives* for comparing oneself to others (e.g., Halliwell & Dittmar, 2005; Knobloch-Westerwick & Romero, 2011; Martin & Gentry, 1997). In fact, the texts that typically accompany idealized body imagery in the media may encourage different motives for social comparisons (e.g., to improve your appearance, or to compare your physical attractiveness with idealized others to spot your weaknesses). Studying idealized body imagery within its textual context seems important.

The present study investigates how verbal magazine messages that instigate social comparison motives may interact with idealized body imagery in affecting media users' body satisfaction. In the following sections, we outline our theoretical rationale in how underlying motives for body comparison may affect body satisfaction in response to idealized body imagery. Then, we formulate our hypotheses followed by a description of our methodological approach to test hypotheses in an experimentally controlled design.

### **Media Exposure to Ideal-Bodies and Social Comparison**

Prior work yielded inconsistent results for exposure to idealized body imagery impacting body perceptions and related measures (e.g., see Holmstrom, 2004; López-Guimerà

et al., 2010). Among women, the vast majority of studies found that exposure to thin-ideal imagery raises internalization of this ideal and guides subsequent negative body-related issues such as body dissatisfaction, distorted body perceptions, weight control measures such as disordered eating, and depression (e.g., Grabe et al., 2008; Groesz et al., 2002; Harrison, 2000; Jones & Smolak, 2011; López-Guimerà et al., 2010). Additionally, research insights reveal that men may also suffer from body image concerns (Aubrey & Taylor, 2009; Cohane & Pope Jr., 2000). Exposure to ultra-muscular body imagery inflicted body dissatisfaction, which was even further associated with depression and eating disorder symptoms (Agliata & Tantleff-Dunn, 2004; Barlett et al., 2008; Olivarda, Pope Jr., Browiecki, & Cohane, 2004). Recent meta-analyses and reviews confirmed these findings of exposure to idealized body imagery negatively impacting both women and men (Grabe et al., 2008; Groesz et al., 2002; López-Guimèra et al., 2010). In contrast, other meta-analyses concluded that idealized body depictions resulted in only small to hardly any effects on body perceptions (Ferguson, 2013; Holmstrom, 2004). Some studies even found more positive body perceptions after exposure to models with idealized bodies (e.g., Knobloch-Westerwick & Crane, 2012; Mills et al., 2002). We argue that these differences might be dependent on how the idealized body imagery is presented: Contextualizing such ideal imagery may trigger different responses. For example, variations in textual framing of media models are found to both increase (Veldhuis, Konijn, & Seidell, 2014a) and decrease body dissatisfaction (Veldhuis, Konijn, & Seidell, 2012; 2014b), depending on the *content* of accompanying verbal messages. In an attempt to further explain these different reactions to ideal-image exposure, we consider variations in how individuals compare themselves to thin-ideal models to be of pivotal importance.

In body image research, social comparison (cf. Festinger, 1954) with media models has been revealed as an important underlying mechanism for internalization of ideal standards and for developing body-perceptions (e.g., Cattarin et al., 2000; Dittmar & Howard, 2004;

Hargreaves & Tiggemann, 2009; Tiggemann & McGill, 2004). Social comparison comes about both consciously and unconsciously and generally occurs with those who are similar on a relevant domain, such as demographics (e.g., Suls, Martin & Wheeler, 2002). More specifically, *appearance comparison* and *body comparison* refer to comparison of appearance-related and body-specific qualities, such as weight, size, and shape, respectively (cf. Jones, 2001; Schutz, Paxton, & Wertheim, 2002). Research showed for decades that media figures function as relevant targets for such comparisons on physical attributes (e.g., Jones, 2001; Milkie, 1999; Schutz et al., 2002). Hence, the present study focused on *same-sex* media models with ideally-toned bodies as reference points for body comparison. That is, in our controlled experimental design, women were exposed to ultrathin female models (cf., Grabe et al., 2008; López-Guimèra et al., 2010) and men saw ultramuscular male bodies (cf., Hargreaves & Tiggemann, 2009; Law & Labre, 2002).

Social comparison theory distinguishes upward and downward processes of comparison (Lockwood & Kunda, 1997). Downward comparison refers to comparing oneself with those who are worse off (Wheeler & Miyake, 1992), whereas upward comparisons occur with others who seem to be better off on the dimension of comparison. As media models are mostly seen as more ideal and attractive than oneself, most likely upward social comparison mechanisms are triggered by exposure to idealized body imagery (Wheeler & Miyake, 1992). Upward social comparison can either negatively or positively impact self-image (Suls et al., 2002): On the one hand, upward social comparison with media models can lead to experiencing self-ideal discrepancy and developing disturbed and negative self-concepts regarding one's body or weight (e.g., Bailey & Ricciardelli, 2010; Bessenoff, 2006; Greenwood, 2009; Tiggemann & Polivy, 2010). On the other hand, upward social comparison might also have an inspiring and motivating function and lead to self-improvement efforts, for example, restricting food intake (Hargreaves et al., 2009; Knobloch-Westerwick & Crane,

2012; Mills et al., 2002; cf. self-discrepancy theory of Higgins, 1987). Thus, the specific direction of the impact of upward appearance comparison is unclear and can be either negatively or positively impacting body image. The perceived attainability of the presented body-ideal seems an important factor.

For upward social comparison to function as motivating, greater perceived attainability of such ideal bodies seems to play a key-role in guiding positive outcomes of upward comparison. For instance, Knobloch-Westerwick and Romero (2011) found that body-dissatisfied readers spent more time on ideal body ads when body-improvement articles about exercising and dieting, compared to body-unrelated control articles, were included in a magazine. In other words, when provided with ‘how to’ information, recipients may well seek out upward social comparison and find inspiration for self-improvement. Hence, the motives with which ideal body imagery is processed could be pivotal for how onlookers are affected as detailed in the next section.

### **Motives for Social Comparison**

Further specifying social comparison theory, scholars postulate that the extent to and direction into which media models affect body-perceptions depends on the  *motive* to compare oneself with these models (Halliwel & Dittmar, 2005; Knobloch-Westerwick & Romero, 2011; Levine & Murnen, 2009; Martin & Gentry, 1997). Three motives are discussed to be most relevant here: 1) self-evaluation, 2) self-improvement (which both pertain to upward comparison), and 3) self-enhancement (which pertains to downward comparison; Helgeson & Mickelson, 1995). Upon ideal-body media exposure, most likely upward social comparison will occur due to a self-ideal discrepancy (Bessenoff, 2006; Higgins, 1987; Tiggemann & McGill, 2004), while self-enhancement from downward comparison seems highly uncommon (also argued in Halliwel & Dittmar, 2005, p. 250). Thus, we focused on *self-improvement* and *self-evaluation* as underlying motives for upward comparison.



**Self-improvement.** Research indicates that negative effects from exposure to idealized body imagery can be counteracted when such images of media models are presented in specific contexts, such as accompanied by a message that the model is way too thin (Veldhuis et al., 2012; 2014b). Related, even positive effects on body perceptions are found from contextualizing idealized body imagery by inducing social comparison (Knobloch-Westerwick & Crane, 2012) or by reading attainability articles (Mills et al., 2002) before exposure to the images. The self-improvement motive for social comparison (see Helgeson & Mickelson, 1995) might explain these findings: The self-improvement motive directs not only comparison of oneself with others and experiencing self-ideal discrepancies, but also the motivation and inspiration to improve oneself as a result (Lockwood & Kunda, 1997). For example, a headline like *'The Burn Fat-Build Muscle-Diet: A New You in 30 Days'* on Men's Fitness magazine points at self-improvement measures such as dieting and, thus, suggests that the magazine directly provides information on *how* to reach the goal of an ideal weight. Suggestions and means to achieve the ideal-body goal are key elements in media exposure driving self-improvement, which motivates viewers to improve one's body and reach the ideal (Harrison, Taylor, & Marske, 2006; Knobloch-Westerwick & Romero, 2011). As a result, people are expected to feel better about their body when self-improvement underlies body comparison.

Indeed, the few studies that manipulated social comparison motives and tested their causal effects on body-related issues revealed that induction of self-improvement motives preceding exposure to idealized body imagery in magazine advertisements and articles can readdress negative effects from such exposure. More specifically, self-improvement guided more positive self-perceptions of physical attractiveness compared to self-evaluation or control groups in (pre-)adolescent girls (Martin & Gentry, 1997). Additionally, reading articles that are high in attainability measures (i.e., lose weight through dieting) before

exposure to magazine advertisements with thin-ideal body images led to higher self-esteem and less negative affect in female restraint eaters compared to lower-attainability or body-irrelevant articles (Mills et al., 2002). Lastly, the study of Knobloch-Westerwick and Romero (2011) found that including articles with attainability measures in a magazine (compared to a magazine with body-irrelevant articles) allowed for longer exposure to ideal-body ads in body dissatisfied adult women and men. Hence, we expected that verbal messages accompanying ideal body portrayals that induce self-improvement comparison would increase body satisfaction, compared to pre-exposure body satisfaction (H1a) and compared to ideal imagery with neutral messages (H1b).

**Self-evaluation.** Self-evaluation as a motive for social comparison underlies upward comparison in a way that yields unrealistic and usually unattainable ideals, such as with most body imagery in media portrayals. Such standards of idealized bodies are unrealistic since they deviate from actual body measures in society (Fouts & Burggraf, 2000), while they also have become increasingly thinner (for women) and more muscular (for men) over time (Agliata & Tantleff-Dunn, 2004; Sypeck, Grey, & Ahrens, 2004). Self-evaluation is expected to occur when people evaluate their personal qualities, capacities, social norms, expectations and values against those of others who are seen as more capable, more attractive, and better than oneself (Festinger, 1954; Jones, 2001). For example, the headline ‘*Miss Skinny versus Miss Muscle: the Two Body Trends*’ on Grazia magazine might prompt self-evaluation of one’s body compared to the models portrayed on the cover. Given that no attainability measures are given on how to overcome the self-ideal body discrepancies, unlike in case of self-improvement, self-evaluation with ideal media models usually prompts negative body perceptions (Lockwood & Kunda, 1997). Indeed, the experimental studies of Halliwell and Dittmar (2005), and Martin and Gentry (1997) found that induced self-evaluation comparison before viewing magazine advertisements with ideal models, guided higher body-focused

anxiety and more negative self-perceptions of physical attractiveness in women and girls. Likewise, research suggested that feedback of peers on thin-ideal body imagery without providing effective ideas on how to overcome self-ideal discrepancies made viewers focus on self-ideal comparisons, which increased body dissatisfaction (Veldhuis et al., 2014a). In sum, the above theorizing led us to the assumption that exposure to ideal body imagery accompanied by verbal messages triggering self-evaluation comparison reduces body satisfaction, compared to pre-exposure body satisfaction (H2a) and compared to ideal imagery with neutral messages (H2b).

Thus far, only a few studies in body-image research manipulated motives for social comparison and tested the causal effects on body-related perceptions (Halliwell & Dittmar, 2005; Knobloch-Westerwick & Romero, 2011; Martin & Gentry, 1997; Mills et al., 2002). However, this research mostly studied social comparison motives as induced separately, *before* exposure to models with idealized bodies (e.g., see Halliwell & Dittmar, 2005). To create more naturally occurring media exposure (see also Knobloch-Westerwick & Romero, 2011; Want, 2009), we *simultaneously* showed idealized body imagery and messages that induced different social comparison motives as an integrated display on magazine covers.

With regard to the study group, we had several reasons to focus on ‘emerging adults’: Being large-scale media consumers, youngsters form a most vulnerable group for media imagery impacting their body image (e.g., López-Guimèra et al., 2010). More specifically, ‘emerging adults’ find themselves in a distinct developmental stage that is characterized by increased independency from their parents and developing their self-identity, which renders this age very important for establishing healthy lifestyle behaviors (Nelson et al., 2008). Furthermore, we included both women and men - while most studies on social comparison motives have included women only (Halliwell & Dittmar, 2005; Martin & Gentry, 1997; Mills et al., 2002), men are also impacted by exposure to models with ideal bodies and subject

to social comparison (e.g., Agliata & Tantleff-Dunn, 2004; Aubrey & Taylor, 2009; Barlett et al., 2008; Hargreaves & Tiggemann, 2009). For men, the direction of hypotheses is similar to those of the females (i.e., H1 and H2).

## Method

### Design and Participants

In order to examine the assumed subtle differences in motives underlying social comparison while viewing magazine covers that would lead to opposing effects on body perceptions, we designed a carefully controlled experiment. Based on the above theorizing, we included verbal references of self-improvement motives versus self-evaluation motives through messages (to be contrasted with body-irrelevant control messages) and visual representations of either female thin-ideal or male muscularity-ideal same-sex models on magazine covers. Furthermore, we included measures of body satisfaction before and after exposure to magazine covers. This mixed experimental design allowed to test the hypotheses as derived from combining theoretical principles and previous findings on social comparison motives.

A total of 173 late adolescents and young adults were recruited from introductory classes from various higher education organizations in the Netherlands. They participated in an experimental design with social comparison motives (self-improvement vs. self-evaluation vs. control) and recipient gender as between-subjects factors, and with body satisfaction as within-subjects factor (pre- versus post-exposure measures). To create a homogeneous group of higher-educated participants in so-called 'emerging adulthood' (aged 18-25 years; cf. Arnett, 2000; Nelson, Story, Larson, Neumark-Sztainer, & Lytle, 2008), 23 participants were removed from the original database (16 based on a higher age, and 7 based on a too low education level). As a result, 150 participants were included in subsequent analyses (all higher-educated and aged 18-25 years;  $M_{\text{age}} = 21.91$ ,  $SD_{\text{age}} = 2.06$ ; 101 were females).

The participants were randomly assigned to one of three experimental conditions (self-evaluation,  $n = 53$ ; self-improvement,  $n = 48$ ; and control,  $n = 49$ ). Distributions of age ( $F(2,147) = .241, p = .786$ ), gender ( $F(2,147) = .791, p = .455$ ), Body Mass Index<sup>1</sup> ( $F(2,145) = .430, p = .651$ ), baseline measure of social comparison regarding physical appearance<sup>2</sup> ( $F(2,147) = .003, p = .997$ ), and magazine use<sup>3</sup> ( $F(2,147) = .468, p = .627$ ) were equal across conditions (see Table 1. for means and standard deviations). As a result, no covariates were included in subsequent analyses. Participation in this study was approved by the ethics committee of our institution, was entirely voluntary, completely confidential, and anonymous.

## Materials

**Social comparison motives in messages.** This study included three experimental conditions that varied only in the content of magazine covers' messages, whereas the images of models with idealized bodies and further presentation and lay-out of the magazine covers were kept identical throughout the experimental conditions. Two conditions varied in experimentally induced social comparison motives (i.e., self-evaluation vs. self-improvement) conveyed through magazine headlines whereas the control condition used body-irrelevant (neutral) headlines.

Each experimental condition used a set of two magazine covers, which were created specifically for our study purposes. Each cover conveyed a social comparison motive message through a main headline and a sub-headline. An overview of the exact messages in each experimental condition and the number of words used per headline is provided in Table 2. We strived to include a close to equal number of words per headline. The messages are generally similar for both genders, except that, following literature on features of ideal bodies, the word 'slim' is used for females (e.g., Grabe et al., 2008) and 'muscular' for males (e.g., Hargreaves & Tiggemann, 2009).

**Magazine cover.** To ensure ecological validity, the stimulus materials combined texts and images in a magazine setting (following arguments in Aubrey, 2010; Holmstrom, 2004; Knobloch-Westerwick & Crane, 2012). Magazines seem to typically display images of idealized bodies accompanied by texts, such as headlines, that directly evoke social comparison (for various motives as described previously). Research shows that men reading sports magazines and women reading beauty magazines report increased levels of appearance-related worries (Botta, 2003; Morry & Staska, 2001). Furthermore, magazines are identified as an important source of exposure to body-related content (Harper & Tiggemann, 2008; Law & Labre, 2002). This renders magazines a relevant and appropriate appearance-focused setting for presenting our stimuli and to test the *direct interaction* between idealized body imagery and texts directing the social comparison motives in an *experimentally controlled design*. Subsequently, this allows to test the *causal impact* on body-related outcome measures.

For the purpose of the present study, we developed full-color and full-screen presentations of magazine covers (see above). Each cover presented three same-sex model images<sup>4</sup> and a headline emphasizing same-sex body-ideals. In contrast to Martin and Gentry (1997), we included idealized body imagery in our control group in order to be able to attribute the effects to variations in headline content. The same regularity of magazine lay-out was pursued for both females and males (following Martin & Gentry, 1997, who stress stimuli consistency).

In each condition, the first cover was called “Trend Magazine” and included the following sub-headlines: “New Season Trends” for both females and males, and “Beach Shorts - Under €30” for males or “Beach Bikinis - Under €30” for females. Additionally, three pictures displayed models with ideal bodies (female models for female participants and male models for male participants) and some background beach images. The second cover used in each experimental condition, was called “Women’s Style” for females, and “Men’s

Style” for males, and included the following sub-headlines (similar for both genders): “Special Edition”, “This Month’s Hot Stories”, “New Fab Shoes – Rule the World”, and “Music & Movies”. Finally, some smaller pictures of shoes and a small picture of hats were portrayed on the second cover.

The colors that were used for the magazine covers and for the texts mimicked colors that are generally displayed on commonly available magazines such as “Men’s Health” and “Cosmopolitan”. Accordingly, the first cover used bright yellow, bright blue, and grey colorings for males, and bright yellow, bright pink, and grey for females. The second cover displayed red, blue and yellow for both males and females. Furthermore, each cover included a bar code in the right bottom corner.

### **Procedure**

Participants were recruited at their educational institution and through e-mail. The study was conducted online by means of Qualtrics. This software allowed random assignment of participants to one of three same-sex experimental magazines targeting social comparison motives. The participants were assured that their answers were anonymous and would be treated confidentially for study purposes only. The undergraduate students could receive extra credit for participation. Participants took only one session that lasted approximately 20 minutes.

The online questionnaire first asked participants for their socio-demographics (embedded in filler items), including age, educational ability, and gender. The latter allowed participants’ designation to covers portraying either female models or male models, while allocation to experimental conditions was random. This first part further asked for physical features (i.e., current body weight and height), trait social comparison regarding physical appearance, magazine use, and baseline body satisfaction. Hereafter, the two magazine covers from one experimental condition were presented one-by-one (online). The participants

decided when to proceed from the first cover to the second cover, and from there to the remaining questionnaire. After stimuli exposure, post-exposure body satisfaction was asked. Then, again, the participants were shown the two magazine covers of their condition. This time, after *each* cover manipulation check items were asked to check for possible confounders. Finally, the participants were thanked for their participation.

### **Measurements**

**Body satisfaction.** The dependent variable body satisfaction was measured with 4 items on a 21-point semantic scale (-10 = very dissatisfied; 10 = very satisfied) which were embedded in 11 distracter items to avoid demand characteristics (cf. 'Quality of Life Scale' of Ferrans & Powers, 1985; also see Knobloch-Westerwick & Romero, 2011). The items assessed state body satisfaction by asking for the extent of one's *current* satisfaction with personal appearance, body size and shape, and physical attractiveness. Body satisfaction was measured both prior to and after stimulus exposure (Cronbach's  $\alpha_{pre} = .93$ ; Cronbach's  $\alpha_{post} = .94$ ). Higher scores on the scale resembled more body *satisfaction*, whereas lower scores indicated more body *dissatisfaction*.

**Manipulation check.** Although the messages' contents were pre-tested and can be considered as intentional and intrinsic features of the stimuli (following O'Keefe, 2003), we included a manipulation check in the present study to ensure that interpretation of the magazine covers was correct. Each of the headlines was rated on its fit of belonging to a magazine with information on how to attain a better body shape (i.e., *self-improvement*) or to a magazine with information that allocated self-other body comparison (i.e., *self-evaluation*). Two items followed each headline and were rated on a ten-point scale (1 = totally disagree; 10 = totally agree): 'This headline suggests that the magazine provides information on how to improve one's body shape' (i.e., indicative for the *self-improvement* condition) and 'This headline suggests that the magazine provides information that allows comparing one's own



body shape to others' body shape' (i.e., indicative for the *self-evaluation* condition). Because the self-evaluation scores of both covers within an experimental condition correlated significantly ( $r = .799, p < .01$ ), these were added up to a sum score of self-evaluation ratings of the messages in that condition. Similarly, the self-improvement scores for the two covers of an experimental condition correlated significantly ( $r = .767, p < .01$ ), and were subsequently collapsed to a sum score of self-improvement ratings of the messages within that condition.

## Results

### Manipulation check

A MANOVA with experimental condition of social comparison motives (self-evaluation vs. self-improvement vs. control) and recipient gender as between-subjects factors, included the two manipulation check sum scores of messages' fit with 1) magazines on *self-evaluation*, and 2) magazines on *self-improvement* as dependent variables. Results revealed a multivariate effect for the experimental condition of social comparison motives (Wilks'  $\lambda = .349, F(4,286) = 49.52, p < .001, \eta^2 = .41$ ), which was confirmed by univariate  $F$ -tests for *self-improvement* ratings ( $F(2,144) = 69.98, p < .001, \eta^2 = .49$ ) and for *self-evaluation* ratings ( $F(2,144) = 44.67, p < .001, \eta^2 = .38$ ). Importantly, no multivariate effects were found for gender ( $p = .364$ ), or for the interaction between experimental condition and gender ( $p = .283$ ).

Further testing the significant main effects of the experimental social comparison motives condition, subsequent post-hoc tests (Bonferroni) specified that the messages in the self-improvement condition were evaluated as significantly better fit to a magazine on improving one's own body than the messages in both other experimental conditions. Likewise, the messages in the self-evaluation condition were perceived as significantly more indicative of belonging to a magazine that directed self-other body comparison than the messages in the self-improvement and control condition (all  $ps < .001$ ; see Table 2. for means

and standard deviations). These results confirmed our manipulation of the magazine cover messages pertaining to social comparison motives in the intended direction.

### **Testing Hypotheses**

Testing H1 and H2, we used a repeated measures ANOVA with experimental condition of social comparison motives and recipient gender as between-subjects factors, and body satisfaction (pre- versus post-exposure) as the within-subjects factor (See Figure 1. for means and standard deviations of pre-exposure and post-exposure body satisfaction per experimental condition).

Multivariate tests revealed a significant interaction effect for the between-subjects factor experimental condition and within-subjects factor body satisfaction (Wilks'  $\lambda = .950$ ,  $F(2, 144) = 3.76$ ,  $p = .026$ ,  $\eta^2 = .05$ ). Furthermore, no multivariate interaction effect was found for the within-subjects factor body satisfaction and between-subjects factor gender ( $p = .677$ ). Moreover, no multivariate three-way interaction was found for the between-subjects factors and the within-subjects factor ( $p = .452$ )<sup>5</sup>.

Further testing the effect of self-improvement messages (H1a), pairwise comparisons (Sidak) revealed a significant difference between pre-exposure and post-exposure measures of body satisfaction at the level of the self-improvement messages ( $p = .002$ ). That is, body satisfaction significantly increased after exposure to self-improvement messages when compared to baseline measures of body satisfaction. This effect is visualized in Figure 1.

Subsequent testing of the effect of self-evaluation messages (H2a) by means of pairwise comparisons (Sidak) revealed no significant difference between pre-exposure and post-exposure measures of body satisfaction at the level of the self-evaluation messages ( $p = .504$ ). Lastly, no significant difference was found for pre- versus post-exposure body satisfaction at the level of the control messages ( $p = .511$ ).

Additionally, these results were confirmed by a univariate ANCOVA with the pre-exposure body satisfaction as covariate, experimental condition and gender as independent factors, and the post-exposure body satisfaction as dependent factor (cf. Senn, 2006<sup>6</sup>). Results revealed a main effect of experimental condition on post-exposure body satisfaction,  $F(2,143) = 3.72, p < .027, \eta_p^2 = .05$ . Furthermore, a main effect of pre-exposure body satisfaction on post-exposure body satisfaction was found,  $F(1,143) = 1950.10, p < .001, \eta_p^2 = .93$ . No significant effects were found for gender ( $p = .704$ ) or the experimental factor by gender interaction ( $p = .456$ )<sup>7</sup>. Subsequent pairwise comparisons (Sidak) showed that post-exposure body satisfaction following self-improvement messages is significantly higher than following control messages ( $p = .025$ ), confirming H1b. Furthermore, self-evaluation messages induced similar levels of body satisfaction compared to control messages ( $p = .725$ ), which does not support H2b.

In sum, results confirmed a positive effect of self-improvement messages. More specifically, exposure to magazine covers with idealized body imagery increased body satisfaction when these covers contained messages with self-improvement measures, compared to control messages and compared to baseline measures of body satisfaction. Furthermore, we found no support for self-evaluation messages on magazine covers impacting body satisfaction.

## Discussion

The present study aimed to shed light on the paradox of the large readership in magazines portraying models with ideally thin bodies despite evidence that such imagery induces body *dissatisfaction* among its viewers. Therefore, we tested the *causal* impact of how idealized body imagery is contextualized by verbal messages in evoking different motives for social comparison. In an experiment, we encouraged either *self-evaluation* or *self-improvement* motives through messages accompanying thin-ideal (for women) or

muscularity-ideal (for men) imagery. Our results demonstrate that self-improvement messages accompanying ideal-body media models increase body satisfaction in young adults, both for men and women, while self-evaluation messages did not impact body satisfaction.

In line with hypotheses, self-improvement messages on a magazine cover with thin or muscular body-ideal images prompted an increase in body satisfaction in our study. This effect was demonstrated in two ways: The level of body satisfaction after exposure to self-improvement messages was higher 1) when compared to control messages, and 2) when compared to one's baseline body satisfaction (i.e., before exposure). Our finding that self-improvement motives increase body *satisfaction* implies that the inconsistency in the extant literature regarding effects from ideal-body exposure and social comparison with media models can be explained by how media images are contextualized (cf. Helgeson & Mickelson, 2005; Suls et al., 2002). Contextualization of idealized body imagery by verbal references and taking into account underlying motivational processes is important in clarifying effects of media exposure (cf., Harrison et al., 2006; Levine & Murnen, 2009; Knobloch-Westerwick & Crane, 2012). The positive impact of self-improvement messages on body satisfaction converges with few previous studies on induced self-improvement and attainability measures before ideal-body exposure (e.g., Knobloch-Westerwick & Romero, 2011; Martin & Gentry, 1997). While these studies presented the texts separate from the thin-ideal imagery, the current study combined the text and imagery on manipulated magazine covers such that ideal bodies were directly surrounded by messages evoking social comparison.

Our findings also explain why people still read magazines portraying ideally-toned bodies, whereas a large body of research found this to cause negative effects (e.g., Barlett et al., 2008; Grabe et al., 2008). Self-improvement headlines like "The Burn Fat-Build Muscle-Diet: A New You in 30 Days" may instigate sparks of hope by offering new ideas on how to reach the ideal (cf. Lockwood & Kunda, 1997). The suggestion presented in the verbal

messages how one could attain an ideal body guided the positive self-perceptions by motivating and inspiring the viewers to improve oneself. In all, the consequences of exposure to ideally-toned bodies seem to be largely dependent on the context in which those images are portrayed, such as verbal messages, headlines and commentary accompanying the ideal imagery.

Verbal message contextualization of visual representations of ideal bodies moderates how recipients are affected in their body satisfaction not only through traditional verbal text, but also through feedback from others. For example, a recent study showed that verbal feedback from relevant others (i.e., peers) could also moderate the effects of idealized body imagery in either direction depending on the content of such peer feedback. When peers indicated an ultra-thin model as within reach with just a little effort, yet without any suggestions on *how* to reach that ideal, an increase in body *dissatisfaction* was the result in adolescent girls (Veldhuis et al., 2014a). On another note, the presentation of information labels attached to thin-ideal images counteracted negative feelings when such information labels explicated the underweight status of those thin-ideal models (Veldhuis et al, 2012; 2014b). In the current study, our finding that self-improvement texts surrounding ideally-shaped models resulted in positive effects implies a similar counteracting effect. That is, presenting certain motivating messages together with idealized imagery may result in increased body satisfaction rather than body *dissatisfaction*.

Interestingly, our study revealed that both women and men showed similar reactions to social comparison motives attached to displays of ideal bodies, which supplements the existing literature focusing mainly on women (e.g., Halliwell & Dittmar, 2005). Clearly, men are also susceptible to body-ideals in terms of experiencing negative body perceptions when presented with male ideal imagery (Barlett et al., 2008). What is considered ‘an ideal body’ however differs for both sexes: For decades, general female ideal-body standards pertain to

ultrathin bodies in Western society (e.g., Grabe et al., 2008). In contrast, a pumped-up muscular body prevails as being 'ideal' in men (Hargreaves & Tiggemann, 2009). Despite the body-ideal differences, body image in both women and men is found to be negatively affected by exposure to same-sex body ideals (e.g., Barlett et al., 2008; López-Guimerà et al., 2010). As our stimuli specifically targeted female and male participants separately with *same-sex* body-ideal models, the current findings for self-improvement texts were anticipated for both women and men. Furthermore, it should be noted that more recently, women's ideals seem to be evolving from 'ultrathin' to 'curvy thin' or 'athletic' bodies (Webb, Warren-Findlow, Chou, & Adams, 2013; Benton & Karazia, 2015). Given that the models in our present study represent the more traditional ultrathin body-ideal for women, this leaves room to investigate the responses to various social comparison motives in case of exposure to these evolving ideals.

The results for self-evaluation messages did not follow our expectations, but they do provide valuable information. Based on previous studies that explicitly drove self-ideal body comparisons while no attainability measures were given (Halliwell & Dittmar, 2005; Martin & Gentry, 1995; Veldhuis et al., 2014a), we expected that self-evaluation messages accompanying ideal-body images would instigate lower levels of body satisfaction. However, self-evaluation messages left body satisfaction unchanged in the current study. This result is not consistent with previously found disturbed and negative body self-concepts following upward social comparison (e.g., Bessenoff, 2006; Greenwood, 2009). However, not finding a difference between the self-evaluation and control messages in impacting body satisfaction can be explained as follows: Exposure to idealized body images may automatically lead to self-evaluation comparisons. As an inherent effect of thin-ideal exposure, self-evaluation comparisons are likely to occur when no accompanying message prompts other types of comparison or put those models in a different light (e.g., through (under)weight information

or peer feedback). Hence, no increase in (dis)satisfaction then occurs by self-evaluation motives, as was the case in the current study. Such an explanation is in accordance with previous studies that found no difference between induced social comparison and spontaneously occurring social comparison in impacting body satisfaction (Knobloch-Westerwick & Crane, 2012; Want, 2009). Thus, ongoing exposure to idealized body imagery leads to accepting these bodies as sociocultural standards, thereby guiding social comparison and modeling processes (e.g., Barlett et al., 2008; also cf. Cultivation Theory postulating that repetitively communicated messages become integrated in perceptions of social reality; Gerbner, Gross, Morgan, Signorielli, & Shanahan, 2002). Consequently, self-evaluation of one's body against those idealized bodies of media models seems to be quite common as is experiencing body dissatisfaction: The latter phenomenon is being referred to as 'normative discontent', which is found to be very prevalent nowadays (Tantleff-Dunn, Barnes, & Larose, 2011). With the increase of idealized imagery exposure via new media technology, normative discontent has become an important concept for future research.

To reflect in detail on the implications of our findings, a better understanding of what is so appealing about ideal-body portraying media that people keep attending to it (despite ruining their body satisfaction) could help with counteracting the negative effects of ideal-body exposure. Moreover, it creates possibilities to utilize similar mechanisms for positive outcomes. Our study suggests that short verbal messages presenting attainable means for body-improvement actions promise to be an effective strategy for body image interventions. Such interventions may then use a mass media approach to counteract negative media-induced body perceptions and to carefully guide a healthy body size by proper lifestyle behaviors. That said, when developing media-based interventions targeting body image, one should be aware of the effects of the specific wording used in (health) messages: Our research implies that youngsters seem highly sensitive to subtleties in information accompanying

idealized body imagery. These subtleties might further influence their processing of information and direct their responses in terms of increasing or decreasing body satisfaction. Most likely, this not only accounts for the effects of body-related media content, but also for the effects of intervention programming in the realm of body image. Applied to general health communication, if we understand *how* self-improvement social comparisons work for recipients, we could get a lot of mileage out of this phenomenon when it comes to improving everyday health behaviors. Hence, pushing this line of research further by examining *how* people are *selecting* self-improvement messages to boost their motivation for behavior change (e.g., weight loss) seems highly relevant (see also Sarge & Knobloch-Westerwick, 2013; Knobloch-Westerwick, Johnson, & Westerwick, 2013).

As all studies, our study has several strengths and limitations that hold implications for future research. Although the present study focused on a homogenous group of higher-educated females and males in emerging adulthood, we did not consider individual differences that might further moderate the impact of texts and images on body perceptions. Several scholars argue that some individuals are more likely to be affected by media's ideal-bodies than others and that individual difference variables, such as trait levels of self-esteem or appearance schematicity, should be considered in body image research (Veldhuis et al., 2014b; Ferguson, 2013; Roberts & Good, 2010). Including more participants in future research may allow segmentation of the target group in terms of individual differences that may interact with social comparison motives. For example, the current range of BMI among our participants was too small to create substantially different BMI groups, although it is important to check the impact of social comparison motives among individuals differing in body-relevant variables such as BMI or self-efficacy to change one's body. The paradigm as tested in this study should be tested in a broader group among people of various weight statuses but also among various age groups (given that we now focused on a specific



developmental group of emerging adulthood). Additionally, future research could apply a longitudinal approach (cf., Knobloch-Westerwick & Crane, 2012; Levine & Murnen, 2009, Tiggemann, 2014) to further assess the long-term impact of stimulating self-improvement on, for example, actual behavior to improve oneself such as dieting and exercising.

Furthermore, a note of caution must be made about individuals' connotations made to ideal-body images. In response to an exploratory open-ended question about what the magazine images portrayed, some respondents answered in terms of stereotypes, pre-existing beliefs and prejudices such as: "*A bunch of skeletons in bikini*", "*Slender and trained models that don't comply with the average size of a woman*", or: "*Photoshopped males with trained bodies*". It seems important to apprehend connotations in media effects research regarding idealized bodies, in particular because mass media probably already contributed to such associations before participants partake in research. Likewise, future research could extend to assessing the conscious versus unconscious processing of texts and images. In an inquisitive open-ended question to recall of headline content, some of our participants claimed that they had looked more at the pictures instead of the messages: "*Beach something. I forgot. Didn't pay too much attention. The main attention was focused on the images*". Including eye-tracking measures will shed a light at the focus points of participants, allowing to investigate differences between image-focused versus text-focused media users (cf. visual versus verbal learners, Mayer & Massa, 2003). Likely, future research can examine whether the patterns demonstrated in the present study apply to other media contexts (such as the internet) as well.

Our study also entails several strengths. We used magazines as a highly popular and strongly appearance-related setting for *simultaneously* showing idealized body imagery and social comparison texts. Such a setting in which body-imagery and body-related texts are combined resembles a naturally occurring setting like in magazine stores (Holmstrom, 2004; Ferguson, 2013). This ecologically valid approach complements previous studies on

experimentally manipulated social comparison motives in which the motives were mainly induced *before* ideal-body exposure (e.g., Halliwell & Dittmar, 2005), or by using multiple induction moments within one participant (i.e., Martin & Gentry, 1997). This approach also allows to test the *direct interaction* of imagery and texts and their *causal impact* on body-related outcome measures.

The way we applied the verbal messages is in accordance with literature suggesting that texts should be short and simple in order to be effective and cause effects (Cowburn & Stockley, 2005). However, our approach could be further improved. Given the forced exposure of our present study, participants could hardly avoid the images as they can in daily life. Therefore, future research could show a full magazine, instead of covers only, in which participants decide themselves to be exposed to certain texts and images. Following Knobloch-Westerwick and Romero (2011), measuring selective exposure in case of the various social comparison motives seems relevant then.

Finally, a strength of our study is the two-fold approach: 1) comparison with baseline body satisfaction, and 2) comparison with body-irrelevant control messages. In doing so, we could rule out possible confounds and allocate causal effects from the type of social comparison motives that surround idealized body imagery on onlookers' state body satisfaction (cf. Holmstrom, 2004; Ferguson, 2013; Levine & Murnen, 2009).

In sum, our study provided important insights into the contextualization of media images by using verbal references that accompany idealized body imagery and holds implications for health interventions. Implications are, among others, that reading magazines with promising self-improvement messages like “inspire for action with the ultimate body-work-out” can make viewers feel better about their body. The findings of the current study are relevant in view of explaining why some studies found positive effects of exposure to body-ideals on body satisfaction (e.g., Halliwell & Dittmar, 2005) in contrast to a vast majority of

studies that found negative impact of such exposure (e.g., Grabe et al., 2008). Differentiating viewers' motives for comparison with media models' ideal body shapes is thus of pivotal importance for predicting and understanding effects of ideal body exposure. The present findings demonstrate that verbal messages on body improvement options can be helpful tools in health communication interventions - if they draw on social comparison motives effectively.

### References

- Agliata, D., & Tantleff-Dunn, S. (2004). The impact of media exposure on males' body image. *Journal of Social and Clinical Psychology, 23*, 7-22. doi: 0.1521/jscp.23.1.7.26988
- Arnett, J.J. (2000). Emerging adulthood. A theory of development from the late teens through the twenties. *American Psychologist, 55*, 469-480. doi: 10.1037/0003-066X.55.5.469
- Aubrey, J.S. (2010). Looking good versus feeling good: An investigation of media frames of health advice and their effects on women's body-related self-perceptions. *Sex Roles, 63*, 50-63. doi: 10.1007/s11199-010-9768-4
- Aubrey, J.S., & Taylor, L.D. (2009). The role of lad magazines in priming men's chronic and temporary appearance-related schemata: An investigation of longitudinal and experimental findings. *Human Communication Research, 35*, 28-58. doi: 10.1111/j.1468-2958.2008.01337.x
- Bailey, S.D., & Ricciardelli, L.A. (2010). Social comparisons, appearance related comments, contingent self-esteem and their relationships with body dissatisfaction and eating disturbance among women. *Eating Behaviors, 11*, 107-112. doi: 10.1016/j.eatbeh.2009.12.001
- Barlett, C.P., Vowels, C.L., & Saucier, D.A. (2008). Meta-analyses of the effects of media images on men's body-image concerns. *Journal of Social & Clinical Psychology, 27*, 279-310. doi: 10.1521/jscp.2008.27.3.279
- Benton, C., & Karazsia, B.T. (2015). The effect of thin and muscular images on women's body satisfaction. *Body Image, 13*, 22 - 27. doi: 10.1016/j.bodyim.2014.11.001
- Bessenoff, G. R. (2006). Can the media affect us? Social comparison, self-discrepancy, and the thin ideal. *Psychology of Women Quarterly, 30*, 239-251. doi: 0361-6843/06

- Botta, R. A. (2003). For your health? The relationship between magazine reading and adolescents' body image and eating disturbances. *Sex Roles, 48*, 389-399.
- Cattarin, J.A., Thompson, J.K., Thomas, C., & Williams, R. (2000). Body image, mood, and televised images of attractiveness: The role of social comparison. *Journal of Social and Clinical Psychology, 19*, 220 – 239. doi: 10.1521/jscp.2000.19.2.220
- Cohane, G. H. and Pope Jr., H. G. (2000). Body image in boys: A review of the literature. *International Journal of Eating Disorders, 29*, 373 - 379. doi: 10.1002/eat.1033
- Cowburn, G., & Stockley, L. (2005). Consumer understanding and use of nutrition labelling: A systematic review. *Public Health Nutrition, 8*, 21–28. doi: 10.1079/PHN2004666
- Dittmar, H. & Howard, S. (2004). Thin-ideal internalization and social comparison tendency as moderators of media models' impact on women's body-focused anxiety. *Journal of Social and Clinical Psychology, 23*, 768 - 791. doi: 10.1521/jscp.23.6.768.54799
- Ferguson, C.J. (2013). In the eye of the beholder: Thin-ideal media affects some, but not most, viewers in a meta-analytic review of body dissatisfaction in women and men. *Psychology of Popular Media Culture, 2*, 20-37. doi: 10.1037/a0030766
- Ferrans, C. & Powers, M. (1985). Quality of life index: Development and psychometric properties. *Advances in Nursing Science, 8*, 15 - 24.
- Festinger, L. (1954). A theory of social comparison processes. *Human Relations, 7*, 117-140. doi: 10.1177/001872675400700202
- Fouts, G., & Burggraf K. (2000). Television situation comedies: Female weight, male negative comments, and audience reactions. *Sex Roles, 42*, 925 – 932. doi: 10.1023/A:1007054618340
- Garner, D. M. (2002). Body image and anorexia nervosa. In T. F. Cash & T. Pruzinsky (Eds.), *Body image: A handbook of theory, research, and clinical practice* (pp. 295–303). New York, NY: Guilford.

- Gerbner, G., Gross, L., Morgan, M., Signorielli, N., & Shanahan, J. (2002). Growing up with television: Cultivation processes. In D. Zillmann & J. Bryant (Eds.). *Media effects: Advances in theory and research* (43-68). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Grabe, S., Ward, L.M., & Hyde, J.S. (2008). The role of the media in body image concerns among women: A meta-analysis of experimental and correlational studies. *Psychological Bulletin, 134*, 460-476. doi: 10.1037/0033-2909.134.3.460
- Greenwood, D. (2009). Idealized TV friends and young women's body concerns. *Body Image, 6*, 97-104. doi: 10.1016/j.bodyim.2008.12.001
- Groesz, L.M., Levine, M.P., & Murnen, S.K. (2002). The effect of experimental presentation of thin media images on body satisfaction: A meta-analytic review. *International Journal of Eating Disorders, 31*, 1-16. doi: 10.1002/eat.10005
- Halliwell, E., & Dittmar, H. (2005). The role of self-improvement and self-evaluation motives in social comparisons with idealised female bodies in the media. *Body Image, 2*, 249-261. doi: 10.1016/j.bodyim.2005.05.001
- Hargreaves, D.A., & Tiggemann, M. (2009). Muscular ideal media images and men's body image: Social comparison processing and individual vulnerability. *Psychology of Men & Masculinity, 10*, 109-119. doi: 10.1037/a0014691
- Harper, B., & Tiggemann, M. (2008). The effect of thin ideal media images on women's self-objectification, mood, and body image. *Sex Roles, 58*, 649-657. doi: 10.1007/s11199-007-9379-x
- Harrison, K. (2000). The body electric: thin-ideal media and eating disorders in adolescents. *Journal of Communication, 50*, 119-143. doi: 10.1111/j.1460-2466.2000.tb02856.x

- Harrison, K., Taylor, L.D., & Marske, A.L. (2006). Women's and men's eating behavior following exposure to ideal-body images and text. *Communication Research, 33*, 507 – 529. doi: 10.1177/0093650206293247
- Helgeson, V.S., & Mickelson, K.D. (1995). Motives for social comparison. *Personality and Social Psychology Bulletin, 21*, 1200-1209. doi: 10.1177/01461672952111008
- Higgins, E.T. (1987). Self-discrepancy: A theory relating self and affect. *Psychological Review, 94*, 319 – 340. doi: 10.1037/0033-295X.94.3.319
- Holmstrom A.J. (2004). The effect of the media on body image: A meta-analysis. *Journal of Broadcasting and Electronic Media, 48*, 196-217. doi: 10.1207/s15506878jobem4802\_3
- Jones, D.C. (2001). Social comparison and body image: Attractiveness comparisons to models and peers among adolescent girls and boys. *Sex Roles, 45*, 645-664. doi: 10.1023/A:1014815725852
- Jones, D.C., & Smolak, L. (2011). Body image during adolescence: A development perspective. In B.B. Brown & M. J. Prinstein (Eds.), *Encyclopedia of adolescence* (pp. 77-86). San Diego: Academic Press.
- Knobloch-Westerwick, S., & Crane, J. (2012). A losing battle: Effects of prolonged exposure to thin-ideal images on dieting and body satisfaction. *Communication Research, 39*, 79-102. doi: 10.1177/0093650211400596
- Knobloch-Westerwick, S., & Romero, J.P. (2011). Body ideals in the media: Perceived attainability and social comparison choices. *Media Psychology, 14*, 27-48. doi: 10.1080/15213269.2010.547833
- Knobloch-Westerwick, S., Johnson, B.K., & Westerwick, A. (2013). To your health: Self-regulation of health behaviour through selective exposure to online health messages. *Journal of Communication, 63*, 807-829. doi: 10.1111/jcom.12055

- Law, C., & Labre, M.P. (2002). Cultural standards of attractiveness: A 30-year look at changes in male images in magazines. *Journal of Mass Communication Quarterly*, 79, 697–711. doi: 10.1177/107769900207900310
- Levine, M.P., & Murnen, S.K. (2009). Media, negative body image and disordered eating “Everybody knows that mass media are/are not [pick one] a cause of eating disorders”: A critical review of evidence for a causal link between media, negative body image, and disordered eating in females. *Journal of Social and Clinical Psychology*, 28, 9-42. doi: 10.1521/jscp.2009.28.1.9
- Lockwood, P., & Kunda, Z. (1997). Superstars and me: Predicting the impact of role models on the self. *Journal of Personality and Social Psychology*, 73, 91-103. doi: 10.1037/0022-3514.73.1.91
- López-Guimerà, G., Levine, M. P., Sánchez-carracedo, D., & Fauquet, J. (2010). Influence of mass media on body image and eating disordered attitudes and behaviors in females: A review of effects and processes. *Media Psychology*, 13, 387 - 416. doi: 10.1080/15213269.2010.525737
- Martin, M.C., & Gentry, J.W. (1997). Stuck in the model trap: The effects of beautiful models in ads on female pre-adolescents and adolescents. *Journal of Advertising*, 26, 19-33. doi: 10.1080/00913367.1997.10673520
- Mayer, R.E., Massa, L.J. (2003). Three facets of visual and verbal learners: Cognitive ability, cognitive style, and learning preference. *Journal of Educational Psychology*, 95, 833-846. doi: 10.1037/0022-0663.95.4.833
- Milkie, M.A. (1999). Social comparisons, reflected appraisals, and mass media: The impact of pervasive beauty images on Black and White girls’ self-concepts. *Social Psychology Quarterly*, 62, 190-210. doi: 10.2307/2695857



- Mills, J. S., Polivy, J., Herman, P., & Tiggemann, M. (2002). Effects of exposure to thin media images: Evidence of self-enhancement among restrained eaters. *Personality and Social Psychology Bulletin*, *29*, 1687–1699. doi: 10.1177/014616702237650
- Morry, M. M., & Staska, S. L. (2001). Magazine exposure: Internalization, self objectification, eating attitudes, and body satisfaction in male and female university students. *Canadian Journal of Behavioural Science*, *33*, 269-279. doi: 10.1037/h0087148
- Nelson, M.C., Story, M., Larson, N.I., Neumark-Sztainer, D., & Lytle, L.A. (2008). Emerging adulthood and college-aged youth: An overlooked age for weight-related behaviour change. *Obesity*, *16*, 2205–2211. doi: 10.1038/oby.2008.365
- Neumark-Sztainer, D., Paxton, S.J., Hannan, P.J., Haines, J., & Story, M. (2006). Does body satisfaction matter? Five-year longitudinal associations between body satisfaction and health behaviors in adolescent females and males. *Journal of Adolescent Health*, *39*, 244-251. doi: 10.1016/j.jadohealth.2005.12.001
- O’Keefe, D.J. (2003). Message properties, mediating states, and manipulation checks: Claims, evidence, and data analysis in experimental persuasive message effects research. *Communication Theory*, *13*, 251-274. doi: 10.1111/j.1468-2885.2003.tb00292.x
- Olivarda, R., Pope Jr., H. G., Borowiecki III, J. J. & Cohane, G. H. (2004). Biceps and body image: The relationship between muscularity and self-esteem, depression, and eating disorder symptoms. *Psychology of Men & Masculinity*, *5*, 112 - 120. doi: 10.1037/1524-9220.5.2.112
- Paeratakul, S., White, M. A., Williamson, D. A., & Ryan, D. H., & Bray, G. A. (2002). Sex, race/ethnicity, socioeconomic status, and BMI in relation to self-perception of overweight. *Obesity Research*, *10*, 345-350. doi: 10.1038/oby.2002.48

- Roberts, A., & Good, E. (2010). Media images and female body dissatisfaction: The moderating effects of the five-factor traits. *Eating Behaviors, 11*, 211-216. doi: 10.1016/j.eatbeh.2010.04.002
- Sarge, M., & Knobloch-Westerwick, S. (2013). Impacts of efficacy and exemplification in an online message about weight loss on weight management self-efficacy, satisfaction and personal importance. *Journal of Health Communication, 18*, 827-844. doi: 10.1080/10810730.2012.757392
- Schutz, H. K., Paxton, S. J., & Wertheim, E. H. (2002). Investigation of body comparison among adolescent girls. *Journal of Applied Social Psychology, 32*, 1906-1937. doi: 10.1111/j.1559-1816.2002.tb00264.x
- Senn, S. (2006). Change from baseline and analysis of covariance revisited. *Statistics in Medicine, 25*(24), 4334-44. doi: 10.1002/sim.2682
- Spettigue, W., & Henderson, K.A. (2004). Eating disorders and the role of the media. *The Canadian Child and Adolescent Psychiatry Review, 13*, 16-19.
- Suls, J., Martin, R., & Wheeler, L. (2002). Social comparison: Why, with whom and with what effect? *Current Directions in Psychological Science, 11*, 159-163. doi: 10.1111/1467-8721.00191
- Sypeck, M.F., Gray, J.J., & Ahrens, A.H. (2004). No longer just a pretty face: Fashion magazines' depictions of ideal female beauty from 1959 to 1999. *International Journal of Eating Disorders, 36*(3), 342-347. doi: 10.1002/eat.20039
- Tantleff-Dunn, S., Barnes, R.D., & Larose, J.G. (2011). It's Not Just a "Woman Thing:" The Current State of Normative Discontent. *Eating Disorders, 19*, 392-402. doi: 10.1080/10640266.2011.609088

- Tiggeman, M., & McGill, B. (2004). The role of social comparison in the effect of magazine advertisements on women's mood and body dissatisfaction. *Journal of Social and Clinical Psychology, 23*, 23-44.
- Tiggemann, M., & Polivy, J. (2010). Upward and downward: Social comparison processing of thin idealized media images. *Psychology of Women Quarterly, 34*, 356-364. doi: 10.1111/j.1471-6402.2010.01581.x
- Tiggemann, M. (2014). The status of media effects on body image research: Commentary on articles in the themed issue on body image and media. *Media Psychology, 17*, 127-133. doi: 10.1080/15213269.2014.891822
- Thompson, J.K., Heinberg, L., & Tantleff, S. (1991). The physical appearance comparison scale (PACS). *The Behavior Therapist, 14*, 174.
- Veldhuis, J., Konijn, E.A., & Seidell, J.C. (2012). Weight information labels on media models reduce body dissatisfaction in adolescent girls. *Journal of Adolescent Health, 50*, 600-606. doi: 10.1016/j.jadohealth.2011.10.249
- Veldhuis, J., & Konijn, E. A., & Seidell, J.C. (2014a). Negotiated media effects: Peer feedback modifies effects of media's thin-body ideal on adolescent girls. *Appetite, 73*, 172-182. doi: 10.1016/j.appet.2013.10.023
- Veldhuis, J., Konijn, E. A., & Seidell, J.C. (2014b). Counteracting media's thin body ideal in adolescent girls: informing is more effective than warning. *Media Psychology, 17*, 154-184. doi: 10.1080/15213269.2013.788327
- Want, S. C. (2009). Meta-analytic moderators of experimental exposure to media portrayals of women on female appearance satisfaction: Social comparisons as automatic processes. *Body Image, 6*, 257-269. doi: 10.1016/j.bodyim.2009.07.008

Webb, J.B., Warren-Findlow, J., Chou, J., & Adams, L (2013). Do you see what I see? An exploration of interethnic ideal body size comparisons among college women. *Body Image, 10*, 369–379. doi: 10.1016/j.bodyim.2013.03.005

Wheeler, L. , & Miyake, K. (1992). Social comparison in everyday life. *Journal of Personality and Social Psychology, 62*, 760-773. doi: 10.1037/0022-3514.62.5.760

World Health Organization (2006). *Constitution of the World Health Organization. Basic Documents, Forty-fifth edition, Supplement, October 2006*. Retrieved from <http://www.who.int/about/definition/en/print.html> (accessed May 18, 2015).

World Health Organization (2015). *Obesity and overweight. Fact sheet N°311*. Retrieved from <http://www.who.int/mediacentre/factsheets/fs311/> (accessed May 7, 2015).

### Endnotes

<sup>1</sup> Body Mass Index was calculated by dividing self-reported weight (in kilograms) by squared height (in meters).

<sup>2</sup> A trait measure of physical appearance comparison was measured with Physical Attractiveness Comparison Scale (PACS; Thompson, Heinberg, & Tantleff, 1991). These 5 items (4 indicative) on a 5-point scale (1 = totally disagree; 5 = totally agree) formed a reliable scale (Cronbach's alpha = .72).

<sup>3</sup> Magazine use was assessed with 1 item on how many magazines were read during the past week (11-point scale from 'not at all', '1', '2', [...], '10 or more').

<sup>4</sup> In the main study, respondents evaluated the portrayed models' thinness (10-point scale: very thin, fit - very big, out of shape) and attractiveness (10-point scale: very unattractive, ugly - very attractive, beautiful; measurements were in line with previous studies (e.g., Veldhuis et al., 2014b; Martin and Gentry, 1997). Scores for both covers within an experimental condition added up to sum scores for model thinness ( $r = .369, p < .01$ ) and model attractiveness ( $r = .342, p < .01$ ). A MANOVA revealed that the portrayed models' thinness and attractiveness were evaluated similarly across experimental conditions (multivariate effect: Wilks'  $\lambda = .974, F(4,292) = 1.03, p = .392, \eta p^2 = .01$ ; univariate  $F$ -tests:  $p = .381$  for model thinness, and  $p = .338$  for model attractiveness).

<sup>5</sup> The pattern of (non-)significance of this repeated measures ANOVA as well as subsequent pairwise comparisons (Sidak) did not change when BMI was included as a covariate.

<sup>6</sup> Senn (2006) discusses the (favorable) use of analysis of covariance (ANCOVA), compared to the simple analysis of change scores (SACS), for estimates of treatment effects and changes from baseline: including the baseline measure as a covariate, and the pre-treatment measure as dependent variable.

<sup>7</sup> This pattern of (non-)significance of this ANCOVA and subsequent pairwise comparisons (Sidak) did not change when BMI was included as a covariate.

Table 1

*Means (M) and Standard Deviations (SD) of Age, BMI, Appearance Comparison and Magazine Use per Experimental Condition (and Total)*

Condition	Age		BMI			Appearance Comparison		Magazine Use	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>range</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Self-Improvement	21.94	2.16	21.71	2.28	16.99-27.47	2.91	.74	2.10	1.13
Self-Evaluation	22.04	1.87	22.12	3.36	17.65-30.84	2.92	.81	1.92	1.22
Control	21.76	2.19	22.21	2.74	18.29-28.23	2.91	.82	1.90	1.07
Total	21.91	2.06	22.01	2.83		2.92	.79	1.97	1.14

*Note.* Distributions were equal across the experimental conditions (all *ps ns*).

Table 2

*Exact Statements for Messages used in Stimuli for the Self-Evaluation, Self-Improvement and Control Conditions, and Means (M) and Standard Deviations (SD) (per Gender and Total) of Manipulation Check Sum Scores per Experimental Condition.*

	Fit with Self-Improvement Magazine						Fit with Self-Evaluation Magazine					
	Females		Males		Total		Females		Males		Total	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
<b>Social Comparison Motives Messages</b>												
Self-Improvement (n <sub>words both covers</sub> = 29)												
Cover-1: Get this sexy, slim* & confident quickly How to shape up for the beach-body trend!												
Cover-2: Boost your body to the latest trend! Get inspired for action: the ultimate body work-out!	14.83	3.79	14.11	3.81	14.54 <sup>a</sup>	3.78	10.86	4.70	12.16	4.50	11.38 <sup>b</sup>	4.62
Self-Evaluation (n <sub>words both covers</sub> = 30)												
Cover-1: Are you this sexy, slim* & confident? Can you keep up with the beach-body trend?												
Cover-2: Compare your body to the latest trend! Check if you can live up to the ideal!	8.58	5.29	10.93	4.73	9.25 <sup>b</sup>	5.20	15.82	5.35	14.73	2.94	15.51 <sup>a</sup>	4.79
Control (n <sub>words both covers</sub> = 28)												
Cover-1: Take a break: 10 most relaxing trips Plus: fun facts on dazzling holiday resorts												
Cover-2: Favorite time-out sound tracks: Rock hits Gift guide: Trendy vacation gadgets on page 7	3.26	2.68	4.73	3.92	3.71 <sup>c</sup>	3.14	5.59	5.09	5.40	4.61	5.53 <sup>c</sup>	4.90

*Note.* Means in columns with different subscripts indicate significant differences based on pairwise comparisons (Bonferroni),  $p < .001$ . \* ‘Slim’ is used in the messages for female participants, whereas the word ‘muscular’ is used instead for male participants in these particular messages.



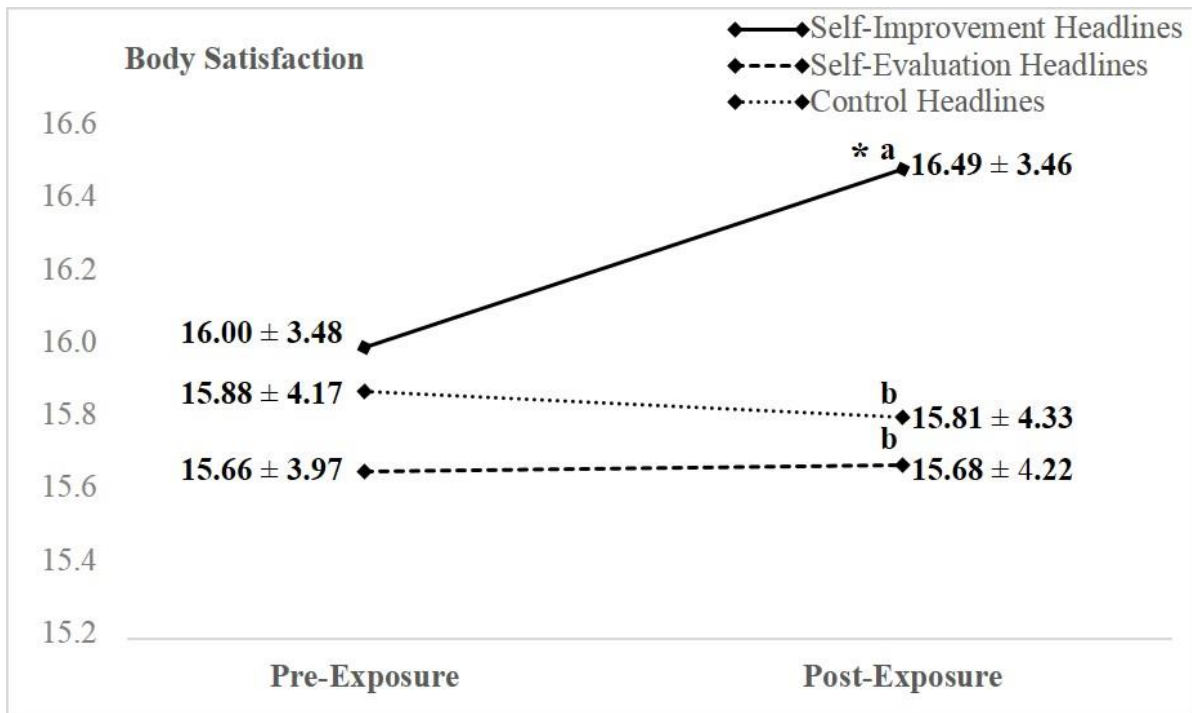


Figure 1. Pre- and post-exposure body satisfaction per social comparison motive experimental condition (numbers indicate means  $\pm$  standard deviations). Lines indicated with a \* indicate a significant difference between pre- and post-exposure, and lines with different letters indicate a significant difference in *post-exposure* body satisfaction between experimental groups, based on pairwise comparisons (Sidak),  $p < .05$ .